A STUDY OF THE IMPACT OF THE PANCHMAHAL DAIRY (A MILK PRODUCERS' CO-OPERATIVE UNION) ON MILK PRODUCERS OF PANCHMAHALS DISTRICT IN RELATION TO ANIMAL HUSBANDRY PRACTICES

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ABSTRACT

A STUDY OF THE IMPACT OF THE PANCHMAHAL DAIRY (A MILK PRODUCERS' CO-OPERATIVE UNION) ON MILK PRODUCERS OF PANCHMAHALS DISTRICT IN RELATION TO ANIMAL HUSBANDRY PRACTICES

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India is a predominantly an agricultural country, where, keeping milch animals has been never a separate occupation from agriculture. The production and consumption of milk and milk products per capita in India is very low as compared with some developed countries. The advancement in the field of dairy production and management has opened an avenue where the milk yield can be increased manifold and considerably at a short span of time with adoption of package of dairy practices. It is well known fact that the hard core of poverty is found in rural areas. The hope for solving the problems of rural poverty and under employment lies in animal husbandry. Keeping in view of this, the overall objective of this study was to know the impact of Panchmahal dairy on milk producers of Panchmahals district

in relation to animal husbandry practices.

Objectives of the study :-

1. To study the socio-economic characteristics of the milk producers of dairy and control villages.
2. To study the difference of knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.
3. To determine the difference in adoption of following improved animal husbandry practices between milk producers of dairy and control villages.
   (a) Feeding,
   (b) Watering,
   (c) Housing,
   (d) Animal breeding,
   (e) Animal health and care and
   (f) Clean milk production.
4. To determine the level of adoption of improved animal husbandry practices in relation to characteristics of milk producers.
5. To determine the attitude of members of milk producers co-operative society towards animal husbandry services / Panchmahal dairy.
6. Attitude of milk producers towards animal husbandry.

METHODOLOGY

The present study was conducted in Panchmahals district of Gujarat State. Population for the study consisted of 1 / categories of the respondents i.e. milk producers of dairy

villages and control (non-dairy) villages. There are eleven talukas in Panchmahals district, out of eleven talukas, three non-adivasi talukas were purposely selected. From each selected talnka two dairy and two control villages were selected at random. Care was taken to select villages having approximately equal population both in dairy and control villages, thus, in all twelve villages from three talukas were selected. Fifteen milk producers from dairy and control villages were selected with the help of sampling method. Thus, the sample of the study was 180. The respondents were interviewed in the month of March-April 1984.

After collecting data, results were transferred to master tables and its frequencies, percentage and transformed mean score were worked out. The chi-square test was utilised to find out the relationship between characteristics and level of adoption of improved animal husbandry practices, where the calculated value of chi-square was significant and contigency coefficient was carried out to know the association. The 't' test was worked out to know the difference in knowledge level and adoption level of the respondents of both the categories. The statistical measures were used to test the hypotheses.

Major findings :-

1. Majority of the respondents had middle age with primary education and intermediate caste group.
2. Social participation of milk producers of dairy villages was found to be higher than those of the control villages.
3. Majority of the respondents had farming as their main and

dairying as subsidiary occupation.

4. Most of the milk producers in both the groups had small and medium size of land holding, more participation in village organisations than those of control villages.
5. Majority of the respondents had joint type of family. Medium size of family was found in dairy villages and it was larger in control villages.
6. Half of the milk producers from dairy villages and slightly less than two third of the milk producers from control villages maintained 1 to 2 milch animals.
7. Majority of the respondents in both the groups had daily average milk production upto 5 litres.
8. Majority of the milk producers of the dairy villages had higher level of knowledge and adoption of improved animal husbandry practices as compared to those of control villages.
9. There was significant relationship between milk producers' level of adoption and characteristics like education and social participation.
10. Most of the milk producers of both the groups had favourable attitude towards animal husbandry.
11. There was favourable attitude of milk producers of dairy villages towards animal husbandry services of Panchmahal dairy.

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C E R T I F I C A T E

This is to certify that the thesis entitled, " A STUDY OF THE IMPACT OF THE PANCHMAHAL DAIRY (A MILK PRODUCERS' CO-OPERATIVE UNION) ON MILK PRODUCERS OF PANCHMAHALS DISTRICT IN RELATION TO ANIMAL HUSBANDRY PRACTICES" submitted by Shri Bhailalbhai Manibhai Patel, in partial fulfilment of the requirements for the degree of Master of Science (Agriculture) in the subject of Extension Education of the Gujarat Agricultural University is a record of bonafide research work carried out by him under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma or other similar title.

(H.L.PATEL)
MAJOR ADVISOR

Anand,
August 4th, 1984.

A C K N O W L E D G E M E N T

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Anand,
August 4th, 1984.

B.Patel
(Bhailalbhai M. Patel)

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INTRODUCTION

CHAPTER - I

I N T R O D U C T I O N

The emergence of Green Revolution seems to have acted like a pace setter for the introduction of White Revolution in India. India is a predominantly an agricultural country where, keeping milch animals has been never a separate occupation from agriculture. The production and consumption of milk and milk products per capita in India is very low as compared with that in some of the developed countries. Inspite of the fact that India has one-half of world's buffaloes and one-fifth of world's cattle, it is rather pity to note that the average milk production in India is very low.

The future of White Revolution could be predicted more convincingly if adequate empirical evidences about and of the most important aspects of dairy enterprise i.e. adoption of dairy innovations, be made available to the policy makers and administrators of Dairy Development Programme in India.

Adoption of dairy innovations is a key for dairy development in the country, which has been identified as an alternative occupation for the vast majority of the small and marginal farmers and landless labourers. The advancement in the field of dairy production and management has opened an avenue where the milk yield can be increased manifold and considerably at a short span of time with adoption of package of dairy practices.(31).

Most of the developing countries are having agricultural based economy and so is India's. The pdoularity of India is that the substantial parts of its population lived below the

poverty line. It is a well known fact that the hard core of poverty is found in rural areas. The poorest sections belong to the families of landless labourers, small and marginal farmers, schedule castes and schedule tribes. Unemployment and poverty are the two problems interlinked, so that solution to one would provide to some extent to the solution to the other problem too. (45)

It is obvious that one can not increase the land area. Agriculture cannot take in more people than today. Hence the hope for solving the problems of rural poverty and under-employment lies in the agricultural based i.e. agro-industries. Dairy farming is one such industry next to agriculture as source of income to the rural households. (1)

In the dairy sectors, co-operatives have recognised to be an effective measures to improve the milk production potential and thereby ameliorate the socio-economic life of millions of small, marginal and landless cattle owners scattered over large areas. The role of milk producers co-operative assumes significant dimensions in the context of the present status of dairying in India.

Milk production in this country has long been an important cottage industry (54). Inspite of covering one fifth of world's cattle population, it contributes only to the extent of 5.5. % of world's milk production. Food and Agriculture Organisation reported that there existed in India 178.38 million cattle and 57.43 million buffaloes and 94 % of milch cows, yield less than a litre of milk a day (5). The total milk production in the country, has increased during this period

from some 28.00 million tonnes (1977-78) to some 37.00 million tonnes. The per capita consumption of milk which is estimated at 107 g. (1977-78) is likely to be around 144 g. per capita according to Aneja (1)

The rapidly growing human population, vagaries of the seasons and the gap between the requirements of the population of adequate quality and quantity of food on one hand and efforts to increase food production on the other hand, have made the problem much more serious and urgent. An average diet of man in the country is very poor in many respects. But the most critical deficiency in the diet is that of animal proteins which are essential for proper growth and tissue repairs from early childhood to the old age.

The low level of milk consumption is primarily due to the poor state of milk production in the country. Owing to these facts, the need for increasing the milk production rapidly in the country is being pertinently felt. During the last decade dairying and animal husbandry programmes have received considerable attention in India's planned development.

Milk production programmes not only ensure better and balanced nutrition for the people, but also offer opportunities to the rural masses for gainful employment and supplementing the agricultural income. In many areas rural dairying assumes a special significance as an effective instrument for improving economic and social conditions of the villages, especially the weaker sections in the villages.

The dominance of private milk traders, scarcity of supply and the limitations of the procurment and processing

capacity of the organised dairy industry have prevented the country from milk production to the potential as well as desired level. To solve such problems milk co-operatives were started before more than three decades.

Gujarat occupies a place of pride in the field of co-operative dairy development in India. This is mainly due to the impressive strides which, it has taken in organising a chain of co-operative dairies in many parts of the State in the post-independent period. At present there are 11 Anand pattern dairy co-operative unions functioning in Gujarat State, they are ~~deplicated~~ depicted in figure - 1.

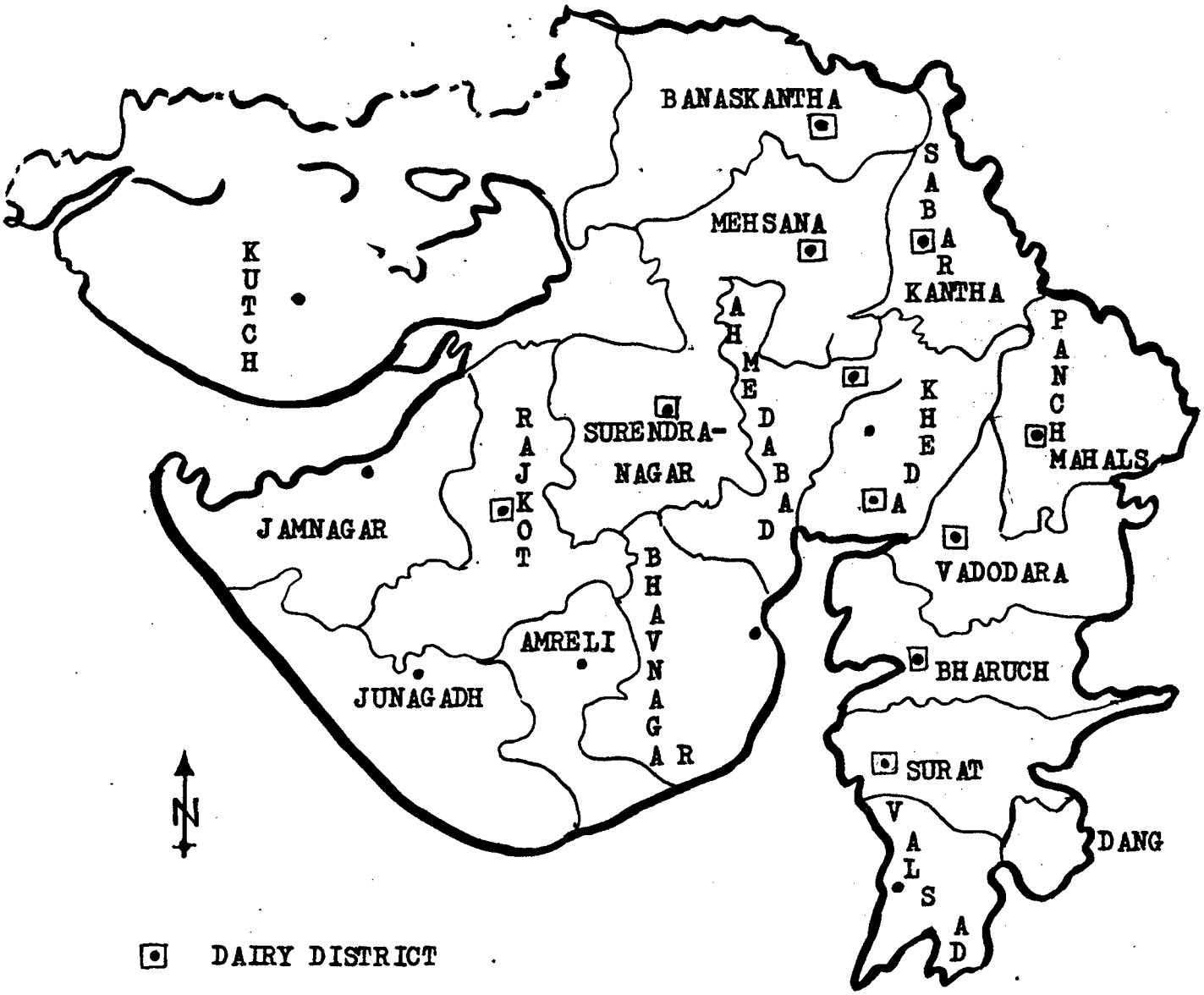
Dr. S.K.Dey rightly stated that (13) :

" The co-operative Dairy Development in Gujarat has been a phenomenal feature in this country. Lessons had to be broughtout for wider emulation by the world."

AMUL (The Kaira District Co-operative Milk Producers Union Ltd.,) pattern has become a household word in the co-operative world. 'Amul' and its affiliated village level milk producers' co-operative societies have demonstrated their utility in the rural development. The success of co-operative dairies represents a high watershed in the evolution of the co-operative movement in the country, more particularly in the State of Gujarat.

There are two popular co-operative models for Dairy Development. The first is co-operative consumers' society. In this model, the consumers get together, produce milk, process and supply to consumers ; and the other is the producers' co-operative, under which the producers of an area get together, pool their milk and market it, with or without processing.

MAP SHOWING ANAND MODEL DAIRY EXISTING IN GUJARAT STATE



⊡ DAIRY DISTRICT

(1)	ABAD DAIRY..... AHMEDABAD	(7)	PANCHMAHAL DAIRY.. GODHRA
(2)	AMUL DAIRY..... ANAND	(8)	SABAR DAIRY ..... HIMATNAGAR
(3)	BANAS DAIRY..... PALANPUR	(9)	RAJKOT DAIRY..... RAJKOT
(4)	BARODA DAIRY..... VADODARA	(10)	SUMUL DAIRY ..... SURAT
(5)	DUDHDHARA DAIRY... BHARUCH	(11)	SURENDRANAGAR DAIRY ..... SURENDRA - NAGAR
(6)	DUDHSAGAR DAIRY... MEHSANA		

FIGURE : 1

The producers' co-operative model has proved a more successful system for organising dairies (29).

Through milk societies, the co-operative milk producers' union provides number of technical inputs to the farmers for raising milk production. This has been followed by Panchmahals District Co-operative Milk Producers' Union (Panchmahal Dairy) in middle Gujarat. A really successful experiment in the field of milk co-operative has been made in the Kaira District and the same pattern of dairy industry has been followed in Panchmahals district.

Panchmahals District Co-operative Milk Producers' Union Ltd., (Panchmahal Dairy) has been established in the year 1973 on co-operative basis. Initially the milk was supplied to Amul, Baroda and Sabar dairy. It has special significance for nation's general welfare and prosperity as an industry. There are 466 milk producers' co-operative societies running in the villages of Panchmahals District associated with this dairy organisation at present. The rural development services of the union is aimed at the overall economic, educational and social uplift of the villages alongwith programmes for enhancement of milk production in the villages. The major rural development programmes and services are as under :

(1) Providing marketing facilities for milk,

(2) Formation of new milk societies and its supervision and guidance,

(3) Financial contribution to the milk societies,

(4) Business guidance and educational services to milk societies,

(5) Artificial insemination facilities at village level,

(6) Other breeding facilities at village level e.g. frequent and regular pregnancy diagnosis, infertility treatment, cross-breeding of cows etc.,

(7) Animal health and veterinary care/facilities for milch animals and effective check over genetic drain of milch animals,

(8) Programmes for balanced cattle feed and green fodder etc,

(9) Strengthening of co-operative movement,

(10) Changing the ingrained traditional attitude of rural society.

Dairy development, however, has now opened up a new era for Indian dairy farming community. The new technologies have established their superiority over the old ones. It is therefore, believed that these changes in such technologies will lead to socio-economic development of the country. Thus, dairy co-operative organisation offers an opportunity whereby the gains of the White Revolution can flow to the producers and generate a self sustaining and progressively accelerating movement momentum. (32).

Statement of the problem :-

Many research studies have been made to determine the influence of milk co-operatives in terms of social and economic changes. But no scientific and systematic efforts have been made to study the influence of such type of co-operatives in terms of increase in knowledge, adoption of improved animal husbandry practices and attitudes towards dairy farming as a whole.

Hence, an effort in this direction was made by planning and conducting a study titled as :

"A study of the impact of Panchmahal Dairy (A Milk producers' co-operative union) on milk producers of Panchmahals district in relation to animal husbandry practices."

Objectives of the study :-

The overall objective of the study was to know the impact of Panchmahal dairy on milk producers of Panchmahals district in relation to animal husbandry practices. The study was designed around the following specific objectives :

(i) To study the socio-economic characteristics of the milk producers of dairy and control villages.

(ii) To study the difference of knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.

(iii) To determine the difference in adoption of following improved animal husbandry practices between milk producers of dairy and control villages.

(a) Watering,

(b) Feeding,

(c) Housing,

(d) Animal breeding,

(e) Animal health and care and

(f) Clean milk production.

(iv) To determine the relationship between socio-economic characteristics of milk producers of dairy villages and their level of adoption of animal husbandry practices.

(v) To study the difference in attitude of members of milk producers' co-operative society towards animal husbandry services of Panchmahal dairy.

(vi) To study the attitude of milk producers towards animal husbandry.

Hypotheses :-

1. There is no relationship between milk producers of the dairy and control villages and socio-economic characteristics.
2. There is no difference between knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.
3. There is no difference in adoption of following improved animal husbandry practices between milk producers of dairy and control villages.
   (a) Watering,
   (b) Feeding,
   (c) Housing,
   (d) Animal breeding,
   (e) Animal health and care and
   (f) Clean milk production.
4. There is no significant relationship between socio-economic characteristics of milk producers of dairy villages and their level of adoption.
5. There is no difference in attitude of members of milk producers' co-operative society towards animal husbandry services of Panchmahal dairy.

6. There is unfavourable attitude of milk producers towards animal husbandry.

Importance of the study :-

This type of study will help to know as to how and what extent the organisation has been considered to be helpful by the people specially who are directly related with the organisation. Thus, this study will be of great value and use to the planners, administrators, co-operative workers, extension workers and others, who are directly or indirectly associated with the co-operative dairying.

Limitations of the study :-

This study has the limitations of time and resources for a single investigator. Hence, the present study was confined to 90 respondents of six dairy villages and 90 respondents of six control villages of Panchmahals district.

Definition of the terms :-

The terms as they are employed in this study are defined as under :

(1) Dairy villages

The villages covered by district co-operative milk producers union limited.

(2) Control villages

The villages not covered by district co-operative milk producers' union limited.

(3) Adoption

Adoption is a decision to continue full use of an innovation. The adoption process is a mental process through which an individual passes from first hearing

of an innovation to final adoption (43).

(4) Impact

Webster describes the impact as the force of impression or operation of one thing on the other, effect a forceful contact and a collusion. In simple words, it is the effect of one on the other.(37).

(5) Improved practices

Scientifically derived animal husbandry practices recommended to the dairy farmers for adoption by the Animal Husbandry Department of the state Government.

(6) Attitude

It is the negative or positive effect of the member, dairy farmer associated with dairy farming and dairying.

REVIEW OF LITERATURE

CHAPTER - II

REVIEW OF LITERATURE

Dairying has all along been considered as subsidiary occupation for the village farming community as it ensures a supplimentary income to small and marginal farmers and landless cattle owners. It also has been regarded as a major source of additional diet and income to the farmers. Now a days, milk co-operatives are the most suitable structure for dairy development. The main purpose of this investigation was to study the impact of Panchmahal dairy (A Milk producers' Co-operative Union) on milk producers' of Panchmahals district in relation to Animal Husbandry Practices. Keeping in mind the objectives of the study to establish some guideline, the related literature was reviewed and presented in this chapter.

Literature reviewed have been classified into the following heads :

2.1. Historical background of the Milk Co-operative in India and Gujarat.

2.2. Socio-economic characteristics of the milk producers.

2.3. Knowledge regarding improved animal husbandry practices.

2.4. Adoption of improved animal husbandry practices.

2.5. Socio-economic characteristics and level of adoption of improved animal husbandry practices.

2.6. Attitude towards co-operative milk producers' Union.

2.7. Attitude towards animal husbandry.

2.1. HISTORICAL BACKGROUND OF THE MILK CO-OPERATIVE IN INDIA AND GUJARAT.

There is no doubt in the fact that, to boost up the milk production and raise the socio-economic status of the dairy farmers, the several programmes have been introduced from time to time.

Prior to the independence of India, there was progress in the field of dairying as such, but after independence particularly from the initiation of First Five Year Plan (1951) the Government of India has been giving more and more attention on dairy development programmes by allocating more funds. As early as in 1970, the Government of India launched a massive programme viz : Operation Flood I and II with the ample help of European Nations and World Food Programme (WFP). Besides this, the Government of India has undertaken various schemes through organisations and institutions viz : Indian Dairy Corporation (IDC), National Dairy Development Board (NDDB), Animal Husbandry Departments of all Staton, Private Sector Organisations of milk producers co-operatives and Dairy Plants, National Dairy Research Institute (NDRI), Agricultural Universities and other dairy and Veterinary Research Centres also having production Service Programmes like Intensive Cattle Development Programme (ICDP) and key village schemes etc.

But it can not be denied that we have not achieved the desired goal. There must be counter acting forces confronting achievements as set forth. It is obvious that these are nothing but the problems or constraints in adoption of dairy innovations beside other constraints.

It is the experience of extension workers that, when they go with the introduction of new innovation that some of the farmers respond promptly, some need a lot of persuation and some resist the practice till to end. The main reason of the short coming is the lack of intermittent and firm persuation about the merits of innovations. For achieving better results, the extension workers should understand the factors influencing the adoption of innovations (31).

The first milk co-operative society established in Gujarat was the " Choryasi Taluka Co-operative Milk Marketing Society." It was registered in 1939 in Surat district. It procured the surplus milk from the villages of Choryasi Taluka and sold it in raw form in Surat city. Again in 1946, when the farmers of Kaira district felt that they were deplorably compelled to sell their milk at throwaway prices to the Government approved contractors. The Kaira District was divided into three zones where the private milk traders were operating with supreme monopoly. The poor farmers were exploited to the extent that they had lost faith in the economic activities of the milk trade. They were so much broken that they sought the advice of Sardar Vallabhbhai Patel who gave them the idea of organising their own co-operatives and sell their milk by themselves. Thus, was born the Kaira District Co-operative Milk Producers' Union.

This giant organisation had to pass through innumerable teething troubles and difficulties. The union however, was started under these odds in 1946 and could organise only 8 village milk co-operatives by 1947. But, the economic pressure

was high that, at last, the deadlock was broken and the movement started gathering momentum. Today, Amul Dairy run by the Kaira Milk Union is the largest dairy in the co-operative sector.

The Kaira Milk Union succeeded because it gave technical inputs to improve the milk yield of animals and fair price to the milk producer and high quality milk and milk products to the consumers.

Encouraged by the success of the Kaira Milk Union, farmers of the other districts in Gujarat had formed milk co-operatives on the Anand pattern.

In 1964, the then Prime Minister of India, the late Shri Lal Bahadur Shastri, visited Anand to inaugurate the Union's cattle feed plant. He recommended that co-operatives on the Anand pattern should be set up throughout the country. The National Dairy Development Board (NDDB) was set up in Anand in 1965 in pursuance of this directive.

The NDDB drew up a programme known as "Operation Flood" to replicate the Anand pattern in the milk sheds of Bombay, Delhi, Calcutta and Madras. The implementation of programme started in the year 1970 - 71 (39).

The creation of more 'Anands' was recommended also under World Bank Projects in Karnataka, Madhya Pradesh and Rajasthan. At Anand, the Kaira Union served as a 'Model Live Laboratory' and the NDDB as the 'Multiplier Agency'. At present, operation flood - II is going on and 54 co-operative milk producers' unions on Anand model are functioning in various parts of the country.

2.2. SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS.

2.2.1. Age :-

Srivastava (53) in his study found that majority of the respondents were in the age group of 30 to 49 years. Further, Gupta and Sohal (16), Bharaswadkar and Kothikhane (7) and Rabari (39) found out that most of the dairy farmers belonged to middle age group.

In another study, Katarya (23) found that, among the milk producers who had supplied milk to the milk supply scheme to a greater percentage (58.00) were in younger age group.

2.2.2. Education :-

Patel (33) in his study expressed that majority of the milk producers had education upto primary level, Dwara (15) Halyal (17) and Patel (32) have also found similar type of results.

But the studies made by Bakshi (4) and Rao and Sohal (41) reported that majority of the respondents had low education.

2.2.3. Caste :-

Dwara (15) expressed that majority of the respondents were from intermediate group. In their study Desai and Dubey (12) reported that Patels dominated over other castes (70.30 per cent) in milk producers' co-operative society. Similar trend was also reported by Patel et al. (35) and Halyal (17).

But in another study, Patel (32) revealed that dairy farming occupation has been mainly taken up by higher caste farmers.

2.2.4. Social participation :-

Rabari (39) stated that majority of the respondents from dairy villages occupied the membership in various organisation. It was also reported by Patel (33) and Patil et al. (36).

2.2.5. Occupation :-

Patel (32) in his study on " A study of the influence of Baroda dairy (A milk co-operative organisation) in relation to animal husbandry practices on milk producers of Baroda district in Gujarat State " observed that farming was main and dairying as subsidiary occupation preferred by the respondents. Similar results were also reported by Patel (33), Patel et al. (35), Dubey et al. (14) and Rao (42).

2.2.6. Land holding :-

Dave (10) found that majority of the respondents who supplied their milk to the milk co-operative society had small holdings. Bakshi (4), Patil et al. (36) and Kothikhane et al. (25) supported the same result.

In another study, Patel, Thakur and Pandey (35) concluded that majority of the milk producers in dairy and control villages were from the weaker sections (Landless and small farmers) of the society.

2.2.7. Family type and size :-

Patel (32) from his study reported that majority of the respondents from dairy and control group had nuclear type of family. These findings were supported by Srivastav (53) and Rabari (39).

Patel (33) found that majority of the dairy farmers having more than five members in the family. Saxena and Verma (44) reported the same type of results.

Patel et al. (35) pointed out that most of the families in dairy villages were of small size vis : upto five members in a family.

In another study, Gupta and Sohal (16) observed that majority of the dairy farmers having 6 to 8 members in a family i.e. medium size family.

2.2.8. Herd size :-

Rao and Sohal (41) found that majority of the dairy farmers (88.00 per cent) possessed 1 to 4 milch animals. Similar result was given by Katarya (23).

In another study, Patel and Pandey (34) stated that majority of the dairy farmers had 1 to 2 milch animals. Bakshi (4), Kamat (21), Koli (24), Jain (19), Bharaswadkar and Kothikhane (7) and Shah (46) found the same type of results in their studies.

2.2.9. Milk production :-

Rabari (39) reported that majority of the respondents from dairy and control groups had average daily milk production upto 5 litres. Similar trend was reported by Patel (32).

While, Patel (33) found in his study that majority of the respondents had average more than 5 litres of daily milk production.

2.3. KNOWLEDGE REGARDING IMPROVED ANIMAL HUSBANDRY PRACTICES

Success in extension comes only when people act on new knowledge, not when they have only expose to it. In the words of Paul Leugans (26)

> " of all the influences to which people are subjected, the influence of ideas is probably the most important. Man's greatest enslaver has always been ignorance, his greatest emancipator has always been truth understood and wisely acted upon."

Rao and Sohal (41) in their study expressed that level of knowledge pertaining to dairy husbandry practices was found to be high among the members of the co-operative societies than non co-operative milk producers.

Whereas, Rao and Sohal (40) stated that majority of the milk producers in all the three systems of milk collection were falling in medium knowledge group. This finding is strongly supported by Malik and Sohal (27) and Rabari (39).

2.4. ADOPTION OF IMPROVED ANIMAL HUSBANDRY PRACTICES.

According to Rogers (43) the adoption process is one type of decision making process. The adoption of an innovation requires a decision by an individual whether to use the new idea and cease using old or traditional one.

In this respect, Aswath (3) reported that dairy farmers had medium to high level of adoption. Patel (32) in his study also found same a result.

On the other hand, Malik and Sohal (27) found that most of the respondents had medium and low adoption level of animal husbandry practices.

2.4.1. Watering :-

Rabari (39) observed that the milk producers watered their animals from public water trough (Havada) or ponds of the village. In another study, Patel (33) revealed that more number of the respondents were serving water to their milch animals at common water through trough of the village.

2.4.2. Feeding :-

Bakshi (4) stated in his research study that out of one hundred and twenty dairy farmers, sixty seven had adopted improved feeding practices to certain extent. The number of dairy farmers, who had adopted improved feeding practices to a greater extent was fourteen, while seventeen were found to be poor adopters.

Further, Patel (33) reported that more number of the respondents who had membership for more than five years had adopted improved feeding practices as compared to respondents who had membership for five or less than five years. In the same line, Hundal and Sohal (18) found that balanced feeding was relatively better adopted by the milk suppliers in the milk-shed area of Ludhiana milk plant. This type of finding was given by Pandey et al. (30).

Further, Patel (33) stated that majority of the respondents had cultivated lucerne in winter season in the area less than 0.5 hectare. Pandey et al. (30) found that the average area under the fodder groups and the average yield per hectare of green fodder was significantly higher in the project villages.

2.4.3. Housing facility :-

Patel (33) found that large number of respondents who had membership for more than five years had provided facilities in cattleshed used for housing cattle as compared to the respondents who had membership for five years or less than five years. Similar finding was also reported by Sohi and Kherde (50) stating that practice like pucca animal shelter was adopted more by the milk producers in the study area.

2.4.4. Improved breeding practices :-

Balasubramanyam and Knight (5) reported that most of (92.50 per cent) the dairy farmers had adopted improved breeding practices. The similar finding was also reported by Bakshi (4), Sinha et al. (48), Channe Gowda et al. (9) and Patel and Pandey (34).

Patel (33) observed that more number of respondents who had membership for more than five years had more adopted artificial insemination in comparison to the respondents who had membership for five or less than five years.

Further, Sohi and Kherde (50) reported that higher risk, unprofitability, lack of facilities of supply were the main reasons for non-adoption of artificial insemination. Similar result was given by Prasad et al. (38) in his study.

Singh et al. (47) stated that majority of the non-adopters considered artificial insemination to be inhuman. Some believed that cross bred bullocks were dull, weak and less useful and a few of them were of the opinion that the conceptional rate was quite low.

2.4.5. Animal health and care :-

Bakshi (4) found that out of 120, 43 respondents had adopted improved disease control practice to a higher degree. In other study, Hundal and Sohal (18) observed that practices like vaccination against contagious diseases, deworming and oat cultivation were adopted more and least adopted practices were dehorning, cultivation of lucerne crop and use of mineral mixture.

In their study, Sohi and Kherde (50) revealed that protective vaccination against contagious diseases was more adopted by the dairy farmers whereas, deworming and dehorning were the least adopted practices.

2.4.6. Clean milk production :-

Patel, J.G. (32) reported in his investigation that the majority of the respondents had medium level of adoption. Rabari (39) and Balasubramanyam and Knight (5) expressed the same results in their research study on " Extent of Adoption of Dairy innovations."

In other study, Patel (33) stated that there was less difference in the steps followed by both the groups of milking time.

2.5. SOCIO-ECONOMIC CHARACTERISTICS AND LEVEL OF ADOPTION.

2.5.1. Age and adoption :-

The association between age and level of adoption is presented in the pages to follow. There is a logical reason to believe that age had no effect on extent of adoption. In support to this statement Rabari (39) found that there was no

significant relationship between age of the milk producers and their level of adoption. Hundal and Sohal (18) in their study proved that age of milk producers was not correlated with the adoption of improved dairy practices. This finding was in accordance with those of Kapse and Sohal (22) and Patel (32).

2.5.2. Education and adoption :-

We know that education is nothing but the process of bringing the desired changes in human behaviour. Hence, it plays an important role in the process of adoption. Education is generally believed to have the effect of widening the mental horizons of a person and thereby prepare him to be receptive to new ideas. That is why the education of farmers is the most important factor. It makes the farmers to see the advantages flowing from the adoption of improved innovations.

The various studies conducted by different researchers has revealed that degree of success in dairy farming has the direct proportion to farmers' level of education. Gupta and Sohal (16) concluded that the education of the cattle owners was found to be significantly and positively correlated with the adoption of the animal husbandry practices. Kapse and Sohal (22), Malik and Sohal (27) and Sohi and Kherde (50) had reported the same results.

2.5.3. Caste and adoption :-

It may be assumed that caste had no direct influence on extent of adoption. Dave (10) revealed that there was no significant association between caste and the feeding practices. In another study, Rabari (39) reported the similar observations.

2.5.4. Social participation and adoption :-

Malik and Sohal (27) found that there was no effect of social participation of the respondents on their level of adoption of dairy innovations. Sohi and Kherde (50) and Patel (32) observed the same type of findings in their studies.

2.5.5. Land holding and adoption :-

Benerji and Dubey (6) stated that size of holding was found to have significant relationship with the adoption of innovations. Gupta and Sohal (16) and Sohi and Kherde (50) also expressed the same type of results in their studies.

2.5.6. Herd size and adoption :-

Patel (32) found that there was no significant association between herd size of the milk producers and their level of adoption of improved animal husbandry practices. This finding was also supported by Rebari (39).

2.6. ATTITUDE TOWARDS CO-OPERATIVE MILK PRODUCERS' UNION.

An attitude is a learned, emotionally formed predisposition to react in consistant way favourable or unfavourable towards a person, things and ideas.

Favourable attitude is a basic requisite for effective and successful functioning of the dairy co-operatives. One step going further, it may be inferred that favourable attitude is a forerunner of the active participation of the members of daily working of dairy co-operatives.

Further, attitude is a mental and natural state of readiness to respond, organised through experience exhorting a directive and/or dynamic influence on behaviour.

Patel (32) observed that most of the milk producers had favourable attitude towards dairy farming. In their study Bakshi (4), Patel (33), Rabari (39), Srinivas and Reddy (52) reported same result.

2.7. ATTITUDE TOWARDS ANIMAL HUSBANDRY.

Bakshi (4) stated that majority of the respondents had favourable attitude towards milk supply scheme. Hattemvar (55) also observed similar result.

METHODOLOGY

CHAPTER - III

METHODOLOGY

This chapter is concerned with the research design, tools and techniques of a scientific investigation employed in the light of the objective of the present study. The procedure employed for carrying out this study has been presented under the following heads :

3.1. Area of study.

3.2. Selection of the talukas.

3.3. Selection of the villages.

3.4. Selection of the respondents.

3.5. Construction of the interview schedule.

3.6. Collection of data.

3.7. Statistical framework for analysis of the data.

3.1. Area of study :-

The main idea behind this investigation was to study of the impact of the Panchmahal Dairy (A milk producers' co-operative union) on milk Producers of Panchmahals district in relation to Animal Husbandry Practices. Accordingly, the Panchmahals district was selected purposively for this investigation. The district is consisting of eleven talukas. Taluka - wise number of dairy villages and non-dairy villages (control villages) have been presented in Table I.

TABLE I

TALUKAWISE NUMBER OF DAIRY AND CONTROL VILLAGES

Sr.No.	Name of taluka	Dairy villages Number	Control villages Number	Total villages
1.	Dahod	25	96	121
2.	Devgadh Baria	41	143	184
3.	Godhra	60	102	162
4.	Halol	42	83	125
5.	Jambughoda	4	51	55
6.	Kalol	52	19	71
7.	Limkheda	19	225	244
8.	Lunawada	137	202	339
9.	Santrampur	27	364	391
10.	Shahera	40	49	89
11.	Zalod	19	133	152
	Total	466	1467	1933

In Panchmahals district there were totally 1933 villages. According to census 1971, there were 466 dairy villages and 1467 non-dairy villages (2).

3.2. Selection of the talukas :-

There are eleven (6 non-adivasi and 5 adivasi) talukas in Panchmahals district. Out of 6 non-adivasi talukas, three talukas viz. Godhra, Kalol and Lunawada were selected purposely because there were more number of milk co-operatives in these three talukas. Moreover, before the starting of Panchmahal's dairy plant, the milk was supplied to Amul, Baroda and Saber dairy. There were old milk co-operatives existing in these three talukas.

3.3. Selection of the villages :-

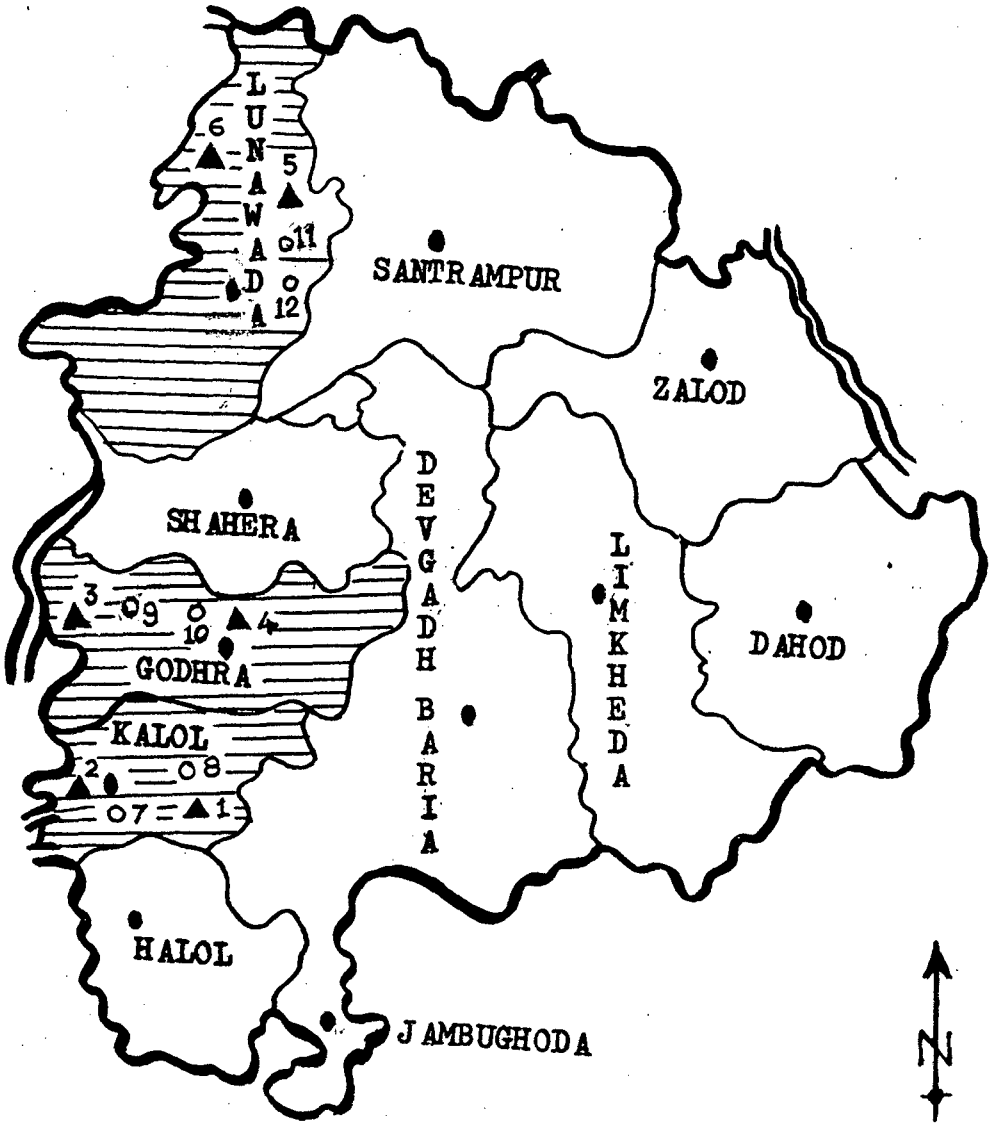
From each randomly selected taluka, two dairy and two control villages were selected at random for this study. The population record of all these randomly selected villages was obtained from census 1971 (2). Care was taken to select villages having approximately equal population both in dairy and control villages, thus twelve villages from three talukas were selected. The location of the villages have been shown in the map of Panchmahals district in figure - 2.

3.4. Selection of the respondents :-

The list of the members of all the six dairy villages were obtained from the secretaries of the respective village milk producers' co-operative societies. The name of the members were arranged in alphabetical order. From these lists fifteen milk producers' from each dairy village were selected with the help of sampling method. Thus ninety respondents from dairy villages were interviewed for this study.

In respect of six control villages the list of milk producers was obtained from sarpanch and land revenue officer at village level of the respective selected control villages. The name of milk producers' were arranged in alphabetical order. From these lists fifteen milk producers from each control village were selected with the help of sampling method. Thus, the sample from control villages consisted of ninety respondents.

MAP OF PANCHMAHALS DISTRICT SHOWING VILLAGES UNDER STUDY



● TALUKA HEADQUARTER

NO.	DAIRY VILLAGES ▲	NO.	CONTROL VILLAGES ○
1.	ALVA	7.	KATOL
2.	PINGADI	8.	KARADA
3.	RATANPUR (K)	9.	VINZOL
4.	AMBALI	10.	SHAMLI
5.	NARODA	11.	MOTASONELA
6.	VADAGAM	12.	SAJJANPUR

FIGURE : 2

Hence, the total sample of milk producers from dairy and non dairy villages consisted of 180 families spread all over the twelve villages of Panchmahals district. The village wise distribution of respondents interviewed have been given in Table II.

TABLE II

VILLAGE WISE DISTRIBUTION OF THE RESPONDENTS

Sr.No.	Name of Taluka	Name of Dairy villages	No. of respondents interviewed	Name of Control villages	No. of respondents interviewed
1.	Godhra	Ambali	15	Shamli	15
		Ratanpur(k)	15	Vinzol	15
2.	Kalol	Alva	15	Karada	15
		Pingadi	15	Katol	15
3.	Lunawada	Naroda	15	Motasonela	15
		Vadagam	15	Sajjanpur	15
	Total		90		90 = 180

3.5. Construction of the Interview schedule :-

To get the correct response and information from the respondents, the interview schedule was considered as one of the most appropriate tools. Keeping in view the objectives of the study and respondents' background common schedule was prepared for both the categories of milk producers. In formulating questions and statements for schedule, the investigator secured technical guidance from the available

literature and teaching staff of Extension Education Institute, Anand. The help of professors of Animal Husbandry Department, Veterinary College, Anand was also taken. The schedule was circulated to the post-graduate students of the extension department and professors of Animal Husbandry Department of Veterinary College, Anand with a request to give their suggestions. The suggestions, thus obtained were incorporated in the interview schedule. Then, the revised schedule was translated into Gujarati language with the help of Gujarati language professor, so that it could be understood by the respondents in the villages. Afterwards the interview schedule was pretested with ten respondents to test the accuracy and clarity of responses. On the basis of pretesting the interview schedule was revised after few changes to make it deem valid for collection of data. English version of the final interview schedule which was used for this study has been given at Appendix 'I'.

3.6. Collection of data :-

The interview schedule developed for this study was used for collecting information by personal interview, from 90 milk producers of dairy villages and 90 milk producers of control villages in twelve selected villages of three non adivasi talukas namely Godhra, Kalol and Lunawada of Panchmahals district.

The respondents were contacted individually at their home or at milk co-operative society's building, in some cases

on their farms and at common places in the villages. At the time of interview all possible efforts were made to develop due rapport with them. The aims and objectives of the study were explained to them with a view to facilitate them in in giving correct responses. The questions from the schedule were asked to them one by one and their responses were recorded in the schedule. The data were collected during the month of March and April 1984.

3.7. Statistical framework for analysis of the data :-

The data were tabulated, organised, analysed and presented in such a way that it may give proper representation and answer to the specific objectives of the study.

I. PERSONAL CHARACTERISTICS

To describe the respondents according to their personal characteristics, the respondents were grouped into different categories on the basis of available data as under(20).

(i) Age :-

The data regarding age of the respondents were collected and divided into three age groups i.e.

(a) Young age group (upto 35 years)
(b) Middle age group (36 to 50 years)
(c) Old age group (above 50 years)

(ii) Education :-

Information regarding formal education was collected according to their level of education and respondents were categorised into four categories, i.e.

(a) Illiterate

(b) Primary

(c) Secondary

(d) College

(iii) Caste :-

The respondents were divided into three categories of caste as suggested by Desai (11) as follows.

(a)	Higher caste	(Patel, Brahmin and Baniya)
(b)	Intermediate caste	(Solanki, Raolji, Rajput, Barot, Mistry, Chauhan and Thakor)
(c)	Lower caste	(Vanker, Chamar, Harijan and Naik)

(iv) Social participation :-

Information regarding membership in rural organisations was collected and categorised as under :

(a) No participation

(b) Participation in one organisation.

(c) Participation in two organisations.

(d) Participation in more than two organisations.

(e) Holding of position.

(v) Occupation :-

Information regarding occupation was collected and categorised as :

(a) Main occupation

(a) Farming
(b) Dairying
(c) Service
(d) Business

(b) Subsidiary occupation

(a) Farming
(b) Dairying
(c) Service Agril. labour work
(d) Business.

(vi) Land holding :-

It was measured by asking the respondents to indicate the actual area of land cultivated by them at the time of interview. The collected information was divided into four groups i.e.

(a) Landless
(b) Small holders (upto 2 hectares)
(c) Medium holders (2.1 to 4.0 hectares)
(d) Large holders (above 4.0 hectares)

(vii) Type and size of family :-

Information regarding type and size of family was obtained and classified into two and three groups respectively. For the type of family two groups i.e.

(a) Nuclear
(b) Joint

For the size of the family three groups i.e.

(a) Small size (upto 5 members)
(b) Medium size (6 to 8 members)
(c) Large size (above 8 members)

(viii) Herd size :-

The term herd size indicates only the number of milch animals. It was measured by asking the respondents about the milch animals kept by them. The information regarding herd size was stratified into three groups viz.

(a) Small size (upto 2 milch animals)

(b) Medium size (3 to 4 milch animals)

(c) Large size (above 4 milch animals)

(ix) Daily milk production and mode of selling milk :-

Information regarding daily milk production was collected and categorised into three groups i.e.

(a) Upto 5.0 litres/day

(b) From 5.1 to 10.0 litres/day

(c) Above 10.0 litres/day.

As regards the mode of selling milk, they were categorised into following four groups :

(a) Milk co-operative society

(b) Retail milk buyer

(c) Neighbour

(d) Convert into ghee for sale.

(x) Measurement of knowledge :-

To measure the knowledge of the respondents in respect of improved animal husbandry practices, the respondents were asked about their knowledge regarding improved animal husbandry practices like feeding, breeding and management. A set of twenty four statements pertaining to above aspects of animal husbandry was put to the respondents. Equal weightage was given to the statements. Then, the score value was assigned to each statement and the total score regarding knowledge was obtained. On the basis of the information received, the stratification of farmers was done as low, medium and high. The formula used for calculating the knowledge index is given on the next page (20).

$$K_i = \frac{X_1 + X_2 + \ldots\ldots\ldots X_n}{N} \times 100$$

Where,

K_i = Knowledge index

$X_1 + X_2 \_\_\_\_\_ + X_n$ = Total number of correct and 'yes' responses.

N = Total number of items in the test.

The knowledge index was calculated for every respondent. Later on, all the respondents were grouped into three levels of knowledge as follow :

1. Low level of knowledge : 0 to 33 score.
2. Medium level of knowledge: 34 to 66 score.
3. High level of knowledge : 67 to 100 score.

(b) Measurement of level of adoption :-

The information regarding the level of adoption of each of the selected practices was collected.

To compute the score of adoption of each improved animal husbandry practice adopted by the farmers, the scoring of each practice was determined by seeking the opinion of the judging committee of 5 professors of Veterinary College of the Gujarat Agricultural University, Anand Campus, Anand.

The total score obtained by individual milk producer and sum of the total of all the respondents were calculated separately for each selected practice. With the help of mean ($\bar{X}$) and standard deviation (S.D.) the respondents were categorised as high, medium and low with respect to their level of adoption.

Level of adoption	Limit
High	$\bar{X}$ + S.D.
Medium	In between upper and lower limit.
Low	$\bar{X}$ - S.D.

TABLE III

SCORING PROCEDURE FOR DETERMINING THE LEVEL OF ADOPTION OF THE RESPONDENTS WITH RESPECT TO IMPROVED ANIMAL HUSBANDRY PRACTICES

Sr.No.	Item	Score Value	Level of adoption	Scoring range
1.	Watering	0 - 7	High	Above - 3
			Medium	2 to 3
			Lower	below 2
2.	Feeding	0 - 25	High	Above - 10
			Medium	6 to 10
			Lower	Below 6
3.	Housing	0 - 6	High	Above - 3
			Medium	2 to 3
			Lower	Below 2.
4.	Animal Breeding	0 - 5	High	Above - 3
			Medium	2 to 3
			Lower	Below - 2.
5.	Animal Health & Care	0 - 7	High	Above - 3
			Medium	2 to 3
			Lower	Below - 2.
6.	Clean Milk Production	0 - 12	High	Above - 7
			Medium	5 to 7
			Lower	Below - 5.
7.	Overall adoption	0 - 62	High	Above - 30
			Medium	21 to 30
			Lower	Below - 21.

(C) DEVELOPMENT OF ATTITUDE SCALE

Likert attitude measurement scale was used to measure the attitude towards dairy farming and dairying, the scale value was given in the following manner for positive statements which indicate favourable attitude (8).

Sr.No.	Response category	Score value
1.	Strongly agree	5
2.	Agree	4
3.	No opinion	3
4.	Disagree	2
5.	Strongly disagree	1

In case of negative statements, the score was given in a reverse manner.

The total score for each respondent was then calculated by summing over the score value of each statement. The scale concerning attitude towards dairy farming and dairying, had separate nine statements. The maximum possible score was forty five, while minimum possible score was nine. The total score value for neutral response i.e. no opinion response for nine statements was twenty seven. Therefore, the favourable attitude was considered when total score value was above twenty seven and unfavourable when total score value obtained was less than twenty seven.

II. Statistical methods used :-

(a) 't' Test :-

In order to determine the difference between milk producers of dairy and control villages for their knowledge

and level of adoption squareroot transformation was utilized to stabilise the variance more effectively. Transformation of $\sqrt{x}$ category is effective in which counts of rare events when the counts are small $\sqrt{x + 1}$ category is effective. After transforming the score value, Fisher's 't' test was applied by using the following formula (8).

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S.E.\ (\bar{X}_1 - \bar{X}_2)}$$

Where,

$\bar{X}_1$ = Mean of sample - 1.

$\bar{X}_2$ = Mean of sample - 2.

$S.E.\ (\bar{X}_1 - \bar{X}_2)$ = Standard error of sample - 1 and sample - 2.

$$S.E.\ (\bar{X}_1 - \bar{X}_2) = \sqrt{S^2P \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Where,

S^2P = Pooled variance of both the sample,

n_1 = Total number of sample - 1.

n_2 = Total number of sample - 2.

Pooled variance,

$$S^2P = \frac{Ex_1^2 - \frac{(Ex_1)^2}{n} + Ex_2^2 - \frac{(Ex_2)^2}{n}}{(n_1 - 1) + (n_2 - 1)}$$

Where,

$Ex_1^2 - \frac{(Ex_1)^2}{n}$ = SS of sample - 1.

$Ex_2^2 - \frac{(Ex_2)^2}{n}$ = SS of sample - 2.

(b) Chi - square test :-

In order to test the null hypotheses and relationship between independent and dependent variables, the chi-square test was applied by using following formula (8).

$$\chi^2 = \frac{\sum (O - E)^2}{E}$$

Where χ^2 = Chi-square,

$\sum$ = Summation,

O = Observed frequency in the group,

E = Expected frequency in the group.

For calculating expected frequency of a group, following formula was used.

$$E_{ij} = \frac{R_i C_j}{N}$$

Where,

E_{ij} = Expected frequency for a cell belonging to i^{th} row and j^{th} column.

R_i = i^{th} row total,

C_j = j^{th} column total,

N = Total frequency.

In addition to this, frequencies and percentages were used for presenting the data.

Contigency Coefficient was computed when the calculated chi-square value was significant. The formula is given as under.

$$C = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

C = Contigency coefficient

χ^2 = Calculated chi-square value

N = Number of observation.

FINDINGS AND DISCUSSION

CHAPTER IV

FINDINGS AND DISCUSSION

This chapter deals with the presentation, analysis, interpretation and discussion of the data. The data collected through personal interview with the help of structured interview schedule, have been classified, tabulated, analysed, presented, interpreted and discussed in a systematic and scientific way in light of the objectives of the study. The statistical tests deemed as proper were applied wherever necessary. The facts and findings of the study are grouped in the following heads and discussed in the succeeding pages seriatim as per the objectives of the study.

4.1. Socio-economic characteristics of milk producers of dairy and control villages.

4.2. Difference of knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.

4.3. Difference in adoption of improved animal husbandry practices between milk producers of dairy and control villages.

4.4. Relationship between socio-economic characteristics of the milk producers of dairy villages and their level of adoption.

4.5. Attitudes of members of milk producers co-operative society towards animal husbandry services of Panchmahal dairy.

4.6. Attitude of milk producers towards animal husbandry.

4.1. SOCIO-ECONOMIC CHARACTERISTICS OF MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES.

It is generally believed that socio-economic characteristics play an important role in modernization of dairy farming occupation. Keeping this in view, the data about socio-economic characteristics of milk producers of dairy and control villages were collected and presented in the following sequence :

i. Age,
ii. Education,
iii. Caste,
iv. Social participation,
v. Occupation,
vi. Land holding,
vii. Type and size of family,
viii. Herd size,
ix. Daily milk production and mode of selling.

(i) Age :-

Based on the cultural notions, the respondents were classified age wise into three age groups as (i) Young age group (upto 35 years), (ii) Middle age group (36 to 50 years) and (iii) Old age group (Above 50 years). The data collected from the respondents in this regard are presented in Table IV.

TABLE IV.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR AGE GROUP

Sr. No.	Age group	Milk producers				Chi-square value
		Dairy villages		Control villages		
		Number	Percent	Number	Percent	
1.	Young age group (upto 35 years)	22	24.44	19	21.11	
2.	Middle age group (36-50 years)	46	51.12	50	55.56	0.408 Non-significant.
3.	Old age group (Above 50 years)	22	24.44	21	23.33	
	Total	90	100.00	90	100.00	

It can been seen from the Table IV that slightly more than half (51.12 per cent and 55.56 per cent) of the respondents from dairy and control villages belonged to middle age group i.e. 36 to 50 years respectively. Thus, it can be said that majority of the milk producers in both the groups were from middle age group. This finding is in accordance with those of Gupta and Sohal (16), Bhareswadkar and Kothikhane (7), Rabari (39) and Patel (32).

The percentage of milk producers of dairy villages are equal (24.44) in young and old age groups, while in control villages 21.11 per cent of the respondents belonged to the young age group and 23.33 per cent of the respondents belonged to the old age group.

The chi-square value (0.408) was non-significant at 5 per cent level of significance, which indicates that the respondents from both the groups were more or less equal in the age group.

(ii) Education :-

Educational level of a farmer plays an important role in the understanding of new innovations regarding development of dairy farming. For the purpose of proper presentation of data, the respondents were categorised into four educational groups namely (i) Illiterate, (ii) Primary education, (iii) Secondary education and (iv) College education. The data have been presented in Table V.

TABLE V

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR EDUCATIONAL LEVEL

Educational level	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Illiterate	14	15.56	23	25.56	
Primary	57	66.33	52	57.78	3.952
Secondary	16	17.78	15	16.66	Non-significant
College	3	3.33	0	0.00	
Total	90	100.00	90	100.00	

The information given in Table V reveals that majority (66.33 per cent and 57.78 per cent) of the respondents from dairy villages and from control villages had taken education upto primary level respectively. While 15.56 per cent and 25.56 per cent of the milk producers from dairy villages and control villages respectively were illiterate. Thus, it is clear from the above table that in both the groups, majority of the milk producers possessed education upto primary level. The majority of the respondents from both the groups were found to be in middle age group, so they might have not

attended school in past due to lack of educational facility or due to less importance given to the education in the past by the rural society. It may be also due to the reason that since the villages are situated in somewhat interior part and because of lack of all weather transport facilities, the people of the villages might have not availed the benefit for secondary education in the near by villages. This finding is supported by Patel (33), Dwara (15) and Rabari(39).

The calculated chi-square value (3.952) shows non-significant trend. It indicates that there is no significant difference between the levels of formal education among milk producers in dairy and control villages.

(iii) Caste :-

The purpose of the study was also to know whether the caste of the milk producers affects in their dairy profession. The respondents were divided into three categories of caste as suggested by Desai (11).

(i)	Higher caste	(Patel, Brahmin, Baniya)
(ii)	Intermediate caste	(Solanki, Raolji, Rajput, Barot, Mistry, Chauhan and Thakor)
(iii)	Lower caste	(Vankar, Harijan, Chamar, and Naik)

The data regarding the caste of milk producers are presented in Table VI.

TABLE VI.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR CASTE

Caste status	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Higher	34	37.78	19	21.11	10.876**
Intermediate	51	56.67	54	60.00	
Lower	5	5.55	17	18.89	
Total	90	100.00	90	100.00	

** Significant at 1 % level of significance.

From the data presented in Table VI, it is observed that 51 milk producers (56.67 per cent) from dairy villages and 54 (60.00 per cent) milk producers ~~from~~ from control villages fall in intermediate caste group, while 34(37.78 per cent) milk producers from dairy villages and 19 (21.11 per cent) milk producers from control villages were from higher caste group.

It is clearly observed from the data that majority of the respondents in both the groups were from higher and intermediate caste groups. It can be concluded that dairy farming occupation has been mainly taken up by higher and intermediate caste farmers. This finding is in line with the findings of Patel et al. (35), Desai and Dubey (12) and Patel (32). While referring to the caste, it was observed that there was significant relationship in both the groups. Thus, the milk producers of both the groups differed with respect to their caste. This might have happened because of the comparatively better economic condition of the higher caste group. Again, the contigency coefficient value (0.33)

indicates that there is fairly association between caste and dairy profession of milk producers.

(iv) Social participation :-

Membership and position held by a farmer in various rural organisations indicates his social participation status in his community. In the present study, the social participation of milk producers were stratified as member of one organisation, member of two organisations and member of more than two organisations and holding the position in any of the organisation. The data in this regard are presented in Table VII.

TABLE VII.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR SOCIAL PARTICIPATION

Type of social participation	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
No participation	0	0.00	44	48.89	
Participation in one organisation	26	28.89	40	44.44	
Participation in two organisation	48	53.33	2	2.22	98.624 **
Participation in more than two organisation	8	8.89	0	0.00	
Holding of position	8	8.89	4	4.45	
Total	90	100.00	90	100.00	

** Indicates significant at 1 % level of significance.

It is concluded from the Table VII that there was not a single respondent without membership in dairy villages, while nearly one half of the respondents (44) of the milk producers in control villages were not participating in any of the organisations. Further, 53.33 per cent of the milk producers

from dairy villages belonged to the category of membership in two organisations, ~~53.33~~ and 28.89 per cent in one organisation. Respondents from both the categories like participation in more than two organisations and holding position belonged to dairy villages were 8.89 per cent, while, there was no respondent participating in more than two organisations and only 4.45 per cent respondents were holding position in some organisation from control villages.

Thus, it can be seen that majority of the milk producers from dairy villages occupied more membership in various organisations than those of control villages. This finding is supported by Patel (33) and Patil et al. (36). They observed that majority of the milk producers were the members of the milk producers' co-operative society and other co-operative organisations in the villages.

The calculated chi-square value (98.624) shows the high significant difference in social participation of milk producers in both the groups to a considerable extent. This might be due to non-existance of milk producers' co-operative society in control villages. Further, contigency coefficient value (0.73) shows that there is good association between the membership or position held in a village organisation and dairying.

(v) Occupation :-

The respondents were asked about their major and subsidiary occupation. Occupation-wise distribution of the respondents is given in ~~below mentioned~~ Table VIII.

TABLE VIII.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR OCCUPATION

Occupation	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Main occupation					
Farming	70	77.78	75	83.33	
Dairying	10	11.11	7	7.78	1.594 Non-significant
Service	2	2.22	3	3.33	
Business	8	8.89	5	5.56	
Total	90	100.00	90	100.00	
Subsidiary occupation					
Farming	12	13.33	10	11.11	
Dairying	68	75.56	75	83.34	3.302 Non-significant
Agril.labour work	7	7.78	2	2.22	
Business	3	3.33	3	3.33	
Total	90	100.00	90	100.00	

The data presented in above Table VIII regarding occupation reveal that farming was the main occupation and dairying was the subsidiary occupation of most of the milk producers of both the groups. This finding is in line with those of Patel(33), Dubey et al. (14), Rabari (39) and MurliManohar and Sudarshan (28).

The calculated chi-square value of both the groups shows non-significant trend. So it can be concluded that the respondents of both the categories were not differing significantly in their occupation. This might be due to subsidiary nature of dairy farming occupation.

(vi) Land holding :-

The respondents were asked about the possession of the land by them. The respondents were classified on the basis

of their size of land holding into four groups (i) Landless, (ii) Small holders, (up to 2 hectares) (iii) Medium holders (2.1 to 4.0 hectares) and (iv) Large holders (Above 4.0 hectares). The information received from the respondents in this regard is presented in Table IX.

TABLE IX

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR SIZE OF LAND HOLDING

Land holding	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Landless	1	1.11	7	7.78	
Small holders	38	42.22	37	41.11	
Medium holders	29	32.22	35	38.89	9.286 *
Large holders	22	24.45	11	12.22	
Total	90	100.00	90	100.00	

* Significant at 0.05 level of significante.

It can be seen from the data presented in Table IX that 42.22 per cent and 41.11 per cent of the respondents from dairy and control villages possessed small size of land holding, while 32.22 per cent and 38.89 per cent respondents from dairy and control villages were from medium size of land holding group respectively. There were 24.45 per cent and 12.22 per cent of the milk producers had large size of land holding from dairy and control villages respectively.

It is clear from the data that majority of the respondents in both the groups were from small and medium size of land holding. The dairy villages having double number (22) of big farmers than those of control villages (11).

This finding is in confirmity with Rabari (39).

Significant chi- quare (9.286) suggests that respondents

of all the categories in both the groups were differing significantly in size of land holding.

The contigency coefficient value (0.31) indicates fairly association between land holding of milk producers and dairying.

(vii) Type and size of family :-

The respondents were classified into two groups according to their family (i) Nuclear and (ii) Joint type of family.

As regard the size of family, respondents were grouped into three categories (i) Small size (upto 5 members), (ii) Medium size (6 to 8 members) and (iii) Large size (Above 8 members). Information regarding the type and size of family is presented in Table X.

TABLE X.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR TYPE AND SIZE OF FAMILY

Family	Milk producers				Chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Type of family					
Nuclear	34	37.78	23	25.56	3.106 Non-significant
Joint	56	62.22	67	74.44	
Total	90	100.00	90	100.00	
Size of family					
Small	19	21.11	23	25.56	4.904 Non significant
Medium	48	53.33	33	36.67	
Large	23	25.56	34	37.77	
Total	90	100.00	90	100.00	

The data presented in Table X concluded that majority (62.22 per cent) of the respondents from diary villages and 74.44 per cent of the respondents from control villages belonged

to joint type of family. As regard the size of family the data reveal that slightly more than half (48) and slightly more than one third (33) of the respondents from dairy and control villages belonged to medium size of family, whereas, 23 and 34 respondents of both the groups had large size of family. Thus, majority of the respondents from both the dairy and control villages were found in joint type of family. As regard the size of family, majority of the respondents from dairy villages belonged to medium size family whereas larger size of family was found in control villages.

From the observed value of chi-square it can be said that no remarkable difference was observed in family type and size of milk producers in dairy and control villages.

(viii) Herd size :-

The term 'Herd size' indicates only the number of milch animals. The information regarding herd size was stratified in three groups viz. (i) Small size (upto 2 milch animals), (ii) Medium size (3 to 4 milch animals) and (iii) Large size (Above 4 milch animals). The data regarding the same are presented in Table XI.

TABLE XI

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR SIZE OF HERD

Herd size	Milk producers				chi-square value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Small	45	50.00	54	60.00	2.770 Non-significant
Medium	38	42.22	33	36.67	
Large	7	7.78	3	3.33	
Total	90	100.00	90	100.00	

It is apparent from the Table XI that exactly one half (50.00 per cent) of the milk producers from dairy villages

and about two third (60.00 per cent) of the milk producers from control villages possessed small size of herd, whereas, 42.22 per cent and 36.67 per cent of the milk producers of both the groups had medium size of herd. Thus, it can be observed that majority of the milk producers from dairy villages and control villages maintained one or two milch animals i.e. small size of herd. This finding is in accordance with those reported by Bakshi(4), Kamat (21), Bharaswadkar and Kothikhane (7) and Patel (32).

The observed chi-square value (2.770) indicates non-significant difference. Thus, the milk producers of dairy and control villages do not differ in possessing milch animals.

(ix) DAILY MILK PRODUCTION AND MODE OF SELLING

The information regarding daily milk production and mode of selling have been presented in Table XII.

TABLE XII.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR DAILY MILK PRODUCTION AND MODE OF SELLING.

Item	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Numbers	Percent
Daily milk production				
(i) Upto 5.0/litres/day	52	57.78	69	76.67
(ii) From 5.1 to 10.0 litres/day	27	30.00	17	18.89
(iii) Above 10.00 litres/ day	11	12.22	4	4.44
Total	90	100.00	90	100.00
Mode of selling milk				
(i) Milk co-operative society	90	100.00	10	11.11
(ii) Retail milk buyer	00	0.00	27	30.00
(iii) Neighbour	00	0.00	13	14.44
(iv) Convert into ghee forsale	00	0.00	40	44.45
Total	90	100.00	90	100.00

From the Table XII it is revealed that 52 milk producers (57.78 per cent) and 69 milk producers (76.67 per cent) from dairy villages and control villages had daily milk production upto 5 litres respectively. There were 27 respondents (30.00 per cent) from dairy villages and 17 respondents (18.89 per cent) from control villages had daily milk production from 5.1 to 10.0 litres. Further, there were 12.22 per cent and 4.44 per cent of the milk producers in dairy and control villages producing above 10 litres of milk per day respectively. The number of milk producers were more (11 respondents) in dairy villages who had above 10 litres of daily milk production. On the other hand there were only 4 respondents from control villages who had above 10 litres of daily milk production. For the low milk production the probable reason may be that data were collected in the month of March and April (starting of summer) and in this period milk yield of milch animal is generally reported to be poor.

Mode of selling milk :-

It is also observed from the Table XII that in dairy villages almost all the milk producers (100.00 per cent) supplied their milk to the milk producers' co-operative society while in control villages only 11.11 per cent milk producers had supplied their milk to the neighbouring villages milk producers' co-operative society, whereas a good number of milk producers 40 (44.45 per cent) were producing ghee for retail sell. Remaining milk producers(30.00 per cent) from control villages sold their milk to retail milk buyer while 14.44 per cent sold to their neighbours.

4.2. DIFFERENCE OF KNOWLEDGE REGARDING IMPROVED ANIMAL HUSBANDRY PRACTICES BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES.

The main focus of the study was to assess the impact of Panchmahal dairy on animal husbandry practices as adopted by dairy farmers. Hence it was felt worth to know that to what extent the District Milk Union of Panchmahal has helped the dairy farmers in aquisition of knowledge regarding modern animal husbandry practices. The extension services of dairy are meant for all the farmers, but personal and socio-economic traits of the farmers play an important role in adoption of practices disseminated by the agency. Naturally, it leads to difference in knowledge of dairy farmers.

In view of this, in the present study, an attempt is made to know the impact of extension services of Panchmahal dairy on the level of knowledge of dairy farmers. The respondents were asked about improved animal husbandry practices like feeding, breeding and management. A set of twenty four statements pertaining to above aspects of animal husbandry was put to the respondents. Equal weightage was given to the statements. Then the score value was assigned to the statement and the total score regarding knowledge was obtained.

The collected information have been presented in Table XIII and depicted in Figure - 3.

From the data presented in Table XIII, it is observed that majority of the respondents (70.00 per cent) belonged to dairy villages and 85.56 per cent from control villages were found in medium level of knowledge, whereas, the respondents

from dairy villages (30.00 per cent) and 4.44 per cent fr control villages were found in high level of knowledge. Not a single respondent from dairy villages belonged to low level of knowledge and on the other hand 10.00 per cent of the respondents from control villages belonged to the group of low level of knowledge.

TABLE XIII

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF KNOWLEDGE REGARDING IMPROVED ANIMAL HUSBANDRY PRACTICES

Level of knowledge	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	0	0.00	9	10.00
Medium	63	70.00	77	85.56
High	27	30.00	4	4.44
Total	90	100.00	90	100.00

The 't' value was carried out to see whether there was any significant difference regarding knowledge of improved animal husbandry practices between milk producers of dairy and control villages. The data pertaining to this have been presented in Table XIV.

TABLE XIV.

COMPARISON BETWEEN MILK PRODUCERS' OF DAIRY AND CONTROL VILLAGES IN RESPECT OF THEIR KNOWLEDGE REGARDING IMPROVED ANIMAL HUSBANDRY PRACTICES

Milk producers	Number	Transformed Mean Score	Sampling variance $(S)^2$
Dairy villages	90	21.63	0.133
Control villages	90	15.83	0.194
t = 10.979 **		df = 178.	

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF KNOWLEDGE REGARDING IMPROVED ANIMAL HUSBANDRY PRACTICES

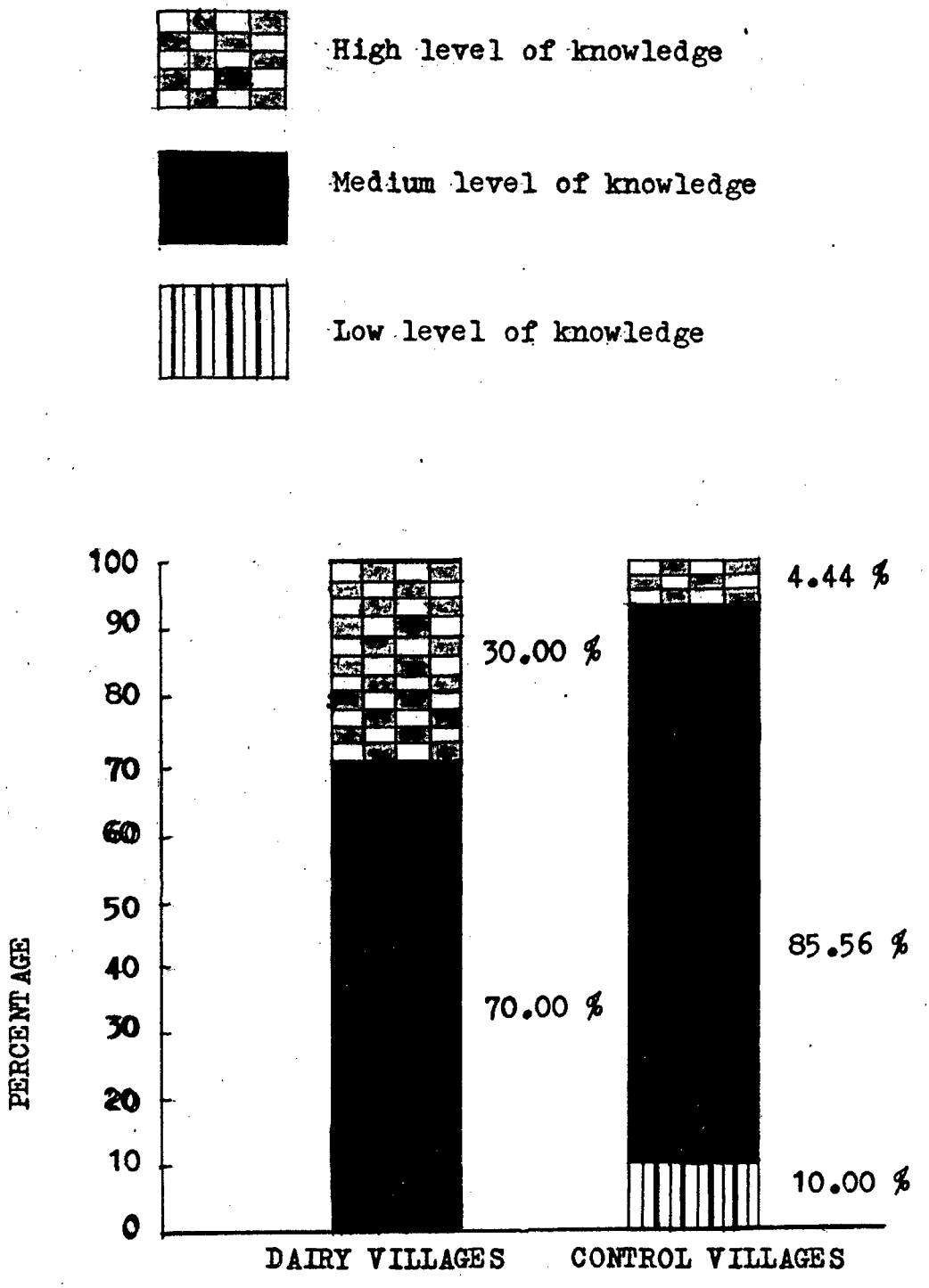


FIGURE : 3

It is observed from the Table XIV that calculated value of 't' is 10.979 which is significant at 0.01 level of significance, therefore, it provides sufficient ground to reject the hypothesis that " there is no difference in knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages."

On the basis of above findings, conclusion can be drawn that dairy extension services of Panchmahal dairy had influenced in increasing the knowledge of milk producers of dairy villages regarding the animal husbandry practices. This finding is in accordance with the observations made by Aswath (3) and Patel (32).

4.3. DIFFERENCE OF ADOPTION OF IMPROVED ANIMAL HUSBANDRY PRACTICES BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES.

In the present study, an effort was made to find out the influence of the extension services of Panchmahal dairy on the adoption of improved animal husbandry practices of the milk producers. The following six animal husbandry practices namely, (i) Watering, (ii) Feeding, (iii) Housing, (iv) Animal breeding, (v) Animal health and care and (vi) Clean milk production were studied.

The respondents were stratified according to their level of adoption as low, medium and high adopters.

(i) Watering :-

In this practice, place, number and time of serving water to the milch animal were included.

To find out the impact of Panchmahal dairy in respect of watering practices of milk producers, the information

regarding watering practices followed by the respondents was collected. The data have been presented in Table XV.

TABLE XV

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF WATERING PRACTICES

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	7	7.78	15	16.67
Medium	78	86.67	73	81.11
High	5	5.55	2	2.22
Total	90	100.00	90	100.00

The data presented in Table XV indicate that out of 90 respondents, 78 (86.67 per cent) respondents from dairy villages and 73 respondents (81.11 per cent) from control villages had medium level of adoption. Five respondents (5.55 per cent) from dairy villages and 2 respondents (2.22 per cent) from control villages were found in high level of adoption. Further, 7 respondents (7.78 per cent) from dairy villages and 15 respondents (16.67 per cent) from control villages were found in low level of adoption.

To find out the statistical difference, if any, between milk producers of dairy and control villages regarding the level of adoption of watering practices, the transformed mean score was calculated. The data in this regard are presented in Table XVI.

The Table XVI focuses the light on the difference between milk producers of dairy and control villages regarding the level of adoption. The observed value of 't' is 1.325

which is non-significant, therefore, the null hypothesis that ' there is no difference in adoption of watering practices between milk producers of dairy and control villages in this connection is accepted.

TABLE XVI.

COMPARISON BETWEEN MILK PRODUCERS' OF DAIRY AND CONTROL VILLAGES IN RESPECT OF ADOPTION OF WATERING PRACTICES

Milk producers	Number	Transformed mean score	Sampling variance $(S)^2$
Dairy villages	90	2.56	0.053
Control villages	90	2.40	0.040

$t = 1.325$ (N.S.) $\quad df = 178$

On the basis of this finding it can be said that there was no influence of extension activities of Panchmahal dairy on watering practices of milk producers of dairy villages. It might be due to the reason that importance of scientific watering practices has not yet been realised by the milk producers of dairy villages. It is also observed that they were serving water to their animals from pond or river of the village. This finding is supported by Rabari (39).

(ii) Feeding :-

In order to ascertain the influence of Panchmahal dairy in respect of feeding practices of milk producers, the data were collected in this regard and presented in Table XVII.

The data in Table XVII reveal that 64.44 per cent milk producers from dairy villages and 41.11 per cent from control villages fall in the medium level of adoption group. A good number of the milk producers (25.56 per cent) from

dairy villages and 2.22 per cent from control villages were found in high level of adoption group. Further, 10 per cent of the milk producers from dairy villages and 56.67 per cent from control villages were found in low level of adoption group. It is clear from the table that milk producers from dairy villages had high level of adoption of feeding practices as compared to those of control villages.

TABLE XVII

DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF FEEDING PRACTICES

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	9	10.00	51	56.67
Medium	58	64.44	37	41.11
High	23	25.56	2	2.22
Total	90	100.00	90	100.00

The 't' value was carried out to see whether there was any significant difference in adoption of feeding practices between milk producers of dairy and control villages. The data pertaining to this have been presented in Table XVIII.

TABLE XVIII

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES IN RESPECT OF THEIR ADOPTION OF FEEDING PRACTICES

Milk producers	Number	Transformed mean score	Sampling variance $(s)^2$
Dairy villages	90	8.73	0.145
Control villages	90	5.65	0.175

$t = 9.041$ $df = 178$

The data in Table XVIII indicate th t the observed value of 't' (9.041) which is significant at 0.01 level of significance, therefore, it provides sufficient ground to reject the hypothesis that there is no difference in adoption of feeding practices between milk producers of dairy and control villages. On the basis of this finding it can be said that there was significant impact of Panchmahal dairy on adoption of feeding practices of the milk producers of dairy villages. This finding is in accordance with the findings of Bakshi (4), Patel (33) and Hundal and Sohal (16).

(iii) Housing :-

This practice was consisted of place of keeping milch animals, arrangement of manger, cleanliness of cattle shed and bedding for milch animals in the shed.

To study the influence of Panchmahal dairy on adoption of housing practices of milk producers, the data are analysed and presented in Table XIX.

TABLE XIX.

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF HOUSING FACILITY

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	0	0.00	1	1.11
Medium	58	64.44	59	65.56
High	32	35.56	30	33.33
Total	90	100.00	90	100.00

The data in Table XIX reveal that majority of milk producers in both the groups were found in medium level of

adoption. Further, 32 (35.56 per cent) respondents from dairy villages and 30 (33.33 per cent) respondents from control villages were belonged to high level of adoption. Not a single number of respondent was found in low level of adoption in dairy villages, while only one respondent was observed in low adoption group in control villages. To find out statistical difference 't' test was carried out. Data pertaining to this are presented in Table XX.

TABLE XX

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES IN RESPECT OF THEIR LEVEL OF ADOPTION REGARDING HOUSING FACILITY

Milk producers	Number	Transformed mean score	Sampling variance $(S)^2$
Dairy villages	90	3.206	0.041
Control villages	90	3.056	0.046

t = 1.185 df = 178

The data presented in Table XX indicate that the observed value of 't' is 1.185 which is non-significant, hence null hypothesis that there is no difference in level of adoption of housing facility between milk producers of dairy and control villages is accepted.

On the basis of such information it can be said that there was no influence on extension activities of Panchmahal dairy on housing facility of the milk producers of dairy villages. This indicates that there was no difference in the adoption level of milk producers of both the groups regarding housing facility.

(iv) Animal breeding :-

In this practice, method of conceiving, pregnancy diagnosis test and duration of serving milch animals after calving were covered for the study.

Further, to study the difference in the adoption of animal breeding practices of the milk producers of the dairy and control villages, respective information was collected and analysed. The data in this regard have been presented in Table XXI.

TABLE XXI

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF ANIMAL BREEDING PRACTICES

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	9	10.00	12	13.33
Medium	62	68.89	74	82.23
High	19	21.11	4	4.44
Total	90	100.00	90	100.00

The data presented in Table XXI indicate that majority of the milk producers from both the groups were found in medium level of adoption, while 21.11 per cent of the milk producers from dairy villages and 4.44 per cent of the milk producers from control villages were found in high level of adoption. Furht Further, there were 10 per cent and 13.33 per cent of the respondents from both the type of villages were found in low level of adoption.

It is clear from the above table that milk producers of dairy villages had high level of adoption than those of control villages in animal breeding practices. To find out the

statistical difference between dairy and control villages in this regard that there is no difference in adoption of animal breeding ~~programme~~ practice between milk producers of dairy and control villages, the data are presented in Table XXII.

TABLE XXII

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES IN RESPECT OF ADOPTION OF ANIMAL BREEDING PRACTICES

Milk producers	Number	Transformed mean score	Sampling variance $(S)^2$
Dairy villages	90	2.74	0.029
Control villages	90	2.23	0.059

t = 4.082 df = 178

The data presented in Table XXII reveal that the observed value of 't' is 4.082 which is significant at 0.01 level of significance, indicating that there is significant difference in adoption of animal breeding practices of the milk producers of dairy and control villages. This provides sufficient ground to reject the hypothesis that ' there is no difference in level of adoption of animal breeding practices between milk producers of dairy and control villages.'

On the basis of above information it is inferred that due to extension activities of Panchmahal dairy, milk producers ~~of~~ of dairy villages realised the importance of improved animal breeding practices. This finding is in accordance with the findings of Patel (33), Channe Gowda et al. (9), Pandey et al. (30), Patel and Pandey (34), Rabari (39) and Balasubramanyam and Knight (5).

(v) Animal health care :-

Animal health care means measures taken to protect milch animals against diseases and after care, calf deworming and dehorning of milch animals.

In order to ascertain the impact of Panchmahal dairy in respect of animal health care of milk producers of dairy and control villages, the information in this regard was collected and presented in Table XXIII.

TABLE XXIII

DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION REGARDING ANIMAL HEALTH CARE

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	1	1.11	27	30.00
Medium	67	74.45	58	64.44
High	22	24.44	5	5.56
Total	90	100.00	90	100.00

It can be observed from the Table XXIII that majority (74.45 per cent) of the respondents from dairy villages and 64.44 per cent respondents from control villages belonged to medium level of adoption group. Only 1.11 per cent respondents from dairy villages and 30.00 per cent of the respondents from control villages were found in low level of adoption. While, 24.44 per cent from dairy villages and 5.56 per cent respondents from control villages were found in high level of adoption.

It is clear from the table that milk producers of dairy villages had high level of adoption regarding animal

health care practices than those of control villages.

In order to find out the statistical difference in level of adoption regarding animal health care of milk producers of dairy and control villages, respective information was collected. The data presented in Table XXIV focus light on the same.

TABLE XXIV

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES IN RESPECT OF THEIR LEVEL OF ADOPTION REGARDING ANIMAL HEALTH CARE

Milk producers	Number	Transformed mean score	Sampling variance (S^2)
Dairy villages	90	3.02	0.029
Control villages	90	1.94	0.059
	t = 9.200	df = 178	

The data from Table XXIV reveal that the observed 't' value (9.200) is significant at 1.0 per cent level of significance. This leads to reject the hypothesis that there is no difference in adoption of improved animal health and care practices between milk producers of dairy and control villages pertaining to this. On the basis of this finding it can be concluded that there was significant difference in adoption level of milk producers of dairy and control villages. Hence, the conclusion is that Panchmahal dairy has played significant role in animal health care of the milk producers of dairy villages. This finding is in agreement with those of Bakshi (4), Hundal and Sohal (18), Sohi and Kherde (50) and Patel (32).

(vi) Clean milk production :-

Clean milk production included several steps such as time of milking, method of milking and speed of drawing milk.

In order to find out the influence of Panchmahal dairy in respect of steps followed for clean milk production by the milk producers, the data received are presented in Table XXV.

TABLE XXV

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION FOR CLEAN MILK PRODUCTION

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	6	6.67	11	12.22
Medium	50	55.55	60	66.67
High	34	37.78	19	21.11
Total	90	100.00	90	100.00

It is apparent from the Table XXV that majority of the respondents in both the groups belonged to the category of medium adopters. Only 6.67 per cent and 12.22 per cent of the milk producers in dairy and control villages fall in the low level of adoption category respectively. While, 37.78 per cent milk producers from dairy villages and 21.11 per cent respondents from control villages were found in high adoption level group.

The detailed analysis was carried out to know the statistical difference between milk producers of dairy and control villages regarding the level of adoption of clean milk production practices. The information pertaining to this is obtained and presented in Table XXVI.

TABLE XXVI.

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL VILLAGES IN RESPECT TO THEIR LEVEL OF ADOPTION FOR CLEAN MILK PRODUCTION

Milk producers	Number	Transformed mean score	Sampling variance (S^2)
Dairy villages	90	6.86	0.070
Control villages	90	6.20	0.096

t = 2.493 N.S. df = 178

The data presented in Table XXVI focus light on the difference in level of adoption for clean milk production of milk producers of dairy and control villages. Observed 't' value indicates non-significant difference between the variables therefore, the hypothesis that there is no difference in adoption of clean milk production practices between milk producers of dairy and control villages in this connection is approved.

On the basis of above information, it is concluded that there was no influence of extension efforts of Panchmahal dairy on the steps followed for clean milk production by the milk producers. The probable reason for this, might be that farmers of dairy villages have not yet realised the importance of this practice. Therefore, uncommon difference has not been observed. The impact of this practice on their economy is indirect and of longer duration. It is also one of the important aspects for increasing milk production, this point might have been ingnored by them. This finding is in confirmity with the findings of P tel (33), Rabari (39) and Balasubramanyam and Knight (5).

(vii) Over all adoption :-

Further, to study the difference in over all adoption of improved animal husbandry practices of milk producers of dairy and control villages, the information was collected and presented in Table XXVII and depicted in figure - 4.

TABLE XXVII

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF IMPROVED ANIMAL HUSBANDRY PRACTICES

Level of adoption	Milk producers			
	Dairy villages		Control villages	
	Number	Percent	Number	Percent
Low	1	1.11	31	34.44
Medium	70	77.78	59	65.56
High	19	21.11	0	0.00
Total	90	100.00	90	100.00

The data presented in Table XXVII reveal that majority (77.78 per cent) of the milk producers from dairy villages and 65.56 per cent from control villages were found in medium adoption level, while, in low level of adoption, only 1.11 per cent and 34.44 per cent of the respondents from dairy and control villages were observed respectively. A good number of the milk producers (21.11 per cent) from dairy villages were observed in high adoption level. Not a single respondent was found from control villages in high level of adoption.

In order to ascertain the difference in adoption of improved animal husbandry practices of milk producers of dairy and control villages of Panchmahals district, the

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR LEVEL OF ADOPTION OF IMPROVED ANIMAL HUSBANDRY PRACTICES.

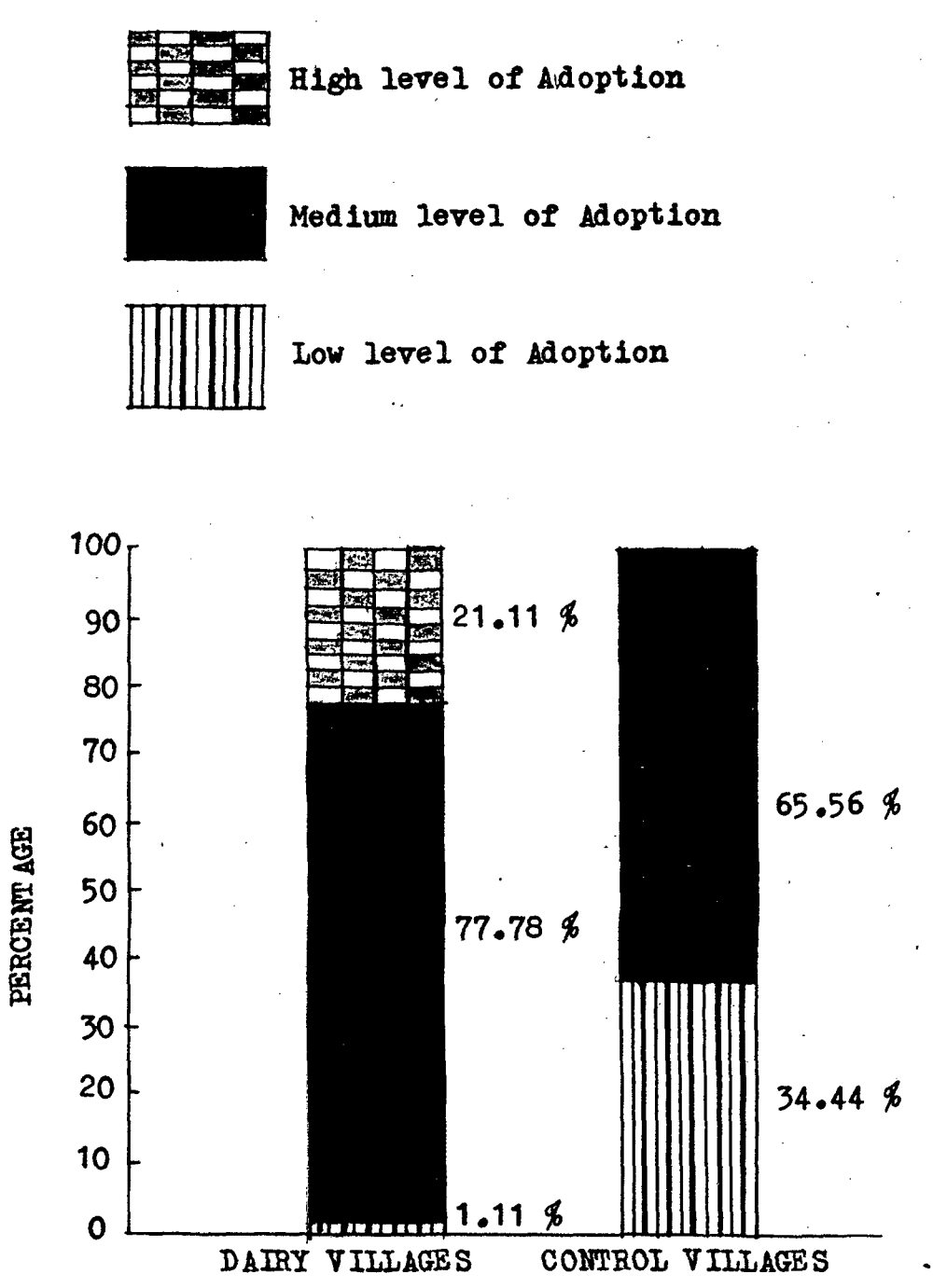


FIGURE : 4

transformed mean score value was computed. The information received is presented in Table XXVIII.

TABLE XXVIII

COMPARISON BETWEEN MILK PRODUCERS OF DAIRY AND CONTROL ~~CONTROL~~ VILLAGES IN RESPECT OF THEIR ADOPTION OF IMPROVED ANIMAL HUSBANDRY PRACTICES.

Milk producers	Number	Transformed mean score	Sampling variance (S^2)
Dairy villages	90	27.38	0.122
Control villages	90	21.82	0.176

t = 9.663 df = 178

The data presented in Table XXVIII indicate that the observed value of 't' (9.663) is significant at 1.0 per cent level of significance, therefore, it provides sufficient ground to reject the hypothesis that there is no difference in level of adoption of improved animal husbandry practices between milk producers of dairy and control villages.

On the basis of above information it can be inferred that Panchmahal dairy has played a significant role in adoption of improved animal husbandry practices.

4.4. RELATIONSHIP BETWEEN SOCIO-ECONOMIC CHARACTERISTICS OF THE MILK PRODUCERS OF DAIRY VILLAGES AND THEIR LEVEL OF ADOPTION.

To ascertain the relationship between socio-economic characteristics (independent variables) of the milk producers of dairy villages and level of adoption (dependent variables) of improved animal husbandry practices, the chi-square test (χ^2 test) of independence was applied and the results are presented in succeeding pages in the following sequence :

1. Age and adoption.
2. Education and adoption.
3. Caste and adoption.
4. Social participation and adoption.
5. Land holding and adoption.
6. Family type and adoption.
7. Family size and adoption.
8. Herd size and adoption.

1. Age and Adoption :-

In order to study the relationship between the age of milk producers and their level of adoption of improved animal husbandry practices, after due statistical analysis the data are presented in Table XXIX.

TABLE XXIX

RELATIONSHIP BETWEEN AGE OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION

Age group	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Young age	0	0.00	17	18.89	5	5.56	22	24.44
Middle age	0	0.00	34	37.78	12	13.33	46	51.11
Old age	1	1.11	19	21.11	2	2.22	22	24.44
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 4.775

N.S. = Non-significant at 0.05 level.

It is apperent from data presented in Table XXIX that the observed value of chi-square is 4.775. The observed value is less than the table value (9.488) at 5 per cent level of significance and 4 degrees of freedom, which is non-significant.

Hence, it provides sufficent ground to accept the hypothesis that there was no significant relationship between the age of milk producers and their level of adoption. This finding is in accordance with those of Kapse and Sohal (22), Sohi and Kherde (50) and Patel (32).

2. Education and adoption :-

In order to study the impact of education on adoption, further statistical analysis was made to examine the relationship between education and level of adoption of improved animal husbandry practices, the data regarding the same are presented in Table XXX.

TABLE XXX

RELATIONSHIP BETWEEN EDUCATION OF MILK PRODUCERS AND THEIR LEVEL OF ADOPTION.

Educational Level	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Illiterate	0	0.00	14	15.56	0	0.00	14	15.56
Primary	1	1.11	47	52.22	9	10.00	57	63.33
Secondary	0	0.00	7	7.78	9	10.00	16	17.78
College	0	0.00	2	2.22	1	1.11	3	3.33
Total	1	1.11	70	77.78	19	21.11	90	100.00

$\chi^2 = 13.962^*$

It can be seen from the data presented in Table XXX that the observed value of chi-square (13.962) is greater than the table value 12.592. Thus, the chi-square value at 0.05 level of significance for 6 degrees of freedom is significant.

Hence, it gives sufficient ground to reject the hypothesis. Therefore it proves that there is significant relationship between education and level of adoption of the dairy farmers. It is quite obvious that education plays an important

role in changing the attitude and behaviour of the milk producers. It is also possible that education helps in developing thinking ability to take appropriate decision to adopt new innovations.

In this Table, chi-square value is significant, hence, contigency coefficient (0.37) was computed and it indicates fairly association between education and level of adoption of dairy milk producers.

3. Caste and adoption :-

The data pertaining to the relationship between caste and level of adoption have been analysed and presented in Table XXXI.

TABLE XXXI

RELATIONSHIP BETWEEN CASTE OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION.

Caste	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Higher	1	1.11	22	24.44	11	12.22	34	37.78
Intermediate	0	0.00	43	47.78	8	8.89	51	65.67
Lower	0	0.00	5	5.56	0	0.00	5	5.55
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 5.098 N.S. = Non-significant at 0.05 level.

From the data presented in Table XXXI it is found that the chi-square value (5.098) is less than the table value 9.488 at 0.05 level of significance for 4 degrees of freedom which shows non-significant trend. This leads to accept the hypothesis that there is no significant relationship between socio-economic characteristics (caste) of milk producers of dairy villages and their level of adoption. Hence, it can be

concluded that the two variables i.e. caste of milk producers and level of adoption are independent of each other. This finding is supported by Dave (10) and Rabari (39).

4. Social participation and adoption :-

The detail analysis of the data was carried out to ascertain the relationship between social participation and level of adoption. The information in this regard is presented in Table XXXII.

TABLE XXXII

RELATIONSHIP BETWEEN SOCIAL PARTICIPATION OF MILK PRODUCERS OF DAIRY VILLAGES AND THEIR LEVEL OF ADOPTION

Social participation	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Participation in one organisation.	1	1.11	24	26.67	1	1.11	26	28.89
Participation in two organisation.	0	0.00	37	41.11	11	12.22	48	53.33
Participation in more than two organisation	0	0.00	6	6.67	2	2.22	8	8.89
Holding of position.	0	0.00	3	3.33	5	5.56	8	8.89
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 14.409

* = Significant at 0.05 level.

C.C. = 0.37

It can be seen from the Table XXXII that the observed value of chi-square 14.409 which is less than the table value 12.592 at 0.05 level of significance for 6 degrees of freedom

which shows significant relationship. Therefore it disapproves the hypothesis that " there is no relationship between social participation and level of adoption". This might had happened due to the low education, backwardness, low income, lack of educational facilities in nearby villages of such area.

Contigency coefficient value is 0.37 indicates the fair association between social participation and level of adoption of dairy milk producers.

5. Land holding and adoption :-

In order to study the relationship between land holding and level of adoption of improved animal husbandry practices the data were collected and analysed. The results obtained are presented in Table XXXIII.

TABLE XXXIII

RELATIONSHIP BETWEEN LAND HOLDING OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION.

Land holding	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Landless	0	0.00	1	1.11	0	0.00	1	1.11
Small	0	0.00	35	38.89	3	3.33	38	42.22
Medium	1	1.11	18	20.00	10	11.11	29	32.22
Large	0	0.00	16	17.78	6	6.67	22	24.45
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 9.502 Non-significant

It can be seen from the Table XXXIII that the observed chi-square value 9.502 is less than the table value 12.592 at 0.05 level of significance for 6 degrees of freedom, therefore it is non-significant. This leads to accept the hypothesis that

" there is no relationship between land holding and level of adoption of milk producers." Hence, it can be concluded that the two variables i.e. land holding of milk producers of dairy villages and level of adoption of animal husbandry practices are independent of each other.

6. Family type and adoption :-

The data regarding family type of dairy milk producers were collected and analysed to ascertain the relationship between family type of dairy milk producers and their level of adoption. The same are presented in Table XXXIV.

TABLE XXXIV

RELATIONSHIP BETWEEN TYPE OF FAMILY OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION

Family type	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Joint	0	0.00	43	47.78	13	14.44	56	37.78
Nuclear	1	1.11	27	30.00	6	6.67	34	62.22
Total	1	1.11	70	70.78	19	21.11	90	100.00

χ^2 = 1.342

N.S. = Non-significant at 0.05 level.

It is observed from Table XXXIV that the calculated chi-square value (1.342) is less than 5.99, chi-square value at 0.05 level of significance for 2 degrees of freedom which is non-significant, therefore, the hypothesis is accepted that " there is no relationship between family type and level of adoption."

7. Family size and adoption :-

In order to study the relationship between family size of dairy milk producers and level of adoption of improved animal husbandry practices, the data were further analysed. The data in this connection are presented in Table XXXV.

TABLE XXXV

RELATIONSHIP BETWEEN FAMILY SIZE OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION

Family size	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Small	0	0.00	15	16.67	4	4.44	19	21.11
Medium	1	1.11	36	40.00	11	12.22	48	53.33
Large	0	0.00	19	21.11	4	4.44	23	25.56
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 0.760

N.S. = Non-significant at 0.05 level.

It can be seen from the Table XXXV that the chi-square value (0.760) is less than 9.458 chi-square value at 0.05 level of significance for 4 degrees of freedom which is non-significant. This indicates that there is no relationship between family size and level of adoption. Hence, the hypothesis is accepted, which leads to infer that there is no significant relationship between family size of the milk producers and their level of adoption of animal husbandry practices.

8. Herd size and adoption :-

The data pertaining to the relationship between herd size and level of adoption of improved animal husbandry practices are presented in Table XXXVI.

TABLE XXXVI

RELATIONSHIP BETWEEN HERD SIZE OF DAIRY MILK PRODUCERS AND THEIR LEVEL OF ADOPTION

Herd size	Level of adoption						Total	
	Low		Medium		High			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Small	1	1.11	36	40.00	8	8.89	45	50.00
Medium	0	0.00	29	32.22	6	6.66	35	38.89
Large	0	0.00	5	5.56	5	5.56	10	11.11
Total	1	1.11	70	77.78	19	21.11	90	100.00

χ^2 = 6.095

N.S. = Non-significant at 0.05 level.

It is observed from the Table XXXVI that the chi-square value (6.095) is non-significant even at 5 per cent level of significance. This indicates that there is no significant relationship between herd size and level of adoption. This provides sufficient ground to accept the hypothesis that there is no relationship between herd size of milk producers of dairy villages and their level of adoption. Therefore, it can be concluded that there is no relationship between the herd size of milk producers and their level of adoption of improved animal husbandry practices. This finding is supported by Rabari (39) and Patel (32).

4.5. ATTITUDES OF MEMBERS OF MILK PRODUCERS CO-OPERATIVE SOCIETY TOWARDS ANIMAL HUSBANDRY SERVICES OF PANCHMAHAL DAIRY.

It is universaly accepted fact that an attitude of an individual plays an important role in determining his behaviour with respect to a particular object. As a corollary of this fact, the milk producers' attitude towards animal

husbandry services of Panchmahal dairy was also included in the focus of the present study. With this view in mind the attitude of members of milk producers co-operative society was measured on the basis of attitude score.

The respondents were asked to know their attitude towards animal husbandry services of Panchmahal dairy. Five point attitude scale was used, and according to their agreement (positive or negative) the score was given to each statement. The total score for each respondent was then calculated by summing over the score value of each statement.

On the basis of attitude score, the respondents were stratified into three groups namely (a) Unfavourable (total score value was less than 27), (b) Neutral (total score value was 27) and (c) Favourable (total score value was above 27). The information in this regard is presented in Table XXXVII.

TABLE XXXVII

DISTRIBUTION OF DAIRY MILK PRODUCERS ACCORDING TO THEIR ATTITUDE TOWARDS ANIMAL HUSBANDRY SERVICES OF PANCHMAHAL DAIRY.

Attitude	Milk producers in dairy villages	
	Number	Percent
Unfavourable	3	3.33
Neutral	2	2.22
Favourable	85	94.45
Total	90	100.00

It is clearly observed from Table XXXVII that most of the milk producers in dairy villages have favourable

attitude towards animal husbandry services of Panchmahal dairy, which leads to reject the hypothesis in this regard. It can be concluded that there was favourable attitude of milk producers in dairy villages towards animal husbandry services of Panchmahal dairy.

4.6. ATTITUDE OF MILK PRODUCERS TOWARDS ANIMAL HUSBANDRY

An attempt was made to know the difference of attitude between milk producers of dairy and control villages towards animal husbandry. The results are presented in Table XXXVIII.

TABLE XXXVIII

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR ATTITUDE TOWARDS ANIMAL HUSBANDRY

Attitude	Milk producers				Chi-square Value
	Dairy villages		Control villages		
	Number	Percent	Number	Percent	
Unfavourable	13	14.44	17	18.89	
Neutral	11	12.22	7	7.78	1.422 N.S.
Favourable	66	73.34	66	73.33	
Total	90	100.00	90	100.00	

N.S. = Non-significant.

It is revealed that from Table XXXVIII that 73.33 per cent of the milk producers of both the groups having favourable attitude towards animal husbandry. The milk producers (14.44 per cent) from dairy villages and 18.89 per cent from control villages having unfavourable attitude towards animal husbandry. The remaining 12.22 per cent and 7.78 per cent milk producers from dairy and control villages respectively having no clear opinion. Thus, it can be inferred that

majority of the milk producers in both the groups have favourable attitude towards animal husbandry.

The observed chi-square value (1.422) indicates non-significant against the table value (5.99) of chi-square at 5 per cent level of probability and 2 degrees of freedom. Hence, it gives sufficient ground to accept hypothesis that " there is no difference in attitude of milk producers of dairy and control villages towards animal husbandry " This finding is in line with Srinivas and Reddy (52).

SUMMARY AND CONCLUSIONS

CHAPTER V

SUMMARY AND CONCLUSIONS

In this chapter the description of the study, major findings, implications and scope for further research has been given in nutshell.

5.1. OBJECTIVES OF THE STUDY

The general objective of the study was to know the impact of Panchmahal dairy on milk producers of Panchmahals district in relation to animal husbandry practices. The specific objectives of the study were :

(i) To study the socio-economic characteristics of the milk producers of dairy and control villages.

(ii) To study the difference of knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.

(iii) To determine the difference in adoption of following improved animal husbandry practices between milk producers of dairy and control villages.

- (a) Watering,
- (b) Feeding,
- (c) Housing,
- (d) Animal breeding,
- (e) Animal health and care and
- (f) Clean milk production.

(iv) To determine the relationship between socio-economic characteristics of milk producers of dairy villages and their level of adoption.

(v) To study the difference in attitude of members of milk producers' co-operative society towards animal husbandry services of Panchmahal dairy.

(vi) To study the attitude of milk producers towards animal husbandry.

5.2. HYPOTHESES

In view of the above objectives, the following null hypotheses were formulated :

(i) There is no relationship between milk producers of dairy and control villages and socio-economic characteristics.

(ii) There is no difference between knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.

(iii) There is no difference in adoption of following improved animal husbandry practices between milk producers of dairy and control villages.

(a) Watering,

(b) Feeding,

(c) Housing,

(d) Animal breeding,

(e) Animal health and care and

(f) Clean milk production.

(iv) There is no significant relationship between socio-economic characteristics of milk producers of dairy villages and their level of adoption.

(v) There is no difference in attitude of members of milk producers' co-operative society towards animal husbandry services of Panchmahal dairy.

(vi) There is unfavourable attitude of milk producers towards animal husbandry.

5.3. REVIEW OF RELATED LITERATURE

Various aspects of the topic were reviewed with respect to socio-economic characteristics, level of knowledge and adoption of improved animal husbandry practices of the milk producers, relationship between socio-economic characteristics and level of adoption, attitude towards animal husbandry etc.

5.4. METHODOLOGY

The present study was conducted in the Panchmahals district of Gujarat State. Population for the study consisted of the two categories of the respondents i.e. milk producers of the dairy villages and control villages (without milk producers co-operative society). According to proportion of dairy and control villages, six dairy villages and six control villages were selected randomly. Fifteen milk producers were selected at random at from each of the twelve sample villages. The respondents were interviewed personally in the month of March and April 1984. Keeping in view, the objectives of the study and farmers' background, the interview schedule was prepared. Experts opinion was sought on the items of the schedule to make it more clear, precise and meaningful. Other

methodological procedures for the study consisted of measurement of level of knowledge and adoption of improved animal husbandry practices, relationship between dependent (level of adoption) and independent (characteristics of milk producers) variables and the statistical measures were used to test the hypotheses.

5.5. MAJOR FINDINGS

The important findings of the study are summerised as under :

I. Socio-economic characteristics of milk producers of dairy and control villages.

(i) Age :-

Slightly more than half (51.11 per cent and 55.57 per cent) of the respondents from dairy and control villages belonged to middle age group i.e. 36 to 50 years.

(ii) Education :-

Majority (66.33 per cent and 57.78 per cent) of the respondents of both the groups had primary education whereas, 15.56 per cent and 25.56 per cent of the respondents from dairy and control villages were illiterate.

(iii) Caste :-

Majority (56.67 per cent and 60.00 per cent) of the respondents of both the groups were from intermediate caste group. In both the groups, member of milk producers differed with respect to their caste.

(iv) Social participation :-

Majority of the respondents from dairy villages were found in the category of membership in one or two organisations,

while, 48.89 per cent and 44.44 per cent of the respondents from control villages were found in the category of no membership in any organisation and membership in one organisation respectively.

(v) Occupation :-

Majority of the respondents in both the groups had farming as their main and dairying as subsidiary occupation.

(vi) Land holding :-

Likely to be equal number (38 and 37) of milk producers in both the groups possessed more or less small size of land holding. Medium size of land holding was possessed by the respondents of both the groups. Their number was 29 and 35 respondents respectively.

(vii) Family type and size size :-

Majority (62.22 per cent and 74.44 per cent) of the respondents from dairy and control villages were found in joint type of family respectively. As regard the size of family, slightly more than one half of the respondents from dairy villages had medium size of family, while larger size of family was found in control villages.

(viii) Herd size :-

Majority of the respondents in both the groups maintained one or two milch animals.

(ix) Daily milk production and mode of selling :-

It was found that higher percentage of the respondents in both the groups had average daily milk production upto 5 litres.

Almost all the milk producers of dairy villages sold

their milk only to the milk co-operative society of the village. In respect of control villages, 40 respondents (44.45 per cent) were producing ghee and 30.00 per cent sold the surplus milk to retail buyers.

II. Difference of knowledge regarding improved animal husbandry practices between milk producers of dairy and control villages.

Majority of the respondents (70.00 per cent and 85.56 per cent) for from dairy and control villages had medium level of knowledge. Whereas, 30.00 per cent and 4.44 per cent of the respondents from dairy and control villages had high level of knowledge respectively. None of the respondents from dairy villages and 10.00 per cent of the respondents from control villages had low level of knowledge. This implies that there is a significant influence of Panchmahal dairy on knowledge of milk producers of dairy villages.

III. Difference in adoption of improved animal husbandry practices between milk producers of dairy and control villages.

There was significant difference in adoption of different improved animal husbandry practices between milk producers of dairy and control villages, such as feeding, animal breeding and animal health and care. This indicates that there was a significant influence of Panchmahal dairy in adoption of above improved animal husbandry practices.

There was no significant difference in adoption of improved animal husbandry practices between milk producers of dairy and control villages such as watering, housing and clean milk production practices. This implies that there was no

influence of extension activities of Panchmahal dairy on above mentioned practices.

There was significant difference in overall adoption of improved animal husbandry practices of milk producers of dairy and control villages.

IV. Relationship between socio-economic characteristics of the milk producers of dairy villages and their level of adoption.

(a) Educational level and social participation of the milk producers were found to have significant relationship with the adoption of improved animal husbandry practices.

(b) There was no significant relationship between age, caste, land holding, family type, family size and herd size of the milk producers and their level of adoption of improved animal husbandry practices.

V. Attitude of the members of milk co-operative society towards animal husbandry services of Panchmahal dairy.

There was favourable attitude of milk producers of dairy villages towards animal husbandry services of Panchmahal dairy.

VI. Attitude of milk producers towards animal husbandry.

Majority of the respondents (73.33 per cent) of both the groups viz. dairy and control villages, had favourable attitude towards animal husbandry.

5.6. CONCLUSIONS

1. Majority of the respondents were of middle age with primary education and intermediate caste group.
2. Social participation of milk producers of dairy villages was found to be higher than those of the

control villages.

3. Majority of the respondents (77.78 per cent and 83.33 per cent) had farming as their main and dairying (75.56 per cent and 83.33 per cent) as subsidiary occupation.

4. Most of the milk producers in both the groups had small and medium size of land holding.

5. Majority of the respondents had joint type of family. Medium size of family was found in dairy villages and it was larger in control villages.

6. Half of the milk producers (50.00 per cent) from dairy villages and slightly less than two third (60.00 per cent) of the milk producers from control villages maintained 1 to 2 milch animals.

7. Majority of the respondents (57.78 per cent and 76.67 per cent) from dairy and control villages had daily average milk production upto 5 litres.

8. Almost all the respondents (90), from dairy villages sold their milk to the milk producers' co-operative society, while a good number of the milk producers (40) from control villages were producing ghee for retail sale from the surplus milk.

9. There was no significant difference between milk producers of dairy and control villages in respect of knowledge regarding improved animal husbandry practices. This suggests that there is a significant influence of Panchmahal dairy on knowledge of milk producers of dairy villages.

10. There was significant difference in adoption of different improved animal husbandry practices between milk producers of dairy and control villages such as, feeding, animal breeding and animal health and care. This suggests that there is significant influence of Panchmahal dairy in adoption of improved animal husbandry practices such as feeding, animal breeding and animal health and care.

11. There was no significant difference in adoption of certain improved animal husbandry practices between milk producers of dairy and control villages such as watering, housing and clean milk production.

12. There was significant difference in overall adoption of improved animal husbandry practices of milk producers of dairy and control villages.

13. There was significant relationship between education and social participation of the dairy milk producers and their level of adoption.

14. There was no significant relationship between age, caste, land holding, family type and size and herd size of the milk producers of dairy and control villages and their level of adoption.

15. There was favourable attitude of milk producers of dairy villages towards animal husbandry services of Panchmahal dairy.

16. There was favourable attitude of the respondents in both the groups towards animal husbandry.

5.7. IMPLICATIONS.

1. This type of co-operative dairy organisation may prove to be useful in other states of the country, where animal husbandry is a main or subsidiary occupation of the farmers.
2. Intensive efforts are required to encouraged the milk producers of control villages to establish their own milk producers' co-operative societies.
3. To enhance the adoption of feeding practices, cattle feed factory required to be established.
4. For adoption of animal breeding practices more and more artificial insemination centers should be started in dairy villages.
5. The extension unit of Panchmahal dairy should organise study visits to Baroda dairy or Anand (Amul) dairy, cattle feed factory, semen collection centres and milk yield competitions.
6. The findings of this study have clearly indicated that practices like clean milk production and housing practices were not adopted to a reasonable extent by the dairy farmers. Therefore, intensive extension efforts should be made to make them realise the importance of such practices. The Panchmahal dairy should arrange short duration training courses for farmers and farmwomen with special emphasis on the practices to be inculated among them.
7. To make the respondents aware about the scientific

animal husbandry practices and dairy extension activities of the union for increasing milk production, Panchmahal dairy should strengthened the activities of providing useful literature (Booklets, Folders, Patrikas etc) containing such type of information in vernacular.

8. Special educative efforts are needed to develop favourable attitude towards animal husbandry.

9. More number of milk producers' co-operative societies to be established in adivasi area of the district.

10. Dairy co-operatives or State Government should provide adequate credit facilities to the milk producers for purchase of good buffaloes or crossbred cows and construction of pucca sheds etc.

5.8 Suggestions for further research :-

1. Same type of study should be taken in other district of the state where such type of dairy organisation is functioning.

2. A critical enquiry about the constraints in the non-adoption of watering, housing, and clean milk production practices in milkshed area of Panchmahal dairy should be made.

3. Present study may be repeated at an interval of five years.

4. A study in the area of training needs of tribal farmers for animal husbandry occupation should be conducted.

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APPENDIX

APPENDIX I

INTERVIEW SCHEDULE

Interview No :_____ Date : _____

Name of the milk co-operative Society/Village :_____

Taluka : _____

1. Name :

2. Age (years completed) :

3. Caste :

4. Educational Qualification : (Last examination passed)

5. Occupation :
   (a) Main occupation :
   (b) Subsidiary occupation :

6. Land cultivated :

		Hectares	Gunthas
i)	Owner basis	_____	_____
ii)	Share basis	_____	_____
iii)	Rental basis	_____	_____
	Total	_____	_____

7. Sources of irrigation :

	Source	Hectares	Gunthas
i)	Canal	_____	_____
ii)	Well	_____	_____
iii)	Tube well	_____	_____
iv)	Any other (Specify)	_____	_____

8. Social participation :

Sr.No.	Organisation	Member	Position held
i.	Village Panchayat		
ii.	Milk co-operative society		
iii.	Service co-operative society		
iv.	Farmers' club		
v.	Youth club		
vi.	Other (give details)		

9. Type of family :

(a) Joint ( ) (b) Nuclear ( )

(c) Number of family members : _____

10. Number of milch animals possessed :

Sr.No.	Type of animal	Number	In milk	Dry
i.	Buffalo			
ii.	Cow			
iii.	Any other (specify)			
	Total :			

11. Do you spare any land for fodder production ? : Yes/No.

If 'yes' how much do you spare ? Hectares : _____

Gunthas : _____

12. What is the daily average milk production ? _____ litres

13. How much milk do you consume at home per day ? _____ litres.

14. What is the marketable surplus of milk ? _____ litres.

15. Please, give information regarding sell of surplus milk.

i. Milk co-operative society.

ii. Retail milk buyer.

iii. Neighbours.

iv. Other (give details).

P A R T II

Knowledge about animal husbandry practices

(You have to choose only the alternative responses which you think most correct in cases where multiple choices are given).

1. (a) What are the symptoms of the buffalo in heat ?

A.

B.

C.

D.

E.

F.

(b) Among them which symptoms are more reliable ?

A.

B.

C.

2. Do you know about the artificial insemination ? Yes/No.

If yes, what are the advantages of artificial insemination ?

A.

B.

C.

D.

3. What is the correct time for servicing buffalo/cow after coming in heat ?

   A. Immediately after observing heat symptoms.

   B. Within 12 hrs. on set of heat.

   C. Within 24 hrs. ons set of heat.

   D. Within 36 hrs. on set of heat.

4. When should buffalo be served after calving ?
   (In order to maintain regularity in calving).

   A. Within 45 days.

   B. Within 45 to 90 days.

   C. After 90 days.

5. Please, indicate after how many days the buffalo normally repeats its heat cycle ?

   A. 15 days.

   B. 21 days.

   C. 30 days.

6. When should a buffalo be presented for pregnancy diagnosis ?

   A. 2 months after insemination.

   B. 3 months after insemination.

   C. 4 months after insemination.

7. If your buffalo is not conceived by more than three insemination, what will you do for it ?

   A. Conceiving by a deshi bull.
   B. Waiting for natural care.
   C. Getting the buffalo examined and treated by a Veterinary doctor

8. Different types of cattle feed combinations are given below.

   Please indicate which one is the balanced feed ?

A. Only concentrate feeding.

B. Dry fodder and concentrate feeding.

C. Green fodder and concentrate feeding.

D. Feeding green fodder, dry fodder and concentrate as per requirement of animal.

9. How much Baroda dan (concentrate) or other feeds should be given to the buffalo giving 5 litres of milk ?

A. Baroda dan _____ kg.

or

B. Cotton seed, Bajra, Kuvadia (cassia tora) etc mixture _____ kg.

10. How dry fodder be fed ?

A. As it is.

B. Chaffing into 2 to 3 pieces.

C. Chaffing into small pieces.

11. Please name four fodder crops.

A.

B.

C.

D.

12. What are the advantages of green fodder/grass feeding to milch animals ?

A.

B.

C.

13. Please give the following information about lucerne cultivation.

A. Name of the improved variety : _____

B. Time of sowing : _____.

C. Seed rate per acre : _____.

D. Time of first cutting : _____.

14. How much Baroda dan (concentrate) should be given per day to an advanced pregnant buffalo ?

A. ½ kg. per day.

B. 2 kg. per day.

C. 5 kg. per day.

15. How many months the buffalo is to be kept dry before each calving ?

A. Nil.

B. 2 months.

C. 3 months.

16. When should the colostrum be fed to newly born calf after calving ?

A. Within one hour of birth.

B. After 1 hour of birth.

C. After fall of placenta.

17. Among the following reasons, which is the appropriate for feeding colostrum to newly born calf ?

A. It provides immunity against disease.

B. It increases appetites.

C. It keeps the calf healthy.

18. How should the udder of buffalo be washed before milking for clean milk production ?

A. Washing with luke warm water.

B. Simple water.

C. Water with anti-septic material.

19. Which is the proper place for milking a buffalo for producing clean milk ?

A. In the same cattle shed without cleaning.

B. In the same cattle shed after proper cleaning.

C. In separate clean place.

20. If your buffalo feels difficulty in calving, what will you do ?

A. Whatever is possible.

B Calling a quack (Rabari).

C. Calling a stockman.

D. Calling a veterinary doctor.

21. What are the contagious diseases commonly found in buffalo/cow in this area ?

A.

B.

C.

D.

22. When the animal should get vaccinated against the following diseases ?

Name of disease	Time of vaccination
H.S.	----------
Foot and Mouth Disease	----------

23. Is there any advantages of vaccination to the animal ? Yes/No.

If yes, what are the advantages ?

A.

B.

C.

P A R T III

Adoption of improved animal husbandry practices

A. Watering :-

What is the source of drinking water for your milch animal ?

(a) Common water trough of the village. Yes/No.

If yes,

i. State number of waterings provided per day : _____

ii. State time of serving water : _____

(b) Water basin at home Yes/No.

If yes,

i. Can animal get water according to its will :

Yes _____ No _____.

ii. State number of watering provided per day : _____

iii. State time of serving : _____

B. Feeding :-

1. Which feed do you give to your milch animal ?

Concentrate :
- (a) Baroda dan,
- (b) Cotton seed,
- (c) Kuvadia (cassia tora)
- (d) Guar,
- (e) Maize,
- (f) Mixture (cotton seed, gotar and others)

Green fodder :
- (a) Sheda (Boarder land grass)
- (b) Lucerne,
- (c) Hybrid napier,
- (d) Sundhia Jower,
- (e) Bajri,
- (f) Vegetable byproducts,
- (g) Other (give details)

2. Do you feed byproducts of legume crops ? Yes/No.

3. Do you apply any standard for feeding your animals ?

Yes/No.

If yes, please, mention on what basis you are giving the balanced feed ?

(a) According to body weight,

(b) According to milk production,

(c) According to age,

(d) At the flat rate,

(e) No criteria.

4. Do you feed concentrate to the animal on milk yield basis ?

Yes/No.

5. Do you give bajri, Paddy, Methi, Sava, Oil etc after Calving ? Yes/No.

6. Do you give pregnancy ration to your milch animals ?

Yes/No.

7. Are you practicing silage method for drying of green fodder ?

Yes/No.

8. Do you feed colostrum to the new born calf ? Yes/No.

C. Housing :-

1. Where do you keep your milch animals ?

(a) Mandva,

(b) Kacchashed,

(c) Puccashed,

(d) Verandah,

(e) Other place.

2. Do you make any arrangement for feeding in the shed ?

Yes/No.

If yes, arrangement made for feeding ?

(a) Improved manger,

(b) Kaccha manger.

3. Do you clean, the shed or the place of tying ? Yes/No.

If yes, how frequently do you clean ?

(a) 3 times in a day,

(b) 2 times in a day,

(c) Daily one time,

(d) On alternative day.

4. Do you provide any bedding for buffaloes in the shed ?

Yes/No.

D. Animal breeding :-

1. Which of the following breeding practices do you follow to serve your buffaloes ?

(a) Artificial insemination,

(b) Natural service,

(c) Both.

2. Do you serve your buffalo within 2 to 3 months after calving ? Yes/No.

3. Do you take your buffalo for pregnancy diagnosis test ?

Yes/No.

4. Do you give any treatment to animal which repeats more than three artificial insemination ? Yes/No.

E. Animal health and care :-

1. Measures being taken to protect milch animals against disease.

(a) Getting cattle vaccinated against contagious disease,

(b) Taking the advice of veterinary doctor immediately on becoming animal sick,

(c) Isolation of diseased animal.

2. To whom you call for treatment of sick milch animals ?

(a) Government veterinary doctor,

(b) Dairy veterinary doctor,

(c) Quack (Rabari),

(d) Other (give details)

3. Do you get your milch animals vaccinated against prevalent contagious diseases ? Yes/No.

OR

Do you get your milch animals protected from contagious diseases by getting them vaccinated ? Yes/No.

4. Do you deworm your calf ? Yes/No.

5. Do you dehorn your animals ? Yes/No.

P. Clean milk production :-

1. Do you clean the place used for keeping milch animals before milking ? Yes/No.

2. Do you give bath to your buffalo before milking ? Yes/No.

3. Do you wash your hand before milking ? Yes/No.

4. Do you wash udder before milking ? Yes/No.

If yes, how ?

(a) With simple water,

(b) Washing with lukewarm water,

(c) Water with anti-septic material.

5. What utensils you use for milking ?

(a) Narrow mouth utensil,

(b) Wide mouth utensil.

6. Do you clean the utensil used for milking ? Yes/No.

If yes, what thing you use ?

(a) Cold water,

(b) Warm water,

(c) Sand,

(d) Detergent.

7. Do you keep the utensil in sun-shine for drying after cleaning ? Yes/No.

8. How do you milk your buffalo ?

   (a) Full hand milking,

   (b) Thumb or knuckling.

9. How do you draw milk ?

   (a) Fast,

   (b) Slow,

   (c) Very slow.

10. How much time do you take to sell the milk after milking an animal ?

   (a) Immediately,

   (b) Within one hour,

   (c) Within two hours.

P A R T IV

Attitude of milk producers of dairy villages towards co-operative milk producers' union.

(Indicate the extent of your agreement with the following statements by putting ✓ marks against each item below appropriate column head).

Sr.	Particulars	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5	6	7.
1.	Due to facilities provided by Panchmahal dairy, there is development of dairy business.					
2.	There is wastage of time in selling milk to the milk producers' co-operative society.					
3.	Satisfactory and proper advice regarding animal husbandry is available from the milk producers' co-operative society.					
4.	Money for milk sold to the milk producers' co-operative society is paid regularly by the society.					
5.	Treatment to milch animals given by veterinary doctor appointed by Panchmahal dairy is satisfactory.					
6.	Concentrate from Panchmahal dairy is available regularly.					
7.	Facility for A.I. is available at village level from Panchmahal dairy.					

1	2	3	4	5	6	7
8.	From members of Panchmahal dairy, society get advice and notification regularly.					
9.	The behaviour of the officers of Panchmahal dairy with members of milk co-operative society is satisfactory.					

P A R T V

Attitude of milk producers (Dairy and control villages) towards animal husbandry.

(Indicate the extent of your agreement with the following statements by putting ✓ marks against each item below appropriate column head).

Sr. 1	Particulars 2	Strongly agree 3	Agree 4	No opinion 5	Disagree 6	Strongly disagree
1.	Big land holders can do dairy business in good manner.					
2.	Only educated people can run dairy business efficiently.					
3.	People having less income become successful in dairy business.					
4.	Dairy business helps in meeting expenditure of farming.					
5.	Due to dairy business it is difficult to participate in social activities.					
6.	Dairy business helps in meeting expenditure for running home.					

1.	2.	3.	4.	5.	6.	7.
7.	Animal husbandry is best supplementary business.					
8.	Trying new methods in animal husbandry involves risk.					
9.	There is no risk in animal husbandry with better veterinary facilities.					