CHAPTER 6
SUMMARY AND CONCLUSIONS

Majority of working population in India are engaged in agriculture as well as allied activities field. The livestock population is an important allied activity of agriculture in the world particularly agrarian based countries including India. The cooperative societies have played a significant role in many countries of the world including India. This stock is providing important commodities like milk, meat, leathers and animal related services for human beings. Among these commodities, milk is an important food in the human basket.

In the world total 13 types of major animals are reported viz., goat & sheep, cattle, pigs, geese guinea, buffalos, beehives, horses, ass, camels, other rodents, mules and turkeys. Each type of animal wise and triennia ending TE 2003, 2006 and 2009 data reveal that Goat & Sheep population has remained the highest around 38 percent whereas Turkeys animals population west 01 percent consistently during all the TE 2003, 2006 and 2009. Total livestock population of the world in TE 2003 was 4676.12 million which increased to 5020.74 millions in TE 2009.

Milk Production in the World and Major Countries

The total milk production in the world which was only 542.4 million tonnes in year 1990 increased to 578.8 million tonnes in year 2000 (6.71 per cent), which gradually and steadily increased again to 696.6 million tonnes in year 2009 (again rose 20.35 per cent). Thus, between 1990 to 2009 the world milk production increased by 28.43 per cent. Among the various milky animals, the proportion of milk of cow in total milk production was found maximum with 88.31 per cent in year 1990 followed by buffalo milk (8.13 per cent) and other milk animals like goat and sheep etc. (only 3.56 per cent). During TE2009 United state of America, India, China and Russian Federation contributed above 5 per cent share in the total milk production of cow in the world. India is second largest cow milk producers in the world with 44.23 million tonnes (7.68 per cent) after the United state of America.

In the year 1990, the total world milk production was 542.4 mt wherein India had contributed 53.7 mt. Then milk production increased to 696.6 mt in the world and 110 mt in India in year 2009. Share of milk production of India in total milk
production of world was only 9.90 per cent in year 1990 which has been slowly increasing over the period and it was 15.79 per cent in year 2009.

**Livestock Population in India**

The total livestock population of India was 292.5 million in 1951 which increased to 525.35 million in year 2001. So nearly 80 percent animal population has increased during a period from 1951 to 2001. But this aggregate growth of total livestock population was found to vary significantly across different types of animals during the same period. In this context, the two important findings are: (1) Of the ten types of animals (cattle, goat, buffalo and sheep put together constitute approximately 98 per cent of the total livestock population in India. The population of cattle, goat and buffalo is found to have increased consistently during the same period. The cattle and buffalo population experienced both an increase and a decrease in their respective share to total livestock population. (2) Although the growth rate of cattle population is found to have increased consistently during different periods under analysis. The growth rate of goat and buffalo population was also found to have increased during all the periods under analysis excepting the period from 1992 to 2001.

**Livestock Population in Gujarat**

The total livestock population of Gujarat was 11977 thousand in 1951 which increased to 23795 thousand in year 2007. So nearly animal population has became double during a period from 1951 to 2007. But this aggregate growth of total livestock population was found to vary significantly across different types of animals during the same period. In this context, the three important observations are: (1) The four kinds of animals i.e. cattle, buffalo, sheep and goat put together constitute approximately 93 to 98 per cent of the total livestock population in Gujarat. The population of buffalo is found to have increased consistently during a period from 1951 to 2007 but cattle, goat and sheep has increased during a period from 1950 to 1961 but then after experienced fluctuation during a period from 1972 to 2007. However, the percentage growth of all these animals to total livestock population is found to vary significantly across different census years. (2) Although the category wise population of cattle experienced both an increase and a decrease in percentage in the census year as compared to previous census year, among the cattle population, the in-milk cow has constantly increased except 1951 census. The total livestock population is found to have consistently increased during the census year from 1951 to 2007. (3) The annual compound growth rate of in-milk, dry and total cattle worked
out 1.27 percent, 0.66 percent and 0.70 percent for the period of 1951 to 2007 respectively. In case of buffalo, the percentage growth rate of in-milk, dry and total was 1.99 percent, 2.07 percent and 2.22 percent during 1951 to 2007 respectively. During the same period, the sheep and goat has increased with 0.42 percent and 1.22 percent annually. The total livestock population growth rate was 1.21 percent during 1951 to 2007.

**District-wise Growth of Livestock population**

**(1) Cattle Population**

The cattle population of Gujarat, which stood at 67.50 lakh in 1997 increased to 79.77 lakh in 2007 with an average annual growth rate of 1.68 percent. As compared to buffaloes, the AAGR of cattle for the state was found much lower mainly because of significant reduction in bullocks population and non-increase in indigenous cow population. During period 1997-2007 the AAGR was found positive for all districts except for three districts namely Bharuch, Dahod and Patan. As against 1.68 percent AAGR for Gujarat state, AAGR of selected districts was found higher at 3.87 percent for Panchmahals, 3.44 percent for Sabarkantha and 5.68 percent for Banaskantha district.

**(2) Buffaloes Population:**

The buffalo population of Gujarat, which stood at 62.86 lakh in 1997 had increased to 87.74 lakh in 2007 with an annual average growth rate of 3.39 percent. It is important to note that in 1997, cattle population (67.50 lakh) was higher than buffalo population but owing to higher growth rate, buffalo population (87.74 lakh) surpassed the cattle population (79.77 lakh) in the state in 2007. The data further reveals that the growth of buffaloes was sharp and positive in all the districts (except Navsari) of the state during 1997-2007. Overall, the buffalo population in the state increased at the average annual growth rate of 3.39 percent during 1997-2007. During this period, average annual growth rates in selected Banaskantha, Panchmahals and Sabarkantha districts were 5.91, 5.97 and 2.78 percent respectively.

**(3) Sheep and Goat population:**

An average annual growth rate of sheep population has been negative (-0.75 percent) during the period from 1997 to 2007. It is found that Ahmedabad, Anand, Patan, Sabarkantha and Panchmahals districts recorded the positive AAGR during
period 1997-2007 whereas in remaining districts growth in sheep population is found either negative or stagnant.

The Goat population increased from 43.85 lakh in 1997 to 46.40 lakh in 2007. Thus, overall goat population increased at an average annual growth rate of 0.57 percent during period 1997-2007.

**Trends in area under fodder crops in Gujarat**

An area under fodder crops more or less remained static between 8.5 lakh during 1981-82 to 1985-86 but it has increased to 12 lakh to 13 lakh during 1990-91-2004-05 and it marginally declined to around 11 lakh during 2005-06 and 2006-07. As a result, percent share of area under fodder crops to gross cropped area also found almost stagnant around 8 to 13 percent. However, during 2006-07, area under fodder crops and its percentage to GCA declined to some extent. Owing to significant increase in bovine cattle population and more or less static area under fodder crops, gap between supply and demand of fodder is found to be widening.

Among various fodder growing districts in the state, Kutch, Banaskantha, Patan and Ahmedabad are found to be the major fodder growing districts during 2001-02 t 2006-07. In Narmada, Dangs, Porbandar, Panchmahals, Dohad and Valsad districts, area devoted to pure fodder crops was negligible and less than one percent of GCA. In these districts, livestock are more dependent on dry-fodder and open grazing.

**Development of Milk Co-Operative Society**

The history of man is available only for 6 to 7 thousand years ago when he started to live in family. He started living with animals at first with goats- sheep’s. Gradually man started to store and use milk as his food. By 2300, the Gric- vaidik ‘Hiyokete’ recommended milk as medicine. It is history that the ‘Columbus’ who was the founder of America and other countries, behaved to have carried cows and goats in the boats in which he sailed. ‘Sir William Badbarn’ was the first to experiment financing to the farmers in Purandar taluka of Pune, in 1886. He established the committee for capitalist and collected about Rs. 10 lakh. In Mid of 1818-1888 Refzin societies were established 1883-84 Sulz Deelem societies were established. In 1956 the consumer co-operative societies and in 1870-1890 the Agricultural co-operative societies were established in Japan. In 1964 in Denmark after the war with Germany, it was hard to be in the market of export of agricultural products and that’s why they took a look at other products, except agricultural product, dairy products, butter, bakery etc product had less competition so they gave importance to livestock and its
products. The Farmers of Denmark had gathered to establish the Dairy co-operative in 1882 and around 800 Dairy co-operative societies had started working by the year 1900. Thus, these activities succeeded in Denmark. In the same way, many other countries had also entered in this field viz. Netherland, Switzerland, France America, New Zealand, Poland, Australia, England and also India.

**Dairy Development in India:**

Among the co-operative, milk producing activities is a special in the context of Europe countries and other cold countries. In Indian economy, the milk Industry has an important place in Gujarat, Haryana Punjab and Maharashtra. However, this has not covered an internal part of the socio-economic strata among many states of the country. In the milk industry, Gujarat is a developed as well as progressive state. In 2005-06 dairy milk production was 2.28 billion liter of 12 federations of Gujarat. There were about 11962 milk co operative societies and 2.5 million members in Gujarat during 2005-06. During 2006-07 the dairy milk production was 2.35 billion liters by 13 federations in Gujarat. The milk co operative societies were 12792 and 2.6 million members in this year.

**Progress of Operation Flood Program**

The Operation Flood Program was undertaken after the National Dairy Development Board had been formed in 1965. The program aimed to solve the shortage of milk supply in the four Metropolitan cities of Calcutta, Bombay, Madras and Delhi. This tried to achieve a two-fold objective of increasing the production of milk and making equilibrium of supply and demand in the milk market. It was then decided that the Milk Co-operative formed on Anand pattern in all over the country. The Anand pattern had been accepted as the model because the Kaira District Milk Producers’ Co-operative Union Limited (AMUL) was then recognized as the only ideal Milk Union of the country. In the initial stages of the program, India received a huge amount of butter oil and milk powder as gift from the European Economic Community (EEC).

Before the implementation of the OFP both the production of milk as well as the per capita milk consumption was too low. The position at present has undergone a distinctive change. The trend of keeping milk animals in a scientific method has registered an increase too. As a result, import of milk powder from foreign countries has substantially dropped and after 1976, its import on a commercial basis stopped totally. However, the country got less amount of milk powder after that as gift. This
testified to the fact that, with the inception of the OFP, the Dairy Development Movement in India and also the Dairy Industry has made a remarkable progress. Despite this, the rate of progress has not been the same in different zones. While the Eastern zone is lagging far behind the other zones in this respect, the Western Zone has gone far ahead of others.

The Birth of Amul – a source of India’s Dairy Co-operative Movement

The birth of Amul at Anand provided the impetus to the co-operative dairy movement in the country. The Kaira District co-operative Milk Producers’ Union Limited was registered on December 14, 1946 as a response to exploitation of marginal milk producers by traders or agents of existing dairies in the small town named Anand (in Kaira District of Gujarat). Milk Producers had to travel long distances to deliver milk to the only dairy, the Polson Dairy in Anand. Often milk went sour as producers had to physically carry the milk in individual containers, especially in the summer season. Milk is a commodity that has to be collected twice a day from each cow/buffalo. In winter, the producer was either left with surplus/unsold milk or had to sell it at very low prices. Moreover, the government at that time had given monopoly rights to Polson Dairy (around that time Polson was the most well known butter brand in the country) to collect milk from Anand and supply it to Bombay city in turn. India ranked nowhere amongst milk producing countries in the world in 1946.

The farmers who were unhappy with the unfair and anti milk producers trade practices in Kaira District approached Sardar Vallabhbhai Patel under the leadership of the local farmer leader Tribhuvandas Patel. Sardar Patel advised the farmers to form co-operative and supply milk directly to the Bombay Milk Scheme instead of selling it to Polson (who did the same but gave low prices to the producers). He sent Morarji Desai to organize the farmers. In 1946, the farmers of the area went on a milk strike refusing to be further oppressed. Thus the Kaira District co-operative was established to collect and process milk in the District of Kaira in 1946. Milk collection was also decentralized, as most producers were marginal farmers who were in a position to deliver 1-2 liters of milk per day. Village level co-operatives were established to organize the marginal milk producers in each of these villages. The co-operative was further developed & managed by Dr. V Kurien along with Shri H M Dalaya. The first modern dairy of the Kaira Union was established at Anand (which popularly came to be known as AMUL dairy after its brand name). Indigenous R & D
and technology development at the co-operative had led to the successful production of skimmed milk powder from buffalo milk – the first time on a commercial scale anywhere in the world. The foundations of a modern dairy industry in India were thus laid in India - one of the largest buffalo populations in the world.

The success of the dairy co-operative movement spread rapidly in Gujarat. Within a short span five other district unions – Mehsana, Banaskantha, Baroda, Sabarkantha and Surat were organized. Thus, in 1973, the Gujarat co-operative Milk Marketing Federation was established. The Kaira District co-operative Milk producers’ Union Ltd. which had established the brand name AMUL in 1955 decided to hand over the brand name AMUL to GCMMF. With the creation of GCMMF, it was managed to eliminate competition between Gujarat’s co-operatives while competing with the private sector as a combined stronger force. GCMMF has ensured remunerative returns to the farmers while providing consumers with products under the brand name AMUL. This was possible due to the leadership of the founder Chairman of AMUL, Tribhuvandas Patel and the vision of the father of the White Revolution, Dr. Varghese Kurien who worked as a professional manager at AMUL. Numerous people contributed to this movement which would otherwise not have been possible. Dr. Varghese Kurien, the World Food Prize and the Magsaysay Award winner, is the architect of India’s White Revolution, who helped India emerge as the largest milk producer in the world. Impressed with the development of dairy co-operatives in Kaira District & its success, Shri Lal Bahadur Shastri, the then Prime Minister of India during his visit to Anand in 1964, asked Dr. V Kurien to replicate the Anand type dairy co-operatives all over India. Thus, the National Dairy Development Board was formed and OFP was launched for replication of the Amul Model all over India.

**Dairy Development in Gujarat**

Out of total population, 70 per cent people are living in rural areas and about 68 per cent of them are engaged in agricultural and allied activities for their livelihood. Among the number of rural agriculture allied activities, the animal husbandry i.e. milk producing is the significant economic activity in Gujarat. A co-operative milk dairy industry had exclusively developed in the state. For the ‘White Revolution’ in the country, the Gujarat played the leading role and even today also, our country has an important position in the milk industry in the world. Thus, ‘The Gujarat’ is known as the ‘Denmark’ today. The Milk industry has developed only in some states
i.e. Gujarat, Punjab and Haryana while in the other states this industry has less developed in India. Geer and Kankrej variety for category of cows and Jafrabaji, Surati, Mahesani variety for buffalo category are important for the milk animal.

On the large scale cattle husbandry activities was started in the urban areas of Gujarat particular for cow and Polson dairy was provided best services for the butter during 1990. The Polson dairy was found to have exploited the milk producers in Gujarat and could not contribute to the development of the milk producers in the state. Therefore, producers advanced farmers, village leaders etc. met to Tribuvanbhai Patel, Vallabhbhai Patel and Morarjibhai Desai.

Milk producers had made the Milk Union for the restriction of milk trader’s exploiting policy at Surat in 1938. This union was started to sell the milk directly to the customers. Gradually the milk co-operative societies started in 84 talukas and the exploiting policy of milk traders was closed down. The milk producers had got rescannable prices of their produce.

The first co-operative milk producing society was established in Kheda district in 1946 and that was the fundamental of ‘Amul’. The administration of Amul was transparent and favorable to the milk producers. The growth of Amul was impressive. As a result, the Mahesana District Milk Producers Federation was established in 1960. Later on, many District Milk Producers Federations were started viz. Rajkot in 1963, Surendranagar in 1964, Vadodara 1965, Banas in 1970 and Sabar in 1971 etc. Besides, the income of milk producers was going up because the services related to health of cattle increased. About 13 District level federations were in the year 1971 functioning in the Gujarat and around 64.38 lack liters milk were collected per day.

The state government as well as co-operative industry provided all cattle related maximum facilities and services to milk-producers and co-operative industries which have actively implemented many programmes, schemes and activities for the upliftment for the cattle quality and also obtained the assistance from the other countries. Due to all this a variety of animal were developed in the state. Among the milky animal, the cow was yielding the milk of about 20 to 30 liters per day, to the milk producer’s in the rural and semi rural areas. The milk producers received more milk with less cost from the animal which promoted the milk business in the rural areas. During 2003, about 67.52 lakh liters milk was collected per day by the dairy industry which was found to be the highest over the period of year.
For the scientific academic development of milk industry in the state, the Dairy Science College in 1961 and Animal Husbandry University in 1964 was established. All the wings of the Dairy industry were developed in Gujarat. For the marketing and selling of Gujarat milk products the Milk Marketing Federation was started in 1977 and then the products were sold in all the states of India and in the other countries. Today, Gujarat dairy industry has provided milk in Delhi, Mumbai, Calcutta and Ahmadabad. The National Dairy Development Nigam was established at Anand in 1965. The National Dairy Corporation was established at Vadodara in 1970. The efficient management of dairy industry, the Institute of Rural Management Anand (IRMA) started from 1980 in Anand. The IRMA has provided all kind of services related to milk industry for the overall development of this Industry in the state and country.

**Development of AMUL Dairy**

Sardar Vallabhbhai Patel wrote a letter to the Social Workers of the Kheda district that, there is only one way for the development of Farmers and that is a Co-operative dairy industry. The social workers thought for an establishment of Co-operative Dairy Industry. The first meeting was held under the chairmanship of Shri Morarjibhai Desai with all leaders, farmers and milk producers at Samarkh village. Shri Morarjibhai Desai understood the various benefits of co-operative activities and the decision was taken for the establishment of Co-operative Dairy in this meeting. Shri Morarjibhai Desai had given the weightage on two points with farmers: (1) not to send milk to Mumbai and (2) to start the co-operative milk society.

The Greater Bombay Milk Scheme was closed to receive the milk from the milk societies due to presser of private milk traders. Co-operative workers met to the government but didn’t receive attention. Consequently, the milk producers had not given the milk to private traders and went on strike. This strike was extended for about 15 days. Due to this closed down, the milk could not be provided to the Mumbai from the Anand and the government scheme also failed. The Milk Commissioner of Mumbai visited Anand and he accepted all the demand of milk producers.

Shri Tribhuvandas Kishabhaji Patel was the President of Anand Taluka Sahkari Kharid Vechan Sandh (Federation) in this period. This federation through about purchase and sell of milk’s scheme but there was no results. Some stakeholders or private milk traders did not like that the development of co-operative dairy and they
misguided to milk producers. In this situation, the president and advance farmers met at Nadiad and strongly decided to establishment co-operative dairy. This resulted in ‘The Kheda District Co-operation Milk Producers’ Federation Limited which was registered on 14\textsuperscript{th} December 1946.

Shri Tribhuvandas Kishabhai Patel had started to establish the co-operative milk producing societies at the village level. Shri Patel discussed with the village leaders and farmers of the villages and explained the benefits of the co-operative. He also associated the experts of the Amul dairy with this activity. Consequently, co-operative milk society at Hadgud and Gopalpura was registered first.

**Functions of Co-operative Society**

The co-operative society plays many functions at the village level for the milk producers. It provides various services for cattle and some social welfare activities. Among all these functions, the main function of society is to collect milk from the members both time per day and to pay money on the basis of fat level. The society has to send the collected milk in the dairy at Anand timely. Besides, milk producers benefit due to market availability and also receive satisfactory amount of their produce. They also benefit from extension services of the society and the resultant higher milk production. The society guides scientific basis for the milk development activity to all family members of the society. This has attracted more and more milk producer to actively join the milk co-operative society.

**Establishment of Milk Co-operative Society Vishrampura**

The small village namely Vishrampura, is located in Pelad Tehsil, Anand. In this village, the Milk Co-operative Society was started in 3\textsuperscript{rd} February in year 1966. The entry fee was only Rs 1 for the membership at that time. Total member of the society were 110 and the total fund was Rs 550. The Society kept the value of share Rs 5 in the same period. During 1966, this society collected about 300 liters of milk per day (1.10 lakh liter annually). Now membership of the society has gone up by 462 members and the fund of share is Rs. 2300. At present about 2.92 lakh liters of milk is being collected per day by this co-operative society. The membership of the society has increased to about 320 per cent with growth rate of 3.32 per cent per annum. In the same manner, milk production of the society has gone up by 167 per cent and its growth rate of 2.26 per cent per annum during the last four decades.
Milk Co-operative Society

The total number of member of the milk society was 285 in 1980-81 which has been continuously increased with 481 during 2010-11. The membership in the society has increased about 68.77 percent during 1980-81 to 2010-11. But maximum rise was found during the 1990s with 43.16 percent and minimum was found during 2010s with 5.95 percent. The annual compound growth rate of the number of member is 4.87 per cent per annum. The total collected milk quantity was 1.75 lakh liters during year 1980-81 which increased during year 2005-06 with 3.46 lakh liters, while it increased in year 2010-11 with 5.78 liters. During three decades, the quantity of milk has increased more than three times in the society. The growth rate of collected quantity of milk is registered in two digits with 11.48 percent per annum during 1980-81 to 2010-11. In 1980-81 per member it was 613 liters per annum which increased up to 1201 liters in year 2010-11, and its growth rate is 6.30 percent per annum. About Rs 28,291 was the profit in this society during 1980-81. This gradually increased and it was Rs 5.77 lakh during 2010-11. The growth rate of profit is 33.63 per annual during year 1980-81 to 201011, which is remarkable. Per day per member the consumption of amul feed was 1.15 kg in year 1980-81. It is noticed here that this increased very less up to 2000-01 with 2.05 kg then after declined.

Various Activities of the Milk Co-operative Society

The various activities or programs are conducted by the sample milk co-operative society. The society is providing a different kind of animal feeds namely amul dan, mineral powder, chatan dan, green and dry fodder etc., on the basis of animal age, weight, type of fodder. For increasing the number of milk animal, the society has various breeding items through various program and scheme. The milk society is providing veterinary services at the primary level with very low charges compared to the market charges. In this services, they covered many disease to animals e.g. galsudho, karvaso/movaso etc. The society is arranging various activities/programs for the development of the members. The aims of such kind of activities are to increase the numbers of society’s members.

Objectives of Study: The objectives of the study are as follows:

1) To study the importance and historical growth pattern of milk economy, animal husbandry and milk co-operative society at the level of the world, India, Gujarat and the Vishrampura.
(2) To examine the strategies of increasing milk production in India covering various milk production related programmers during the Five year plans.

(3) To review obstacles and challenges in milk production and its improvement found in various studies over a period of time.

(4) To examine various aspects of buffalo and cow farming practices among the members of Vishrampura Milk Co-operative Society.

(5) To find out policy implications and suggestions to improve quality and quantity of milk among milk producers in Vishrampura milk Co-operative Society.

The present study is based on both the primary data as well as secondary data. The primary data is based on socio-economic profile of the milk producers, land utilization, cropping pattern including fodder crops, agriculture and livestock’ assets, availability of feeding and watering and its expenditure, milk produce and disposal, performance of milk society, its role for milk producers and health care, rates of milk given by the society, various opinions/attitudes/views of sample milk producers regarding cost of production of milk and yield level, suggestions for improvement quality and quantity of milk per unit etc. were collected through interview schedules from the milk producers.

Sample Design

An attempt is made for an in-depth study of one village milk co-operative society of one tehsil of one district of Gujarat State (Anand district) wherein has the major households have been engaged in agriculture along with animal husbandry and they have noteworthy source of income from the milk producing activity.

Livestock development policy during Five year plans

India has emerged as the world's major milk producing country, notwithstanding the poor productivity of native cattle – milk yield averaging 445 kg for cow and 811 kg for buffalo per lactation. A rural based activity, dairying has a wide spread development across states in the country among 70 million small households, rearing one or two cows/ buffaloes. Milk production came on its own after the Green Revolution of the late sixties when wheat and paddy straws became available in abundance for feeding the cattle, thus enhancing the yields. Milk being an important livestock product in the present study, attempts has been made to examine its growth and problems on basis of review of literature. Milk Production to a significant extent depends on the policy approach towards this sector during the plan periods. In this context, a detailed review has been made in this chapter relating to
policy measures taken for development of livestock sector during various plans in India.

**First Five Year Plan 1951-52 to 1955-56**

In the first plan the problems of cattle development in India were considered under the four heads viz. (1) Feeding, (2) Breeding, (3) Removal of useless cattle, and (4) Production against diseases.

**The Second Five Year Plan 1956-57 to 1960-61**

The second plan made provision of over 56 crores on animal husbandry, including dairying. The object of animal’s husbandry programmes in this plan was to increase the supply of milk, meat and eggs. A greater consumption of these products was assumed to be very essential to balance the prevailing customary diets, and to provide efficient bullock power for agricultural operation in every part of the country. Certain animal products such as wool, hair, hides and skins, etc. as industrial raw materials were observed to have growing economic significance. Despite the large livestock population in 1950-51 the net value of livestock products had amounted only to Rs. 664 crores or about 16 per cent of the income from agriculture.

**The Third Five Year Plan 1961-62 to 1965-66**

Development of animal husbandry was envisaged as an integral part of a sound system of diversified agriculture. Emphasis was laid on mixed farming – a system in which crop production and animal husbandry were dovetailed for efficient and economic utilisation of land, labour and capital. It was felt that the integration of farming with animal husbandry was essential for the fuller utilisation of farm by-products, maintenance of soil fertility, fuller employment for agriculturists throughout the year and increase in rural incomes.

**The Fourth Five Year Plan 1969-70 to 1973-74**

The approach to livestock development in the Fourth Plan was based on three major consideration viz; (a) only about 12 per cent of the agricultural component of the gross Domestic product was accounted for by livestock production in India. (b) The Second consideration was nutritional. It was found that compared with cereals the demand for livestock products was more income elastic and it was likely to grow at a rate between 5.5 to 6.4 percent per annum. (c) Animal husbandry offers considerable scope for the diversification of the economy of the small farmer and the landless labourer.
The Fifth Five Year Plan 1974-79

In the fifth plan, it was intended to develop animal husbandry as an important economic occupation for the small and marginal farmer and agricultural labourers. With proper investments the commercial programmes of animal husbandry was viewed quite remunerative. There was a temptation for the detriment of the traditional classes dependent on animal husbandry. It was major aims of the fifth plan it ensure that the traditional classes get a lion’s share at the new programmes of animal husbandry development. For this purpose provision was made in the state and central plans for giving assistance to small farmers and agricultural labourers for rearing cross-breed.

Seventh Five Year Plan: 1985-86 to 1989-90

It was planned to reach an annual production level of 51.00 million tonnes of milk by the end of the Seventh Plan, against the base level production of 38.80 million tonnes in 1984-85, implying an annual growth rate of 5.6 percent.

Eighth Five Year Plan: 1992-97

The importance of the livestock development and dairy development subsector was recognised in improving the economic lot of especially the small and marginal farmers, the landless agricultural labour and rural women. The programmes launched in the previous plans were continued and systematically implemented. Attention was focussed on the technologies being developed to make activities in this subsector economically more remunerative. A rise in the livestock production and Productivity was found to be constrained by inadequate availability of feed and fodder while the treatment of common property resources and their effective management under watershed development programmes constituted an important element, it was to enable the farmers to produce fodder and feed stock material. Extension of the programme was quality seeds of fodder and forage especially of improved varieties were put on a sound basis for meeting the increasing demands of cultivated fodder and grasses. Efforts were made to utilise crop and cellulosic wastes through treatment and enrichment by Uromol Supplementation techniques.

Tenth plan: 2002-07

Livestock rearing is an integral part of crop farming and contributes substantially to household nutritional security and poverty alleviation through increased household income. India had around 57 per cent of the world’s buffalo population and 16 per cent of the cattle population and has become one of the largest producers of milk in the world.
Eleventh five year plan:

The goals for the Eleventh five year plan for the livestock sector were (1) To achieve an overall growth 6% and 7% per annum for the sector as a whole with milk group achieving a growth of 5.0% per annum. (2) The benefit of growth should be equitable, benefiting mainly the small and marginal farmers and landless labours and should benefit poorly endowed areas like draught prone, arid, and semi-arid areas. (3) To provide adequate animal health services for effective disease control. (4) The sector should generate additional employment opportunity to people in the rural areas especially to the female population. (5) Livestock should provide major source of income in the selected area having potential for the mixed crop-livestock farming system and (6) The growth in the sector should result in the improvement of environment, especially in the rural area. Market opportunities have opened up for the livestock sector following the economic liberalization.

Review of Literature

Researchers in India have completed a number of research studies on various aspects of livestock farming over a period of time. A comprehensive review of literature is an essential part of any scientific investigation. Therefore, an attempt has been made to reviews the research studies related with milk co-operative societies of India and Gujarat as well as economy of milk production in India and Gujarat. The finding of the available research works have been presented under the three heads viz.; (1) Feed and fodder for livestock, (2) Animal health, (3) Extension and exhibition programme for animal husbandry.

Feed and fodder constitutes 70 percent of the total milk production. It is a general conclusion that there was a large gap between requirement of feed and fodder and its availability in the past which continued to widen over a period of time. Farmers are found to be providing better and greater feed and fodder to milking animals in comparison with dry animals. Similarly farmers are also found to be providing greater and better feed and fodder to crossbred cows in comparison with desi cows. The supply of feed and fodder is found to face challenges from (a) commercialization of agriculture, (b) pressures on common grazing land, (c) higher export of oilcakes from our country, (d) an increasing prices of feed and fodder, (e) competing use of land for food-feed-fuel-fiber, etc. There is also an indication of overfeeding so livestock sector in our country is found to be facing a problem of
inadequate availability of feed and fodder on one hand and unsatisfactory quality of the available amount of the same.

The livestock population of India is found to be suffering from various types of diseases in greater or lower degree for various parts of the country. The poor health status of an animal adversely influences quality as well as quantity of its milk yield. Government of India and various state governments have of course initiated some efforts to protect animals from different types of diseases through establishment of veterinary services, livestock supervisory units, AI center, etc. These efforts have remained successful to some extents and as a result there is some improvement in milk yield in certain regions of the country.

Dairy industry in general and dairy co-operatives in particular is very much important in the socio-economic development of India in general and rural Indian economy in particular. These cooperatives have to strengthen the level and scope of their role in socio-economic development of the Indian economy, especially in economic reforms era. There is no alternative to the development of dairy co-operatives in overall development, especially rural areas.

**Buffalo farming: A micro economic analysis of Vishrampura village**

Socio-agro economic profile of buffalo farming by sample respondents, their animal (buffalo) husbandry practices, etc are examined. In Vishrampura milk cooperative society there are only 85 members who are engaged in buffalo farming. So, all 85 sample members are selected purposely for the study. This is a census survey in view of the fact that all the members of the society who are engaged in buffalo farming have been selected for primary survey. For an in-depth study, total respondents of buffalo farming have been categories into two parts i.e. (1) Low fat producing respondents (LFPR) and (2) High fat producing respondents (HFPR). This chapter is divided in to five section viz.; (1) Socio Economic profile of Sample Respondents (2) Feeding Practices (3) Breeding Information (4) Animal Health Information and (5) Co-operative Societies Activities and Village Panchayat activities.

**Characteristics of Sample Respondents**

**Age Group:** The average age of the heads of the total sample respondents of was 46 years. Among the various age groups of sample farmers middle age group farmers was found higher with 65.88 percent as compared to young and aged members.
Caste Composition: The majority of the sample respondents (89.41 percent) engaged in buffalo farming were from Other Backward Class category, followed by general category (7.06 percent) and Scheduled Castes category (3.53 percent). This composition was found to vary across LFPR and HFPR respondents.

Membership and Gender: In the total sample member, 14 members (16.47 percent) were female members rest of them were male members. It was observed that above 80 percent sample members were found male in both the category of respondents.

Educational States: Near 50 percent of the heads of the sample respondents had education up to primary school and 31.76 percent had education up to secondary and higher secondary. Only 3.53 percent heads have education above higher secondary i.e. college level. While 15.29 percent or 13 sample members were found illiterate. Majority of the heads of households of LFPR and HFPR groups taken together were educated 79 percent and 92 percent up to primary school and above, respectively. Noticeable point is that the illiterate members was found higher with 20.83 percent in the LFPR as compared to HFPR (8.11 percent)

Socio Economic Profile of Sample Respondents

Total Population: The sample households had a total population of 320 persons. Out of total population, 54.06 percent were male (173 males) and 45.94 percent were female (147 females). As compared to HFPR (137 persons), the population was found higher (near 34 percent) in LFPR category of respondents (183).

Working Population: Out of the total population, 72.81 percent were working and remaining (27.19 percent) were non working population. The percentage of working population was found highest in HFPR group of members with 76.64 and it was 69.95 percent in LFPR group.

Family Size: The majority of the sample respondents (72.94 percent or 62 sample families) have below 4 family members, in both sample categories. The average family size of all the households was 3.76. The family size of LFPR and HFPR members were 3.81 and 3.70, respectively.

Occupation: Out of total population (320 persons), about 32.50 were found non-working people while remaining were found engaged in various economic activities. Out of total working population, it is found that 26.56 percent (85 persons) were working only in animal husbandry related activity, followed by 19.06 percent (61 persons) in farm labour and AH,( Animal Husbandry) 8.44 percent (27persons) in farming with AH. Out of total population of sample of LFPR (183 persons), about
69.71 were found working people while remaining were non-working people. Out of the total working population, it is found that 53.55 percent (98 persons) were engaged in animal husbandry and agriculture with AH related activity. Out of the total population of HFPR (93 persons), about 67.88 percent were found economical working people in the various activities while remaining had dependent people. Out of the total working population, it is found that 27.01 percent (37 persons) were engaged in animal husbandry only followed by farm labours and AH with 12.41 percent (17 persons).

**Composition of Buffalo Population**

Buffalo is the important animal for milk producing activity in the study area because in this area the people have to like buffalo’s milk for the home consumption and other uses. The all kind of total number of buffalo was 213. Among them 105 (49.30 percent) were adult female in milk which had age of above 3 years including born and purchased, whereas 24 buffalos (11.27 percent) were adult (above 3 years) and 84 (below 3 years) were calves (39.44 percent). In case of LFPR sample, out of total in milk 57 adult buffaloes 44 were found to be grown by the respondents themselves and the remaining 13 were purchased from the market. Similarly, in case of HFPR samples, out of total 59 in milk buffaloes, 48 were home grown and the remaining 11 buffaloes were purchased from the market. Thus, born buffaloes are greater than the purchased buffaloes in the study area. In case of dry buffalos, each category’s have about 12 buffaloes and majority was found born animals. All the calves (84) were found born in the sample households but more number was found with (51 calves) LFPR. The number of she-calves was found higher as compared to the he-calves with both the categories of respondents.

**Quality of Livestock Population for All Sample Respondents**

The quality of livestock population plays an important role in improvement of income levels of farmers. The quality of livestock population is revealed by fat rate contained in their milk production. A milking buffalo having fat rate above 8 (Eight) points in milk yield significantly greater income when compared with another milking buffalo having fat rate below 5 (Five) points. So, fat rate in milk produced by a buffalo reflects its quality in terms of income generation.

Of the 129 buffalo population 26 buffaloes obtain fat rate above 7 whereas the remaining 103 buffaloes buffaloes population obtain fat rate below 7. Thus, a noteworthy percent of buffalo livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other buffalo population in the same
village. Thus, a majority of the buffalo population is required to be improved in respect of fat rate content in the milk production.

**Quality of Livestock Population for LFPR and HFPR Sample Respondents**

**LFPR:** Of the 69 buffalo population 29 (42.09 percent) buffaloes obtain fat rate above 6 whereas the remaining 40 buffaloes (57.91 percent) buffaloes population obtain fat rate below 6. Thus, a noteworthy percent of buffalo livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other buffalo population in the same village. Thus, majority of the buffalo population fat rate content is below 6 in the milk production.

**HFPR:** Of the 60 buffalo population 06 (10.00 percent) buffaloes obtain fat rate above 8 whereas the remaining 54 buffaloes (90.00 percent) buffaloes population obtain fat rate below 8. Thus, a noteworthy percent of buffaloes livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other buffaloes population in the same village. Thus, above 90 percent of the buffaloes population is required to be improved in respect of fat rate contain in the milk production.

**Fat Variation**

A general opinion was found from some farmers that fat rate is influenced by natural factors before beginning of a primary survey, so fat rate of an animal is opined to be varying across seasons. In this context, the sample respondents were asked to express their opinion about status of fat content in milk of their buffaloes during kharif, rabi and summer seasons. The variation of fat content in milk is found in the range of one dora to five dora.

All sample respondents on any unanimously opine that there is variation in fat rate of milk across seasons. However, the extent of fat variation experienced by sample farmers is also found to be significant in the study area. But some sample farmers experience variation in the fat during summer season and have not expected its variation during kharif and rabi seasons. Thus, sample farmers are found to experience variation of fat during kharif, rabi and summer season.

**Bonus Payment of Sample Respondents**

Bonus is paid a member of milk co-operative society once in a year on the basis of total milk supplied to society by him. So bonus reflects the actual contribution in terms of milk supply by a member in the milk co-operative society.
Bonus also reflects to some extent the degree of dependence of a member for his livelihood on milk co-operative society.

The average receipt of bonus by all respondents from each milking buffalo is Rs. 3742 whereas each sample households is Rs. 5679. So, on an average each buffalo yields Rs. 300 per month as bonus to a sample respondent and each sample respondents is able to receive on an average Rs. 500 per month as bonus from livestock enterprise during a year. In case of both LFPR and HFPR respondents, an average bonus per buffalo is found to be lower than an average bonus obtained per respondent. This means that sample respondents have benefited from more than one milking animal during year under analyses.

**Ownership of Animal Sheds**

On an average per sample respondent about 117.58 squares feet was found to have been constructed for LFPR, 138.05 squares feet area for HFPR and 126.49 squares feet for all the respondents, respectively. Per buffalo animal an average area of shed is found about 47.03 squares feet, 54.92 squares feet and 50.48 squares feet for the LFPR, HFPR and all respondents, respectively. It is observed that per household as well as per animal the shed area is higher for the HFPR as compared to LFPR. There are two types of animal shed i.e. pacca and kachha in the studied sample area, but it is observed that there have been very few sample with pacca animal sheds. The numbers of animals are found higher with kachach animal sheds.

**Water Requirement for a Buffalo and its Awareness**

The adequate supply of water to buffalo is a precondition for its efficient farming. In this context, expert in this field, Dr. Savani A. V. (2010) has recommended season wise requirement of water for an adult milky animal.

An attempt was made to study about awareness of the sample respondents towards recommended watering during a day and how far the respondents could observe the recommendation in livestock farming practice. The sample respondents are still not adequately aware of scientific doses of water required per buffalo as recommended by experts in the field.

**Drinking Water Facility**

The sample respondents of the study are found to be providing water to their animals either from their own water tank or are providing water two times directly from their tap when village panchayat distributes water. From the second source the
respondents are found to be providing water through buckets because these respondents do not have facilities of water tank with them.

An important pertinent point worth examination is weather sample respondent provide 60 liters of water per day or not. It was attempted to find out average per capita water availability to animals kept by the sample respondents. In this context it was found that total LFPRs provided 34 liters water per day where as total HFPRs are found to be providing 44 liters of water per day to the animals. So in view of 60 liters per day water requirements of animals LFPRs provided 26 liters less water to their animals and HFPRs provided 16 liters less water to their animals. HFPRs are found to be providing more drinking water to their animals in comparison with LFPRs. However in view of actual requirement of 60 liters of drinking water, all the respondents are found to be providing less drinking water to the animals in the study area.

Landholding Pattern

Livestock farming is an important agricultural allied economic activity since it utilizes a significant amount/ share of its various types of products. Therefore an area of cultivated land can influence livestock farming in terms of supply of fodder and its quality. In the study area, out of 85 sample respondents 50 respondents (58.82 percent) do not have land so they are landless sample respondents engaged in buffalo farming. A comparative analysis between LFPR and HFPR revealed that out of 50 sample respondents without land 38 (76.00 percent) belonged to LFPR category and 12 (24.00 percent) belonged to HFPR category. Out of the total 85 sample farmer 35 are found to have owned land. A comparative analysis between LFPR and HFPR revealed that out of 35 sample respondents owning land 10 (28.57 percent) belonged to LFPR category and 25 (71.43 percent) belonged to HFPR category. So a majority of farmers obtaining low fat content lack or do not have land for cultivation whereas a majority of them obtaining high fat content possess land for cultivation.

Cropping Pattern

It has been noted that cereal crops are good in respect of amount of production but possess lower level of nutrient content as fodder animals. The case of pulse is exactly the opposite of cereals. So to ensure quality fodder to animals, it is desirable to maintain 40 percent of area under pulse and 60 percent area under cereals while selecting crops for cultivation during a year. Alternatively, this ratio should be minimum one third pulse area and two third cereals area.
The major crops cultivated by the samples respondents are bajra, paddy, tobacco, wheat and fodder. Among crops cultivated during kharif season the area under bajra was found to be the highest in case of LFPR, HFPR and All Respondents. The second highest area is allocated to paddy crop by the same group in the season. The lowest area is found to have been allocated to fodder crop by LFPR, HFPR and All Respondents.

In the rabbi season the highest area was found under tobacco crop among various crops which is found to above 90 percent of the total rabbi cultivated area in the case of LFPR, HFPR and All Respondents, further HFPR respondents are found to cultivate wheat crop in the rabbi season but LFPR sample respondents are not found to be cultivating wheat crop during this season. In rabbi also the area cultivated by fodder is found to the lowest among various crops cultivated by all sample respondents as well as LFPR samples and HFPR samples.

In case of summer season the sample respondents are found to be cultivating two crops namely bajra and fodder wherein the area under bajra was found to be the highest between the two crops in case of LFPR, HFPR and All Respondents. In this season HFPR samples are found to be cultivating fodder crop but LFPR are not found to be cultivating the fodder crop. The comparative analysis between LFPR and HFPR revealed that LFPR samples have allocated greater area to fodder crop during kharif and rabbi season. When compared with LFPR respondents. During the summer season HFPR samples are found to be cultivating fodder crop but LFPR samples are not cultivating fodder crop. In view of ideal cropping pattern proposed to be suitable for livestock farming, the exiting cropping pattern among the sample respondents is found to be very much far from the expected level.

**Main Production, By – Production and Yield by Sample Respondents**

The total by production of all respondents for bajra, paddy and wheat crops is 903 quintal, 288 quintal and 0.3 quintal respectively. The yield of by product for bajra, paddy and wheat crops worked out to 81.79 quintal, 70.95 quintal and 1.5 quintal respectively.

The total by-products of LFPR respondents are 579 quintal and 118.5 quintal of bajra and paddy respectively. The yields of by-product are 82 quintal for bajra, and 71 quintal for paddy crops, respectively. The total by-products of HFPR respondents are 324 quintal, 324 quintal and 0.3 quintal of bajra, paddy and wheat respectively.
The yield of by-product has 81.82 quintal for bajra, 71 quintal for paddy and 1.5 quintal for wheat and crops, respectively. A comparative analysis about the availability of by products from bajra, paddy and wheat between LFPR samples and HFPR samples indicate that on an average per capita availability of by product from the three crops put to gather is greater in respect of LFPR samples in comparison with HFPR samples.

**Disposal Pattern of Farm by-produce by sample respondents**

Agricultural residues are largely use by livestock sector. Both quality and quantity play an important role in generation of milk production among the animals. Out of total production of bajra 300.4 quintal, near 72 percent (216 quintal) sold and remaining production is kept for the home consumption. For the paddy production, about 107 quintal (near 90 percent) is sold while reaming kept only 12 quintal for home consumption. The tobacco is the commercial crop therefore; the sample farmer sale the whole 261 quintal production. It is also observed that more than 80 percent quantity of main produces of bajra and paddy was sold and remaining share is kept for home consumption as grain and feed for human and animals by the LFPR. About 55 percent of bajra, 94 percent of paddy and 100 percent of tobacco quantities of main product is sold and remaining share is kept for home consumption by the HFPR.

**Recommendation of Daily Feed Requirement of Buffalo and its Awareness**

Scientific feeding to buffalo is a precondition for its efficient farming. Buffalo is required to be provided adequate and nutritious feed. In this context, expert in this field provide the guidance and recommended daily requirement of different type of feed for an adult milky animal.

It is very much pertinent that information of scientific recommendation of daily requirement of feed for a milky animal reach to farmers in a most efficient way. There exit a number of ways for communication of scientific recommendations to farmers. It is attempted to find out as to how far sample respondents are aware of scientific feeding recommendation. The sample farmers believe that they are aware of scientific quantity of green fodder, dry fodder and concentrate require to be given to an adult animal but in reality their belief is very much far from the experts. In other words, the sample respondents have a wrong feeling that they are aware of scientific recommendation of green fodder, dry fodder and concentrate.
Feeding Practices

As a green fodder the grass and as a dry fodder the bajra straw is usually provided by all the sample respondents. The Wheat crop has insignificant share in the cropping pattern of this study area; therefore, the sample respondents provide only 0.91 kg (2.19 percent). Among the different kind of feeds and cakes, the respondents have given dairy feed of about 3.67 kg followed by mixed feed 0.79 kg and maize cake 0.79 kg. The sample respondents are providing 41.77 kg quantity of various fodder and feeds per animal per day. In the total quantity of feeding, 33.38 kg is produced in the home and mostly that was green grass. The feeding of dry fodder is found to be very much low when compared with green fodder.

(1) LFPR: The respondents in this category are found to be providing on an average per day per animal the green grass, dry fodder and various feeds and cakes quantities of 30.64 kg (76.91 percent), 4.70 kg (11.80 percent) and 4.50 kg (11.03 percent) respectively. Among the different feeds and cakes, the higher quantity of dairy feed was found and that was 3.04 kg to the buffalos. The sample respondents are providing overall about 39.84 kg quantities of various fodder (including green and dry) and feeds per buffalo per day. About 80.42 percent quantities is home produced while remaining quantity were purchased from the market.

(2) HFPR: The respondents in this category are found to be providing on an average per day per animal the green grass, dry fodder and various feeds and cakes quantities of 32.88 kg, 4.86 kg and 5.95 kg respectively. Among the different feeds and cakes, the higher quantity of dairy feed was found and that was 4.29 kg to the buffalos. The sample respondents are providing overall about 43.69 kg quantities of various fodder (including green and dry) and feeds per buffalo per day. About 79.45 percent quantity is home produced while remaining quantity were purchased from the market.

Problems of Feeding

Out of 85 sample farmers 6 farmers (7.06 percent) reported a problem of inadequate availability of concentrate whereas remaining 79 (92.94 percent) sample respondent have not experienced an inadequacy of concentrate during period under study. An analysis of sample respondent belonging to LFPR category as well as HFPR category also indicate that quite a few sample farmers face the problem of inadequate availability of concentrate in the study area. The sample respondents do not face any significant problem in respect of different type of feeds in the area under study.
Adoption of AIs

AI is considered to be an important method to fertilize buffaloes during five year plan. Therefore, livestock development policy of India has laid a special emphasis on an improvement and spread of AI in India. This method is found to have been initiated in Vishrampura village after the year 2000. However, a majority of the sample respondents are found to have accepted AI during the period from 2001 to 2005. The similar conclusion is emerging when LFPR respondents are compared with HFPR respondents. This reveals that the rate of adoption of AI among sample respondents is extremely high.

Performance of Breeding Practice

An attempt was made in the primary survey to study fertility approach by all sample respondents and the extent of success in different fertility approach in the study area. The LFPR sample respondent attempted to fertilize their buffalo by AI and natural mating.

(1) Out of 200 buffaloes covered under AI program 132 (66.00 percent) are found to have been fertilized with a single AI application. In case of natural mating out of 13 buffaloes 2 (15.38 percent) buffaloes are found to have been fertilize with a single natural mating. Thus, a comparative analysis between AI and natural mating reveals that AI is more successful in respect of first time application.

(2) Out of 13 buffaloes 2 (15.38 percent) buffaloes got fertilized with a single natural mating application whereas 7 (53.95 percent) buffaloes got fertilized with a 2 natural mating application and 4 (30.77 percent) got fertilized with a 3 natural mating application. Thus, around 85 percent of buffaloes covered under natural mating got fertilized with a 2 to 3 natural mating application and only 15 percent of the buffaloes covered under natural mating got fertilized with a single natural mating application.

(3) Out of 213 buffaloes 200 (93.19 percent) buffalo are fertilized by adopting AI practice and remaining 13 (6.10 percent) are found to have been fertilized by natural mating among the total sample respondent. The majority of the respondents have ownership of buffaloes for more than five years. The two important conclusions are: (a) a majority of buffaloes are fertilized through AI and very insignificant numbers of buffaloes are fertilized through natural
mating. (b) The preference for fertility through AI is found increasing with an increase in the experience of livestock farming.

**Performance of Breeding Practice by LFPR Respondents**

Out of 120 buffaloes owned by LFPR respondents 112 (93.33 percent) buffalo are fertilized by adopting AI practice and remaining 8 (6.67 percent) are found to have been fertilized natural mating. An attempted was made to study success of AI and natural mating; this means how frequently a buffalo is exposed to AI and natural mating for fertility. It is found that 95 percent of buffaloes covered under AI got fertilized with one to two AI applications. Out of 112 buffaloes 89 (79.46 percent) are found to have been fertilize with a single AI application. In case of natural meting out of 8 buffaloes only one (12.50 percent) buffaloes is found to have been fertilized with a single natural mating. Thus, a comparative analysis between AI and natural meting reveals that AI is more successful in respect of first time application.

**Performance of Breeding Practice by HFPR Respondents**

Out of 93 buffaloes owned by HFPR respondents 88 (94.62 percent) buffalo are fertilized by adopting AI practice and remaining 5 (5.38 percent) are found to have been fertilized by natural mating.

An attempted was made to study success of AI and natural mating. It is found that out of 88 buffaloes 43 (48.86 percent) buffaloes got fertilized with a single AI application whereas 42 (47.73 percent) buffaloes got fertilized with a two AI application and only 3 (3.41 percent) got fertilized with a three AI application. Thus, 97 percent of buffaloes covered under AI got fertilized with one to two AI applications.

In case of natural meting out of 5 buffaloes only one (20.00 percent) buffaloes are found to have been fertilized with a single natural mating. Thus, a comparative analysis between AI and natural meting reveals that AI is more successful in respect of first time application.

**Performance of Fertility Practice**

Farmers are found to fertilized buffaloes through two techniques one is AI and second is natural Mating. An attempt was made to study which technique is more preferable / acceptable to sample respondents. Majority of the sample respondents are found to prefer AI techniques in comparison with natural mating. This conclusion is found to be the same in respect of LFPR and HFPR respondents also.
3.5 Problems in Breeding

Breeding of an animal is attempted through AI and natural mating it was attempt to study various problems faced by the sample respondents while breeding activity in the study area. Out of the total 85 sample respondents no one reported any problem in respect of breeding activity. Thus, there is no problem in breeding of buffaloes in the study area.

3.6 Infertile Animal

There is not a single infertile animal among the live stock population owned by total sample respondents. Here its worth to note that Amul sung organized a camp to prevent infertile animal which could have improved the livestock population in the study area.

Animal Health

In view of the primary survey conducted in the year 2007-08 the respondent were asked about various animal diseases prevailing among their animals. It is a very important observation to note that none of the respondent reported any disease for animal. This means that livestock sector of the study area suffer from no disease at present. Thus, the study area has become a disease free area for the livestock sector.

Growth of membership

An attempt was made to study a change in membership in Vishrampura milk cooperative society over a period of time from 1966 to 2011 by LFPR (48), HFPR (37) and all respondents (85) engaged in buffalo farming. The important observation from this study are: (1) In the period from 1966 to 1986 out of total 85 respondents engaged in buffalo farming 33 (38.82 percent) had become member in the milk cooperative society. Out of 48 respondents 17 (35.42 percent) of LFPR and in case of HFPR respondent and out of 37 respondent 16 (43.24 percent) were members in milk co-operative society. Thus, larger percentage of the respondent from HFPR group reported to be the member in milk co-operative society as compared to the LFPR. (2) In the period from 1990 to 2000, out of 85 respondent engaged in buffalo farming 15 (17.65 percent) had become member in the milk co operative society. Out of 48 respondents, 5 (10.42 percent) for LFPR and out of 37 respondents, 10 (27.03 percent) for HFPR were members in milk co-operative society. This shows that the larger percentage of the respondent from HFPR group reported to be the member in milk co-operative society. (3) In period from 1966 to 2000 the first 35 years of the society out of 37 HFPR respondents 70.27 percent respondent had join milk co
operative society where as out of 48 LFPR respondents only 45.84 percent respondent had join milk co-operative society. Thus, a majority of the HFPR respondent had become member in the milk co-operative society during the first 35 years of the society.

**Acceptations of Techniques for Increasing Milk Quantity and its Fat**

Vishrampura milk cooperative society provides important guidance about various techniques to be use by its members to increase quantity of buffalo milk and an improvement of fat content in milk. These techniques are; 1) To feed green and dry fodder with 20gms mineral mix powder per animal, 2) To feed amul dan 5kg per day rather than other feed, 3) To provide 60 to 70Lts of drinking water per buffalo, 4) Adoption of AI for animal fertility and 5) Regular vaccination.

Out of total 85 sample respondents 72 (84.71 percent) respondents opine that regular vaccination is an important technique for increasing milk quantity and fat. In case of LFPR respondents out of 48 sample farmers 40 (83.33 percent) sample farmers opine the view similarly in case of HFPR respondents out of 37 sample farmers 32 (86.49 percent) sample farmers said that regular vaccination is an important technique for increasing milk quantity and its fat. A comparative analysis across the different technique indicated for increasing milk quantity and fat reveals that a majority of all sample farmers, a majority of HFPR respondents and a majority of LFPR responses consider regular vaccination as an important technique for increasing milk quantity and its fat content.

**Review of Livestock Farming related Literature by Sample Respondents**

Scientist and successful practisner in the field of livestock continuously generate knowledge which is published in different forms by different institutions. Farmer reading such publications benefit from the knowledge and remain successful certain extend in the field of livestock farming. An attempt was made to know deferent types of livestock farming related literature regularly studied by the sample farmers. In all the sample farmers are found to be reading four types of livestock farming related literature viz namely 1) Gramya Pashu Vidhaya book 2) Amul Patrika 3) Pasupalan Literature and 5) Annual Report of Vishrampura Milk Cooperative Society.

Out of 85 total sample farmers 60 (70.59 percent) sample farmers opine that Gramya Pashu Vaidhaya book is an important literature for livestock farming. In case of LFPR sample farmers out of 48 sample farmers 30 (62.50 percent) sample farmers
opine that the same view, similarly in case of HFPR sample respondents out of 37 sample farmers 30 (81.08 percent) sample farmers opine that the Gramya Pashu Vaidhaya book is an important literature for livestock farming.

A comparative analysis across the different types of literature related to livestock farming indicated for increasing milk quantity and fat reveals that a majority of all sample farmers, a majority of HFPR respondents and a majority of LFPR responses consider Gramya Pashu Vidhya book as an important literature for livestock farming to an increasing milk quantity and its fat content.

**Members Participation in Livestock Developments Programs**

The participation in any livestock development programs by a farmer will obviously lead to an improvement in milk and its total quantity of a buffalo. Vishrampura gram panchayat is found to have organized a number of livestock development programs namely (1) Loan Assistant Program (2) Prize Distribution Program (3) Animal Fertility Program (4) Determination Of Appropriate Prize of milk and (5) Members Provident Fund Program.

Out of 85 samples respondent 30(35.29 percent) sample respondent had participated in loan assistant program. A comparison of participation between LFPR and HFPR sample respondent in this program reveled that LFPR sample respondent was significantly greater when compared with HFPR sample respondent. Further a greater number of sample respondents had participated in loan assistant program when compared with remaining other livestock development program.

**Cow farming: A micro economic analysis of Vishrampura village**

Socio-agro economic profile of cow farming by sample respondents, their animal (cow) husbandry practices, etc. is described. In Vishrampura milk cooperative society there are only 100 members who are engaged in cow farming. So, all 100 sample members are selected purposely for the study. This is a census in view of the fact that all the members of society who are engaged in cow farming have been selected for primary survey. For an in-depth study, total respondents of cow farming have been categories into two parts i.e. (1) Low fat producing respondents (LFPR) and (2) High fat producing respondents (HFPR). This chapter is divided in to five parts viz.; (1) Socio Economic profile of Sample Respondents (2) Feeding Practices (3) Breeding Information (4) Animal Health Information and (5) Co-operative Societies Activities and Village Panchayat activities.
Characteristics of Sample Respondents

Age Group: The average age of the heads of the total sample respondents was 51 years. Among the various age groups of sample farmers, middle age group farmers were found higher with 71.00 percent as compared to young and aged members.

Caste Composition: The majority of the sample respondents (67.00 percent) engaged in cow farming were from Other Backward Class category, followed by general category (31.00 percent) and Scheduled Castes category (2.00 percent). This composition was found to vary across LFPR and HFPR respondents.

Membership and Gender: In the total sample members, 14 members (20.00 percent) were female members, rest of them were male members. It was observed that above one forth sample members were found male in both the category of respondents.

Educational Status: It is noticed that there was no relationship between education and category of member of the milk society. The data reveals that majority of the heads of households of LFPR and HFPR groups taken together were educated 81.00 percent and 80.00 percent up to primary school and above, respectively. The reasons for the good level of education are development of educational facilities outside of the nearest village/town, awareness regarding the importance of education and improvement in the economic condition of the farmers. Noticeable point is that the illiterate member was found lower with 18.75 percent in the LFPR as compared to HFPR (20.00 percent) respondents.

Socio Economic Profile of Sample Family

Total Population: That sample households had a total population of 416 persons. Out of total population, 55.29 percent were male (230 males) and 44.71 percent were female (186 females). As compared to HFPR (81 person), the population was found higher (76 percent) in LFPR category of respondents (335 person).

Working Population: Out of the total population, 46.15 percent were working and remaining (53.85 percent) were non-working population. The percentage of working population was found highest in HFPR group of members with 49.38 and it was lowest 45.37 percent in group members of cow LFPR.

Family Size: The majority of the member respondents 38.00 percent or 38 sample families have below 4 family members, in both sample categories. The average family size of the households was 4.16 for All Respondents. The family size of LFPR and HFPR members were 4.19 and 4.05, respectively.
Occupation:

Out of total population (416 persons); about 42.31% were found non-working people while remaining had engaged in various economic activities. Out of total working population, it is found that 26.20% (109 persons) were only in animal husbandry related activity, followed by 9.16% (41 persons) in farm labour and AH, 13.46% (56 persons) in farming with AH. Out of total population of sample of LFPR (335 persons), about 57.31% were found working people while remaining were non-working people. Out of total working population, it is found that 36.12% (121 persons) were engaged in animal husbandry and agriculture with AH related activity. Out of total population of sample of HFPR (48 persons), about 59.26% were found working people in the various activities while remaining had dependent people. Out of total working population, it is found that 23.46% (19 persons) were engaged in animal husbandry only followed by farm labours and AH with 11.11% (9 persons).

Composition of Cow Population

Cow farming is an important allied to agriculture activity providing regular income to sample respondents. There are total 347 cows among 100 sample respondents selected from Vishrampura milk cooperative society. All important findings emerging from the study are presented as: (1) There are total 347 cows owned by 100 households who are members in the society. Of 347 cows 193 (55.62% percent), 48 (13.83% percent) and 106 (30.55% percent) animals belong to a category of adult female cow in milk, adult female dry cow and young stock below 3 years respectively. Of the total young stock of 106 (30.55% percent), 62 (17.87% percent) are female calves and 44 (12.68% percent) male calves. Thus, nearly 50% of cow population is found to be in milk and a noteworthy number of young stock will a part of this group which reveals progressive future improvement of in milk cow population in the village under study.

All 100 sample households own 193 adult female cows in milk so every sample household has either one or more than one in milk adult female cow yielding income from milk production. Further if 48 adult female dry cow and 62 female young stocks are added in the figure 193 than it works out to 303 female cow populations. Than each respondent have either two or more than two female cows in the village. Thus A critical analysis of composition of all animals, HFPR and LFPR clearly reveals that approximately 40 percent of the total cow population existing with
sample households is purchased from the market whereas 60 percent of the cow population is found to have been borned in the house of sample households. So in case of cow farming sample households are found to prefer home production when compared with number of animals purchased from the market.

**Quality of Livestock Population for All Sample Respondents**

Out of the 241 cows population 10 (4.15 percent) cows obtain fat rate above 5 whereas the remaining cows 231 (95.85 percent) cows population obtain fat rate below 5. Thus, a noteworthy percent of cows livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other cows population in the same village. Thus, a majority of the cows population is required to be improved in respect of fat rate content in the milk production.

**Quality of Livestock Population for LFPR and HFPR Sample Respondents**

LFPR: Of the 210 cow population 53 (25.24 percent) cows obtain fat rate above 3.6 whereas the remaining 157 cows (74.76 percent) cows population obtain fat rate below 3.6. Thus, a noteworthy percent of cows livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other cows population in the same village. Thus, majority of the cows population fat rate content is below 3.6 in the milk production.

HFPR: Of the 31 cow population 2 (6.45 percent) cows obtain fat rate above 5 whereas the remaining 29 cows (93.55 percent) cows population obtain fat rate below 5. Thus, a noteworthy percent of cows livestock population obtain lower unsatisfactory fat rate in comparison with the high fat content drawing other cows population in the same village. Thus, above 93 percent of the cows population is required to be improved in respect of fat rate content in the milk production.

**Fat Variation**

All sample respondents unanimously opine that there is variation in fat rate of milk across seasons. However, the extent of fat variation experienced by sample farmers is also found to be significant in the study area. But some sample farmers experience variation in the fat during summer season and have not expected its variation during kharif and rabi seasons. Thus, sample farmers are found to experience variation of fat during kharif, rabi and summer season.

**Bonus Payment of Sample Respondents**

The average receipt of bonus by all respondents from each milking cow is Rs. 20812 whereas each sample households is Rs. 18331. So, on an average each cow
yields Rs. 1734 per month as bonus to a sample respondent and each sample respondents is able to receive on an average Rs. 1528 per month as bonus from livestock enterprise during a year.

In case of both LFPR and HFPR respondents, an average bonus per cow is found to be lower than an average bonus obtained per respondent. This means that sample respondents have benefited from more than one milking animal during year under analyses.

**Ownership of Animal Sheds**

On an average area of animal shed per sample household 286.38 squares feet for LFPR, 192.55 squares feet area for HFPR and 267.61 squares feet for all the respondents. Per animal average area of shed worked out to 75.86 squares feet, 85.58 squares feet and 77.12 squares feet for the LFPR, HFPR and all respondents, respectively. It is observed that per household as well as per animal the shed area is higher for the HFPR as compared to LFPR. There are two types of animal shed i.e. pacca and kachha in the studied sample area, but it is observed that very few sample with pacca animal sheds. The numbers of animals are found higher with kachach animal sheds.

**Water Requirement for a Cow and its Awareness**

An attempt was made to study about awareness of the sample respondents towards recommended watering during a day and how far the respondents could observe the recommendation in livestock farming practice. The respondents are still not adequately aware of scientific doses of water required per cow as recommended by experts in the field.

**Drinking Water Facility**

An important pertinent point worth examination is weather sample respondent provide 60 liters of water per day or not. It was attempted to find out average per capita water availability to animals kept by the sample respondents. In this context it was found that total LFPRs provided 38 liters water per day where as total HFPRs are found to be providing 48 liters of water per day to the animals. So in view of 60 liters per day water requirements of animals LFPRs provided 22 liters less water their animals and HFPRs provided 12 liters water their animals. HFPRs are found to be providing more drinking water to their animals in comparison with LFPRs. However in view of actual requirement of 60 liters of drinking water, all the respondents are found to be providing less drinking water to the animals the study area.
Landholding Pattern

Livestock farming is an important agricultural allied economic activity since it utilizes a significant amount/share of its various types of products. Therefore an area of cultivated land can influence livestock farming in terms supply of fodder and its quality. In the study area, out of 100 sample respondents 44 respondents (44.00 percent) do not have land so they are landless sample respondents engaged in cow farming. A comparative analysis between LFPR and HFPR revealed that out of 44 sample respondents without land 33 (75.00 percent) belonged to LFPR category 11 (25.00 percent) belonged to HFPR category. Of the total 100 sample farmer 36 are found to have owned land. A comparative analysis between LFPR and HFPR revealed that out of 56 sample respondents owning land 47 (83.93 percent) belonged to LFPR category and 09 (16.07 percent) belonged to HFPR category. So a majority of farmers obtaining high fat content lack or do not have land for cultivation whereas a majority of them obtaining low fat content possess land for cultivation.

Cropping Pattern

The major crops cultivated by the samples respondents are bajra, paddy, banana, chilly, cotton, sesame, tobacco, wheat and fodder. Among crops cultivated during kharif season the area under bajra was found to be the highest in case of LFPR, HFPR and All Respondents. The second highest area is allocated to banana crop by the same group in the season. The lower area is found to have been allocated to paddy chilly cotton sesame fodder crop by LFPR, HFPR and All Respondents.

In the rabbi season the highest area was found under tobacco crop among various crops which is found to around 80 percent of the total rabbi cultivated area in the case of LFPR, HFPR and All Respondents, further LFPR and HFPR respondents are found to cultivate wheat crop in the rabbi season. In rabbi also the area cultivated by fodder is found to be the lowest among various crops cultivated by all sample respondents as well as LFPR samples and HFPR samples.

In case of summer season the sample respondents are found to be cultivating two crops namely bajra and fodder wherein the area under bajra was found to be the highest between the two crops in case of LFPR, HFPR and All Respondents. In this season LFPR samples are found to be cultivating fodder crop but HFPR sample are not found to be cultivating the fodder crop.

The comparative analysis between LFPR and HFPR revealed that HFPR samples have allocated greater area to fodder crop during kharif and rabbi season.
when compared with LFPR respondents. During the summer season LFPR samples have found to be cultivating fodder crop but HFPR samples are not cultivating fodder crop. In view of ideal cropping pattern proposed to be suitable for livestock farming, the exiting cropping pattern among the sample respondents is found to be very much far from the expected level.

**Main Production, by –production and Yield by Sample Respondents**

The total of production of all respondents bajra, paddy, wheat and fodder crops are 1652 quintal 1511 quintal and 235 quintal respectively. The yield of by product for bajra, paddy and wheat crops worked out to 44.98 quintal 100 quintal and 31.84 quintal respectively.

The total by-products of LFPR respondents are 1350 quintal 1280 quintal and 190 quintal of bajra paddy and wheat respectively. The yields of by-product are 44.97 quintal for bajra 100 quintal for paddy and 31.88 for wheat crops, respectively.

The total by-products of HFPR respondents are 302 quintal, 231 quintal and 45 quintal of bajra, paddy and wheat respectively. The yield of by-product has 45.01 quintal for bajra, 100 quintal for paddy, and 31.69 quintal for wheat crops, respectively.

A comparative analysis about the availability of by products from bajra, paddy and wheat between LFPR samples and HFPR samples indicate that on and average per capita availability of by product from the three crops put to gather is greater in respect of LFPR samples in comparison with HFPR samples.

**Disposal Pattern of Farm by-produce by sample respondents**

Out of total production of bajra 2408 quintal, near 40 percent (971 quintal) sold and remaining production is kept for the home consumption. For the paddy and wheat production, about 1785 quintal (91 percent) and 980 quintal (79.08) is sold while reaming kept only 159 quintal and 205 quintal for home consumption. The tobacco, sesameum, cotton, potato, banana, and chilly is the commercial crop therefore; the sample respondents sale the whole quintal production. In case of fodder crop remaining whole production for their animals feed by all sample respondents. It is also observed that more than 90 percent and 73.94 quantities of main produces of paddy and, wheat and sold and remaining share is kept for home consumption as grain and feed for human and animals by the LFPR. In case of HFPR on an average 95 percent quantities of main produces of paddy and wheat has sold and
remaining share is kept for home consumption by as grain and feed for human and animals by HFPR.

**Recommendation of Daily Feed Requirement of Cow and its Awareness**

Scientific feeding to cow is a precondition for its efficient farming. Cow is required to be provided adequate and nutrition feed. In this context, expert in this field provide the guidance, and recommended daily requirement of different type of feed for an adult milky animal.

It is very much pertinent that information of scientific recommendation of daily requirement of feed for a milky animal reach to farmers in a most efficient way. There exit a number of ways for communication of scientific recommendations to farmers. It is attempted to find out as to how far sample respondents are aware of scientific feeding recommendation.

The sample farmers believe that they are aware of scientific quantity of green fodder, dry fodder and concentrate require to be given to an adult animal but in reality their belief is very much far from the experts. In other words, the sample respondents have a wrong feeling that they are aware of scientific recommendation of green fodder, dry fodder and concentrate.

**Feeding Practices**

As a green fodder the grass and as a dry fodder the bajra and wheat straw is usually provided by all the sample respondents. Among the different kind of feeds and cakes, the respondents has given green grass, dry fodder and dairy feed of about 21.10 5.41 and 5.85 kg followed by mixed feed 2.26 kg and makai khol 3.66 kg. The sample respondents are providing 38.73 kg quantity of various fodder and feeds per animal per day. In the total quantity of feeding, 71.55 kg is produced in the home and mostly that was green grass. The feeding of dry fodder is found to be very much low when compared with green fodder.

**LFPR:** The respondents in this category are found to be providing on an average per day per animal the green grass, dry fodder and various feeds and cakes quantities of 18.64 kg 3.11 kg and 4.21 kg respectively. Among the different feeds and cakes, the higher quantity of dairy feed was found 2.84 kg to the cows. The sample respondents are providing overall about 25.95 kg quantities of various fodder (including green and dry) and feeds per cow per day. About 80.66 percent quantities is home produced while remaining quantity were purchased from the market.
(2) HFPR: The respondents in this category are found to be providing on an average per day per animal the green grass and Lucerne, dry fodder and various feeds and cakes quantities of 23.56 kg 7.73 kg) and 19.34 kg respectively. Among the different feeds and cakes, the higher quantity of dairy feed was found and that was 8.87 kg to the cows. The sample respondents are providing overall about 51.51 kg quantities of various fodder (including green and dry) and feeds per cow per day. About 67 percent quantity is home produced while remaining quantity were purchased from the market.

**Problems of Feeding**

Out of 100 sample farmers 3 farmers (3.00 percent) reported a problem of inadequate availability of concentrate whereas remaining 97 (97.00 percent) sample respondent have not experienced an inadequacy of concentrate during period under study. An analysis of sample respondent belonging to LFPR category as well as HFPR category also indicate that quite a few sample farmers face the problem of inadequate availability of concentrate in the study area. The sample respondents do not face any significant problem in respect of different type of feeds in the area under study.

**Adoption of AIs**

Majority of the sample respondents are found to have accepted AI during the period from 2001 to 2005. The similar conclusions are emerging when LFPR respondents compared with HFPR respondents.

**Performance of Breeding Practice**

An attempt was made in the primary survey to study fertility approach by all sample respondents and the extent of success in different fertility approach in the study area. The LFPR sample respondent attempted to fertilize their cow by AI and natural mating.

1. Out of 316 cows covered under AI program 275 (87.03 percent) are found to have been fertilized with a single AI application. In case of natural meting out of 31 cows 4 (12.90 percent) cows are found to have been fertilize with a single natural mating. Thus, a comparative analysis between AI and natural meting reveals that AI is more successful in respect of first time application.

2. Out of 31 cows 4 (12.90 percent) cows got fertilized with a single natural meting application whereas 9 (29.04 percent) cows got fertilized with a 2 natural meting application and 18 (58.06 percent) cow got fertilized with a
third natural mating application Thus, around 87 percent of cows covered under natural mating got fertilized with a two to third natural mating application and only 15 percent of the cows covered under natural mating got fertilized with a single natural mating application.

(3) Out of 347 cows 316 (91.07 percent) cow are fertilized by adopting AI practice and remaining 31 (8.93 percent) cow are found to have been fertilized by natural mating among the total sample respondent. The majority of the respondents have ownership of cow for more than five years. The two important conclusions are: (a) a majority of cow is fertilized through AI and very insignificant numbers of cow are fertilized through natural mating. (b) The preference for fertility through AI is found increasing with an increase in the experience of livestock farming.

Performance of Breeding Practice by LFPR Respondents

Out of 302 cows owned by LFPR respondents 281 (93.05 percent) cow are fertilized by adopting AI practice and remaining 21 (6.95 percent) cow are found to have been fertilized natural mating. An attempted was made to study success of AI and natural mating; this means how frequently a cow is exposed to AI and natural mating for fertility. It is found that 93 percent of cow covered under AI got fertilized with one to two AI applications. Out of 281 cow 252 (89.68 percent) are found to have been fertilize with a single AI application. In case of natural meting out of 21 cows only 3 (14.29 percent) cow is found to have been fertilized with a single natural mating. Thus, a comparative analysis between AI and natural meting reveals that AI is more successful in respect of first time application.

Performance of Breeding Practice by HFPR Respondents

Out of 45 cows owned by HFPR respondents 35 (77.78 percent) cow are fertilized by adopting AI practice and remaining 10 (22.22 percent) cows are found to have been fertilized by natural mating.

An attempted was made to study success of AI and natural mating. It is found that out of 35 cows 23 (65.72 percent) cows got fertilized with a single AI application whereas 6 (17.14 percent) cows got fertilized with a two AI application and only 6 (17.14 percent) cows got fertilized with a three AI application. Thus, 85 percent of buffaloes covered under AI got fertilized with one to two AI applications.

In case of natural meting out of 10 cows only one (10.00 percent) cow are found to have been fertilized with a single natural mating. Thus, a comparative
analysis between AI and natural mating reveals that AI is more successful in respect of first time application.

**Performance of Fertility Practice**

Farmers are found to fertilized buffaloes through two techniques one is AI and second is natural Mating. An attempt was made to study which technique is more preferable / acceptable to sample respondents. Majority of the sample respondents are found to prefer AI techniques in comparison with natural mating. This conclusion is found to be the same in respect of LFPR and HFPR respondents also.

**Problems in Breeding**

Breeding of an animal is attempted through AI and natural mating it was attempt to study various problems faced by the sample respondents while breeding activity in the study area. Out of the total 100 sample respondents no one reported any problem in respect of breeding activity. Thus, there is no problem in breeding of buffaloes in the study area.

**Infertile Animal**

There is not a single infertile animal among the live stock population owned by total sample respondents. Here its worth to note that Amul sung organized a camp to prevent infertile animal which could have improved the livestock population in the study area.

**Animal Health**

In view of the primary survey conducted in the year 2007-08 the respondent were asked about various animal diseases prevailing among their animals. It is a very important observation to note that none of the respondent reported any disease for animal. This means that livestock sector of the study area suffer from no disease at present. Thus, the study area has become a disease free area for the livestock sector.

**Growth of membership**

An attempt was made to study a change in membership in Vishrampura milk cooperative society over a period of time from 1966 to 2011 by LFPR (80), HFPR (20) and all respondents (100) engaged in cow farming. The important observation from this study are: (1) In the period from 1966 to 1986 out of total 100 respondents engaged in cow farming 65 (65.00 percent) had become member in the milk cooperative society. Out of 80 respondents 54 (67.05 percent) were members in milk cooperative society whereas in case of HFPR respondent out of 20 respondent 11 (55.00 percent) respondent were members in Milk Co operative Society. Thus, larger
percentage of the respondents from LFPR group reported to be the member in Milk Co-operative Society when compared to the HFPR. (2) In the period from 1990 to 2000, out of 100 respondent engaged in cow farming 6 (6.00 percent) had become member in the milk co-operative society. Out of 80 respondents, 5 (6.25 percent) for LFPR respondents, and out of 20 respondents, 1 (5.00 percent) for HFPR were member in milk co-operative society. This shown larger percentage of the respondent, from LFPR group reported to be the member in Milk Co-operative Society when compared with the HFPR respondents. (3) In period from 1966 to 2000 that is daring first 35 years of the society, out of 20 HFPR respondents 60.00 percent respondents had join milk co-operative society whereas out 80 LFPR respondents 73.30 percent respondent had join Milk Co-operative Society. Thus, a majority of the LFPR respondents had became member in the milk co-operative society in during the first 35 years of the society.

Acceptations of Techniques to Increasing Milk Quantity and its Fat

Vishrampura Milk Co-operative Society provides important guidance about various techniques to be use by its members to increase quantity of milk per cow and an improvement of fat content in milk. These techniques are: 1) To feed green and dry fodder with 20 gms mineral mix powder per animal, 2) To feed amul dan 5 kg per day rather than other feed, 3) To provide 60 to 70 Lts of drinking water per cow, 4) Adoption of AI for animal fertility, and 5) Regular vaccination it was asked to sample farmers as to out of these five techniques which techniques are acceptation to them. A comparative analysis across the different technique indicated for increasing milk quantity and fat reveals that a majority of all sample farmers, a majority of HFPR respondents and a majority of LFPR responses consider feed amul dan 5 kg per day rather than other feed as an important technique for increasing milk quantity and its fat content.

Review of Livestock Farming related Literature by Sample Respondents

Scientist and successful practisner in the field of livestock continuously generate knowledge which is published in different forms by different institutions. Farmer reading such publications benefit from the knowledge and remain successful certain extend in the field of livestock farming. So an attempt was made in the present study to know different types of livestock farming related literature regular studied by the sample farmers. In all the sample farmers are found to be reading four types of livestock farming related literature viz. namely 1) Gramya Pashu Vidhaya book

Out of 100 total sample farmers, 77 (77.00 percent) sample farmers opine that Gramya Pashu Vaidhaya book is an important literature for livestock farming. In case of LFPR sample farmers out of 80 sample farmers 60 (75.00 percent) sample farmers opine that the same view, similarly in case of HFPR sample respondents out of 20 sample farmers, 17 (85.00 percent) sample farmers opine that the Gramya Pashu Vaidhaya book is an important literature for livestock farming. A comparative analysis across the different types of literature related to livestock farming indicated for increasing milk quantity and fat reveals that a majority of all sample farmers, a majority of HFPR respondents and a majority of LFPR responses consider Gramya Pashu Vidhya book as an important literature for livestock farming to an increasing milk quantity and its fat content.

**Members Participation in Livestock Developments Programs**

The participation in any livestock developments programs by a farmer will obviously lead to an improvement in milk and its total quantity of a cow. Vishrampura Gram Panchayat is found to have organized a number of livestock programs namely (1) Loan Assistant Program (2) Prize Distribution Program (3) Animal Fertility Program (4) Determination of appropriate prize of milk and (5) Members Provident Fund Program.

Out of 100 sample respondent 38 (38.00 percent) sample respondents at participated in loan assistant program. A comparison participation between LFPR and HFPR sample respondents in this program reveled that LFPR sample respondents was significantly greater when compared with HFPR sample respondents. Further a greater number of sample respondents at participated loan assistant program comparison with remaining other live stock development program.