

## FOREWORD

This study was carried out with a view to examine the economics of dairying with crossbred cows in Western Maharashtra. It is often argued that crossbred cows need special attention and veterinary care and dairying with crossbred cows does not become an economically viable proposition without giving them green fodder, and, as such it is really those milk producers who have some irrigated land and green fodder can conduct dairying with crossbred cows profitably. In order to see if it was really so, about 250 milk producers were selected for a sample survey; 46 per cent of them had some irrigated land, another 44 per cent were dry land farmers, and about ten per cent were landless labourers. They belonged to six villages in Pune, Sangli and Solapur districts having different agro-climatic conditions and cropping pattern. The results of the sample survey showed that even the landless or those who had no irrigated land and were marginal or small farmers could conduct dairying with crossbred cows profitably. These milk producers have accepted artificial insemination for crossbreeding the local breeds of cows. In the process, their crossbred cows are adapted to local climatic conditions. They are able to take necessary care of crossbred cows even though they are poor. Of course, the existence of an assured market for milk at a predetermined price is a prerequisite. Fortunately, there now exists a net work of the Milk Producers' Cooperative Societies in a large number of villages in western Maharashtra.

In the present study, a review of the crossbreeding of cows with artificial insemination since 1970, by the Animal Husbandry Department of the State Government, Bharatiya Agro Industries Foundation and other agencies was also taken up. It showed that the programme of crossbreeding of cows is now fairly well established in Western Maharashtra. As a result, the collection of cow milk under the Government Milk Scheme is rapidly increasing from year to year. The main problem at present is that supply of cow milk, particularly in the flush season, is more than what the market for fluid milk can absorb. Due to lower fat content of cow milk, the cost of marketing milk products made therefrom is higher as compared to the milk products manufactured from buffalo milk. The price of milk in Maharashtra State is higher as compared to Gujarat and other States. In the circumstances, it is difficult for the Dairy Cooperatives from other States in the matter of marketing of milk and particularly, of milk products. It is, therefore, necessary to explore ways of utilising cow milk for manufacturing milk products which can be sold profitably and also develop market for cow milk in the metropolitan areas.

Further, fodder supply and particularly green fodder will become a serious constraint if, during the next decade, dairying with crossbred cows is given to the rural poor in large numbers as a subsidiary occupation under various programmes of the Central and State Government. Therefore, the

State Government will have to chalk out a long term programme of dairying in Maharashtra after carefully considering the increase in the number of crossbred cows and consequent increase in milk supply, constraint of fodder resources and arrangements for disposal of incremental cow milk, and in the light of this, take a policy decision regarding the intensification or otherwise of the programme of crossbreeding of cows.

V.S.Chitre

24th August 1987

Gokhale Institute of  
Politics and Economics,  
Pune 411 004

State Government will have to chalk out a long term programme of dairying in Maharashtra after carefully considering the increase in the number of crossbred cows and consequent increase in milk supply, constraint of fodder resources and arrangements for disposal of incremental cow milk, and in the light of this, take a policy decision regarding the intensification or otherwise of the programme of crossbreeding of cows.

V.S.Chitre

24th August 1987

Gokhale Institute of  
Politics and Economics,  
Pune 411 004

State Government will have to chalk out a long term programme of dairying in Maharashtra after carefully considering the increase in the number of crossbred cows and consequent increase in milk supply, constraint of fodder resources and arrangements for disposal of incremental cow milk, and in the light of this, take a policy decision regarding the intensification or otherwise of the programme of crossbreeding of cows.

V.S.Chitre

24th August 1987

Gokhale Institute of  
Politics and Economics,  
Pune 411 004

State Government will have to chalk out a long term programme of dairying in Maharashtra after carefully considering the increase in the number of crossbred cows and consequent increase in milk supply, constraint of fodder resources and arrangements for disposal of incremental cow milk, and in the light of this, take a policy decision regarding the intensification or otherwise of the programme of crossbreeding of cows.

V.S.Chitre

24th August 1987

Gokhale Institute of  
Politics and Economics,  
Pune 411 004

State Government will have to chalk out a long term programme of dairying in Maharashtra after carefully considering the increase in the number of crossbred cows and consequent increase in milk supply, constraint of fodder resources and arrangements for disposal of incremental cow milk, and in the light of this, take a policy decision regarding the intensification or otherwise of the programme of crossbreeding of cows.

V.S.Chitre

24th August 1987

Gokhale Institute of  
Politics and Economics,  
Pune 411 004

Opportunity Cost of Family Labour, Milch Animals with the Dairy Farmers, Livestock Holding in December 1983 and November 1984, Land Cultivated, Fodder Resources. Farm Produced and Purchased Fodder, Place of Obtaining Feed and Fodder, When is Green Fodder Given to the Milch Animals?, Cattle Feed, Oil-cake and Wheat Bran, Income from Dairying

V CROSSBREEDING AND SPECIAL CARE OF THE  
CROSSBRED COWS AND CALVES

88 - 113

Homebred-Crossbred Cows, Sex of Calves, Deaths of Calves, Disposal of Calves, Cost of Rearing Crossbred Female Calves Until Their First Calving, Cattle Sheds, Area per Animal, Animal Health, Veterinary Care and Services, Frequency of Bathing Crossbred Cows, Deaths of Milch Animals in 1981-82 to 1983-84, Causes of Deaths of Milch Animals, Insurance and Repayment of Loan in Respect of Milch Animals which Died.

VI PURCHASES AND SALES OF CROSSBRED COWS AND  
OTHER CAPITAL EXPENDITURE

114 - 137

Milch Animals Purchased, Reason for Purchase, Year of Purchase, Place of Purchase, From Whom Purchased?, Age and Number of Calvings at Purchase, Number of Calvings at the Time of the Survey, Expenditure on Purchase of Milch Animals, Sources of Finance for Purchases, Loan for Buying Milch Animals, Subsidy on Purchases, Instalment of Repayment of Loan, Source of Repayment of Loan Taken for Purchase of Milch Animals, Reason for Not Paying the Loan Instalment in Time, Loan for Purchase of Second Milch Animal, Other Capital Expenditure, Year in Which Other Capital Expenditure was incurred, Sale of Milch and Draught Animals, Average Price per Animal Sold.

VII DAIRY ENTERPRISE OF SAMPLE DAIRY FARMERS

138 - 204

Inter-Calving Period, Average Lactation Length and Average Lactation Yield, H.F. Crossbred Cows, Jersey Crossbred Cows,



Opportunity Cost of Family Labour, Milch Animals with the Dairy Farmers, Livestock Holding in December 1983 and November 1984, Land Cultivated, Fodder Resources. Farm Produced and Purchased Fodder, Place of Obtaining Feed and Fodder, When is Green Fodder Given to the Milch Animals?, Cattle Feed, Oil-cake and Wheat Bran, Income from Dairying

V CROSSBREEDING AND SPECIAL CARE OF THE  
CROSSBRED COWS AND CALVES

88 - 113

Homebred-Crossbred Cows, Sex of Calves, Deaths of Calves, Disposal of Calves, Cost of Rearing Crossbred Female Calves Until Their First Calving, Cattle Sheds, Area per Animal, Animal Health, Veterinary Care and Services, Frequency of Bathing Crossbred Cows, Deaths of Milch Animals in 1981-82 to 1983-84, Causes of Deaths of Milch Animals, Insurance and Repayment of Loan in Respect of Milch Animals which Died.

VI PURCHASES AND SALES OF CROSSBRED COWS AND  
OTHER CAPITAL EXPENDITURE

114 - 137

Milch Animals Purchased, Reason for Purchase, Year of Purchase, Place of Purchase, From Whom Purchased?, Age and Number of Calvings at Purchase, Number of Calvings at the Time of the Survey, Expenditure on Purchase of Milch Animals, Sources of Finance for Purchases, Loan for Buying Milch Animals, Subsidy on Purchases, Instalment of Repayment of Loan, Source of Repayment of Loan Taken for Purchase of Milch Animals, Reason for Not Paying the Loan Instalment in Time, Loan for Purchase of Second Milch Animal, Other Capital Expenditure, Year in Which Other Capital Expenditure was incurred, Sale of Milch and Draught Animals, Average Price per Animal Sold.

VII DAIRY ENTERPRISE OF SAMPLE DAIRY FARMERS

138 - 204

Inter-Calving Period, Average Lactation Length and Average Lactation Yield, H.F. Crossbred Cows, Jersey Crossbred Cows,

LIST OF TABLES

<u>Table</u>		<u>Page</u>
1.1	No. of Irrigated Dairy Farmers and Others in the Selected Villages According to Number of Crossbred Cows	8
2.1	Livestock Position in Maharashtra State as per 1978 Livestock Census (Percentage Distribution)	13-14
2.2	Districtwise Crossbred Cattle in Maharashtra State (as per 1978 Livestock Census)	15-18
2.3	Number of Artificial Inseminations Done and Calves Born in Maharashtra State Since 1970-71 to 1984-85	22
2.4	Districtwise Artificial Insemination Done in Maharashtra State Since 1970-71 to 1984-85	25-26
2.5	Districtwise Calves Born in Maharashtra State Since 1970-71 to 1984-85	26-27
2.6	Work Done by the BAIF in Cattle Breeding Centres in India Since Inception upto March 1983	31
2.7	Work Done by the BAIF in Maharashtra State During April 1979 - 1983	32
2.8	Jalgaon Zilla Sahakari Doodh Utpadak Sangha Ltd., Jalgaon ; Number of A.I. Centres, Number of Cows, Treated with A.I. and Number of C-B Calves Born in 1974-75 to 1984-85	37
3.1	Sample Villages : No. of Households, (1971 Census) Land Use, Cropping Pattern (1984-85) and No. of Milch Cattle	40-41
3.2	Milk Cooperatives in the Six Villages : Year of Establishment and Statistics Regarding Number of Members, Sale of Milk and Cattle-Feed, Net Profit During 1983-84 and Share Capital and Reserve Funds as on 30th June 1984	47
3.3	Progress of Nandre Dudh Puravatha Sahakari Society, Limited, 1973-74 to 1983-84	50
4.1	Caste and Religionwise Distribution of Sample Families	56
4.2	Distribution of Sample Families According to Their Main and Subsidiary Occupation	57
4.3	Distribution of Families According to the Year of Starting Dairy Enterprise and Membership of Milk Cooperative	58

<u>Table</u>	<u>Page</u>
4.4 Distribution of Family Members Engaged in Dairy Enterprise According to Their Relation to the Head of the Family and Their Educational Status	61
4.5 Distribution of Persons Working in Dairy Enterprise According to Total Daily Hours of Work in Dairying	63
4.6 Distribution of Persons Working in the Dairy Enterprise According to Daily Time Spent in Taking the Milch Animals for Grazing	64
4.7 Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Milking	65
4.8 Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Cleaning the Cattle Shed	65
4.9 Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Selling Milk	66
4.10 Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Other Work Relating to Dairying	67
4.11 Livestock Holding in December 1983 and November 1984 of the Sample Dairy Farmers	71-73
4.12 Classification of Dairy Farmers According to the Number of Crossbred Cows and Size of Their Cultivated Holding	76
4.13 Classification of Dairy Farmers According to the Number of Crossbred Cows and Size of Irrigated Area	77
4.14 Farm Produced and Purchased Fodder During the Reference Year	80
4.15 Distribution of Irrigated Dairy Farmers According to Income from Dairy During the Reference Year	85
4.16 Distribution of Other Dairy Farmers According to Income from Dairying During the Reference Year	86

<u>Table</u>	<u>Page</u>
5.1 Distribution of Homebred, Crossbred Cows According to Year in Which Their First Crossbred Calf was Born	89
5.2 Percentage Distribution of the Calves Born According to Sex	93
5.3 Percentage Distribution of Disposal of Male Calves	95
5.4 Percentage Distribution of Disposal of Female Calves	95
5.5 Distribution of Dairy Farmers According to the Number of Milch and Draught Animals and Average Area per Animal in the Cattle Shed	105
5.6 Source of Water Supply and Frequency of Bathing Crossbred Cows : Sourcewise and Villagewise Distribution	108
5.7 Deaths of Milch Animals in the Years 1981-82, 1982-83 and 1983-84	109
5.8 Percentage Distribution of Milch Animals Reported Dead in 1981-82 to 1983-84 by Cause of Death	112
6.1 Year of Purchase of Milch Animals	116
6.2 Classification of Purchased Milch Animals Indicating Their Calving at the Time of the Survey	118
6.3 Average Purchase Period of Milch Animals According to Their Number of Calvings at the Time of Purchase	120
6.4 Distribution of Irrigated and Other Dairy Farmers According to Other Capital Expenditure Incurred on Different Items (Except Milch Animals) of Dairying	128
6.5 Distribution of Dairy Farmers According to the Type of Other Capital Expenditure and the Year in Which it was Incurred	129
6.6 Milch and Draught Animals Sold by the Dairy Farmers Classified According to the Year of Sale and Reason for Sale	131-132

<u>Table</u>	<u>Page</u>
6.7 Villagewise Sales of Milch Cattle and Draught Cattle During the Year 1981-82, 1982-83 and 1983-84	134
6.8 Sales of Milch and Draught Animals in the Years 1981-82, 1982-83 and 1983-84 and Average Price per Animal Sold	136
7.1 Inter-Calving Period and Dry Period of H.F.C-B Cows Owned by Irrigated Dairy Farmers and Others	140
7.2 Inter-Calving Period and Dry Period of Jersey C-B Cows Owned by Irrigated Dairy Farmers and Others	140
4.3 H.F.Crossbred Cows : Average Lactation Length and Average Lactation Yield	142
7.4 Jersey Crossbred Cows : Average Lactation Length and Average Lactation Yield	143
7.5 Other Cows : Average Lactation Length and Average Lactation Yield	145
7.6 Buffaloes : Average Lactation Length and Average Lactation Yield	146
7.7 Distribution of Milch Animals According to Lactation Yield at Different Lactations (in lts.)	147
7.8 Percentage Distribution of H.F.Crossbred Cows in Different Calvings by Lactation Length	148
7.9 Percentage Distribution of Jersey Crossbred Cows in Different Calvings by Lactation Length	148
7.10 Percentage Distribution of Buffaloes in Different Calvings by Lactation Length	149
7.11 Percentage Distribution of Other Cows in Different Calvings by Lactation Length	149
7.12 Milk Yield on the Day Prior to the Field Investigator's Visit of H.F. and Jersey Crossbred Cows in Different Lactations Owned by Irrigated Dairy Farmers and Other Dairy Farmers	151

<u>Table</u>	<u>Page</u>	
7.13	Dung Production and Disposal	154
7.14	Villagewise Disposal of Total Milk Production During the Reference Year by the Irrigated Dairy Farmers and Others	158
7.15	Total Milk Production and Lactation months During the Reference Year, Yield per Lactation Month and Value of Milk Production Reported by the Dairy Farmers from Six Villages Having Only One or Two Crossbred Cows	161
7.16	Classification of Dairy Farmers According to Composition of Their Herd of Milch Animals	163
7.17	Receipts from and Expenditure on Dairy Enterprise During the Reference Year in Respect of Irrigated Dairy Farmers	164-167
7.18	Receipts from and Expenditure on Dairy Enterprise During the Reference Year in Respect of Other Dairy Farmers	168-173
7.19	Total Expenditure Including Imputed Value of Family Labour and Expenditure on Feed, Fodder etc., for the Calf/Calves	174
7.20	Net Surplus (a) After Excluding Expenditure on Calves and (b) After Excluding Expenditure on Calves and Imputed Wages of Family Labour	175-176
7.21	Cash Receipts from Sale of Milk and Milk Products and Expenditure in Cash According to Composition of the Herd of Milch Animals of Irrigated Dairy Farmers and Other Dairy Farmers	184
7.22	Average Expenditure per Crossbred Cow on Feed, Fodder and Concentrates During the Reference Year Reported by Irrigated Dairy Farmers and Other Dairy Farmers	189
7.23	Average Cash Receipts per Crossbred Cow During the Reference Year as Reported by Irrigated Dairy Farmers and Other Dairy Farmers	190
7.24	Expenditure per Crossbred Cow During the Reference Year on Dry and Green Fodder Reported by Irrigated Dairy Farmers and Other Dairy Farmers	193

<u>Table</u>	<u>Page</u>
7.25 Average Lactation Length and Lactation Yield per Month and Expenditure per Litre of Milk of H.F. and Jersey Crossbred Cows Owned by the Irrigated Dairy Farmers and Others During the Reference Year According to Composition of Ration	195
8.1 Expenditure on Feed, Fodder and Concentrates per Month in Different Lactations in Respect of H.F. and Jersey Crossbred Cows Owned by Irrigated Dairy Farmers and Other Dairy Farmers	211
8.2 Receipts and Expenditure During the Reference Period of a H.F. Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Irrigated Dairy Farmers	218-219
8.3 Receipts and Expenditure During the Reference Period of H.F. Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Other Dairy Farmers	220-221
8.4 Receipts and Expenditure During the Reference Period of a Jersey Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Irrigated Dairy Farmers	222-223
8.5 Receipts and Expenditure During the Reference Period of a Jersey Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Other Dairy Farmers	224-225

CHAPTER I  
INTRODUCTORY

In the Agro-Economic Research Centre of the Central Ministry of Agriculture located at the Institute, an evaluation study of an integrated dairy development scheme at Warnanagar in Kolhapur district of Maharashtra State was carried out in 1981\*. It revealed that dairying with a cow of local, non-descript breed is not economic. In respect of crossbred cows, (hereinafter referred to as C-B cows) however, it was found that returns from dairying were more than adequate for repayment of loan taken, if any, for their purchase. The sample selected for the Warna Study was small and did not have in it adequate numbers C-B cows. As such it was not possible to examine in that study the economics of dairying with C-B cows. A study of this problem deserves attention also because of the Government's policy during the last fifteen years to crossbreeding of local cows with exotic bulls to improve the milking ability of cows. In Maharashtra State, the Directorate of Animal Husbandry of the State Government (A.H. Department) has been carrying out on a large scale programme of artificial insemination (A.I.) and crossbreeding of cows and grading of buffaloes. Besides, the Bharatiya Agro Industries Foundation (BAIF), situated in Pune district is also engaged in such a programme in different parts of the country including Maharashtra

---

\* Evaluation of an Integrated Dairy Development Scheme (Warnanagar). D.P.APTE, Mimeograph Series No.21, Gokhale Institute of Politics and Economics, Pune, 1982.



State. A few Sugar and Dairy Cooperatives in the State have also tried to implement the programme in their area of operation.

In spite of the efforts of the State Government, the BAIF and other agencies, the C-B cows are to be found only in certain pockets in some of the districts as the A.H. department started the programme first in Pune district, where the department is located, and in some of the neighbouring districts. During the last ten years, under various schemes of finance of the Central and State Governments, commercial and cooperative banks and other agencies, a large number of milch cattle are purchased every year. Such schemes visualise purchase of high-yielding, graded animals under the schemes. It is, however, found that most of the borrowers purchase non-descript milch cattle. The reasons reported are non-availability of such high-yielding milch animals in the local market, inability of the small and marginal farmers, particularly the landless labourers to take care of C-B cows and to procure or raise enough green fodder, etc. Besides, there are other factors such as the beneficiaries' desire to get some milk and income therefrom as long as they can obtain it and later dispose of the animal. There is in some schemes, such as for Tribals and Weaker Sections, element of subsidy in the loans given. The loans are to be repaid in 36 to 48 equated monthly instalments. So that even if the beneficiaries are unable to successfully continue in dairy business, at least for some months they get

income from milk and they are not much concerned if they are unable to service the loan. Hence, it is proposed to examine in the present study, the conditions under which dairying with C-B cows becomes profitable and the reasons which prevent many of the milk producers from keeping such cattle and rearing calves born of C-B cows and examine such other issues. In the following are given the objectives of the present study.

### Objectives

1. To take a stock of A.I. and crossbreeding services rendered by the A.H. Department of the State Government, the BAIIF, the Sugar and Dairy Cooperatives and such other agencies in Maharashtra State since 1970-71 and review their performance.

2. To carry out a survey, in select rural areas of Maharashtra State, of about 250 dairy farmers (defined as those who are engaged in dairying either as main or subsidiary occupation and irrespective of whether they are cultivators or non-cultivators) who conduct dairying with C-B cows. The survey is expected to reveal conditions under which dairying becomes profitable and also the reasons which prevent many of the rural milk producers from buying such cattle, the cost of rearing the C-B calves born until their first calving, the veterinary and other such cattle need and financial and other constraints. In particular, we propose to examine the performance of dairy farmers having some irrigated land vis-a-vis others who have only dry land and the landless, who own C-B cows.

income from milk and they are not much concerned if they are unable to service the loan. Hence, it is proposed to examine in the present study, the conditions under which dairying with C-B cows becomes profitable and the reasons which prevent many of the milk producers from keeping such cattle and rearing calves born of C-B cows and examine such other issues. In the following are given the objectives of the present study.

### Objectives

1. To take a stock of A.I. and crossbreeding services rendered by the A.H. Department of the State Government, the BAIIF, the Sugar and Dairy Cooperatives and such other agencies in Maharashtra State since 1970-71 and review their performance.

2. To carry out a survey, in select rural areas of Maharashtra State, of about 250 dairy farmers (defined as those who are engaged in dairying either as main or subsidiary occupation and irrespective of whether they are cultivators or non-cultivators) who conduct dairying with C-B cows. The survey is expected to reveal conditions under which dairying becomes profitable and also the reasons which prevent many of the rural milk producers from buying such cattle, the cost of rearing the C-B calves born until their first calving, the veterinary and other such cattle need and financial and other constraints. In particular, we propose to examine the performance of dairy farmers having some irrigated land vis-a-vis others who have only dry land and the landless, who own C-B cows.

Department that a majority of those who own C-B cows are those who grow some irrigated crops including lucerne and, as such, dairy farmers are found in irrigated tracts in large numbers. It was also reported that in the dry regions, even though dairying with C-B animals is not as profitable as in the irrigated areas, some dairy farmers in the dry regions find it worthwhile and have begun rearing C-B cows for dairying purposes.

In the canal/well irrigated areas, dairy farmers who cultivate sugarcane, feed sugarcane tops along with lucerne and other green fodder to their milch cattle. Hence we decided to select villages having dairy farmers growing sugarcane. With a view to find out whether absence of sugarcane tops in the green fodder affects productivity of the milch animals and the cost of production of milch, we decided to select two villages from Pune district where potato is one of the irrigated crops. Further, to study the problem in the dry regions, we decided to select villages from dry regions of Sangli and Solapur districts. Our research staff talked to knowledgeable staff from the A.H. Department to identify the villages which had the above mentioned characteristics.

After selecting six villages from Pune, Sangli and Solapur districts, we proceeded to select a sample of dairy farmers therefrom. In the two villages from Pune district, Kalamb and Ranjani from Ambegaon Tahsil, we sent our Field Investigators to make a census and noted the land owned and area irrigated, if any, and the number of C-B cows and calves and other

milch animals owned by each family. Then we prepared a list in a descending order according to the number of C-B cows and calves they owned. From the six villages we had to draw a sample of 250 dairy farmers, i.e. about 40 to 45 dairy farmers in each village. Hence from the above mentioned list, we took a proportionate sample by taking a random start.

The census in these two villages having about 900 households took 16 man-days. Hence it was not convenient to follow the same method in other villages as it would have taken a number of days to carry out the census. We, therefore, decided to note the names of the dairy farmers who sold milk to the Milk Cooperatives in the villages on the day prior to the Field Investigator's visit and arrange these in a descending order according to the quantity of milk sold by them. After preparing such a list at Umadi in Sangli district and drawing the sample, it was found that it included some dairy farmers residing in some of the neighbouring villages. Hence such names were substituted by including in the sample the name of the dairy farmers, preceding or succeeding the name of the sample dairy farmer originally selected. We presumed that most of the selected dairy farmers would own C-B cows and/or calves. However, when the fieldwork was completed in Umadi, it was found that out of 45 dairy farmers, to whom the schedule was canvassed, only 19 of them owned C-B cows and/or calves. Hence in the other village from Sangli district, viz., Nandre, we asked our investigator to visit the two cooperatives in the

village and, when the dairy farmers came to deliver milk, note whether they were residents of Nandre and the number of C-B cows and/or calves they owned, and the quantity of milk delivered for sale by them on that day. After noting this information, we prepared lists of dairy farmers owning (a) one C-B cow and (b) two or more C-B cows; and drew a proportionate random sample of dairy farmers from (a) and (b).

During discussions with the staff of the A.H. Department in Solapur district, we were told that the C-B cows are to be found mainly in Malshiras taluka and particularly near about Akluj where the Cooperative Sugar Factory is located. However, we wanted to select dairy farmers from dry lands in Solapur district. We were told that the C-B cows are to be found in large numbers at Mandrup where the State Government's Dry Land Farming Centre is located. Hence we selected village Mandrup. The other village, Antroli, which is adjacent to Mandrup, was selected because both dry and irrigated farmers in this village owned C-B cows.

The villages finally selected, the number of irrigated and other dairy farmers selected in each of them and the composition of the herd of their milch cattle is shown in Table 1.1. It will be seen from the Table that the number of Dairy farmers in our sample having one C-B cow formed about the same proportion, (about 72 per cent) in the total irrigated farmers as also the dry land farmers, while those having two C-B cows formed 20 per cent in the case of the former and 17 per cent in the case of the latter.

village and, when the dairy farmers came to deliver milk, note whether they were residents of Nandre and the number of C-B cows and/or calves they owned, and the quantity of milk delivered for sale by them on that day. After noting this information, we prepared lists of dairy farmers owning (a) one C-B cow and (b) two or more C-B cows; and drew a proportionate random sample of dairy farmers from (a) and (b).

During discussions with the staff of the A.H. Department in Solapur district, we were told that the C-B cows are to be found mainly in Malshiras taluka and particularly near about Akluj where the Cooperative Sugar Factory is located. However, we wanted to select dairy farmers from dry lands in Solapur district. We were told that the C-B cows are to be found in large numbers at Mandrup where the State Government's Dry Land Farming Centre is located. Hence we selected village Mandrup. The other village, Antroli, which is adjacent to Mandrup, was selected because both dry and irrigated farmers in this village owned C-B cows.

The villages finally selected, the number of irrigated and other dairy farmers selected in each of them and the composition of the herd of their milch cattle is shown in Table 1.1. It will be seen from the Table that the number of Dairy farmers in our sample having one C-B cow formed about the same proportion, (about 72 per cent) in the total irrigated farmers as also the dry land farmers, while those having two C-B cows formed 20 per cent in the case of the former and 17 per cent in the case of the latter.

### Period of Reference

The period of reference for obtaining information about the milch cattle, milk yields, receipts and expenditure on account of dairy business and other items was December 1, 1983 to November 30, 1984. The purpose was to work out the receipts and expenditure, net profit, labour days, etc., for a period of one year. In most of the field investigations the reference year is the agricultural year. However, as it was not possible to take up the survey until December 1984, it was decided to cover the period of 12 months prior to 1st December 1984.

### The Schedule

In the schedule canvassed for the sample dairy farmers, we sought information on 1) land cultivated and area irrigated, if any; 2) fodder produced on the farm; 3) family members and others working in dairy enterprise, their labour-input for dairying; 4) live-stock holding in December 1983 and November 1984; 5) details regarding G-B cows and calves, cows of local breed and buffaloes, and, in particular; 6) information regarding purchases of such animals; 7) feeding practices, feed and fodder purchased; 8) cost of feeding and maintenance of the calves from birth until their first calving; 9) as also cost of feeding a milch cattle in one calving cycle as also for the reference period; 10) milk production of each animal in each calving; 11) total milk produced during the reference period; 12) its disposal by way of sale to the Milk Cooperative and private consumers, milk consumed at home and fed to calves; 13) dung manure



14) sale and death of cattle in the years 1981-82 to 1983-84;  
15) cattle insurance; 16) disposal of dead cattle;  
17) facilities and experience regarding crossbreeding and A.I. services and 18) information on veterinary services, cattle-shed, water supply and such other details. Towards the end of the schedule we derived from the data collected, a consolidated statement of income from, and expenditure on, different items during the reference period regarding dairying.

#### Time Schedule

We submitted our research proposal to the Directorate of Economics and Statistics of the Ministry of Agriculture for its comments on 20th August 1984. The Directorate vide its letter dated 15th October, 1984 communicated that we may go ahead with the project. The schedule to be canvassed for the dairy farmers was finalised in November 1984. The field work could not be commenced until December 1984 due to non-availability of a field investigator. It took nearly six months between December 1984 and June 1985 to complete the field work, though originally we had planned to complete it in five months. The reasons for delay were (a) difficulties in carrying out the field-work due to the elections to the Parliament and State Assembly and (b) leave the staff had to take for personal reasons. The field-work was carried out mainly by the Field Inspector and one Field Investigator.

Though we had thought of starting tabulation of data as soon as field-work in one district was completed we could not do

so as the field staff had to complete a part of the schedule after applying prices to milk production, family labour, fodder, etc., to arrive at the total receipts and expenditure. This work was carried out only after canvassing the schedule in all the six villages as we wanted to complete the field-work before the onset of monsoon. Hence the work of data processing could begin from July 1985. As the staff had to be delegated for the field-work of another research project, the data processing work also got delayed. The drafting of the report was taken up simultaneously. Most of the data processing work was completed by the end of January 1986 and the drafting of the report by the end of March 1986. The total time taken from the commencement of field-work in December 1984 till completion of the study was about 16 months, as against 14 months stipulated in the project proposal.

After this brief introduction to the subject and methodology used for the purpose of the study, we shall review in the next chapter the work of A.I. and crossbreeding done by the State Government and other agencies.

## CHAPTER II

### REVIEW OF A.I. AND CROSSBREEDING WORK DONE BY THE STATE GOVERNMENT AND OTHER AGENCIES

In the present chapter we propose to take a stock of work done in A.I. and crossbreeding of cows by the State Government through its A.H. Department, the BAIF and other agencies in Maharashtra State. The crossbreeding programme of cows was taken up by the A.H. Department in 1970. Hence it is proposed to review its work done in the years 1970-71 to 1984-85.

#### Livestock Census

We may begin by considering the 1978 livestock census data for Maharashtra State. The percentage of total cattle, cows in milk as also percentages of total buffaloes and buffaloes in milk, regionwise and also districtwise within each region are shown in Table 2.1. It is seen from the Table that the cows in milk (18,70,000) exceeded the number of buffaloes in milk (12,75,000) by about 47 per cent.

Regionwise, the Aurangabad region had the maximum number of cows in milk followed by Nashik, Pune, Amraoti, Nagpur and Bombay regions. As for buffaloes in milk, Pune region had about 39 per cent of the total followed by Aurangabad, Nashik, Bombay, Amraoti and Nagpur regions. There were wide variations within the districts in each region also. For instance, Kolhapur had the maximum number of buffaloes in milk but a much smaller number of cows. The position was somewhat similar in Sangli and Satara districts. As for cows, Ahmednagar and Nanded districts had each of them 5.6 per cent of the total cows,

**Table 2.1: Livestock Position in Maharashtra State as per 1978 Livestock Census (Percentage Distribution)**

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Greater Bombay	0.1	0.2	1.9	4.6
Thane	3.2	2.5	3.4	3.4
Raigad	2.7	2.8	2.8	1.7
Ratnagiri	3.3	2.2	2.0	1.3
Sindhudurg	1.6	1.0	1.9	1.1
<b>Bombay Region</b>	<b>10.9</b>	<b>8.7</b>	<b>12.0</b>	<b>12.1</b>
Nashik	5.5	4.9	3.1	2.6
Dhule	3.9	3.4	3.6	3.4
Jalgaon	4.1	3.8	5.7	5.6
Ahmednagar	5.5	5.6	3.0	2.7
<b>Nashik Region</b>	<b>19.0</b>	<b>17.7</b>	<b>15.4</b>	<b>14.3</b>
Pune	4.7	5.3	5.2	5.8
Satara	2.5	3.1	6.8	7.5
Sangli	1.8	2.6	7.2	8.2
Solapur	3.1	3.8	4.4	4.3
Kolhapur	1.8	2.0	10.9	13.4
<b>Pune Region</b>	<b>13.9</b>	<b>16.8</b>	<b>34.5</b>	<b>39.2</b>
Aurangabad	3.0	3.0	1.5	1.3
Jalna	2.4	2.5	1.0	0.9
Parbhani	4.1	5.2	2.8	2.9
Beed	3.6	4.1	2.8	2.7
Nanded	4.3	5.6	3.9	3.8
Osmanabad	2.1	2.5	2.9	3.0
Latur	2.4	3.1	3.6	3.5
<b>Aurangabad Region</b>	<b>21.9</b>	<b>26.0</b>	<b>18.5</b>	<b>18.1</b>

(Continued)

Table 2.1: (Continued)

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Buldhana	3.6	3.7	2.2	2.3
Akola	3.8	4.3	2.8	2.8
Amraoti	3.8	3.6	2.3	2.4
Yeotmal	5.0	4.4	2.6	2.1
Amraoti Region	16.2	16.0	9.9	9.6
Wardha	2.6	2.1	1.3	1.0
Nagpur	4.3	4.0	1.8	1.6
Bhandara	4.2	3.4	3.2	2.2
Chandrapur	4.1	3.3	2.1	1.5
Gadchiroli	2.9	2.0	1.3	0.4
Nagpur Region	18.1	14.8	9.7	6.7
Maharashtra State	100.0	100.0	100.0	100.0
Total 100% = (in '000)	15,218	1,870	3,899	1,275

Source: Performance Budget 1984-85, Animal Husbandry, 1984, Annexure I, pp.450-51.

followed by Parbhani, Pune and Nashik Districts, which had about five per cent each of the total cows in milk.

In Table 2.2 we have shown districtwise and regionwise C-B cattle in Maharashtra State as per the 1978 Census as also the 1982 Census. It is seen from the Table that in 1978 there were only 63,458 C-B adult females over 2 years in the entire State, 35,780 of them being in milk. The C-B cows in milk

Table 2.1: (Continued)

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Buldhana	3.6	3.7	2.2	2.3
Akola	3.8	4.3	2.8	2.8
Amraoti	3.8	3.6	2.3	2.4
Yeotmal	5.0	4.4	2.6	2.1
Amraoti Region	16.2	16.0	9.9	9.6
Wardha	2.6	2.1	1.3	1.0
Nagpur	4.3	4.0	1.8	1.6
Bhandara	4.2	3.4	3.2	2.2
Chandrapur	4.1	3.3	2.1	1.5
Gadchiroli	2.9	2.0	1.3	0.4
Nagpur Region	18.1	14.8	9.7	6.7
Maharashtra State	100.0	100.0	100.0	100.0
Total 100% = (in '000)	15,218	1,870	3,899	1,275

Source: Performance Budget 1984-85, Animal Husbandry, 1984, Annexure I, pp.450-51.

followed by Parbhani, Pune and Nashik Districts, which had about five per cent each of the total cows in milk.

In Table 2.2 we have shown districtwise and regionwise C-B cattle in Maharashtra State as per the 1978 Census as also the 1982 Census. It is seen from the Table that in 1978 there were only 63,458 C-B adult females over 2 years in the entire State, 35,780 of them being in milk. The C-B cows in milk

Table 2.1: (Continued)

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Buldhana	3.6	3.7	2.2	2.3
Akola	3.8	4.3	2.8	2.8
Amraoti	3.8	3.6	2.3	2.4
Yeotmal	5.0	4.4	2.6	2.1
Amraoti Region	16.2	16.0	9.9	9.6
Wardha	2.6	2.1	1.3	1.0
Nagpur	4.3	4.0	1.8	1.6
Bhandara	4.2	3.4	3.2	2.2
Chandrapur	4.1	3.3	2.1	1.5
Gadchiroli	2.9	2.0	1.3	0.4
Nagpur Region	18.1	14.8	9.7	6.7
Maharashtra State	100.0	100.0	100.0	100.0
Total 100% = (in '000)	15,218	1,870	3,899	1,275

Source: Performance Budget 1984-85, Animal Husbandry, 1984, Annexure I, pp.450-51.

followed by Parbhani, Pune and Nashik Districts, which had about five per cent each of the total cows in milk.

In Table 2.2 we have shown districtwise and regionwise C-B cattle in Maharashtra State as per the 1978 Census as also the 1982 Census. It is seen from the Table that in 1978 there were only 63,458 C-B adult females over 2 years in the entire State, 35,780 of them being in milk. The C-B cows in milk

Table 2.1: (Continued)

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Buldhana	3.6	3.7	2.2	2.3
Akola	3.8	4.3	2.8	2.8
Amraoti	3.8	3.6	2.3	2.4
Yeotmal	5.0	4.4	2.6	2.1
Amraoti Region	16.2	16.0	9.9	9.6
Wardha	2.6	2.1	1.3	1.0
Nagpur	4.3	4.0	1.8	1.6
Bhandara	4.2	3.4	3.2	2.2
Chandrapur	4.1	3.3	2.1	1.5
Gadchiroli	2.9	2.0	1.3	0.4
Nagpur Region	18.1	14.8	9.7	6.7
Maharashtra State	100.0	100.0	100.0	100.0
Total 100% = (in '000)	15,218	1,870	3,899	1,275

Source: Performance Budget 1984-85, Animal Husbandry, 1984, Annexure I, pp.450-51.

followed by Parbhani, Pune and Nashik Districts, which had about five per cent each of the total cows in milk.

In Table 2.2 we have shown districtwise and regionwise C-B cattle in Maharashtra State as per the 1978 Census as also the 1982 Census. It is seen from the Table that in 1978 there were only 63,458 C-B adult females over 2 years in the entire State, 35,780 of them being in milk. The C-B cows in milk



Table 2.1: (Continued)

District	% of total cattle	% of total cows in milk	% of total buffaloes	% of total buffaloes in milk
Buldhana	3.6	3.7	2.2	2.3
Akola	3.8	4.3	2.8	2.8
Amraoti	3.8	3.6	2.3	2.4
Yeotmal	5.0	4.4	2.6	2.1
Amraoti Region	16.2	16.0	9.9	9.6
Wardha	2.6	2.1	1.3	1.0
Nagpur	4.3	4.0	1.8	1.6
Bhandara	4.2	3.4	3.2	2.2
Chandrapur	4.1	3.3	2.1	1.5
Gadchiroli	2.9	2.0	1.3	0.4
Nagpur Region	18.1	14.8	9.7	6.7
Maharashtra State	100.0	100.0	100.0	100.0
Total 100% = (in '000)	15,218	1,870	3,899	1,275

Source: Performance Budget 1984-85, Animal Husbandry, 1984, Annexure I, pp.450-51.

followed by Parbhani, Pune and Nashik Districts, which had about five per cent each of the total cows in milk.

In Table 2.2 we have shown districtwise and regionwise C-B cattle in Maharashtra State as per the 1978 Census as also the 1982 Census. It is seen from the Table that in 1978 there were only 63,458 C-B adult females over 2 years in the entire State, 35,780 of them being in milk. The C-B cows in milk

formed only about 1.9 per cent of the total cows in milk in the State. The C-B cows in milk (47 per cent of the total) as also adult females (42 per cent of the total) were found in large numbers in Pune Region. Nashik Region had 33 per cent of the total C-B cows in milk as also adult females. The remaining 20 per cent of the C-B cows in milk as also 25 per cent of adult females were found in the other four regions.

Districtwise, concentration of C-B cows in milk was found in Ahmednagar, Pune, Sangli and Kolhapur, these four districts accounting for about 65 per cent of the total. These four districts had also the maximum number of adult females and accounted for about 60 per cent of total adult females.

Thus we find concentration of C-B cows in Western Maharashtra. The small percentage of C-B cows in milk in the total cows in milk as per the 1978 Census does not reflect any large scale impact of the crossbreeding programmes of the State Government, BAIF and other agencies which were in operation since the early 'seventies. This is as one would expect when any such programme is introduced. It takes time to convince the dairy farmers of the benefits of crossbreeding as also for them to learn the technique of rearing such cows for the purposes of dairying. The programme, however, gathered momentum after about a decade as is evidenced from the 1982 Census.

In the 1982 Census, the adult C-B have been defined as 'over two and a half years' as against '3 years' in respect of adult males and '2 years' in respect of adult females in the

1978 Census. Hence the two series are not strictly comparable. Still, the substantial increase in numbers in all categories of C-B cattle in the 1982 Census shows how the programme is ... making rapid progress.

Between 1978 and 1982, the male cattle increased by almost eight times, the female adults in milk by about three and a half times and the total C-B cattle by about three times.

In 1982, there were 72,631 C-B bullocks. We do not have 1982 census figures for total bullocks. However, to get a rough idea regarding the proportion of the C-B bullocks in the total, we may consider the 1977 census data. In 1977, there were 63.29 lakh male cattle over three years. (Indian Agriculture in Brief, 20th Edition, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture and Rural Development, Delhi 1982, pp.178-179). Their number would be still larger in 1982. Hence it will be seen that in spite of eight times increase between 1977 and 1982, the 72,631 C-B male adults would form only about one per cent of the total number of bullocks. Thus it appears that even by 1982, the C-B bullocks were not accepted as plough cattle.

Similarly the C-B cows in milk formed about two per cent of total cows in milk as per the 1978 census. Even if the number of C-B cows in milk increased by about three and a half times between 1978 and 1982, still they would form not more than five per cent of the total cows in milk in 1982. The

proportion of graded buffaloes in milk in the total buffaloes in milk would also be about the same or even less.

There was concentration of C-B cows in milk in 1982 in Ahmednagar, Pune, Sangli and Kolhapur districts, though their share in the total declined from 65 per cent in 1978 to 56 per cent in 1982 due to increase in their numbers in other districts. However, even by 1982, the A.I. and crossbreeding programme had not made much progress in Amraoti, Aurangabad, and Nagpur divisions, as the crossbreeding work in these divisions was started in the last three years of 1970's.

In the light of this background information, we will review in the following section the A.I. and crossbreeding work done by the State Government and other agencies.

#### A.H. Department

The A.H. Department carries out its A.I. programme through the Intensive Cattle Development Projects (I.C.D.P.), Key Village Centres (K.V.C.), District A.I. Centres, Veterinary Hospitals and Polyclinics and A.I. Sub-centres of the Zilla Parishads. Out of about 2,700 A.I. Centres in the State, facility for A.I. by frozen semen was available at about 1,300 Centres in 1983-84. The staff is being trained to administer frozen semen. However, it will take some time for the staff to acquire necessary expertise both in terms of conception of the cows as also in economising on the use of semen.

It is seen from Table 2.3 that with a modest performance of 17,948 A.I. in 1970-71, the number of A.I. rose to 1,32,538

proportion of graded buffaloes in milk in the total buffaloes in milk would also be about the same or even less.

There was concentration of C-B cows in milk in 1982 in Ahmednagar, Pune, Sangli and Kolhapur districts, though their share in the total declined from 65 per cent in 1978 to 56 per cent in 1982 due to increase in their numbers in other districts. However, even by 1982, the A.I. and crossbreeding programme had not made much progress in Amraoti, Aurangabad, and Nagpur divisions, as the crossbreeding work in these divisions was started in the last three years of 1970's.

In the light of this background information, we will review in the following section the A.I. and crossbreeding work done by the State Government and other agencies.

#### A.H. Department

The A.H. Department carries out its A.I. programme through the Intensive Cattle Development Projects (I.C.D.P.), Key Village Centres (K.V.C.), District A.I. Centres, Veterinary Hospitals and Polyclinics and A.I. Sub-centres of the Zilla Parishads. Out of about 2,700 A.I. Centres in the State, facility for A.I. by frozen semen was available at about 1,300 Centres in 1983-84. The staff is being trained to administer frozen semen. However, it will take some time for the staff to acquire necessary expertise both in terms of conception of the cows as also in economising on the use of semen.

It is seen from Table 2.3 that with a modest performance of 17,948 A.I. in 1970-71, the number of A.I. rose to 1,32,538

in 1974-75 and nearly trippled by 1979-80 when 3,75,314 A.I. were done. The number continued to increase further and from 1982-83, more than five lakh A.I. were done every year. In the early 'seventies' semen of exotic animals was used only or mainly, as semen of C-B animals was not available. However, during the last decade, the availability of semen from C-B bulls is gradually increasing. This is evident from Table 2.3, from which it is seen that the proportion of A.I. done from semen of C-B bulls in the total is increasing and that of A.I. from semen of exotic bulls is maintained at the same level. The proportion of A.I. done from semen of C-B vis-a-vis exotic increased at a slow rate until 1982-83 and in rapid strides in a couple of years thereafter. For instance, in 1984-85 as against 5,28,022 A.I. done from semen of exotic bulls, the number of A.I. done from A-B bulls was 1,51,615, the total A.I. done having reached a figure of about 6.80 lakhs. Thus the programme seems to have gathered momentum in the 'eighties.

We may also consider the number of C-B born in each year. Starting with 1,467 calves born in 1970-71 the number increased to 18,024 in 1974-75, 56,266 in 1979-80, and 1,43,010 in 1984-85. The districtwise data given in Table 2.5 regarding calves born also shows concentration of C-B calves in Western Maharashtra, the Pune region alone accounting for 51 per cent of the total calves born during the decade ending 1979-80.

The share in the total work of A.I. done by various institutions/agencies, the number of C-B calves born between

1970-71 and 1984-85 and the number of A.I. per C-B calf born are shown below:

	1970-71 to 1984-85		No. of A.I. per C-B calf born
	% of total A.I. done	% of total calves born	
I.C.D.P.s	34.8	35.4	5.7
K.V.C.s	19.8	21.4	5.3
D.A.H.O.s	41.6	38.9	6.2
Other Institutions	3.8	4.3	5.1
Total	100.0 49,05,171	100.0 7,77,360	5.8

While calculating the average number of A.I. per C-B calf born, it will be proper to deduct the number of A.I. done in 1984-85 from the total for the period 1970-71 to 1984-85 as most of the calves born from the A.I. done in 1984-85 would be post-April 1985. If this deduction is done, the average number of A.I. per C-B calf born comes to 4.9 instead of 5.8.

The thrust of the A.H. Department's programme is on crossbreeding of cows and a little less on grading of buffaloes, as is evident from Tables 2.4 and 2.5. There is a distinct preference among the urban consumers for buffalo milk. In view of this, the Department may consider A.I. in respect of buffaloes in larger numbers than in the last five years.

**Table 2.4: Districtwise Artificial Insemination  
Done in Maharashtra State Since 1970-71 to 1984-85**

Sr. No.	District	Artificial Insemination Done				Total
		Exotic	Cros- sbred	Indi- genous	Buffaloes	
1.	Bombay	-	-	-	-	-
2.	Thane	32,010	32	1,623	3,845	37,510
3.	Raigad	19,454	771	1,056	12,080	33,361
4.	Ratnagiri	1,07,138	13,988	4,841	47,777	1,73,744
5.	Sindhudurg	10,820	17	-	5,436	16,273
	<u>Total Bombay Region</u>	<u>1,69,422</u>	<u>14,808</u>	<u>7,520</u>	<u>69,138</u>	<u>2,60,888</u>
6.	Nashik	1,71,972	9,491	5,749	11,781	1,98,993
7.	Dhule	2,29,741	10,626	5,100	60,548	3,06,015
8.	Jalgaon	1,15,695	6,042	6,594	33,899	1,62,230
9.	Ahmednagar	4,33,334	81,615	64,084	6,721	5,85,754
	<u>Total Nashik Region</u>	<u>9,50,742</u>	<u>1,07,774</u>	<u>81,527</u>	<u>1,12,949</u>	<u>12,52,992</u>
10.	Pune	6,55,249	43,641	13,373	1,14,300	8,26,563
11.	Satara	2,42,537	24,014	1,20,822	1,02,600	4,89,973
12.	Sangli	3,57,138	64,438	41,087	4,13,765	8,76,428
13.	Solapur	80,275	5,532	56,353	18,768	1,60,928
14.	Kolhapur	2,82,781	20,715	24,072	3,95,436	7,23,004
	<u>Total Pune Region</u>	<u>16,17,980</u>	<u>1,58,340</u>	<u>2,55,707</u>	<u>10,44,869</u>	<u>30,76,896</u>
15.	Aurangabad	2,33,233	10,244	7,394	17,575	2,68,446
16.	Jalna	39,600	1,971	-	892	42,463
17.	Parbhani	79,898	1,149	4,137	13,265	98,449
18.	Beed	1,22,097	9,075	4,058	19,894	1,55,124
19.	Nanded	66,314	5,651	4,851	15,021	91,837
20.	Osmanabad	1,36,009	2,134	12,199	16,434	1,66,776
21.	Latur	44,291	1,752	-	34	46,077
	<u>Total Aurangabad Region</u>	<u>7,21,442</u>	<u>31,976</u>	<u>32,639</u>	<u>83,115</u>	<u>8,69,172</u>

(Continued)



Table 2.4: (Continued)

Sr. No.	District	Artificial Insemination Done				Total
		Exotic	Crossbred	Indigenous	Buffaloes	
22.	Buldhana	87,932	9,353	7,500	58,303	1,63,088
23.	Akola	61,900	4,091	5,376	47,713	1,19,080
24.	Amravati	89,777	3,508	11,874	23,793	1,28,952
25.	Yavatmal	55,095	5,220	5,274	25,684	91,273
	<u>Total Amravati Region</u>	<u>2,94,704</u>	<u>22,172</u>	<u>30,024</u>	<u>1,55,493</u>	<u>5,02,393</u>
26.	Wardha	67,604	7,933	8,957	4,359	88,853
27.	Nagpur	2,08,039	18,521	4,571	13,600	2,44,731
28.	Bhandara	77,649	2,397	1,204	5,324	86,574
29.	Chandrapur	23,725	9,237	3,905	16,555	53,422
30.	Gadchiroli	679	27	-	323	1,029
	<u>Total Nagpur Region</u>	<u>3,77,696</u>	<u>38,115</u>	<u>18,637</u>	<u>40,161</u>	<u>4,74,609</u>
	<u>Total Maharashtra State</u>	<u>41,31,986</u>	<u>3,73,185</u>	<u>4,26,054</u>	<u>15,05,725</u>	<u>64,36,950</u>

Table 2.5: Districtwise Calves Born in Maharashtra State Since 1970-71 to 1984-85

Sr. No.	District	Calves born			Total
		Crossbred	Indigenous	Buffaloes	
1.	Bombay	-	-	-	-
2.	Thane	5,532	474	691	6,697
3.	Raigad	2,831	174	2,082	5,087
4.	Ratnagiri	18,422	1,923	9,708	30,053
5.	Sindhudurg	1,693	-	1,008	2,701
	<u>Total Bombay Region</u>	<u>28,478</u>	<u>2,571</u>	<u>13,489</u>	<u>44,538</u>

(Continued)

Table 2.4: (Continued)

Sr. No.	District	Artificial Insemination Done				Total
		Exotic	Crossbred	Indigenous	Buffaloes	
22.	Buldhana	87,932	9,353	7,500	58,303	1,63,088
23.	Akola	61,900	4,091	5,376	47,713	1,19,080
24.	Amravati	89,777	3,508	11,874	23,793	1,28,952
25.	Yavatmal	55,095	5,220	5,274	25,684	91,273
	<u>Total Amravati Region</u>	<u>2,94,704</u>	<u>22,172</u>	<u>30,024</u>	<u>1,55,493</u>	<u>5,02,393</u>
26.	Wardha	67,604	7,933	8,957	4,359	88,853
27.	Nagpur	2,08,039	18,521	4,571	13,600	2,44,731
28.	Bhandara	77,649	2,397	1,204	5,324	86,574
29.	Chandrapur	23,725	9,237	3,905	16,555	53,422
30.	Gadchiroli	679	27	-	323	1,029
	<u>Total Nagpur Region</u>	<u>3,77,696</u>	<u>38,115</u>	<u>18,637</u>	<u>40,161</u>	<u>4,74,609</u>
	<u>Total Maharashtra State</u>	<u>41,31,986</u>	<u>3,73,185</u>	<u>4,26,054</u>	<u>15,05,725</u>	<u>64,36,950</u>

Table 2.5: Districtwise Calves Born in Maharashtra State Since 1970-71 to 1984-85

Sr. No.	District	Calves born			Total
		Crossbred	Indigenous	Buffaloes	
1.	Bombay	-	-	-	-
2.	Thane	5,532	474	691	6,697
3.	Raigad	2,831	174	2,082	5,087
4.	Ratnagiri	18,422	1,923	9,708	30,053
5.	Sindhudurg	1,693	-	1,008	2,701
	<u>Total Bombay Region</u>	<u>28,478</u>	<u>2,571</u>	<u>13,489</u>	<u>44,538</u>

(Continued)

Table 2.4: (Continued)

Sr. No.	District	Artificial Insemination Done				Total
		Exotic	Crossbred	Indigenous	Buffaloes	
22.	Buldhana	87,932	9,353	7,500	58,303	1,63,088
23.	Akola	61,900	4,091	5,376	47,713	1,19,080
24.	Amravati	89,777	3,508	11,874	23,793	1,28,952
25.	Yavatmal	55,095	5,220	5,274	25,684	91,273
	<u>Total Amravati Region</u>	<u>2,94,704</u>	<u>22,172</u>	<u>30,024</u>	<u>1,55,493</u>	<u>5,02,393</u>
26.	Wardha	67,604	7,933	8,957	4,359	88,853
27.	Nagpur	2,08,039	18,521	4,571	13,600	2,44,731
28.	Bhandara	77,649	2,397	1,204	5,324	86,574
29.	Chandrapur	23,725	9,237	3,905	16,555	53,422
30.	Gadchiroli	679	27	-	323	1,029
	<u>Total Nagpur Region</u>	<u>3,77,696</u>	<u>38,115</u>	<u>18,637</u>	<u>40,161</u>	<u>4,74,609</u>
	<u>Total Maharashtra State</u>	<u>41,31,986</u>	<u>3,73,185</u>	<u>4,26,054</u>	<u>15,05,725</u>	<u>64,36,950</u>

Table 2.5: Districtwise Calves Born in Maharashtra State Since 1970-71 to 1984-85

Sr. No.	District	Calves born			Total
		Crossbred	Indigenous	Buffaloes	
1.	Bombay	-	-	-	-
2.	Thane	5,532	474	691	6,697
3.	Raigad	2,831	174	2,082	5,087
4.	Ratnagiri	18,422	1,923	9,708	30,053
5.	Sindhudurg	1,693	-	1,008	2,701
	<u>Total Bombay Region</u>	<u>28,478</u>	<u>2,571</u>	<u>13,489</u>	<u>44,538</u>

(Continued)

cooperatives, because of the limited capacity of chilling, pasturisation and processing (manufacture of milk powder, etc.). The supply of cow milk will increase in the coming years due to crossbreeding programme. Hence, until we develop market for liquid cow milk and ways of using cow milk for making milk products as also a market therefor, it may not be prudent to push hard the A.I. and crossbreeding programme.

#### Bharatiya Agro-Industries Foundation (BAIF)

The BAIF, situated at Urali Kanchan in Pune District in Maharashtra State, is a voluntary organisation. It was registered in 1967 as a Public Trust to achieve socio-economic betterment of the rural community by improvement of agriculture and providing efficient milk production as an important component of it. Its work of A.I. and crossbreeding in an organised manner started in 1970-71 with the establishment of 12 Centres, with Urali Kanchan, situated at a distance of about 28 kms. from Pune, as its base. In 1976, a team of the Planning Commission visited the BAIF to assess its work done between 1971 and 1976 and recommended to the Government of India to declare the BAIF's programme of crossbreeding as a part of the National Integrated Rural Development Programme (IRDP). In April 1978, the Government of India entrusted to the BAIF the responsibility of establishing and operating 500 IRDP centres in backward regions of different States to benefit about half a million rural families owning over a million cows. The Government provided the necessary financial assistance for the purpose.

In Table 2.6 we have given data regarding the number of centres of the BAIF, number of A.I. done, pregnancies checked and C-B female calves born in the years 1970-71 to 1982-83 in India, the major part of the work being in Maharashtra State. Separate figures for Maharashtra State were available for the years 1979-80 to 1982-83, only and are given in Table 2.7. To get a dimension of the work done by the BAIF, we may compare the number of A.I. done by the BAIF with that of the A.H. Department of the State Government. In 1982-83, the A.H. Department did about 5.65 lakhs A.I. while the BAIF did about 1.06 lakhs. We may consider the data regarding the A.I. and C-B calves born with a view to find out the average number of A.I. per C-B calf born. The average came to 4.9 A.I. per C-B calf born if we take into consideration the data of the A.I. department for the years 1970-71 to 1984-85. We could not work out the average for the BAIF in the same manner because it gives the number of female calves born only from out of the cases examined and not the total A.I. and total calves born as in the case of the A.H. Department. If we consider, the number of examinations done up to March 1980 and the number of female calves born up to March 1981 we find that the average comes to 5.7 examinations per female calf born. Considering the fact that more than one A.I. is needed on an average for successful conception, the average number of A.I. per female calf born would be greater than 5.7 A.I. Similarly the BAIF data gives figures of First and Repeat A.I. from which it is seen that as

In Table 2.6 we have given data regarding the number of centres of the BAIF, number of A.I. done, pregnancies checked and C-B female calves born in the years 1970-71 to 1982-83 in India, the major part of the work being in Maharashtra State. Separate figures for Maharashtra State were available for the years 1979-80 to 1982-83, only and are given in Table 2.7. To get a dimension of the work done by the BAIF, we may compare the number of A.I. done by the BAIF with that of the A.H. Department of the State Government. In 1982-83, the A.H. Department did about 5.65 lakhs A.I. while the BAIF did about 1.06 lakhs. We may consider the data regarding the A.I. and C-B calves born with a view to find out the average number of A.I. per C-B calf born. The average came to 4.9 A.I. per C-B calf born if we take into consideration the data of the A.I. department for the years 1970-71 to 1984-85. We could not work out the average for the BAIF in the same manner because it gives the number of female calves born only from out of the cases examined and not the total A.I. and total calves born as in the case of the A.H. Department. If we consider, the number of examinations done up to March 1980 and the number of female calves born up to March 1981 we find that the average comes to 5.7 examinations per female calf born. Considering the fact that more than one A.I. is needed on an average for successful conception, the average number of A.I. per female calf born would be greater than 5.7 A.I. Similarly the BAIF data gives figures of First and Repeat A.I. from which it is seen that as

In Table 2.6 we have given data regarding the number of centres of the BAIF, number of A.I. done, pregnancies checked and C-B female calves born in the years 1970-71 to 1982-83 in India, the major part of the work being in Maharashtra State. Separate figures for Maharashtra State were available for the years 1979-80 to 1982-83, only and are given in Table 2.7. To get a dimension of the work done by the BAIF, we may compare the number of A.I. done by the BAIF with that of the A.H. Department of the State Government. In 1982-83, the A.H. Department did about 5.65 lakhs A.I. while the BAIF did about 1.06 lakhs. We may consider the data regarding the A.I. and C-B calves born with a view to find out the average number of A.I. per C-B calf born. The average came to 4.9 A.I. per C-B calf born if we take into consideration the data of the A.I. department for the years 1970-71 to 1984-85. We could not work out the average for the BAIF in the same manner because it gives the number of female calves born only from out of the cases examined and not the total A.I. and total calves born as in the case of the A.H. Department. If we consider, the number of examinations done up to March 1980 and the number of female calves born up to March 1981 we find that the average comes to 5.7 examinations per female calf born. Considering the fact that more than one A.I. is needed on an average for successful conception, the average number of A.I. per female calf born would be greater than 5.7 A.I. Similarly the BAIF data gives figures of First and Repeat A.I. from which it is seen that as

against 3,50,451 first A.I., there were 1,21,991 repeat A.I., that is for every three first A.I., one repeat A.I. However, such data are not available in the statistics of the A.H. Department.

As the data from the two agencies are not comparable for the reasons stated above, it is not possible to comment on their comparative efficiency in the matter of average number of A.I. per C-B calf born.

#### A.I. Work Done by Other Agencies

The information regarding the work done by a sugar cooperative, given in the present section, is based on an interview with one of the senior executives of the BAIF. It was learnt that the Sanjivani Sahakari Sakhar Karkhana, Ltd., situated at Shinganapur in Kopergaon tahsil of Ahmednagar district, had introduced the scheme regarding A.I. and crossbreeding of cows in its area of operation in 1970. The scheme was started with the facilities given by the BAIF. Later on, the management of the Sugar Cooperative felt that it may render the services through its own organisation by training the staff at the village level in the Milk Cooperatives. Out of about four to six persons in a Milk Cooperative engaged in receiving milk, keeping accounts, etc., one person was trained in administering A.I. It was felt that such a person would be able to give the A.I. services to the cows owned by the villagers when approached for availing of the A.I. facilities, and the scheme could be implemented by the Sugar Cooperative independently of the BAIF,



except for the supply of semen. However, the Sugar Cooperative was unable to implement the scheme successfully. It was told that though administering A.I. is not a very skilled job and can be learnt after short training, it is necessary that such a person should have an opportunity to administer A.I. to a sufficient number of cows every month to retain his skill. In a village of average size, there may not be more than 100 cows, half of which would be in milk at a time and, of the remaining, not all would be taken for A.I. In the circumstances not more than a few cows would be brought to the A.I. centre of the Milk Cooperative every month. The trained person, under these circumstances, is not able to render A.I. successfully. Hence, the Sugar Cooperative abandoned its scheme and requested the BAIF to render the services through its centres.

We were told that the Sugar Cooperatives at Pravaranagar and Warnanagar had also tried the programme. However, after initial experiment these as well as the other sugar cooperatives, except the one at Akluj, namely, Yeshwant Sahakari Sakhar Karkhana, Ltd., Shankar Nagar, in Solapur district, requested the BAIF to run the A.I. Centres. Even the sugar cooperative at Akluj, in view of similar difficulties, as faced by the other sugar cooperatives in running the A.I. Centres on their own, decided to run only three A.I. Centres on its own and let the BAIF run the other A.I. Centres in its area of operation.

Though we had planned to visit the Sugar Cooperative at Akluj to know about its experience of running the three centres,

for want of time it was not possible for us to visit the Akluj Sugar Cooperative. In August 1984, the BAIF was rendering the A.I. services in the areas of 22 Sugar Cooperatives from out of 54 Sugar Cooperatives located in seven districts of Western Maharashtra. 27 sugar cooperatives from other parts of the State, it was stated, did not invite the BAIF to start the A.I. Centres.

Except the three centres run by the Akluj Sugar Cooperative, the statistics regarding A.I. in the area of the sugar cooperatives is included in the work done by the BAIF.

We may next consider the work done by the Dairy Cooperatives. As an illustration, we will refer to the Jalgaon Zilla Sahakari Doodh Vikas Federation Limited, Jalgaon. The Federation, as a part of its programme of cattle development, set up 8 A.I. Centres on its own in 1974-75 in its area of operation. The number of A.I. Centres gradually increased to 117 by 1978-79 and, after a decline to about 80 to 90 Centres in the years 1980-81 to 1982-83, again rose to 123 in the year 1984-85. In the beginning, liquid semen was used. However, in recent years frozen semen is used at most of the A.I. The Federation installed a liquid nitrogen plant in 1981-82. It also arranges training of staff of the Milk Cooperatives in administering A.I. For every calf born from the A.I. administered by such workers, the Federation pays them Rs. 30 per C-B calf born. The Federation also arranges examination for pregnancy and renders veterinary advice and aid free of charge/at subsidised rates to the members of the Milk Cooperatives. It also organizes camps for identifying

the cattle for castration. The Federation had on its staff 25 Veterinary Doctors in 1984-85.

The data regarding the number of A.I. Centres, number of cows treated with A.I. and the number of C-B calves born in the years 1974-75 to 1984-85 is given in Table 2.8. It is seen from the Table that with 113 A.I. Centres, 16,477 A.I. were done in 1983-84, and 4524 C-B calves were born in 1984-85. The I.D.C. has given financial assistance to the Federation from 1981 under Operation Flood II to carry out the A.I. and cross-breeding programme. The Federation has 863 Milk Cooperatives as its members. In relation to the number of Milk Cooperatives, the number of C-B calves born from A.I. appears to be quite small. We did not obtain data from the other Dairy Cooperatives in the State. However, the illustration of the Jalgaon Federation will help to appreciate the efforts made by the Dairy Cooperatives. If such efforts are made in each district, it will be possible to have C-B calves born in each year in large numbers in the entire State through the work of the Dairy Cooperatives or such other agencies.

To conclude, we may observe that in the past few years, the A.H. Department is doing A.I. in very large numbers since 1980. The BAIF and other agencies are also carrying out A.I. and crossbreeding though on a modest scale as compared to the State Government. Whatever data we obtained from the BAIF and other agencies, suggest that these other agencies will also add a significant number to the stock of C-B cows in the years to come.

**Table 2.8:** Jalgaon Zilla Sahakari Doodh Utpadak Sangh Ltd., Jalgaon : Number of A.I. Centres, Number of Cows Treated with A.I. and Number of C-B Calves Born in 1974-75 to 1984-85

Year	No. of A.I. Centres	No. of Cows Inseminated	No. of C-B Calves born
1974-75	8	198	-
1975-76	35	1106	35
1976-77	81	1975	148
1977-78	92	863	173
1978-79	117	467	87
1979-80	124	846	35
1980-81	83	3183	255
1981-82	83	7175	906
1982-83	91	11926	2419
1983-84	113	16477	3438
1984-85	123	14432	4524
<b>Total</b>		<b>58648</b>	<b>12020</b>

The statistics regarding A.I. done shows that, in Western Maharashtra in particular, the dairy farmers seem to have accepted the programme. However, the same cannot be said of the other parts of the State. Before intensifying the A.I. and cross-breeding programme in the coming years, it will be necessary to consider a major constraint, namely, total feed and fodder resources and the number of local cows, C-B cows and buffaloes such resources can sustain.

Besides, the problem of marketing of cow milk may also act as a serious constraint. In view of this, it will be necessary to estimate the number of C-B cows that we should really add to the cattle population every year. The State Government will have to carry out the necessary exercise in order to come up with concrete plan and policies and set targets for A.I. to be done during the next decade or so.

Besides, the problem of marketing of cow milk may also act as a serious constraint. In view of this, it will be necessary to estimate the number of C-B cows that we should really add to the cattle population every year. The State Government will have to carry out the necessary exercise in order to come up with concrete plan and policies and set targets for A.I. to be done during the next decade or so.

**Table 3.1: Sample Villages : No. of Households, (1971 Census) Land Use, Cropping Pattern (1984-85) and No. of Milch Cattle**

	Pune District	Sangli District	Solapur District			
	Kalamb	Ranjani	Umadi	Nandre	Mandrup	Antroli
<u>No. of Households</u> 1971 Census	470	414	1,009	1,526	1,310	189
<u>Total Geographical Area (ha.)</u>	1,641	1,757	7,402	3,139	7,431	1,014
<u>Cultivable Area as per cent of Total Geographical Area</u>	72.0	79.0	94.0	96.0	96.0	87.5
<u>Gross Cropped Area (ha.)</u>	1,215	1,632	5,088	2,878	6,673	871
<u>Area Irrigated as per cent of Gross Cropped Area</u>	22.4	16.5	3.1	38.2	1.5	6.1
<u>Cropping Pattern: (1984-85 (ha.))</u>						
Jowar	477	459	3,565	1,016	4,431	486
Bajra	543	758	551	-	63	1
Wheat	19	17	102	29	121	12
Paddy	-	-	5	17	19	3
Gram, Arhar and Pulses	94	35	557	373	814	110
Other Oilseeds	-	-	85	11	1,039	188
Cotton	-	-	80	1	7	1
Potato	26	65	-	-	-	-
Other Vegetables, Flowers and Fruit	16	186	43	117	30	14
Sugarcane	-	5	28	1,033	31	34
Other Crops	-	-	12	110	-	-
Maize	3	9	4	4	2	3
Kadwal	-	23	8	15	2	5
Sheori	-	-	-	5	-	-
Lucerne	7	53	-	-	-	-
Gajaraj Grass	-	5	-	-	-	-
Groundnut	30	17	48	147	114	14

(Continued)

	Pune District		Sangli District		Solapur District	
	Kalamb	Ranjani	Umadi	Nandre	Mandrup	Antroli
<u>Grazing Land (ha.)</u>	9	19	16	23	27	N.A.
<u>Milch Cattle</u>						
C-B Cows	(406)*	(620)*	370	440 (761)*	240	N.A.
Other Cows and Calves	465 (140)*	1,005 (92)*	570	310 (14)*	730	N.A.
She-Bufferaloes	95 (61)*	649 (97)*	483	1,170 (464)*	800	N.A.

\* As per our listing. In Kalamb, Ranjani and Nandre, our field staff visited the Milk Cooperatives and noted the number of milch cattle owned by those who came to deliver the milk on that day. It will be seen from the Table that there is a very large difference in the number of milch cattle appearing in the Village Records and the number noted by our field staff.

The number of households as per the 1971 Population Census was 470. It may be highlighted that, out of the 247 families in our preliminary listing which reported that they owned milch cattle, 78 per cent owned C-B cows and/or calves. Of those who did not own C-B cows/calves, about 60 per cent reported storage/absence of green fodder as the reason for not keeping such cattle.

#### Ranjani, Ambegaon Tahsil, Pune District

Ranjani is situated to the east of Kalamb, off the Pune-Nashik highway, at a distance of about 20 kms., from Kalamb. It is connected to Kalamb by an all-weather road. The annual rainfall is about 2000 mms. to 3000 mms.



Of the total geographical area of 1757 ha., 12 per cent is under forest, 1 per cent is grazing land, 8 per cent is under other uses and the remaining 79 per cent is cultivable land. In this village also, Jowar and Bajra accounted for nearly three-fourths of the gross cropped area. However, as compared to Kalamb, at Ranjani, the area under lucerne (53 ha.), Kadwal (23 ha.), Gajaraj grass (5 ha.) and maize (9 ha.), that is green fodder crops, was much larger and formed 5.5 per cent of the gross cropped area. Potato (65 ha.) and chilli, tomato, other vegetables and fruit orchards (186 ha.) accounted for 15 per cent of the gross cropped area. The area under crops irrigated by wells formed 16.5 per cent of the gross cropped area.

There were 414 households at Ranjani as per the 1971 Population Census. Of the 454 families noted in our preliminary listing, 314 families owned milch cattle and 82 per cent of them had C-B cows and/or calves.

#### Umadi, Jath Tahsil, Sangli District

This village lies in a drought-prone area. The annual rainfall is about 500 mms. It is connected to the district headquarters, Sangli, as also the Cooperative Dairy at Miraj by a highway, the distance from Umadi to Sangli/Miraj being about 160 kms.

Of the total geographical area of 7,402 ha., the grazing land occupies 125 ha., 256 ha. are classified as unfit

for cultivation and about 86 ha. are under non-agricultural uses. The remaining, about 94 per cent of the total geographical area, is cultivable land. The area irrigated by wells formed only 3 per cent of the gross cropped area.

Jowar is the main crop grown on 72 per cent of the gross-cropped area. Bajra and pulses each occupy 11 per cent. Sugarcane (28 ha.) and maize - kadwal (12 ha.), together with 48 ha. under groundnut are the sources of green fodder. Wheat, cotton, other oilseeds and vegetables account for the rest, about 4 per cent of the gross cropped area. There were 1,009 households at Umadi as per the 1971 Population Census.

#### Nandre, Miraj Tahsil, Sangli District

Nandre is situated at a distance of about 12 kms., from Sangli, the district headquarters. It is within easy reach of the Cooperative Dairy at Miraj also. The village is situated in an area which has an annual rainfall of about 750 mms.

Of the total geographical area of 3139 ha., 23 ha. is classified as grazing land and another 90 ha. as under non-agricultural uses. The remaining, about 96 per cent, is cultivable land. The area under well irrigation is about 460 ha., and another 600 ha. of land is irrigated under seven lift irrigation schemes. Because of the irrigation facilities, Sugarcane is cultivated on about 36 per cent of the gross-cropped area. Jowar accounts for another 36 per cent. Pulses (13 per cent), groundnut (5 per cent) and vegetables, other oilseeds and other crops (9 per cent) and maize, kadwal and sheori (one per cent) are the other crops.

Nandre is one of the few villages from the Sangli-Kolhapur area where some of the dairy farmers started buying between 1975-79 in large numbers C-B cows from Bangalore. However, most of them started crossbreeding their local cows with A.I. Our preliminary listing revealed that about 290 households owned 470 C-B cows and 281 C-B calves together with 243 she-buffaloes. Besides 9 more households owned only C-B cows together with 9 she-buffaloes. Another about 200 households engaged in dairying owned only a few cows of non-descript breeds and 230 she-buffaloes.

Mandrup, South Solapur Tahsil, Solapur District

Mandrup, lies in the rainfall shadow zone with a scanty annual rainfall of about 575 mms. It is located on the Solapur-Bijapur highway, about 24 kms. to the south of Solapur. There were 1310 households as per the 1971 Population Census.

On the total geographical area of 7,431 ha., 96 per cent is classified as cultivable land, the remaining being under other uses including about 27 ha., classified as grazing land. Jowar is the main crop, accounting for two-thirds of the gross cropped area. Bajra and pulses (15 per cent), groundnut (2 per cent), other oilseeds (16 per cent), cotton and sugarcane, maize and kadwal (1 per cent) are the other crops. The area under irrigated crops forms only 1.5 per cent of the gross cropped area.

There were two Milk Cooperatives in the village until June 1984. The total milk purchased by the two cooperatives during 1983-84 was about 600 litres a day on an average. Since

one of the Milk Cooperatives had become defunct in 1984-85, some local milk traders/agents had each employed a few small farmers/landless labourers to collect milk from the dairy farmers and to take it on bicycles for delivery at Solapur. Some of them also milked the cows owned by the dairy farmers. They were paid upto Rs. 10 per day plus 0.5 lt. to 1.0 lt. of milk a day. This facility is preferred by the dairy farmers as (a) they do not have to spend time to milk the cows and to go to the Cooperative to deliver milk, (b) the rate per litre of milk they receive is higher than that paid by the Cooperative, (c) there is no rejection of milk, whereas cooperatives refused milk, particularly in summer, stating that it was not fit for sale and purchased, if at all, at Rs. 0.50 per litres, and (d) payment is made regularly by the traders/agents once in ten days (every day in a few cases) to the dairy farmers, while the Milk Cooperatives some times take longer period to make payment.

Antroli, South Solapur Tahsil, Solapur District

Antroli is connected to Mandrup by an all weather road and is about 15 kms., from Mandrup. The annual rainfall is about 575 mms. Of the total geographical area of 1,014 ha., the cultivable area of the village forms about 88 per cent. Of the area under crops, 6.1 per cent is irrigated by wells. Jowar occupied 56 per cent of the gross cropped area, followed by other oilseeds (22 per cent) and pulses (13 per cent). In the remaining 9 per cent of the gross cropped area was sugarcane (54 ha.), groundnut (14 ha.), wheat (12 ha.) and maize and kadwal (8 ha.). There were 189 households as per the 1971 Population Census.

### Milk Cooperatives in the Sample Villages

There were 8 Milk Cooperatives in the six villages. In Table 3.2 is given information about the year of establishment, number of members, sale of milk and cattle feed and net profit in 1983-84 and share capital and reserve funds of the Milk Cooperatives as on 30th June 1984. In the following paragraphs is given a brief account of each cooperative.

1) Shri Krishna Dudh Vyavasayik Sahakari Sanstha Maryadit, Kalamb

The Milk Cooperative at Kalamb was established on 16th December 1978. It had 241 members as on 30th June 1984. Its annual sales of milk rose from Rs. 3,25,504 in 1980-81 to Rs. 8,13,825 in 1983-84. The Annual Report for 1983-84 observed that the cooperative's milk collection, about 1,000 lpd. (litres per day) in 1983-84 was increasing from year to year in spite of shortage of fodder. The sale of cattle feed had increased from Rs. 38,000 in 1980-81 to about Rs. 1,11,000 in 1983-84 and the net profit from Rs. 5,844 in 1980-81 to Rs. 26,631 in 1983-84. The reserve funds increased from Rs. 203 in 1980-81 to Rs. 59,807, which included Rs. 44,747 on account of Building Fund. One of its members had donated about 1,000 sq.ft. of land to the cooperative for the building it proposed to construct. The District Dairy Cooperative collected milk from the cooperative twice a day.

2) Shri Narasinha Dudh Vyavasayik Sahakari Sanstha Maryadit, Ranjani

The Milk Cooperative was registered in February 1978.

### Milk Cooperatives in the Sample Villages

There were 8 Milk Cooperatives in the six villages. In Table 3.2 is given information about the year of establishment, number of members, sale of milk and cattle feed and net profit in 1983-84 and share capital and reserve funds of the Milk Cooperatives as on 30th June 1984. In the following paragraphs is given a brief account of each cooperative.

1) Shri Krishna Dudh Vyavasayik  
Sahakari Sanstha Maryadit, Kalamb

The Milk Cooperative at Kalamb was established on 16th December 1978. It had 241 members as on 30th June 1984. Its annual sales of milk rose from Rs. 3,25,504 in 1980-81 to Rs. 8,13,825 in 1983-84. The Annual Report for 1983-84 observed that the cooperative's milk collection, about 1,000 lpd. (litres per day) in 1983-84 was increasing from year to year in spite of shortage of fodder. The sale of cattle feed had increased from Rs. 38,000 in 1980-81 to about Rs. 1,11,000 in 1983-84 and the net profit from Rs. 5,844 in 1980-81 to Rs. 26,631 in 1983-84. The reserve funds increased from Rs. 203 in 1980-81 to Rs. 59,807, which included Rs. 44,747 on account of Building Fund. One of its members had donated about 1,000 sq.ft. of land to the cooperative for the building it proposed to construct. The District Dairy Cooperative collected milk from the cooperative twice a day.

2) Shri Narasinha Dudh Vyavasayik  
Sahakari Sanstha Maryadit, Ranjani

The Milk Cooperative was registered in February 1978.

The number of members remained constant at 197 since 1981-82. The milk sold during 1983-84 amounted to Rs. 15,17,835, which recorded an increase of about 25 per cent over the preceding two years. The District Dairy Cooperative started collecting milk every evening from 1983-84. Though this arrangement is not convenient, the members have accepted it.

The Milk Cooperative earned a net profit of Rs. 76,959 during 1983-84 as compared to Rs. 45,955 in 1981-82. Its reserve funds amounted to Rs. 1,98,810 as on 30th June 1984. From the Building Fund amounting to Rs. 47,833, it took up the construction of a building in 1983-84.

3) Umadi Sahakari Duh Vyavasayik Sanstha, Maryadit, Umadi

The Milk Cooperative was registered on 8th June 1979. The audited statements of accounts available for the latest year relate to the year 1982-83. The cooperative does not bring out an Annual Report. As on 30th June 1983, there were 141 members. The Reserves and Building Fund stood at Rs. 10,577.00. Its Annual Milk Collection in 1982-83 was 2,20,720 lts. (i.e. 604 lpd.) The sale of medicines amounted to Rs. 700/- while no sales of cattle feed were reported during the year 1982-83. The Net Profit for the year ended 30th June 1983 was Rs. 10,993.18. Its performance, in comparison with the two Milk Cooperatives at Nandre, which lies in the milk-shed area of Sangli district, is poor.

4) Nandre Dudh Purayatha Sahakari Society Limited, Nandre

This is one of the oldest and progressive society in Sangli district. Registered on 13th December 1957, with 92 members, the number of members stood at 1,438 in 1983-84. The paid-up capital of Rs. 2,410 in 1957 increased to Rs.2,10,380 by 30th June 1984. It had started selling milk in sealed bottles from October 1966, but had to suspend it due to some unforeseen difficulties. From November 1981, it started milk collection on Anand Pattern. It purchased in March 1984 an electronic fat-testing equipment. Since then, payment for milk is made on the basis of fat content. The cooperative made rapid progress after 1973-74 as can be seen from Table 3.3.

As compared to the year 1980-81, the milk purchased as also the net profit in 1983-84 declined, due to the establishment of another Milk Cooperative in this village in November 1979. The Cooperative had fixed a target of 5,000 lts. of milk collection a day by 1977-78 and enabled about 85 members to get loans to buy 180 C-B cows. As a result its milk collection in 1980-81 reached 4,383 lpd., but it declined to 3241 lpd., in 1983-84. The sale of cattle feed during 1983-84 was about Rs. 16.71 lakhs as against Rs. 11.0 lakhs in 1981-82. Its Fixed Assets in Buildings, Dead-stock and Furniture stood at Rs. 2.80 lakhs as on 30th June 1984. Its net profit, as compared to its turnover, is low. For instance, the Milk Cooperative at Ranjani in Pune district earned about the same amount of net profit with less than half of the turnover of the Nandre Milk Cooperative.



Table 3.3: Progress of Nandre Duh Puravatha Sahakari Society, Limited, 1973-74 to 1983-84

	Year			
	1973-74	1976-77	1980-81	1983-84
No. of members	551	939	1,394	1,438
Milk purchased lts.	1,66,842	10,02,462	15,99,862	11,83,180
Paid-up capital Rs.	5,740	31,220	1,29,930	2,01,380
Reserve and other funds Rs.	11,493	N.A.	N.A.	3,00,260
Net profit Rs.	6,625	40,150	75,199	65,622
Dividend	6%	9%	9%	9%

The Cooperative ranks number one since 1978, among the cooperatives which supply milk to the Dairy Cooperative at Miraj. In view of this, the Dairy Cooperative has granted one permanent seat to the Cooperative on its Board of Directors. It has also won several prizes and certificates for its efficient performance.

The Cooperative is housed in its own building with sample space for milk collection and testing, godown for cattle feed and accounts and administrative office. It also constructed, from out of its funds a building for a Veterinary Clinic (of the State Government) on the land given on lease on a nominal rent by the Gram Panchayat. The Cooperative persuaded the Gram Panchayat to install a chaff cutter for cutting kadba. This facility is used by a number of dairy farmers.

The Cooperative, as per the State Government's directive under its scheme of nutritious diet to school children, supplied milk to the students in the local school and also made some financial contribution to family planning. It used its good offices to get veterinary care, A.I. facilities, etc., from the Government and also enabled the dairy farmers to get loans from the banks to buy C-B cattle. However, from a cooperative of over 25 years' standing, one expects greater contribution to the village community.

5) Shree Mahavir Dudh Utpadak  
Sahakari Society, Limited, Nandre

The State Government normally does not register two or more Milk Cooperatives in one village. However, at Nandre, perhaps in view of the large quantity of milk produced in the village, it permitted the Mahavir Cooperative to be established in November 1979. The cooperative's rapid progress can be appreciated from the statistics for the years 1979-80 and 1983-84.

	<u>1979-80</u>	<u>1983-84</u>
No. of members	354	626
Paid-up share capital	Rs. 14,150	Rs. 60,890
Reserve and other funds	360	87,782
Net profit	-5,872	46,921
Loans to members during the year for purchase of milch cattle (up to Rs. 1000), feed, fodder and construction/repair of cattle shed	19,035	2,06,013
Of which, dues receivable at the end of the year	22,742	80,890

Its annual milk collection increased from 4,86,873 lts., in 1981-82 to 6,65,550 lts., in 1982-83 but declined to 5,75,426 lts., in 1983-84. The sale of cattle feed increased from Rs. 6,73,900 in 1981-82 to Rs. 8,55,607 in 1983-84. The decline in milk collection is attributed to rise in the cost of maintaining due to increase in prices of feed and fodder and consequent sale of milch cattle, and inadequate replacement thereof due to these adverse factors.

The Cooperative thought of buying an electronic milk tester but had to give up the idea due to non-availability of chemicals necessary for testing. This, however, has not detracted the dairy farmers from selling milk to the cooperative. It paid to the dairy farmers between 10 paise to Rs. 1.10 per litre between July 1982 and June 1983, over and above the rate at which the Milk Union purchased milk from the Milk Cooperative and thus helped them to get better price for milk. It also enabled a number of dairy farmers to obtain loan from the banks to purchase milch animals.

6) Shree Malasiddha Dudh Utpadak & Vyavasayik Sahakari Sanstha, Maryadit, Mandrup

The Milk Cooperative was established in 1974. Though it had collected during 1983-84, about 370 lpd., at the time of the present survey in 1985, only 15 persons sold milk to the Cooperative. Of these, 5 persons belonged to one family. With the closure of the other Milk Cooperative in the village, the present tendency is to sell milk to the private traders/agents. In the circumstances, this Milk Cooperative may not survive for long.

7) Mandrup Bruhat Vividha Karyakari Seva Sahakari Society, Limited, Mandrup

Though this Multipurpose Cooperative was established in 1914, its milk section was started in 1974. It was reported that, due to some technical reasons, the cooperative was informed that it could not be permitted to run the milk section. Hence from June 1984, the milk section of the cooperative is defunct.

8) Antroli Duh Utpadak, Puravatha Sahakari Sanstha, Antroli

The Milk Cooperative was established in 1974. The number of members is about 125, which is quite large considering that the number of households in the village would be a little over 200. The members own cows mainly and buffaloes only in small numbers. There are four large farmers in the village, each of whom owns 25 to 30 milch cattle. The cooperative uses an electronic milk tester and payment is made according to the fat content of milk. It collects about 900 lpd., in summer and about 2,000 lpd., in flush season, and sells it to the Government Milk Scheme at Solapur. The cooperative sells cattle feed but many of the members prefer to buy oil cake and wheat-bran from Solapur. It has enabled a number of members to obtain loan from the banks for purchase of milch cattle.

The Veterinary Aid Centre is situated at a distance of about 6 kms., from the village but, because of inadequate and unsatisfactory service, the dairy farmers either take their cattle to the veterinary doctor at Mandrup or call him

for a visit. There is also a mobile veterinary unit of the Solapur Dudh Utpadak Sangh <sup>which</sup> visits the village once in a fortnight. One of the employees of the cooperative is trained in rendering first-aid and A.I. and was reported to be giving efficient service.

Under the scheme of the State Government, in Solapur district in the year 1982-83, cattle feed was given with a subsidy to those who owned C-B calves. Since 1983-84, it is made available only to those households which are below 'Poverty Line'. The farmers get a subsidy of 50 per cent and the agricultural labourers a subsidy of 66 per cent on the price of the cattle feed. About 1,300 kg. of cattle feed is given to female calves from the fourth month until their first calving, in about 30 to 32 months starting with one kg. in the first four months <sup>and</sup> gradually increasing to 2.5 kg. in the ninth month.

Keeping the information in the present chapter in background, we will proceed to consider in the following chapters the findings of the present survey.

## CHAPTER IV

### SAMPLE DAIRY FARMERS AND THEIR RESOURCES

We shall consider in the present chapter information about the sample dairy farmers and their resources in milch animals, land, etc. We had selected a sample of 253 dairy farmers having C-B cows and/or calves from six villages in Pune, Sangli and Solapur districts. These included 46 per cent of the dairy farmers who had some irrigated land, 10 per cent who were landless and the remaining 44 per cent who were dry land cultivators. To begin with, we shall consider the Caste and Religion of the dairy farmers with a view to find out if dairying with C-B cows is confined to any advanced community.

#### Caste and Religion

For classification by caste and religion, we made nine broad groups as follows: Brahmin, Maratha, Mali, Artisan Castes, Trading Communities, Scheduled Castes, Scheduled Tribes, Nava Boudha and Muslims. In Table 4.1 we have shown distribution according to caste and religion. It is seen from the Table that the largest group was that of Marathas being 39 per cent of the total families. Though the families belonging to the Scheduled Castes and Scheduled Tribes formed a little over one per cent each, it is important to note that Nava Boudha and Scheduled Castes and Scheduled Tribes, together formed about one-third of the total sample families. The remaining, about 28 per cent of the total families, belonged to other castes among the Hindus. This indicates that as far as rearing

## CHAPTER IV

### SAMPLE DAIRY FARMERS AND THEIR RESOURCES

We shall consider in the present chapter information about the sample dairy farmers and their resources in milch animals, land, etc. We had selected a sample of 253 dairy farmers having C-B cows and/or calves from six villages in Pune, Sangli and Solapur districts. These included 46 per cent of the dairy farmers who had some irrigated land, 10 per cent who were landless and the remaining 44 per cent who were dry land cultivators. To begin with, we shall consider the Caste and Religion of the dairy farmers with a view to find out if dairying with C-B cows is confined to any advanced community.

#### Caste and Religion

For classification by caste and religion, we made nine broad groups as follows: Brahmin, Maratha, Mali, Artisan Castes, Trading Communities, Scheduled Castes, Scheduled Tribes, Nava Boudha and Muslims. In Table 4.1 we have shown distribution according to caste and religion. It is seen from the Table that the largest group was that of Marathas being 39 per cent of the total families. Though the families belonging to the Scheduled Castes and Scheduled Tribes formed a little over one per cent each, it is important to note that Nava Boudha and Scheduled Castes and Scheduled Tribes, together formed about one-third of the total sample families. The remaining, about 28 per cent of the total families, belonged to other castes among the Hindus. This indicates that as far as rearing

Artisans, Service and Educands. The distribution of sample families according to their main and subsidiary occupation is given in Table 4.2. As is to be expected, dairying was reported as a subsidiary occupation by 240 families (out of 247 families which reported a subsidiary occupation). It was the main occupation of only 4 families, 2 of which had agricultural labour as the subsidiary occupation while the other two had no subsidiary occupation.

Table 4.2: Distribution of Sample Families According to Their Main and Subsidiary Occupation

Main Occupation	Subsidiary Occupation					Total
	Culti- vators	Agri. labour	Dairy- ing	Artisans/ Traders	None	
-----						
No. of families						
Cultivation	-	1	210	2	4	217
Agri. Labour	-	-	24	-	-	24
Dairying	-	2	-	-	2	4
Artisans/Traders	1	-	2	-	-	3
Service	-	-	4	-	-	4
Educands	1	-	-	-	-	1
-----						
Total	2	3	240	2	6	253
-----						

As regards the main occupation of the family, as many as 86 per cent of the dairy farmers pursued cultivation as their main occupation. Agricultural labour was the main occupation of another 9.5 per cent and the remaining, about five per cent,



persued an occupation, other than cultivation or dairying, as their main occupation.

#### Year of Starting Dairy Enterprise

In Table 4.3 we have given data regarding the year in which the dairy farmers started dairy enterprise and whether they were members of Milk Cooperative. The data reveals that about 10 per cent of the dairy farmers were in dairy business even before 1970 and the remaining had taken to dairying in the last fifteen years. In fact, almost two-thirds of the families had taken to dairying during the five years preceding the survey. We have noted in Chapter II, that crossbreeding of cows received impetus during the last ten years.

Table 4.3: Distribution of Families According to the Year of Starting Dairy Enterprise and Membership of Milk Cooperative

How long in Dairy Enterprise?	Membership of Milk Cooperative			
	Member	Not-member	Not stated	Total No. of families
One Year	28	1	-	29
Two Years	29	4	1	34
Three Years	30	5	-	35
Four Years	25	7	-	32
Five Years	26	5	1	32
Six to Ten Years	34	10	2	46
Eleven to Fifteen Years	11	3	1	15
Sixteen Years or More	16	7	-	23
Not Stated	2	3	2	7
<b>Total</b>	<b>201</b>	<b>45</b>	<b>7</b>	<b>253</b>

### Membership of Milk Cooperative

As stated in Chapter III, except Mandrup where a milk cooperative was defunct, at all other villages, the milk cooperatives were working efficiently. From Table 4.3, we find that 80 per cent of the dairy farmers were members of the milk cooperatives.

### Size of Family and Composition of Family Members by Sex

The 253 sample families had 1367 persons. The average size of the family came to 5.4 persons per family. Only about 10 per cent of the families had between one to three members while about 80 per cent had between four to seven members. The remaining 10 per cent families had 8 or 9 members. The Male:Female ratio came to 55:45.

The percentage distribution of family members by sex and age (i.e. adults 15 years and above, and non-adults 14 years and below) was as follows: Male adults 37.0, Male non-adults 18.0, Female adults 30.0 and Female non-adults 15.0. About 37 per cent of the family members worked in the dairy enterprise. We shall consider in the following paragraphs information regarding the work they did relating to dairy enterprise.

### Persons Working in Dairy Enterprise

In the 253 sample families of dairy farmers, there were 506 family members and 22 annual farm servants who worked in dairying, i.e., on an average, 2 persons per family. Of the total such persons, 62 per cent were males and 48 per cent were

### Membership of Milk Cooperative

As stated in Chapter III, except Mandrup where a milk cooperative was defunct, at all other villages, the milk cooperatives were working efficiently. From Table 4.3, we find that 80 per cent of the dairy farmers were members of the milk cooperatives.

### Size of Family and Composition of Family Members by Sex

The 253 sample families had 1367 persons. The average size of the family came to 5.4 persons per family. Only about 10 per cent of the families had between one to three members while about 80 per cent had between four to seven members. The remaining 10 per cent families had 8 or 9 members. The Male:Female ratio came to 55:45.

The percentage distribution of family members by sex and age (i.e. adults 15 years and above, and non-adults 14 years and below) was as follows: Male adults 37.0, Male non-adults 18.0, Female adults 30.0 and Female non-adults 15.0. About 37 per cent of the family members worked in the dairy enterprise. We shall consider in the following paragraphs information regarding the work they did relating to dairy enterprise.

### Persons Working in Dairy Enterprise

In the 253 sample families of dairy farmers, there were 506 family members and 22 annual farm servants who worked in dairying, i.e., on an average, 2 persons per family. Of the total such persons, 62 per cent were males and 48 per cent were

Table 4.4: Distribution of Family Members Engaged in Dairy Enterprise According to Their Relation to the Head of the Family and Their Educational Status

Relation to the Head of the family	Education						Total No. of persons
	Illi-terate	Up to 4th std.	5th to 7th std.	8th to 10th std.	Pre-gra-dua-tion	Gra- duate, Diploma holder	
	No. of Persons						
Self	55	33	42	26	4	4	164
Son	21	11	27	34	9	2	104
Brother	-	2	3	4	-	-	9
Father and other male relations	5	2	4	1	1	-	13
Wife	100	16	26	5	-	-	147
Daughter, sister, daughter-in-law	25	11	10	5	1	-	52
Mother and other female relations	12	1	3	1	-	-	17
<b>Total</b>	<b>218</b>	<b>76</b>	<b>115</b>	<b>76</b>	<b>15</b>	<b>6</b>	<b>506</b>

Annual Employment in Dairy Enterprise

From the information the respondents gave regarding the number of hours spent on various work relating to dairying, we converted the total number of hours in a year into days by dividing the total hours by eight to find out the number of days each person worked during the reference year. In all 522 family members and 22 annual farm servants worked in

females. The average number of persons in dairy enterprise was the lowest, 1.68 per family where there was no C-B cow and it increased to 2.09, 2.22, 2.20 and 3.0 where there were one, two, three and four C-B cows (with or without other milch animals) respectively.

With a view to find out who among the family worked in the enterprise as also to know their level of education, we have presented the relevant data in Table 4.4. It will be seen from the Table that the head of the family and his wife, son, daughter/daughter-in-law together accounted for 88 per cent of the total persons in dairy enterprise. It thus appeared to be a family concern. There were 164 heads of families working in dairying, which means that, in respect of the heads of the remaining 80 families, their sons or other members of the family took care of the enterprise.

As for the level of literacy, 43 per cent of them were illiterate. The percentage of illiterates was as high as 63 among females and was quite low, only 28 per cent, among the males. About 15 per cent of the total were educated up to the fourth standard and another 23 per cent up to the seventh standard. There were only 15 per cent who had studied up to the 10th standard and 4 per cent had studied above the school level education. The large percentage of the illiterates or those who had studied up to the fourth standard (they together formed about 60 per cent of the total) shows that dairying with C-B cows was not confined to those who had higher formal education

**Table 4.4: Distribution of Family Members Engaged in Dairy Enterprise According to Their Relation to the Head of the Family and Their Educational Status**

Relation to the Head of the family	Education						Total No. of persons
	Illiterate	Up to 4th std.	5th to 7th std.	8th to 10th std.	Pre-graduate	Graduate, Diploma holder	
	No. of Persons						
Self	55	33	42	26	4	4	164
Son	21	11	27	34	9	2	104
Brother	-	2	3	4	-	-	9
Father and other male relations	5	2	4	1	1	-	13
Wife	100	16	26	5	-	-	147
Daughter, sister, daughter-in-law	25	11	10	5	1	-	52
Mother and other female relations	12	1	3	1	-	-	17
<b>Total</b>	<b>218</b>	<b>76</b>	<b>115</b>	<b>76</b>	<b>15</b>	<b>6</b>	<b>506</b>

#### Annual Employment in Dairy Enterprise

From the information the respondents gave regarding the number of hours spent on various work relating to dairying, we converted the total number of hours in a year into days by dividing the total hours by eight to find out the number of days each person worked during the reference year. In all 522 family members and 22 annual farm servants worked in

dairying. On an average, each family had one male and one female adult working in dairy enterprise. Their total work in dairying during the course of the reference year came to 98 days per person on an average. It was about 85 days in the case of male adults and 100 in the case of female adults. The 22 farm servants, on an average, worked 270 days in a year, that is, almost as full time workers in dairying. The 15 male non-adults worked for 96 days and 12 female non-adults for 99 days, on an average, during the year.

#### Total Daily Hours of Work

The number of hours a person would work in dairying would depend upon the size of the herd of milch and other animals, the number of animals in milk, the location of the site for grazing the animals and of cattle shed, if any, and such other factors. It is seen from Table 4.5 that about 24 per cent spent up to an hour a day and another 33 per cent up to two hours a day. Another about 35 per cent spent three to four hours a day while the remaining, about 8 per cent, spent more than four hours a day in dairying. Thus for a large majority of them, dairying was a part-time occupation. It will also be noted from the Table that among the male adults, only 34 per cent spent more than two hours a day in dairying, while of the female adults, 51 per cent worked for more than two hours a day. In the following paragraphs we shall consider the break-up of their daily work. The data is presented in Table Nos. 4.6 to 4.10.

Table 4.5:-Distribution of Persons Working in Dairy Enterprise According to Total Daily Hours of Work in Dairying

Total hours worked daily	Family members and annual farm servants					Total
	Male adults	Male non-adults	Female adults	Female non-adults	Annual farm servants	
One hour	75	6	39	8	1	129
Two hours	102	3	64	2	1	172
Three hours	57	2	60	2	2	123
Four hours	25	2	33	-	3	63
Five hours	7	1	11	-	1	20
Six hours	2	1	3	-	1	7
Seven to nine hours	1	-	-	-	13	14
Total	269	15	210	12	22	528

Daily Hours Spent in Grazing

It is seen from Table 4.6 that of the total persons working in dairying, about 57 per cent took the cattle for grazing. The percentage was higher among the female adults (60 per cent) than among the male adults (52 per cent). About three-fourths of them spent up to 2 hours a day in grazing the animals. The time spent on grazing varies with the availability of grazing facilities as also distance of the grazing site from the residence. Besides, it depends upon the workload in agriculture or other employment, as they tend to spend more time on grazing the cattle, if they have leisure.



Table 4.6: Distribution of Persons Working in the Dairy Enterprise According to Daily Time Spent in Taking the Milch Animals for Grazing

Daily hours spent in grazing	Family members and annual farm servants					Total
	Male adults	Male non-adults	Female adults	Female non-adults	Annual farm servants	
One	48	4	44	3	2	101
Two	66	4	53	1	4	128
Three	21	1	22	-	3	47
Four	3	1	5	-	6	15
Five	1	-	3	-	5	9
Nil	130	5	83	8	2	228
Total	269	15	210	12	22	528

#### Daily Hours Spent in Milking

The number of animals in milk as also their milk yield determines the time taken for milking. It will be seen from Table 4.7 that about 46 per cent of the total persons (that is about one person per family) were engaged in milking. All of them, except one, spent up to an hour daily in milking. Among those engaged in milking, the male adults and non-adults including the annual farm servants, formed about 65 per cent while the female adults accounted for the remaining.

#### Daily Hours Spent in Cleaning the Cattle Shed

Like milking, the work of cleaning the cattle shed also should not conflict with other work as it can be done during the

Table 4.6: Distribution of Persons Working in the Dairy Enterprise According to Daily Time Spent in Taking the Milch Animals for Grazing

Daily hours spent in grazing	Family members and annual farm servants					Total
	Male adults	Male non-adults	Female adults	Female non-adults	Annual farm servants	
One	48	4	44	3	2	101
Two	66	4	53	1	4	128
Three	21	1	22	-	3	47
Four	3	1	5	-	6	15
Five	1	-	3	-	5	9
Nil	130	5	83	8	2	228
Total	269	15	210	12	22	528

#### Daily Hours Spent in Milking

The number of animals in milk as also their milk yield determines the time taken for milking. It will be seen from Table 4.7 that about 46 per cent of the total persons (that is about one person per family) were engaged in milking. All of them, except one, spent up to an hour daily in milking. Among those engaged in milking, the male adults and non-adults including the annual farm servants, formed about 65 per cent while the female adults accounted for the remaining.

#### Daily Hours Spent in Cleaning the Cattle Shed

Like milking, the work of cleaning the cattle shed also should not conflict with other work as it can be done during the

Table 4.6: Distribution of Persons Working in the Dairy Enterprise According to Daily Time Spent in Taking the Milch Animals for Grazing

Daily hours spent in grazing	Family members and annual farm servants					Total
	Male adults	Male non-adults	Female adults	Female non-adults	Annual farm servants	
One	48	4	44	3	2	101
Two	66	4	53	1	4	128
Three	21	1	22	-	3	47
Four	3	1	5	-	6	15
Five	1	-	3	-	5	9
Nil	130	5	83	8	2	228
Total	269	15	210	12	22	528

#### Daily Hours Spent in Milking

The number of animals in milk as also their milk yield determines the time taken for milking. It will be seen from Table 4.7 that about 46 per cent of the total persons (that is about one person per family) were engaged in milking. All of them, except one, spent up to an hour daily in milking. Among those engaged in milking, the male adults and non-adults including the annual farm servants, formed about 65 per cent while the female adults accounted for the remaining.

#### Daily Hours Spent in Cleaning the Cattle Shed

Like milking, the work of cleaning the cattle shed also should not conflict with other work as it can be done during the

Table 4.10: Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Other Work Relating to Dairying

Daily hours spent in other work	Family members and annual farm servants					
	Male adults	Male non-adults	Female adults	Female Non-adults	Annual farm servants	Total
-----No. of persons-----						
One	22	2	10	1	11	46
Two	-	-	-	-	3	3
Nil	247	13	200	11	8	479
Total	269	15	210	12	22	528

Opportunity Cost of Family Labour

The respondents were asked to state if they had to give up any economic pursuit they were engaged in before taking to dairying with C-B cows. In case they had to give up some such employment, we asked them to indicate their earning from that occupation in a year prior to entry in dairying. In reply, 203 out of 506 family members, stated that they were not engaged in other pursuit before; 45 others were students and 6 were already working in dairying. 192 others stated that they were working on their farm, 48 others were working as agricultural labourers and 12 more were engaged in other occupation. However, except for 10 female adults all others continued to pursue their previous occupation, even after taking to dairying. The 10 female adults, who had ceased to work as agricultural

Table 4.10: Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Other Work Relating to Dairying

Daily hours spent in other work	Family members and annual farm servants					
	Male adults	Male non-adults	Female adults	Female Non-adults	Annual farm servants	Total
-----No. of persons-----						
One	22	2	10	1	11	46
Two	-	-	-	-	3	3
Nil	247	13	200	11	8	479
Total	269	15	210	12	22	528

Opportunity Cost of Family Labour

The respondents were asked to state if they had to give up any economic pursuit they were engaged in before taking to dairying with C-B cows. In case they had to give up some such employment, we asked them to indicate their earning from that occupation in a year prior to entry in dairying. In reply, 203 out of 506 family members, stated that they were not engaged in other pursuit before; 45 others were students and 6 were already working in dairying. 192 others stated that they were working on their farm, 48 others were working as agricultural labourers and 12 more were engaged in other occupation. However, except for 10 female adults all others continued to pursue their previous occupation, even after taking to dairying. The 10 female adults, who had ceased to work as agricultural

No. of C-B cows (Besides  
other milch cattle)

No. of dairy  
farmers

Only C-B calves	21
One C-B cow	180
Two C-B cows	46
Three C-B cows	5
Four C-B cows	1
Total:	----- 253 -----

There were 21 dairy farmers who had only a C-B calf, but twelve of them had cows and/or buffaloes of local non-descript breeds also. Majority of them were landless or small farmers. We had ~~selected~~ these families to get some information on rearing C-B calves and the expenditure incurred on such calves, since birth till their first calving.

As for the number of C-B cows with the remaining 232 dairy farmers, as many as 78 per cent of them had one C-B cow and about 20 per cent had two C-B cows. In the remaining two per cent, only 5 dairy farmers had 3 C-B cows and one had 4 C-B cows. It must, however, be stated that, from whatever information we had collected, while selecting the sample of dairy farmers in four out of six villages to serve as a sampling frame, it was found that the proportion of those having one C-B cow varied between 58 to 64 per cent, those having 2 C-B cows, between 23 and 29 per cent while that of those having three or more C-B cows varied between 11 and 19 per cent. For convenience of fieldwork,

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of



we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C<sub>7</sub>B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C-B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B female calves increased from 140 in December 1983 to 196 in November 1984. Thus it appears that some of the dairy farmers may be engaged in breeding C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent of them were local non-descript breeds. During the year, the number of

we had in our sample a slightly larger representation of those having one C-B cow and lower representation of those having 2 or more C-B cows.

Livestock Holding in December 1983  
and November 1984

We had asked the respondents to report the number of the livestock they had in December 1983 and November 1984 with a view to find out changes in their holding of different types of livestock, and in particular of C-B cows and calves. The data is presented in Table 4.11. The Table reveals that the number of female C<sub>7</sub>B calves increased by about 40 per cent; C-B cows increased by only about 11 per cent during the same period and stood at 292, while there was no significant change in the holding of other milch and draught animals, except that the number of male C-B calves increased from 11 to 24.

During the reference period 46 sales, 4 deaths and 72 purchases of C-B cows were reported. There was thus an addition of 22 C-B cows. Besides, by November 1984 there were 6 cases of first calving of the female calves reported in December 1983. This explains the increase of about 11 per cent of C-B cows. It is worth noting that the number of C-B females from 140 in December 1983 to 196 in November 1984 appears that some of the dairy farmers may be C-B cows for sale as an enterprise.

As regards 64 buffaloes, about 83 per cent were local non-descript breeds. During the y

**Table 4.11: Livestock Holding in December 1983 and November 1984 of the Sample Dairy Farmers**

1 & 3 = No. of Dairy Farmers in December 1983  
and November 1984 respectively  
2 & 4 = No. of Animals in December 1983 and  
December 1984 respectively

Type of Livestock	Kalamb				Ranjani			
	1	2	3	4	1	2	3	4
<u>C-B Cows</u>								
H.F.	15	22	18	23	22	30	22	31
Jersey	12	17	14	17	11	12	12	13
Other C-B	-	-	-	-	-	-	-	-
<u>C-B Female Calves</u>								
H.F.	12	13	16	18	18	22	21	27
Jersey	12	17	17	25	6	7	12	13
Other C-B	-	-	1	1	-	-	-	-
<u>C-B Bullocks</u>	1	1	1	1	-	-	-	-
<u>C-B Male Calves</u>	3	4	4	5	2	2	6	6
<u>Other Cows</u>								
Gir	-	-	-	-	-	-	-	-
Local Non-descript breeds	10	10	8	8	6	6	4	4
<u>Female Calves and Cows</u>								
Gir	-	-	-	-	-	-	-	-
Local Non-descript breeds	1	1	-	-	1	1	2	2
<u>Bullocks</u>	23	53	28	62	19	36	19	36
<u>Bullocks Young Stock</u>	6	10	5	8	5	6	6	6
<u>Buffaloes</u>								
Jafarabadi	3	5	4	5	-	-	-	-
Pandharpuri	-	-	-	-	-	-	-	-
Local Non-descript	2	2	2	2	3	3	4	4
Graded	-	-	-	-	-	-	-	-
<u>Buffaloes Young Stock</u>								
Jafarabadi	2	2	3	3	-	-	-	-
Local Non-descript breeds	1	1	1	1	1	1	4	4
<u>He-Buffaloes</u>	-	-	1	1	-	-	-	-
<u>He-Buffaloes Young Stock</u>	-	-	1	1	-	-	-	-
<u>Old Cows</u>	3	3	2	2	-	-	-	-
<u>Old Buffaloes</u>	1	1	1	1	-	-	-	-
<b>Total</b>	<b>107</b>	<b>162</b>	<b>127</b>	<b>184</b>	<b>94</b>	<b>126</b>	<b>112</b>	<b>146</b>

(Continued)

**Table 4.11: Livestock Holding in December 1983 and November 1984 of the Sample Dairy Farmers**

1 & 3 = No. of Dairy Farmers in December 1983  
and November 1984 respectively  
2 & 4 = No. of Animals in December 1983 and  
December 1984 respectively

Type of Livestock	Kalamb				Ranjani			
	1	2	3	4	1	2	3	4
<u>C-B Cows</u>								
H.F.	15	22	18	23	22	30	22	31
Jersey	12	17	14	17	11	12	12	13
Other C-B	-	-	-	-	-	-	-	-
<u>C-B Female Calves</u>								
H.F.	12	13	16	18	18	22	21	27
Jersey	12	17	17	25	6	7	12	13
Other C-B	-	-	1	1	-	-	-	-
<u>C-B Bulls</u>	1	1	1	1	-	-	-	-
<u>C-B Male Calves</u>	3	4	4	5	2	2	6	6
<u>Other Cows</u>								
Gir	-	-	-	-	-	-	-	-
Local Non-descript breeds	10	10	8	8	6	6	4	4
<u>Female Calves and Cows</u>								
Gir	-	-	-	-	-	-	-	-
Local Non-descript breeds	1	1	-	-	1	1	2	2
<u>Bulls</u>	23	53	28	62	19	36	19	36
<u>Bulls Young Stock</u>	6	10	5	8	5	6	6	6
<u>Buffaloes</u>								
Jafarabadi	3	5	4	5	-	-	-	-
Pandharpuri	-	-	-	-	-	-	-	-
Local Non-descript	2	2	2	2	3	3	4	4
Graded	-	-	-	-	-	-	-	-
<u>Buffaloes Young Stock</u>								
Jafarabadi	2	2	3	3	-	-	-	-
Local Non-descript breeds	1	1	1	1	1	1	4	4
<u>He-Buffaloes</u>	-	-	1	1	-	-	-	-
<u>He-Buffaloes Young Stock</u>	-	-	1	1	-	-	-	-
<u>Old Cows</u>	3	3	2	2	-	-	-	-
<u>Old Buffaloes</u>	1	1	1	1	-	-	-	-
<b>Total</b>	<b>107</b>	<b>162</b>	<b>127</b>	<b>184</b>	<b>94</b>	<b>126</b>	<b>112</b>	<b>146</b>

(Continued)



Table 4.11: (Continued)

Type of Livestock	Antroli				Total			
	1	2	3	4	1	2	3	4
<u>C-B Cows</u>								
H.F.	30	40	40	56	143	188	160	198
Jersey	2	2	2	3	59	65	76	81
Other C-B	3	3	4	4	11	11	13	13
<u>C-B Female Calves</u>								
H.F.	12	16	19	22	85	99	108	128
Jersey	-	-	1	1	32	38	50	59
Other C-B	-	-	1	1	3	3	9	9
<u>C-B Bullocks</u>	-	-	-	-	6	8	6	8
<u>C-B Male Calves</u>	-	-	1	1	10	11	22	24
<u>Other Cows</u>								
Gir	1	1	1	1	4	4	4	4
Local Non-descript breeds	3	3	2	2	25	26	20	21
<u>Female Calves of Cows</u>								
Gir	1	2	1	2	3	4	3	4
Local Non-descript breeds	-	-	-	-	2	2	4	4
<u>Bullocks</u>	12	24	12	24	99	198	100	200
<u>Bullocks Young Stock</u>	3	3	3	4	20	25	21	25
<u>Buffaloes</u>								
Jafarabadi	1	1	1	1	4	6	5	6
Pandharpuri	-	-	-	-	1	2	1	2
Local Non-descript	7	7	8	8	49	54	50	53
Graded	-	-	-	-	3	3	3	3
<u>Buffaloes Young Stock</u>								
Jafarabadi	1	1	1	1	5	5	6	6
Local Non-descript breeds	2	2	3	3	16	18	30	31
<u>He-Buffaloes</u>	-	-	-	-	-	-	2	2
<u>He-buffaloes Young Stock</u>	-	-	-	-	2	2	5	5
<u>Old Cows</u>	-	-	-	-	3	3	2	2
<u>Old Buffaloes</u>	-	-	-	-	1	1	1	1
<b>Total</b>	<b>78</b>	<b>105</b>	<b>100</b>	<b>134</b>	<b>586</b>	<b>776</b>	<b>701</b>	<b>889</b>

Jafarabadi, Pandharpuri and graded buffaloes remained unchanged at 6, 2 and 3 respectively while that of the local non-descript breeds decreased by one and stood at 53.

Compared to the C-B cows and buffaloes, the number of cows and calves of local, non-descript breeds at both the points of reference was small. There were only a few Gir cows. The number of bullocks did not change significantly, being 198 in December 1983 and 200 in November 1984. The young stock of bullocks remained unchanged at 25. Most of the sample farmers do not use C-B bullocks as draught animals. Since they do not have other cows in large enough numbers, they may face difficulties in future in having in adequate numbers homebred bullocks for use as draught animals.

#### Land Cultivated

It is often argued that irrigated dairy farmers can conduct dairying with C-B cows more profitably (as they can give farm produced green fodder) than dry land cultivators or landless. We shall examine in a subsequent chapter the economics of C-B cows with reference to irrigated dairy farmers and others. To know the holding of C-B cows among the dairy farmers, we have classified them according to their land holding and the number of C-B cows they had. The data is presented in Table 4.13. The data in Table 4.12 and 4.13 is summarised below.

Number of C-B cows with or without C-B calves and other milch animals	Dairy Farmers					
	Land owners	Land- less	Total No.	Irri- gated	Others	Total
No C-B cow	19	2	21	6	15	21
One C-B cow	160	20	180	83	97	180
Two C-B cows	43	3	46	23	23	46
Three C-B cows	5	-	5	3	2	5
Four C-B cows	1	-	1	1	-	1
	228	25	253	116	137	253

As for cultivators among the dairy farmers it will be seen from Table 4.12 that of the 253 dairy farmers, all except the 25 landless cultivated land. The landless 25 included 24 agricultural labourers and the remaining one was a petty trader selling seasonal fruit.

Among the 228 cultivator-dairy farmers, 52 were marginal farmers cultivating up to one ha., while 71 others were small farmers, cultivating up to 2 ha. of land, if we classify them as marginal and small farmers without taking into consideration the size of their irrigated land. The remaining 105 dairy farmers, that is about 40 per cent of the total dairy farmers cultivated more than 2 ha. The large percentage, about 58 per cent of the sample dairy farmers of the landless as also those cultivating up to 2 ha. of land, indicates that dairying with C-B cows is not necessarily confined to the medium and large farmers but is also significantly evident among the landless, marginal and small farmers.

Number of C-B cows with or without C-B calves and other milch animals	Dairy Farmers					
	Land owners	Land- less	Total No.	Irri- gated	Others	Total
No C-B cow	19	2	21	6	15	21
One C-B cow	160	20	180	83	97	180
Two C-B cows	43	3	46	23	23	46
Three C-B cows	5	-	5	3	2	5
Four C-B cows	1	-	1	1	-	1
	228	25	253	116	137	253

As for cultivators among the dairy farmers it will be seen from Table 4.12 that of the 253 dairy farmers, all except the 25 landless cultivated land. The landless 25 included 24 agricultural labourers and the remaining one was a petty trader selling seasonal fruit.

Among the 228 cultivator-dairy farmers, 52 were marginal farmers cultivating up to one ha., while 71 others were small farmers, cultivating up to 2 ha. of land, if we classify them as marginal and small farmers without taking into consideration the size of their irrigated land. The remaining 105 dairy farmers, that is about 40 per cent of the total dairy farmers cultivated more than 2 ha. The large percentage, about 58 per cent of the sample dairy farmers of the landless as also those cultivating up to 2 ha. of land, indicates that dairying with C-B cows is not necessarily confined to the medium and large farmers but is also significantly evident among the landless, marginal and small farmers.

Number of C-B cows with or without C-B calves and other milch animals	Dairy Farmers					
	Land owners	Land- less	Total No.	Irri- gated	Others	Total
No C-B cow	19	2	21	6	15	21
One C-B cow	160	20	180	83	97	180
Two C-B cows	43	3	46	23	23	46
Three C-B cows	5	-	5	3	2	5
Four C-B cows	1	-	1	1	-	1
	228	25	253	116	137	253

As for cultivators among the dairy farmers it will be seen from Table 4.12 that of the 253 dairy farmers, all except the 25 landless cultivated land. The landless 25 included 24 agricultural labourers and the remaining one was a petty trader selling seasonal fruit.

Among the 228 cultivator-dairy farmers, 52 were marginal farmers cultivating up to one ha., while 71 others were small farmers, cultivating up to 2 ha. of land, if we classify them as marginal and small farmers without taking into consideration the size of their irrigated land. The remaining 105 dairy farmers, that is about 40 per cent of the total dairy farmers cultivated more than 2 ha. The large percentage, about 58 per cent of the sample dairy farmers of the landless as also those cultivating up to 2 ha. of land, indicates that dairying with C-B cows is not necessarily confined to the medium and large farmers but is also significantly evident among the landless, marginal and small farmers.

Number of C-B cows with or without C-B calves and other milch animals	Dairy Farmers					
	Land owners	Land- less	Total No.	Irri- gated	Others	Total
No C-B cow	19	2	21	6	15	21
One C-B cow	160	20	180	83	97	180
Two C-B cows	43	3	46	23	23	46
Three C-B cows	5	-	5	3	2	5
Four C-B cows	1	-	1	1	-	1
	228	25	253	116	137	253

As for cultivators among the dairy farmers it will be seen from Table 4.12 that of the 253 dairy farmers, all except the 25 landless cultivated land. The landless 25 included 24 agricultural labourers and the remaining one was a petty trader selling seasonal fruit.

Among the 228 cultivator-dairy farmers, 52 were marginal farmers cultivating up to one ha., while 71 others were small farmers, cultivating up to 2 ha. of land, if we classify them as marginal and small farmers without taking into consideration the size of their irrigated land. The remaining 105 dairy farmers, that is about 40 per cent of the total dairy farmers cultivated more than 2 ha. The large percentage, about 58 per cent of the sample dairy farmers of the landless as also those cultivating up to 2 ha. of land, indicates that dairying with C-B cows is not necessarily confined to the medium and large farmers but is also significantly evident among the landless, marginal and small farmers.

the extent of dependence of the dairy farmers on purchased fodder, we sought information about the farm produced fodder as also the fodder purchased by them during the reference period. In Table 4.14 we have given the relevant data. It will be seen from the Table that if we take into consideration the total farm produced and purchased fodder, the former accounts for about 72 per cent of the total.

The dry fodder formed about 72 per cent and the green fodder about 23 per cent of the total farm produced fodder. About the same proportion is found in the purchased fodder also. Even in the matter of dry fodder, the dairy farmers depended to a considerable extent on purchased fodder. If we consider the farm produced and purchased kadba together, we find that the purchased kadba accounted for about 30 per cent of the total. It will become a serious constraint, if for any reason it is not possible to buy kadba from others. In comparison to kadba, the proportion of expenditure on dry fodder from Bajra and other crops was not large.

In the farm produced green fodder, lucerne accounted for about 44 per cent, followed by maize 20 per cent, sugarcane 18 per cent and jowar 11 per cent. The remaining about 7 per cent of green fodder was from groundnut and other crops. The purchases of sugarcane tops, were the maximum being 71 per cent in the total purchases of green fodder and also 61 per cent higher than farm produced sugarcane tops. Like kadba, this can also be serious constraint, if for any reason, sugarcane tops are not available for sale. Lucerne was generally not sold as

the extent of dependence of the dairy farmers on purchased fodder, we sought information about the farm produced fodder as also the fodder purchased by them during the reference period. In Table 4.14 we have given the relevant data. It will be seen from the Table that if we take into consideration the total farm produced and purchased fodder, the former accounts for about 72 per cent of the total.

The dry fodder formed about 72 per cent and the green fodder about 23 per cent of the total farm produced fodder. About the same proportion is found in the purchased fodder also. Even in the matter of dry fodder, the dairy farmers depended to a considerable extent on purchased fodder. If we consider the farm produced and purchased kadba together, we find that the purchased kadba accounted for about 30 per cent of the total. It will become a serious constraint, if for any reason it is not possible to buy kadba from others. In comparison to kadba, the proportion of expenditure on dry fodder from Bajra and other crops was not large.

In the farm produced green fodder, lucerne accounted for about 44 per cent, followed by maize 20 per cent, sugarcane 18 per cent and jowar 11 per cent. The remaining about 7 per cent of green fodder was from groundnut and other crops. The purchases of sugarcane tops, were the maximum being 71 per cent in the total purchases of green fodder and also 61 per cent higher than farm produced sugarcane tops. Like kadba, this can also be serious constraint, if for any reason, sugarcane tops are not available for sale. Lucerne was generally not sold as



### Place of Obtaining Feed and Fodder

The respondents were asked to state the place from where they obtained fodder. As for lucerne, nearly two-thirds of the sample dairy farmers stated that it was not on sale, either in their village or nearby. Of the remaining one-third, that is 83 dairy farmers, only 34 raised lucerne on their farm, while 49 others purchased from the neighbouring farmers. In this connection it may be recalled that 116 out of 253 dairy farmers had some irrigated land. However, only about one-third of them raised lucerne on their farm.

Green fodder from maize or jowar seemed to be more common. Only about 10 per cent of the farmers stated that it was not available. However, of the remaining 226, 136 dairy farmers could buy it from other farmers while 38 dairy farmers produced it on the farm.

Sugarcane tops were not available to 136 dairy farmers, 61 of whom did not have any irrigated land. The remaining 117 dairy farmers had either their own cultivation of sugarcane or could obtain sugarcane tops from other farmers locally. Thus in the matter of green fodder, a majority of the farmers depended upon maize and jowar.

As regards kadba, except in the case of about 2 per cent of the total, all other dairy farmers reported that it was available either on their own farm or with local farmers.

Thus in the matter of fodder supply, dry fodder as also green fodder from maize or jowar was locally available.

However, lucerne was not available to two-thirds of the dairy farmers.

#### When is Green Fodder Given to the Milch Animals?

The respondents were asked to indicate the months in which they gave green fodder to their milch animals and reasons for not giving it in other months. Only about 37 per cent of them stated that they gave green fodder round the year. About 8 per cent gave it for about eight months excluding summer, while another 16 per cent gave green fodder for eight months other than monsoon. About 6 per cent gave green fodder only in winter while about 2 per cent gave it when the cow was in milk. The remaining, about 37 per cent, gave it only in monsoon.

About one-third of the dairy farmers stated that they could not give green fodder as they did not have any irrigated land. Another 33 per cent stated that they either did not have irrigated land or did not produce green fodder and about one-fourth of them further stated that they could not afford it. Another 8 per cent stated that they could not give green fodder in other months because it is expensive to buy. The remaining 20 per cent gave other reasons such as its non-availability in the village or lack of enough water in the wells to raise green fodder.

#### Cattle Feed

The respondents were asked to report the kind of cattle feed they gave to their C-B cows and the place from where they

obtained it. 'Sugras' is the name of a popular brand of cattle feed in Western Maharashtra and as such cattle feed is reported as 'Sugras', even when it had some other brand name. About two-thirds of the dairy farmers reported that they gave Sugras and about one-fourth of them gave oil-cake and/or wheat bran along with it. Of the remaining one-third who did not give Sugras, a large majority of them (75 per cent) did not have any irrigated land. These also included those who had only C-B calves. During the reference year, 60 per cent of the dairy farmers reported expenditure on cattle feed, the average expenditure per reporting farmer being about Rs. 1,225/-.

As regards the source of supply, about 57 per cent of the dairy farmers stated that cattle feed was available in the local Milk Cooperative. The remaining, that is 108 dairy farmers, which included 44 from Mandrup where the Milk Cooperative was defunct, stated that they purchased cattle feed from the neighbouring villages.

#### Oil-cake and Wheat Bran

Oil cake and wheat bran was available with the local traders. About 38 per cent of the dairy farmers reported purchases of oil cake, at an average of Rs. 1190 per reporting dairy farmer. Expenditure on wheat bran was reported by 43 per cent of the dairy farmers, the average expenditure per reporting case being Rs. 864/-.

#### Income from Dairying

Though we shall consider economics of dairying with C-B cows separately, in the present section we propose to examine

the extent to which their overall dairy enterprise brought income to the dairy farmers. It may be mentioned that, 162 dairy farmers owned C-B cows and C-B calves only and the remaining 91 dairy farmers had in their herd non-descript cows and/or buffaloes along with C-B cows. The income from dairying is shown in Table 4.15 for irrigated and in Table 4.16 for other dairy farmers.

On the receipts side we have included the value of total milk production of all the milch animals, dung manure, sales of milch and other animals, and hides and skin of the dead animals. On the expenditure side, we have included the expenditure on feed and fodder (including farm produced), transport of milk, insemination, veterinary care, cattle insurance, salary of paid servants, if any expenditure on grazing land and interest on loan taken, if any, for purchase of milch animals. We have not included depreciation or imputed wages of family labour in the total expenditure. The income from dairy enterprise during the reference period was arrived at by deducting the expenditure from receipts as indicated above. The dairy farmers were then classified into suitable income groups.

It will be noted from the Tables that out of 253 dairy farmers, 82 per cent showed excess of receipts over expenditure. Among the 18 per cent who showed a deficit, about one-fourth of them did not have any milch animal while most of the remaining did not have a milch animal in milk for a major part of the reference year.

the extent to which their overall dairy enterprise brought income to the dairy farmers. It may be mentioned that, 162 dairy farmers owned C-B cows and C-B calves only and the remaining 91 dairy farmers had in their herd non-descript cows and/or buffaloes along with C-B cows. The income from dairying is shown in Table 4.15 for irrigated and in Table 4.16 for other dairy farmers.

On the receipts side we have included the value of total milk production of all the milch animals, dung manure, sales of milch and other animals, and hides and skin of the dead animals. On the expenditure side, we have included the expenditure on feed and fodder (including farm produced), transport of milk, insemination, veterinary care, cattle insurance, salary of paid servants, if any expenditure on grazing land and interest on loan taken, if any, for purchase of milch animals. We have not included depreciation or imputed wages of family labour in the total expenditure. The income from dairy enterprise during the reference period was arrived at by deducting the expenditure from receipts as indicated above. The dairy farmers were then classified into suitable income groups.

It will be noted from the Tables that out of 253 dairy farmers, 82 per cent showed excess of receipts over expenditure. Among the 18 per cent who showed a deficit, about one-fourth of them did not have any milch animal while most of the remaining did not have a milch animal in milk for a major part of the reference year.

the extent to which their overall dairy enterprise brought income to the dairy farmers. It may be mentioned that, 162 dairy farmers owned C-B cows and C-B calves only and the remaining 91 dairy farmers had in their herd non-descript cows and/or buffaloes along with C-B cows. The income from dairying is shown in Table 4.15 for irrigated and in Table 4.16 for other dairy farmers.

On the receipts side we have included the value of total milk production of all the milch animals, dung manure, sales of milch and other animals, and hides and skin of the dead animals. On the expenditure side, we have included the expenditure on feed and fodder (including farm produced), transport of milk, insemination, veterinary care, cattle insurance, salary of paid servants, if any expenditure on grazing land and interest on loan taken, if any, for purchase of milch animals. We have not included depreciation or imputed wages of family labour in the total expenditure. The income from dairy enterprise during the reference period was arrived at by deducting the expenditure from receipts as indicated above. The dairy farmers were then classified into suitable income groups.

It will be noted from the Tables that out of 253 dairy farmers, 82 per cent showed excess of receipts over expenditure. Among the 18 per cent who showed a deficit, about one-fourth of them did not have any milch animal while most of the remaining did not have a milch animal in milk for a major part of the reference year.

Of those 206 dairy farmers who showed a surplus, about 37 per cent showed a surplus exceeding Rs. 5,000/- and another about 27 per cent a surplus of Rs. 2,500/- to Rs. 5,000/-. About 14 per cent had a surplus of less than Rs. 1,000/- while the remaining 22 per cent had a surplus varying from Rs. 1,000/- to Rs. 2,500/-.

It may be reiterated that we have arrived at the income for the herd of milch animals as a whole and not exclusively for C-B cows. We have also not included (i) depreciation or appreciation in the value of milch animals and (ii) imputed value of family labour in the total expenditure.

About 20 per cent of the irrigated dairy farmers incurred a loss whereas only about 18 per cent from among the other dairy farmers sustained loss during the reference year. Similarly, among those showing surplus if we consider those getting income exceeding Rs. 2,500/- from dairying, they formed about 59 per cent among irrigated dairy farmers and in fact a higher percentage, 69 per cent among others (one-fifth of whom were landless).

Thus it will be seen that income from dairying is not necessarily related to whether the dairy farmers have irrigated land or not. It is dependent upon the number of animals in milk during the reference year they have and, of course, the C-B cows among them.

## CHAPTER V

### CROSSBREEDING AND SPECIAL CARE OF THE CROSSBRED COWS AND CALVES

In the present chapter we propose to note the experience, of the dairy farmers, of crossbreeding their cows by A.I., the sex and deaths of the calves born and disposal of the calves. With a view to find out if it is economical to rear a female calf, until its first calving, vis-a-vis buying a C-B cow in its first calving, we shall also examine the data on rearing of C-B calves. The C-B cows, it is often emphasised, need special care and attention. We propose to consider from our survey data the special care the dairy farmers took and the veterinary treatment they gave. Finally, we shall consider the deaths of milch animals, the reported causes of death and also information on cattle insurance.

#### Homebred, Crossbred Cows

In respect of the homebred, C-B cows, we had asked the dairy farmers to state (i) if the cows conceived after the first insemination or had to be inseminated more than once, (ii) whether they felt that the C-B cows do not conceive after the third or fourth calving, (iii) whether they considered that the C-B bullocks/young-stock are as efficient as the bullocks of local breed, (iv) if no longer resorting to A.I., reasons therefor, and (v) whether they insured the cattle every year and if not, reasons therefor. In fact we should have asked these questions also to the dairy farmers who had only purchased C-B cows with them. However, through oversight, these questions remained to



## CHAPTER V

### CROSSBREEDING AND SPECIAL CARE OF THE CROSSBRED COWS AND CALVES

In the present chapter we propose to note the experience, of the dairy farmers, of crossbreeding their cows by A.I., the sex and deaths of the calves born and disposal of the calves. With a view to find out if it is economical to rear a female calf, until its first calving, vis-a-vis buying a C-B cow in its first calving, we shall also examine the data on rearing of C-B calves. The C-B cows, it is often emphasised, need special care and attention. We propose to consider from our survey data the special care the dairy farmers took and the veterinary treatment they gave. Finally, we shall consider the deaths of milch animals, the reported causes of death and also information on cattle insurance.

#### Homebred, Crossbred Cows

In respect of the homebred, C-B cows, we had asked the dairy farmers to state (i) if the cows conceived after the first insemination or had to be inseminated more than once, (ii) whether they felt that the C-B cows do not conceive after the third or fourth calving, (iii) whether they considered that the C-B bullocks/young-stock are as efficient as the bullocks of local breed, (iv) if no longer resorting to A.I., reasons therefor, and (v) whether they insured the cattle every year and if not, reasons therefor. In fact we should have asked these questions also to the dairy farmers who had only purchased C-B cows with them. However, through oversight, these questions remained to

It appeared that the facilities for A.I. were available locally or at a nearby village. We found from our data that A.I. was done in the village itself in 63 out of 78 cases, in a nearby village in two other cases and in a nearby taluka in respect of one more cow. Information was not given in respect of one cow. However, in 11 out of 78 cows, that is about 14 per cent of them, the cows did not conceive by A.I.

To those who did not practice A.I., when asked to state the reasons, six farmers felt that the cows do not conceive by A.I. and need a natural cover. Two others stated that G-B male calves are not efficient and as they need bullocks for use as plough cattle, they do not like to resort to A.I.

Out of 66 cows which conceived as a result of A.I., 38 of them (i.e. 57.6 per cent) conceived after the first insemination, 13 others (i.e. 20.0 per cent) after the second insemination, 12 others (i.e. 18.2 per cent) after the third insemination and the remaining 3 (i.e. 4.5 per cent) after the fourth insemination. These do not include the cows which had to be covered by bulls because they failed to conceive by A.I. Our finding, namely 1.7 A.I. per calf born, comes close to study of 30 cows Demonstration Unit of the National Dairy Research Institute where the average number of A.I. per conception was 1.6 (Gupta J.N. and R.K.Patel, 1985 : 36) (Indian Journal of Agro-Economic, Jan-March 1985). However, both these samples are too small to make any generalisation. The Directorate of Animal Husbandry, Maharashtra State (Statistical Dairy 1980 : 100)

has given the statistics relating to the average number of A.I. required per C-B calf born in the State, which show that 5 A.I. are required on an average per C-B calf born. This is arrived at on the basis of about 38 lakh inseminations performed between 1970-71 to 1983-84 and hence could be considered as representative of the State.

As regards the use of A.I. at second and subsequent calving, only one dairy farmer stated that for the second calving he did not resort to A.I. In the case of fifty C-B cows, A.I. was given at their second and subsequent calving also. Sixteen other cows, which had recently calved or were due to calve for the first time, were yet to be given A.I. The remaining were covered with a bull. Thus it appears that once the dairy farmers accepted A.I., they continued its use in the second and subsequent calvings also.

When asked to state if the C-B cows conceived even after third or fourth calving, 14 dairy farmers stated that the C-B cows do conceive by A.I., even after their third or fourth calving. Eight others gave a negative reply. In the case of 51 C-B cows, as they were still in their first to third calving, the dairy farmers had no experience to report. We had incorporated this question as some dairy farmers feel that the C-B cows do not conceive after their third or fourth calving. However, the number of cases in our study is small and as such it is not possible to come up with any definite conclusion in this regard.

It appeared that the facilities for A.I. were available locally or at a nearby village. We found from our data that A.I. was done in the village itself in 63 out of 78 cases, in a nearby village in two other cases and in a nearby taluka in respect of one more cow. Information was not given in respect of one cow. However, in 11 out of 78 cows, that is about 14 per cent of them, the cows did not conceive by A.I.

To those who did not practice A.I., when asked to state the reasons, six farmers felt that the cows do not conceive by A.I. and need a natural cover. Two others stated that G-B male calves are not efficient and as they need bullocks for use as plough cattle, they do not like to resort to A.I.

Out of 66 cows which conceived as a result of A.I., 38 of them (i.e. 57.6 per cent) conceived after the first insemination, 13 others (i.e. 20.0 per cent) after the second insemination, 12 others (i.e. 18.2 per cent) after the third insemination and the remaining 3 (i.e. 4.5 per cent) after the fourth insemination. These do not include the cows which had to be covered by bulls because they failed to conceive by A.I. Our finding, namely 1.7 A.I. per calf born, comes close to study of 30 cows Demonstration Unit of the National Dairy Research Institute where the average number of A.I. per conception was 1.6 (Gupta J.N. and R.K.Patel, 1985 : 36) (Indian Journal of Agro-Economic, Jan-March 1985). However, both these samples are too small to make any generalisation. The Directorate of Animal Husbandry, Maharashtra State (Statistical Dairy 1980 : 100)

has given the statistics relating to the average number of A.I. required per C-B calf born in the State, which show that 5 A.I. are required on an average per C-B calf born. This is arrived at on the basis of about 38 lakh inseminations performed between 1970-71 to 1983-84 and hence could be considered as representative of the State.

As regards the use of A.I. at second and subsequent calving, only one dairy farmer stated that for the second calving he did not resort to A.I. In the case of fifty C-B cows, A.I. was given at their second and subsequent calving also. Sixteen other cows, which had recently calved or were due to calve for the first time, were yet to be given A.I. The remaining were covered with a bull. Thus it appears that once the dairy farmers accepted A.I., they continued its use in the second and subsequent calvings also.

When asked to state if the C-B cows conceived even after third or fourth calving, 14 dairy farmers stated that the C-B cows do conceive by A.I., even after their third or fourth calving. Eight others gave a negative reply. In the case of 51 C-B cows, as they were still in their first to third calving, the dairy farmers had no experience to report. We had incorporated this question as some dairy farmers feel that the C-B cows do not conceive after their third or fourth calving. However, the number of cases in our study is small and as such it is not possible to come up with any definite conclusion in this regard.

As regards the efficiency as draught cattle of C-B bullocks, 10 dairy farmers expressed that such bullocks were as efficient as the local breeds. Four others expressed their opinion to the contrary. The remaining stated that they have no experience to state. With reference to this question also, a very small number of dairy farmers replied. However, the fact that the dairy farmers had only 8 C-B bullocks but about 200 bullocks of local breeds indicates that the C-B bullocks are not considered suitable as draught animal.

Only 7, out of 69 dairy farmers, reported expenditure on crossbreeding, varying between Rs. 5 and Rs.20. With a view to find out how the sample dairy farmers took to the use of A.I., we had sought some information from them. In 16 out of 78 cases the dairy farmer himself took a decision regarding crossbreeding. Only in two cases the decision was taken at the instance of the neighbours and in one case at the instance of the Chairman of the Milk Cooperative. However, in as many as 51 cases the Veterinary Doctor persuaded them to resort to crossbreeding. In the remaining 8 cases, no information was reported in this matter.

We shall next consider the C-B calves born, particularly their sex, deaths and disposal of calves.

### Sex of Calves

We have tabulated the information regarding the sex of the calves born at each calving in respect of all the milch animals the dairy farmers had at the time of the survey. The data

are presented separately for the milch animals owned by the irrigated dairy farmers and others in Table 5.2.

**Table 5.2: Percentage Distribution of the Calves Born According to Sex**

1 = Reported by Irrigated Dairy Farmers  
2 = Reported by Others

Calves born to the type of animal	Male Calves		Female Calves		Not reported		Total No. (100 per cent)	
	1	2	1	2	1	2	1	2
	%	%	%	%	%	%		
H.F. C-B cows	48	58	52	39	-	3	163	124
Jersey C-B cows	50	61	48	39	2	-	61	44
Other cows	56	41	44	59	-	-	18	39
Buffaloes	65	51	35	39	-	10	46	27

First we shall consider the H.F. C-B cows. The overall Male : Female ratio is 57 : 43. The irrigated dairy farmers reported 163 cases in different calvings of which 48 per cent were males. In respect of others, out of 124 calves 58 per cent were males.

In respect of Jersey C-B cows also, the overall ratio of Male : Female is somewhat similar to that of H.F. However we find a higher ratio of male calves born to such cows owned by others. It is seen from the Table that of the 44 such cases, 61 per cent were male calves. In the cases reported by

irrigated dairy farmers, however, the male calves formed 50 per cent of the total calves born.

We have no data to explain the higher proportion of male calves reported by others. From whatever data we have, we find that the proportion of male calves exceeded that of the female calves born at each calving in the case of such animals owned by the others. Perhaps, because our sample is small, the sex ratio is not 50 : 50.

In the case of cows of local, non-descript breeds also we find that the sex ratio is not 50 : 50. The male calves formed 56 per cent in the case of irrigated dairy farmers and only 41 per cent in the case of others. Similarly, in the case of buffaloes, the male calves formed 65 per cent out of 46 calves reported by the irrigated dairy farmers and only 51 per cent in the case of others. Even if we take into consideration the few cases where sex was not reported and assuming that in such cases they were female calves, their inclusion will not raise the sex ratio to 50 : 50.

#### Deaths of Calves

The data regarding deaths of calves are given in Tables 5.3 and 5.4 along with data regarding disposal of calves born. It is seen from the Table that the percentage of the calves reported dead was higher in the case of all male calves born, except the male calves of the other cows. In the case of H.F. C-B cows, of the 153 male calves born, reported by the irrigated dairy farmers and others, 65 per cent were reported dead.



irrigated dairy farmers, however, the male calves formed 50 per cent of the total calves born.

We have no data to explain the higher proportion of male calves reported by others. From whatever data we have, we find that the proportion of male calves exceeded that of the female calves born at each calving in the case of such animals owned by the others. Perhaps, because our sample is small, the sex ratio is not 50 : 50.

In the case of cows of local, non-descript breeds also we find that the sex ratio is not 50 : 50. The male calves formed 56 per cent in the case of irrigated dairy farmers and only 41 per cent in the case of others. Similarly, in the case of buffaloes, the male calves formed 65 per cent out of 46 calves reported by the irrigated dairy farmers and only 51 per cent in the case of others. Even if we take into consideration the few cases where sex was not reported and assuming that in such cases they were female calves, their inclusion will not raise the sex ratio to 50 : 50.

#### Deaths of Calves

The data regarding deaths of calves are given in Tables 5.3 and 5.4 along with data regarding disposal of calves born. It is seen from the Table that the percentage of the calves reported dead was higher in the case of all male calves born, except the male calves of the other cows. In the case of H.F. C-B cows, of the 153 male calves born, reported by the irrigated dairy farmers and others, 65 per cent were reported dead.

However, the percentage was lower, that is, 47 in the case of male calves of irrigated dairy farmers and 84 per cent in the case of male calves of others. Similar is the situation in the case of the Jersey C-B male calves. About 29 per cent of the male calves of irrigated dairy farmers were reported dead as against 63 per cent in the case of others. This suggests that the unirrigated dairy farmers perhaps tended to neglect the male calves because of the resource constraints, that is, shortage of milk and green fodder to be given in their tender age.

We do not have data to systematically work out the mortality rate. The A.H. Department of the State Government had fixed a norm of 5 per cent mortality for cattle calves born at its cattle Breeding Farms. (Performance Budget, 1984-85 : 177) Even if we consider the deaths among the female calves born, which for all C-B cows came to about 18 per cent in our survey, it appears to be on the higher side and needs attention.

The above mentioned phenomenon is witnessed in the case of male calves of other cows and buffaloes also to a certain extent. For instance, no death was reported in the 10 male calves born of other cows owned by the irrigated dairy farmers while in the case of others, of the 16 male calves born, 31 per cent were reported dead. In the case of buffaloes also, as against 55 per cent of the male calves reported dead by the irrigated dairy farmers, the percentage was as high as 73 in the case of others.

In the case of female calves born, the percentage of deaths was lower than that of the male calves. It will be seen from the Table that in respect of female calves of H.F. C-B cows, the calves reported dead formed 28 per cent in the case of irrigated dairy farmers and only 14 per cent in the case of others. In the case of calves of Jersey C-B cows, 10 per cent were reported dead by the irrigated dairy farmers and only 6 per cent by others.

No deaths were reported of female calves of other cows whether owned by the irrigated dairy farmers or others. In the case of buffaloes, however, the irrigated dairy farmers reported deaths of 41 per cent of the female calves born, the percentage being 50 in the case of others.

We have no data to explain lower percentage of deaths of female calves reported by others as compared to irrigated dairy farmers. Our sample size is small. Besides, if we were to look for a possible reason, it may be that unirrigated dairy farmers being poorer as compared to the irrigated dairy farmers, they take greater care of the female calves which would eventually give them milch animals and consequently additional income.

#### Disposal of Calves

The data regarding disposal of calves born are given in Tables 5.3 and 5.4. As for the sales of calves, we did not ask the reason for sale. As such it is not possible to say whether the dairy farmers sold because of constraints of fodder or other resources or whether it was to earn some income from

sale of calves. As far as the male calves of C-B cows are concerned, it is seen from Table 5.3 that the irrigated dairy farmers reported larger percentage of sales as compared to others. This is due to lower percentage of deaths reported by them and consequently larger number of calves being available for disposal. However, as far as keeping the male C-B calves for their own use is concerned, we find that of the total calves born, hardly up to 10 per cent were with the dairy farmers. This finding is consistent with their belief that the C-B bullocks are not suitable or efficient for use as plough cattle.

In the case of female calves, it is seen from Table 5.4 that in respect of the H.F. C-B calves, the irrigated dairy farmers sold 18 per cent of the total calves born and retained 51 per cent at home. The corresponding figures in respect of the others were a little higher, being 33 per cent and 53 per cent respectively. The larger percentage of sales by others was possible because of lower mortality in the case of calves born reported by them. Besides, they might have preferred to sale with a view to earn additional income. The third reason could be constraint of fodder and other resources.

Similar phenomenon is observed in the case of female calves of Jersey C-B cows. The irrigated dairy farmers sold 13 per cent and retained 70 per cent of the female calves born. The corresponding figures for others are 29 per cent and 59 per cent respectively.

In the case of female calves of other cows, there are not many cases of births reported. The irrigated dairy farmers did not sale any but kept 88 per cent of the female calves born while the others sold 52 per cent and retained 44 per cent.

In the case of female calves of buffaloes, the irrigated dairy farmers reported sale of 12 per cent and retained 41 per cent. The others did not sale any and kept 42 per cent of the calves born.

The percentage of calves given free was less than ten in most of the cases.

Cost of Rearing Crossbred Female Calves  
Until Their First Calving

We had asked the respondents to report the expenditure they incurred on rearing C-B female calves until their first calving. They were to report the milk fed to calves, particularly in the first few weeks after birth, as also green fodder, kadba, Cattle Feed or any other feed. We could get in our sample information for 106 Jersey/H.F. C-B female calves for one full year for 83 of them and for varying durations in the second and third year for a total period of 965 months in their second or third year.

We found that the total expenditure, on an average, per calf was Rs. 930 in the first year. The expenditure in the second and third year came to Rs. 112 per month. We could get in our

sample 13 cases where data for the period since birth until their first calving was available. It showed that they calved for the first time in about 30 months. The average expenditure from the birth until its first calving came to Rs. 3,015. If we consider the average expenditure of Rs. 930 in the first year and for the remaining 18 months until their calving at Rs. 112 per month (Rs. 112 x 18 = Rs. 2,016), the total expenditure from birth till the first calving in about 30 months also works out to about Rs. 2,950, that is, about Rs. 3,000/-.

The composition of the expenditure in the first year was as follows : Value of milk fed 40 per cent, kadba 27 per cent, green fodder 22 per cent, and cattle feed and other feed 11 per cent. Even if we assume that green fodder and cattle feed had to be purchased, the expenditure in that case would come to only about one-third of the total expenditure in the first year. We did not ask itemwise break-up of the expenditure from the second year until calving. However, it is estimated that the cash expenditure may not exceed 50 per cent of the expenditure from the 13th till 30th month i.e. until its first calving. Hence of the total estimated expenditure of Rs. 3,000/-, the cash expenditure would be Rs. 310 in the first year and about Rs. 1,000 from the 13th to 30th month. Thus out of the total estimated expenditure, about 40 per cent would be in cash and the remaining in kind on account of milk fed to the calf and farm produced fodder. Hence the dairy farmer may not have to spend large amount in cash for rearing calves. Besides, whatever cash

expenditure he may have to incur would be spread over 30 months. The estimated expenditure does not include vaccination and veterinary care which expenditure may not be large. We have also not imputed value of family labour as the calves could be taken care of, along with the rest of the animals the dairy farmers may have.

As for the feeding practices, it was found that in all the cases milk was fed to the calf for a few weeks after it was born. In most of the cases, milk was fed for about 60 to 90 days. Some calves were given a litre of milk while others were given two litres of milk a day. The distribution of 106 calves according to total milk fed in the first few months after birth was as follows: up to 35 lts. 5 calves, 60 lts. 16 calves, 50 lts. 37 calves, 120 lts. 17 calves, 180 lts. 23 calves and 270 lts. to 360 lts. 8 calves.

Expenditure on green fodder was reported on all except 5 out of 106 calves, the average expenditure per calf being Rs. 212/-. It was between Rs. 150 to Rs. 250 in 40 per cent of the calves, while in another 33 per cent it was less than Rs. 150. In the remaining 27 per cent of the calves, it exceeded Rs. 300. The expenditure on kadba was also reported on every calf except 5, the average expenditure being about Rs. 250. It was between Rs. 150 to Rs. 350 in 45 per cent of the calves and less than Rs. 150 in respect of another 25 per cent.

sample 13 cases where data for the period since birth until their first calving was available. It showed that they calved for the first time in about 30 months. The average expenditure from the birth until its first calving came to Rs. 3,015. If we consider the average expenditure of Rs. 930 in the first year and for the remaining 18 months until their calving at Rs. 112 per month (Rs. 112 x 18 = Rs. 2,016), the total expenditure from birth till the first calving in about 30 months also works out to about Rs. 2,950, that is, about Rs. 3,000/-.

The composition of the expenditure in the first year was as follows : Value of milk fed 40 per cent, kadba 27 per cent, green fodder 22 per cent, and cattle feed and other feed 11 per cent. Even if we assume that green fodder and cattle feed had to be purchased, the expenditure in that case would come to only about one-third of the total expenditure in the first year. We did not ask itemwise break-up of the expenditure from the second year until calving. However, it is estimated that the cash expenditure may not exceed 50 per cent of the expenditure from the 13th till 30th month i.e. until its first calving. Hence of the total estimated expenditure of Rs. 3,000/-, the cash expenditure would be Rs. 310 in the first year and about Rs. 1,000 from the 13th to 30th month. Thus out of the total estimated expenditure, about 40 per cent would be in cash and the remaining in kind on account of milk fed to the calf and farm produced fodder. Hence the dairy farmer may not have to spend large amount in cash for rearing calves. Besides, whatever cash



expenditure he may have to incur would be spread over 30 months. The estimated expenditure does not include vaccination and veterinary care which expenditure may not be large. We have also not imputed value of family labour as the calves could be taken care of, along with the rest of the animals the dairy farmers may have.

As for the feeding practices, it was found that in all the cases milk was fed to the calf for a few weeks after it was born. In most of the cases, milk was fed for about 60 to 90 days. Some calves were given a litre of milk while others were given two litres of milk a day. The distribution of 106 calves according to total milk fed in the first few months after birth was as follows: up to 35 lts. 5 calves, 60 lts. 16 calves, 50 lts. 37 calves, 120 lts. 17 calves, 180 lts. 23 calves and 270 lts. to 360 lts. 8 calves.

Expenditure on green fodder was reported on all except 5 out of 106 calves, the average expenditure per calf being Rs. 212/-. It was between Rs. 150 to Rs. 250 in 40 per cent of the calves, while in another 33 per cent it was less than Rs. 150. In the remaining 27 per cent of the calves, it exceeded Rs. 300. The expenditure on kadba was also reported on every calf except two, the average expenditure being about Rs. 250. It was less than Rs. 200 per calf in 45 per cent of the calves and more than Rs. 300 in respect of another 25 per cent.

The expenditure on cattle feed in the first year was reported in respect of about half the calves, the average expenditure per calf being Rs. 220. The cattle feed was available at Rs. 1.80 per kg., which means on an average in such fifty per cent of the cases, a calf was given about 122 kg., of cattle feed in about eight months in the first year. Compared to the provision of 1900 kg. of cattle feed under the Milk Production Programme of the State Government for C-B heifer from the age of 4 months to 32 months, the cattle feed given to the C-B heifers in the present survey appears to be staggeringly low. (Performance Budget, 1984-85 : 315).

The ration of milk, green fodder and kadba as also cattle feed to be given to the female C-B calves would depend upon the judgement of the dairy farmers. The information given in this regard by the respondents is only a rough account of the quantities they gave. However, it is still considered good enough to give an idea regarding the total expenditure the dairy farmers incur since birth till the first calving of female C-B calves.

Reference may also be made to the price paid at purchase of C-B cows by the sample dairy farmers with a view to find out how economical it is to rear a female calf and raise it until its first calving. In respect of the H.F. C-B cows in their first calving, the average purchase price was Rs. 4,265. It was Rs. 3,277 in respect of the Jersey C-B cows in their first calving. (Ref. Table 6.3.) These cases

were, however, of purchases some time in the few years preceding the present survey. Hence we may also refer to sales data.

From the sales of C-B cows reported, it was noted (Ref. Table 6.8) that the average sale price in the years 1981-82, 1982-83 and 1983-84 was Rs. 4,550, Rs. 4,096 and Rs. 3,563 respectively per cow. Considering the total estimated expenditure of Rs. 3,000 per homebred C-B cow, that is from its birth till first calving, vis-a-vis the reported purchase/sale prices, it is seen that the dairy farmers stand to gain from the homebred cows.

Ofcourse, there is an element of risk. If by any change, the female calf succumbs to death, the dairy farmer will suffer loss on account of the time spent and expenditure incurred on the calf until its death. However, it is a part of the game. If the dairy farmers want to benefit from rearing the calves rather than buying a C-B cow, they must take the risk also.

#### Cattle Sheds

About 90 per cent of the dairy farmers kept their milch animals in a cattle shed. The remaining 10 per cent kept the milch animals in the open or in their residential house. About one-fourth had constructed the cattle shed after buying C-B cows. The cattle shed was in the residential house in 121 cases and on the farm in respect of the remaining

108 dairy farmers. All the animals, except in the case of two dairy farmers, were stall-fed.

The construction of the cattle shed was temporary in most cases. Of the 191 such temporary structures, only 14 cattle sheds had a raised platform, while in the remaining sheds the floor was at the ground level. Only 10 cattle sheds were pucca structure; there was a platform in 22 sheds while in the remaining cases the floor was at the ground level. These data reveal that most of the dairy farmers have not yet followed the recommendation of the veterinary doctors that the animals should be housed in a shed with a raised platform to prevent infection and diseases.

#### Area Per Animal

We had asked the respondents to report the number of animals in their cattle shed and the area of the shed. 222 out of 253 cultivators reported that they kept their milch and draught animals in a cattle shed. The data is presented in Table 5.5. It is seen from the Table that, on an average, there were 4 animals per cattle shed and the area per animal was about 6.78 sq.mt. which is more than the desired space. As per the desired specification, (I.R.DP., Mandrup : 3) each C-B cow needs about 5.75 sq.mt. The area per animal was larger, about 12.6 sq.mt. where there was only one animal in the cattle shed. It varied between 4.8 sq.mt. to 6.9 sq.mt. per animal when there were 6 to 9 animals in a cattle shed.

108 dairy farmers. All the animals, except in the case of two dairy farmers, were stall-fed.

The construction of the cattle shed was temporary in most cases. Of the 191 such temporary structures, only 14 cattle sheds had a raised platform, while in the remaining sheds the floor was at the ground level. Only 10 cattle sheds were pucca structure; there was a platform in 22 sheds while in the remaining cases the floor was at the ground level. These data reveal that most of the dairy farmers have not yet followed the recommendation of the veterinary doctors that the animals should be housed in a shed with a raised platform to prevent infection and diseases.

#### Area Per Animal

We had asked the respondents to report the number of animals in their cattle shed and the area of the shed. 222 out of 253 cultivators reported that they kept their milch and draught animals in a cattle shed. The data is presented in Table 5.5. It is seen from the Table that, on an average, there were 4 animals per cattle shed and the area per animal was about 6.78 sq.mt. which is more than the desired space. As per the desired specification, (I.R.DP., Mandrup : 3) each C-B cow needs about 5.75 sq.mt. The area per animal was larger, about 12.6 sq.mt. where there was only one animal in the cattle shed. It varied between 4.8 sq.mt. to 6.9 sq.mt. per animal when there were 6 to 9 animals in a cattle shed.

that they were not required to give any veterinary care but at the same time expressed that the veterinary services were not satisfactory.

About 55 per cent of the dairy farmers reported expenditure on medicines and veterinary charges, at an average of Rs. 148 per reporting case during the reference year.

In the matter of veterinary and health care, we had asked the respondents to state also the special care they took of the C-B cows. In reply, 199 out of 253 dairy farmers stated that the special care they took, included cleanliness of the cows and cattle shed, vaccination, adequate ration of feed and fodder and timely veterinary care. Of the remaining 54 dairy farmers, the special care they took was as follows:

	<u>No. of dairy farmers reporting</u>
Cleanliness	11
Vaccination	5
Adequate feed and fodder	16
Veterinary care	17
No reply	5
Total	<u>54</u>

#### Frequency of Bathing Crossbred Cows

It is often emphasised that C-B cattle need special care, particularly bathing and enough water for drinking.

Hence we sought information regarding supply of water. Except 7 per cent, all the remaining dairy farmers stated that they had adequate supply of water even during summer. We had also asked them to report how frequently they bathed the C-B cows. The data regarding source of water supply and frequency of bathing are given in Table 5.6. It is seen from the Table that about 43 per cent of the dairy farmers bathed their cows every day, about 16 per cent others every alternate day, about 10 per cent once in 3 to 6 days while 25 per cent bathed their cows once a week. The frequency of bathing was fortnightly as reported by 4 per cent dairy farmers and even more than a fortnight as reported by a small percentage who depended upon tap water/well on the farm/or had to bring water from some other's well to bathe their cattle.

Interestingly enough, villagewise data reveals that in the two villages from a droughtprone area, C-B cows were bathed daily whereas in other villages with normal rainfall, majority of the cows were bathed once in a week/fortnight. Thus bathing the cows daily or once in a few days appears to be more a matter of habit and consciousness of animal care which farmers from some villages seem to have picked up.

Finally, we consider in the following sections data regarding deaths of milch animals, reported causes of deaths and cattle insurance.

**Table 5.6: Source of Water Supply and Frequency of Bathing Crossbred Cows : Sourcewise and Villagewise Distribution**

Sourcewise	Frequency of bathing G-B cows									
	Daily	2 days	3 days	4 days	6 days	7 days	Fort-night	Mon-th	Not stated	Total
River	-	1	-	1	-	2	-	-	-	4
Well in the house	31	4	1	1	-	2	-	-	-	39
Well on the farm	29	14	5	7	1	41	5	3	-	105
Tap water	19	17	-	7	-	15	2	-	-	60
Brought from elsewhere	7	-	-	-	-	1	3	1	1	13
Well in the village	23	4	-	-	-	1	-	-	-	28
Water storage tank	-	1	-	-	-	1	-	-	-	2
Not stated	-	-	-	2	-	-	-	-	-	2
<b>Total</b>	<b>109</b>	<b>41</b>	<b>6</b>	<b>18</b>	<b>1</b>	<b>63</b>	<b>10</b>	<b>4</b>	<b>1</b>	<b>253</b>
<b><u>Villagewise</u></b>										
Kalamb	3	6	1	4	-	17	7	1	-	39
Ranjani	-	2	2	3	1	27	1	3	1	40
Umadi	6	7	1	2	-	3	-	-	-	19
Nandre	24	19	-	8	-	13	2	-	-	66
Mandrup	34	6	1	1	-	2	-	-	-	44
Antroli	42	1	1	-	-	1	-	-	-	45
<b>Total</b>	<b>109</b>	<b>41</b>	<b>6</b>	<b>18</b>	<b>1</b>	<b>63</b>	<b>10</b>	<b>4</b>	<b>1</b>	<b>253</b>



Deaths of Milch Animals in 1981-82 to 1983-84

The data regarding deaths of milch animals in the years 1981-82 to 1983-84 are presented in Table 5.7. It may be stated that we could not work out the mortality rate as we did not have necessary data.

Table 5.7: Deaths of Milch Animals in the Years 1981-82, 1982-83 and 1983-84

	No. of Deaths of Animals					
	1981-82		1982-83		1983-84	
	No.	%	No.	%	No.	%
C-B cows	8	11.8	14	13.6	4	3.3
C-B female calves	8	11.8	14	13.6	18	14.9
C-B male calves	22	32.3	54	52.3	76	62.9
Other cows	3	4.4	1	1.0	1	0.8
Other female calves	1	1.5	1	1.0	-	-
Others bullocks	4	5.9	1	1.0	-	-
Buffaloes	6	8.8	4	3.9	1	0.8
Other male calves	4	5.9	1	1.0	2	1.6
Other animals	12	17.6	13	12.6	19	15.7
Total	68	100.0	103	100.0	121	100.0

It appears from the Table that the number of deaths reported in each year increased from 1981-82 to 1983-84. This may be due to inability to report accurately the month and year

of death as there was no particular reason for the largest number of deaths reported in 1983-84. It will be noted from the Table that the largest proportion is that of deaths of C-B male calves. It may be recalled that only a few dairy farmers had reported C-B bullocks in their cattle holding. Besides, the dairy farmers had reported that they did not consider that C-B bullocks were as efficient as the bullocks of local breeds. Hence it appears that most of them neglected the male C-B calves and let them die. On the other hand there were smaller number of deaths of female calves as they take more care.

We had asked the farmers to report how they disposed of the dead animals. In all the cases, except one, the dead animal was given without any monetary consideration. Only one dairy farmer reported that he received Rs. 30/- on account of skin of a H.F. C-B cow. It seems the dairy farmers still do not dispose of the dead animals by selling may be because of lack of buyers or feelings towards the dead animals.

When asked to state whether necessary veterinary care could be given, in almost two-thirds of the deaths, it was reported that they could not get or give necessary veterinary treatment. However, these replies are contradictory to their replies to the questions we had asked them earlier in the same interview-schedule and where they had reported that the veterinary services were satisfactory.

### Causes of Deaths of Milch Animals

The data regarding reported cause of death of the animals which died in the years 1981-82 to 1983-84 are given in Table 5.8. We have already noted that the maximum deaths reported in the three years were of male C-B calves (52 per cent of the total), followed by deaths of female C-B calves. (14 per cent of the total).

It is worth considering whether male C-B calves could be reared profitably as beef cattle. However, a critical examination of this problem is not possible in the present study. About 17 per cent of deaths of calves were still births, 14 per cent, (it was 22 per cent in the case of the male C-B calves) were due to under feeding of milk, 17 per cent due to stomach trouble while in 33 per cent cases, the cause of death of calves was not known. The remaining, 19 per cent died of other ailment. Thus the cause of death of male calves could really be lack of interest to keep them alive rather than any disease.

In the case deaths of C-B cows as also of other milch animals, stomach trouble or fever appears to be the main cause. The cause of death was not known in about one-third of the deaths.

### Insurance and Repayment of Loan in Respect of Milch Animals which Died

We had asked the respondents to indicate the amount they received on account of insurance and the position with regard

### Causes of Deaths of Milch Animals

The data regarding reported cause of death of the animals which died in the years 1981-82 to 1983-84 are given in Table 5.8. We have already noted that the maximum deaths reported in the three years were of male C-B calves (52 per cent of the total), followed by deaths of female C-B calves. (14 per cent of the total).

It is worth considering whether male C-B calves could be reared profitably as beef cattle. However, a critical examination of this problem is not possible in the present study. About 17 per cent of deaths of calves were still births, 14 per cent, (it was 22 per cent in the case of the male C-B calves) were due to under feeding of milk, 17 per cent due to stomach trouble while in 33 per cent cases, the cause of death of calves was not known. The remaining, 19 per cent died of other ailment. Thus the cause of death of male calves could really be lack of interest to keep them alive rather than any disease.

In the case deaths of C-B cows as also of other milch animals, stomach trouble or fever appears to be the main cause. The cause of death was not known in about one-third of the deaths.

### Insurance and Repayment of Loan in Respect of Milch Animals which Died

We had asked the respondents to indicate the amount they received on account of insurance and the position with regard

to the repayment of loan taken, if any, at the time of purchase of the animals, in respect of the milch animals which died in the years 1981-82 to 1983-84. Only five dairy farmers reported that they had insured their milch animals. On the death of the animal, they received the amount of which they had insured their cow/buffalo, and repaid the outstanding loan from out of such receipt. The five cases of insurance included two buffaloes of local breeds and one Gir cow, each animal being insured for Rs. 2,000/- and two C-B cows insured for Rs. 5,000/- each.

In this connection it may be recalled that during the three years, deaths of 26 C-B cows were reported. Further only 65 dairy farmers (26 per cent of the total dairy farmers) had reported that they had paid the insurance premium during the reference year, though in most of the cases, it was paid at purchase when a bank loan was taken for purchase and perhaps not paid in later years. May be the respondents failed to report receipts from insurance. But if majority of the dairy farmers are not insuring C-B cows, efforts need to be made to bring home the need for cattle insurance.

CHAPTER VI  
PURCHASES AND SALES OF CROSSBRED  
COWS AND OTHER CAPITAL EXPENDITURE

In the present chapter we propose to consider the information reported by the sample dairy farmers regarding purchases and sales of C-B cows and other milch animals and also other capital expenditure. The data regarding the prices paid at purchase for different types of C-B cows in different lactations as also data on sales and other capital expenditure will be useful in studying the economics of C-B cows. Besides, the information regarding the place of purchase as also from whom purchased, facilities for loan and subsidy, etc., will tell us more about the conditions prevailing in the area where the present survey was carried out. We shall first consider the purchases.

Milch Animals Purchased

With respect to the milch animals the dairy farmers had at the time of the survey, it was found that in all they owned 209 C-B cows which they had purchased. Their classification by breed was as follows: H.F. C-B 140, Jersey C-B 60, Red-Den C-B 7, Danish C-B and Brown Swiss C-B one each. Of the 7 C-B female calves purchased, 3 each were H.F. C-B and Jersey C-B and the remaining was Red-Den C-B, but details of their purchases were not properly reported.

Among the 28 buffaloes purchased, 25 were of local breed, two were Jafarabadi and one was Pandharpuri. Of the 11 cows purchased, 7 were of local non-descript breeds and 4 were Gir cows. Besides, the purchased animals included 3 female calves of Gir cow.

#### Reason for Purchase

When asked to state the reasons for purchases, most of them stated that they wanted to expand dairy business. About one-fifth of the purchases were made to start dairying as a subsidiary occupation. The reason for buying C-B cows was stated as their higher productivity as compared to buffaloes or other cows of local non-descript breeds.

#### Year of Purchase

The data regarding the year of purchase of milch animals are given in Table 6.1. It is seen from the Table that about 90 per cent of the C-B cows were purchased during the years 1981 to 1984. Most of the other cows and buffaloes were purchased about one to five years prior to the survey. The dairy farmers generally do not like to keep older animals and hence replace the old stock by younger animals. The other reason for purchase is their desire to buy milch animals for starting dairy enterprise or to expand it. On account of both these reasons we find purchases of C-B cows in large numbers reported in recent years by the sample dairy farmers.

CHAPTER VI  
PURCHASES AND SALES OF CROSSBRED  
COWS AND OTHER CAPITAL EXPENDITURE

In the present chapter we propose to consider the information reported by the sample dairy farmers regarding purchases and sales of C-B cows and other milch animals and also other capital expenditure. The data regarding the prices paid at purchase for different types of C-B cows in different lactations as also data on sales and other capital expenditure will be useful in studying the economics of C-B cows. Besides, the information regarding the place of purchase as also from whom purchased, facilities for loan and subsidy, etc., will tell us more about the conditions prevailing in the area where the present survey was carried out. We shall first consider the purchases.

Milch Animals Purchased

With respect to the milch animals the dairy farmers had at the time of the survey, it was found that in all they owned 209 C-B cows which they had purchased. Their classification by breed was as follows: H.F. C-B 140, Jersey C-B 60, Red-Den C-B 7, Danish C-B and Brown Swiss C-B one each. Of the 7 C-B female calves purchased, 3 each were H.F. C-B and Jersey C-B and the remaining was Red-Den C-B, but details of their purchases were not properly reported.



Among the 28 buffaloes purchased, 25 were of local breed, two were Jafarabadi and one was Pandharpuri. Of the 11 cows purchased, 7 were of local non-descript breeds and 4 were Gir cows. Besides, the purchased animals included 3 female calves of Gir cow.

#### Reason for Purchase

When asked to state the reasons for purchases, most of them stated that they wanted to expand dairy business. About one-fifth of the purchases were made to start dairying as a subsidiary occupation. The reason for buying C-B cows was stated as their higher productivity as compared to buffaloes or other cows of local non-descript breeds.

#### Year of Purchase

The data regarding the year of purchase of milch animals are given in Table 6.1. It is seen from the Table that about 90 per cent of the C-B cows were purchased during the years 1981 to 1984. Most of the other cows and buffaloes were purchased about one to five years prior to the survey. The dairy farmers generally do not like to keep older animals and hence replace the old stock by younger animals. The other reason for purchase is their desire to buy milch animals for starting dairy enterprise or to expand it. On account of both these reasons we find purchases of C-B cows in large numbers reported in recent years by the sample dairy farmers.

Among the 28 buffaloes purchased, 25 were of local breed, two were Jafarabadi and one was Pandharpuri. Of the 11 cows purchased, 7 were of local non-descript breeds and 4 were Gir cows. Besides, the purchased animals included 3 female calves of Gir cow.

#### Reason for Purchase

When asked to state the reasons for purchases, most of them stated that they wanted to expand dairy business. About one-fifth of the purchases were made to start dairying as a subsidiary occupation. The reason for buying C-B cows was stated as their higher productivity as compared to buffaloes or other cows of local non-descript breeds.

#### Year of Purchase

The data regarding the year of purchase of milch animals are given in Table 6.1. It is seen from the Table that about 90 per cent of the C-B cows were purchased during the years 1981 to 1984. Most of the other cows and buffaloes were purchased about one to five years prior to the survey. The dairy farmers generally do not like to keep older animals and hence replace the old stock by younger animals. The other reason for purchase is their desire to buy milch animals for starting dairy enterprise or to expand it. On account of both these reasons we find purchases of C-B cows in large numbers reported in recent years by the sample dairy farmers.

### Place of Purchase

Of the 209 C-B cows purchased, only 60 were purchased locally while 73 were purchased from one of the neighbouring villages, 28 from a village in a nearby taluka and 19 from the neighbouring districts. Of the remaining, 23 were purchased from Bangalore, which is an important market for C-B cows, and 6 more from elsewhere from Karnataka State. The buffaloes and other cows were purchased locally or from nearby places. The preference for buying locally is, besides saving on the cost of transport, etc., of animals from distant places, the dairy farmers like to buy the animals which are used to local climate and environment. There is also a possibility of buying an animal from a known and reliable person, if he is local or from a neighbouring village.

### From Whom Purchased?

Of the 209 C-B cows purchased, 12 were purchased from relatives, 167 others from farmers, 8 from the weekly cattle market and the remaining 22 from traders. Thus only about 10 per cent of the cows were purchased from traders or others. The same holds true in respect of buffaloes and other cows.

### Age and Number of Calvings at Purchase

The information relating to the age at purchase revealed that about 80 per cent of the C-B cows were between 2 to 5 years of age at purchase. Only about 7 per cent were

heifers and the remaining 13 per cent were about 6 to 9 years old when they were purchased. Of the 209 C-B cows, 138 were purchased at their first calving, while 19 others were purchased as calves. The C-B cows in the second and third calvings were 27 and 17 only and the remaining were in their fourth or fifth calving. Thus only about 25 per cent of the C-B cows purchased were of the second or subsequent calving.

Number of Calvings at the Time of the Survey

We had asked the respondents to state in which calving the milch animal purchased was, at the time of the survey. The data is presented in Table 6.2. It is seen from the Table that the C-B cows in the first three calvings formed 26 per cent, 25 per cent and 23 per cent respectively, the remaining 26 per cent being in their fourth to sixth calving. This shows their preference for keeping C-B cows in the first three calvings.

In respect of other cows and buffaloes also, two-thirds of them were in their first, second or third calving.

Table 6.2: Classification of Purchased Milch Animals Indicating Their Calving at the Time of the Survey

Type of animal	In which calving at the time of the Survey					Total
	1st	2nd	3rd	4th	5th - 9th	
No. of animals						
C-B cows	54	52	49	31	23	209
Other cows	3	1	2	2	3	11
Buffaloes	11	7	3	4	4	29
<b>Total</b>	<b>68</b>	<b>60</b>	<b>54</b>	<b>37</b>	<b>30</b>	<b>249</b>

At the time of purchase, of the 209 C-B cows, 32 were in milk, another 43 were due to calve soon while 114 more cows were pregnant. Two cows were not in milk. Of the remaining, 18 were calves, 13 of them being upto one year, 3 calves were 1 to 2 years old and 2 calves were 2 to 3 years old.

At the time of purchase, the dairy farmer was present in all the cases except three. Besides, the veterinary doctor was present at 22 purchases, a Bank Officer at 12 purchases, and a representative of the Milk Cooperative at 18 purchases. Thus a majority of the purchases were made without the assistance of a veterinary doctor, officers of a bank or milk cooperative.

#### Expenditure on Purchase of Milch Animals

We had asked them to report the purchase price as also incidental expenditure such as travel upto and lodging and boarding and sundry expenses at the place of purchase, transport of the purchased animal upto the village, expenditure on ear-marking, vaccination, insurance etc., incurred at the time of purchase. The total expenditure thus incurred is considered as the purchase price. The data, regarding the purchase price of milch animals classified according to the number of calvings until the purchase, are given in Table 6.3.

It is seen from the Table that H.F. C-B cows, which accounted for about two-thirds of the total purchases, were purchased at an average price of Rs. 4,265 per cow in its first calving. The average price of a cow in the second or subsequent

At the time of purchase, of the 209 C-B cows, 32 were in milk, another 43 were due to calve soon while 114 more cows were pregnant. Two cows were not in milk. Of the remaining, 18 were calves, 13 of them being upto one year, 3 calves were 1 to 2 years old and 2 calves were 2 to 3 years old.

At the time of purchase, the dairy farmer was present in all the cases except three. Besides, the veterinary doctor was present at 22 purchases, a Bank Officer at 12 purchases, and a representative of the Milk Cooperative at 18 purchases. Thus a majority of the purchases were made without the assistance of a veterinary doctor, officers of a bank or milk cooperative.

#### Expenditure on Purchase of Milch Animals

We had asked them to report the purchase price as also incidental expenditure such as travel upto and lodging and boarding and sundry expenses at the place of purchase, transport of the purchased animal upto the village, expenditure on ear-marking, vaccination, insurance etc., incurred at the time of purchase. The total expenditure thus incurred is considered as the purchase price. The data, regarding the purchase price of milch animals classified according to the number of calvings until the purchase, are given in Table 6.3.

It is seen from the Table that H.F. C-B cows, which accounted for about two-thirds of the total purchases, were purchased at an average price of Rs. 4,265 per cow in its first calving. The average price of a cow in the second or subsequent

calving at the time of purchase does not show any trend, may be because our sample is small. The average price of the cows in the third calving was as high as Rs. 4,800 which could be due to their higher milk yield. (Please refer to Table Nos. 7.3 and 7.12). The maximum average price, namely, Rs. 5,373/- is found in respect of the cows in their fifth calving but we have no data to explain the high price. On the whole, it is seen that the average price of a H.F. was higher than that of a Jersey C-B cow. This could be due to greater productivity of the former. (Please refer to Table 7.3).

Except in a few cases of Jersey C-B cows in their fifth or subsequent calvings, where the average purchase price exceeded Rs. 4,500, it ranged between Rs. 3,300 to Rs. 3,600 in respect of those in their first to fourth calving.

Only 7 purchases of Red-Den C-B cows were reported. Their average purchase price is seen to be much higher than that of the H.F. C-B and Jersey C-B cows.

Our data shows that the Gir cows cost almost two to three times the cows of local non-descript breeds. Similarly, the average price of Pandharpuri or Goularu buffaloes is almost twice that of the buffaloes of local non-descript breeds.

From the information regarding the other expenditure, which is included in the purchase price shown in Table 6.3, it is found that 135 dairy farmers reported expenditure which

exceeded Rs. 100. On an average, such expenditure came to about Rs. 350/- per C-B cow. It was upto Rs. 250/- in 32 cases, from Rs. 251 to Rs. 500 in 72 cases, between Rs. 501/- and Rs. 750/-, in 19 cases and between Rs. 751/- to Rs. 1,100 in the remaining 12 cases. The remaining dairy farmers incurred less than Rs. 100 on purchase of milch animals.

On an average, about half of the other expenditure was on account of transport from the place of purchase to the residence of the dairy farmers and the remaining was mainly on account of cattle insurance. The expenditure on vaccination, ear-marking, etc., was negligible. We have considered the payment of insurance premium as capital expenditure and included it in the 'other expenditure' incurred at the time of purchase. The justification is that when the animal is purchased from a bank loan, it has got to be insured and as such the expenditure on insurance becomes unavoidable.

#### Sources of Finance for Purchases

Of the total expenditure of about Rs. 8,72,500 on purchases of 209 C-B cows, about one-third was met from their own resources by the dairy farmers, about 55 per cent from loan from the bank/government, about 7 per cent by sale of an animal they owned, about 3 per cent from short term borrowings and less than one per cent from sale of other assets. In the following are indicated the sources of finance for purchase of C-B cows.



	No. of C-B cows purchased
Loan from a bank	11
Under the Government Scheme	5
Loan from others	2
Sale of milch or other animals	8
Temporary borrowings	2
Own resources	85
Own resources and sale of milch or other animals	8
Own resources and bank loan	34
Own resources, bank loan, other loan, etc.	54
Total:	----- 209 -----

Thus about half the purchases were from their own resources while in respect of the remaining, the dairy farmers availed of loan from the banks, under the I.R.D.P. or other schemes. It was found that the loan from the bank/government was adequate for purchase of the cow.

As regards buffaloes and other cows, 16 buffaloes and all the other cows were purchased from own resources. Ten buffaloes were purchased from own resources supplemented by sale of a milch animal or temporary borrowing and only one buffalo was purchased from bank loan.

#### Loan for Buying Milch Animals

Loans for buying milch animals were reported in 76 cases of which details were furnished in respect of 49 cases. The

rate of interest on such loans was 10 to 12 per cent per annum in 40 cases, about 9 per cent per annum in one case only and 17 and 18 per cent per annum in two and three other cases respectively. The rate of interest was not reported in three cases. Since most of the loans were obtained under some scheme or the other of the State/Central Government, the rate of interest was upto 12 per cent in most of the cases.

Of the 49 cases of loan, in 20 cases the owner himself approached the bank to get a loan. In 20 other cases, the Chairman or others from the Milk Cooperative proposed them to take a loan. The Veterinary Doctor and the Gramsevak proposed in two cases each while the Government Officer/friends proposed in two more cases. The information was not reported in three cases. Thus it is seen that about 40 per cent of the dairy farmers were aware of the facility regarding loans for buying milch animals and approached the agency on their own while the remaining had to be appraised of and persuaded to take a bank loan for this purpose.

#### Subsidy on Purchases

Subsidy on purchase of milch animals was reported by 43 dairy farmers for purchase of 42 C-B cows, one C-B heifer and one buffalo. The average subsidy per reported purchase came to Rs. 1,565/-. It was stated that on the loans under the I.R.D.P., the subsidy was equivalent to 33 per cent and it was raised to fifty per cent of the purchase price in the case of loans taken

by the Scheduled Castes and Scheduled Tribes. The subsidy was credited to the loan account except in three cases where the dairy farmers directly received the subsidy.

#### Instalment of Repayment of Loan

The instalment of repayment of loan was fortnightly in 6 cases, monthly in 10 cases and every 10 days in 27 cases. Two dairy farmers paid annual instalment of more than Rs. 1,000 per annum. The loan instalment was Rs. 50/- to Rs. 100/- where it was payable every 10 days. It varied between Rs. 150 and Rs. 300 when payable monthly and was Rs. 100 or Rs. 200, when payable fortnightly.

#### Source of Repayment of Loan Taken for Purchase of Milch Animals

Of the 253 dairy farmers, 101 indicated the source of repayment of loan taken for purchase of milch animal. 85 of them had repaid it from the sale proceeds of milk through the Milk Cooperatives. Seven others repaid the loan from milk sold to others, particularly as the cooperative at Mandrup was defunct. Only one dairy farmer had repaid the loan from the sale of a milch animal while the remaining 8 had repaid loan from their own funds or by making some other arrangement.

#### Reason for Not Paying the Loan Instalment in Time

Only 16 dairy farmers stated the reasons for not paying the loan instalment in time. Five of them stated that either the

animal was sick or the milk yield was inadequate to leave enough funds for repayment of the loan. The remaining stated financial difficulties as the reason. Since the repayment of loan is usually made from out of the amount due for milk sold to the cooperative, normally, there should be no delay in payment of the loan instalment unless the animal is not in milk or milk yield is inadequate.

#### Loan for Purchase of Second Milch Animal

We had asked the respondents to state if they had applied for loan for purchase of second milch animal. Only 113 out of 253 dairy farmers replied to this question. 23, out of 113, had received the second loan. Of the remaining 90 dairy farmers, only 6 had applied for the second loan but did not get it while 84 did not apply for it. 41 of them had yet to repay the first loan, 12 of them did not apply as they did not have enough fodder, family labour or space to keep an additional C-B cow. Only 2 others stated that they did not find the enterprise profitable. The remaining 29 did not give any reason for not applying for the second loan.

The dairy farmers did not apply for a loan to buy another C-B cow perhaps because within their resources, they could manage only one C-B cow. The other reason could be shorter dry period as compared to buffaloes. The calving cycle of a C-B cow is only about 12 to 13 months including the dry period of 2 to 3 months.

Other Capital Expenditure

We had asked the respondents to report the other capital expenditure they had incurred in recent years. The data classified according to their irrigated holding is presented in Table 6.4. It will be recalled that out of 253 dairy farmers, 116 of them had some irrigated land. It is seen from the Table that 49 out of 73 cattle sheds were constructed by those who did not have any irrigated land. Many of them had taken to dairying with G-B cows in recent years and hence the construction of a cattle shed. The lower percentage among the irrigated farmers reporting expenditure on cattle sheds could also be that many of them might have constructed the cattle sheds in the past. The average expenditure incurred on cattle shed was about Rs. 1,650 in respect of other dairy farmers while the irrigated dairy farmers incurred much higher expenditure, about Rs. 4,500 on an average.

Expenditure on buckets needs to be incurred every few years. About 95 per cent of the dairy farmers reported expenditure on purchase of buckets for carrying water and/or for milking. The average expenditure came to Rs. 51 and Rs. 45 in the case of irrigated dairy farmers and others respectively.

The next common expenditure was on account of chains and ropes which also needs to be incurred every few years. All except three dairy farmers, reported such expenditure. Here also the irrigated dairy farmers reported higher expenditure as compared to the others, being Rs. 50 and 31 respectively.

### Other Capital Expenditure

We had asked the respondents to report the other capital expenditure they had incurred in recent years. The data classified according to their irrigated holding is presented in Table 6.4. It will be recalled that out of 253 dairy farmers, 116 of them had some irrigated land. It is seen from the Table that 49 out of 73 cattle sheds were constructed by those who did not have any irrigated land. Many of them had taken to dairying with G-B cows in recent years and hence the construction of a cattle shed. The lower percentage among the irrigated farmers reporting expenditure on cattle sheds could also be that many of them might have constructed the cattle sheds in the past. The average expenditure incurred on cattle shed was about Rs. 1,650 in respect of other dairy farmers while the irrigated dairy farmers incurred much higher expenditure, about Rs. 4,500 on an average.

Expenditure on buckets needs to be incurred every few years. About 95 per cent of the dairy farmers reported expenditure on purchase of buckets for carrying water and/or for milking. The average expenditure came to Rs. 51 and Rs. 45 in the case of irrigated dairy farmers and others respectively.

The next common expenditure was on account of chains and ropes which also needs to be incurred every few years. All except three dairy farmers, reported such expenditure. Here also the irrigated dairy farmers reported higher expenditure as compared to the others, being Rs. 50 and 31 respectively.

The expenditure on breeding we have considered as a capital expenditure. 19 per cent of the other dairy farmers and 14 per cent of irrigated dairy farmers reported expenditure, about Rs. 15 per reporting family. There was no major item of other capital expenditure.

Year in which Other Capital Expenditure was incurred

The data regarding the year in which other capital expenditure was incurred on different items is given in Table 6.5. It is seen from the Table that about 30 per cent of the total dairy farmers reported capital expenditure on cattle sheds which they had incurred some time during the last decade. The expenditure on buckets was reported by 95 per cent but the year of purchase was reported by only two-thirds of them. In their case, the expenditure was incurred in one of the preceding four years. Though 250 dairy farmers had incurred expenditure on purchases of chains and ropes, information regarding the year of purchase was available from only 11 of them. This expenditure is also incurred once in every few years.

Table 6.5: Distribution of Dairy Farmers According to the Type of Other Capital Expenditure and the Year in which it was Incurred

Type of capital expenditure	Year of Expenditure							Total
	One year back	2 years	3 years	4 years	5 years	6 to 9 years	Not stated	
	No. of Dairy Farmers Reporting							
Cattle shed	13	19	8	14	8	11	-	73
Buckets	44	48	32	25	15	4	73	241
Chains & Ropes	5	4	2	-	-	-	239	250
Total	62	71	42	39	23	15	-	-

The expenditure on breeding we have considered as a capital expenditure. 19 per cent of the other dairy farmers and 14 per cent of irrigated dairy farmers reported expenditure, about Rs. 15 per reporting family. There was no major item of other capital expenditure.

Year in which Other Capital Expenditure was incurred

The data regarding the year in which other capital expenditure was incurred on different items is given in Table 6.5. It is seen from the Table that about 30 per cent of the total dairy farmers reported capital expenditure on cattle sheds which they had incurred some time during the last decade. The expenditure on buckets was reported by 95 per cent but the year of purchase was reported by only two-thirds of them. In their case, the expenditure was incurred in one of the preceding four years. Though 250 dairy farmers had incurred expenditure on purchases of chains and ropes, information regarding the year of purchase was available from only 11 of them. This expenditure is also incurred once in every few years.

Table 6.5: Distribution of Dairy Farmers According to the Type of Other Capital Expenditure and the Year in which it was Incurred

Type of capital expenditure	Year of Expenditure							Total
	One year back	2 years	3 years	4 years	5 years	6 to 9 years	Not stated	
	No. of Dairy Farmers Reporting							
Cattle shed	13	19	8	14	8	11	-	73
Buckets	44	48	32	25	15	4	73	241
Chains & Ropes	5	4	2	-	-	-	239	250
Total	62	71	42	39	23	15	-	-



The expenditure on breeding we have considered as a capital expenditure. 19 per cent of the other dairy farmers and 14 per cent of irrigated dairy farmers reported expenditure, about Rs. 15 per reporting family. There was no major item of other capital expenditure.

Year in which Other Capital Expenditure was incurred

The data regarding the year in which other capital expenditure was incurred on different items is given in Table 6.5. It is seen from the Table that about 30 per cent of the total dairy farmers reported capital expenditure on cattle sheds which they had incurred some time during the last decade. The expenditure on buckets was reported by 95 per cent but the year of purchase was reported by only two-thirds of them. In their case, the expenditure was incurred in one of the preceding four years. Though 250 dairy farmers had incurred expenditure on purchases of chains and ropes, information regarding the year of purchase was available from only 11 of them. This expenditure is also incurred once in every few years.

Table 6.5: Distribution of Dairy Farmers According to the Type of Other Capital Expenditure and the Year in which it was Incurred

Type of capital expenditure	Year of Expenditure							Total
	One year back	2 years	3 years	4 years	5 years	6 to 9 years	Not stated	
	No. of Dairy Farmers Reporting							
Cattle shed	13	19	8	14	8	11	-	73
Buckets	44	48	32	25	15	4	73	241
Chains & Ropes	5	4	2	-	-	-	239	250
Total	62	71	42	39	23	15	-	-

The expenditure on breeding we have considered as a capital expenditure. 19 per cent of the other dairy farmers and 14 per cent of irrigated dairy farmers reported expenditure, about Rs. 15 per reporting family. There was no major item of other capital expenditure.

Year in which Other Capital Expenditure was incurred

The data regarding the year in which other capital expenditure was incurred on different items is given in Table 6.5. It is seen from the Table that about 30 per cent of the total dairy farmers reported capital expenditure on cattle sheds which they had incurred some time during the last decade. The expenditure on buckets was reported by 95 per cent but the year of purchase was reported by only two-thirds of them. In their case, the expenditure was incurred in one of the preceding four years. Though 250 dairy farmers had incurred expenditure on purchases of chains and ropes, information regarding the year of purchase was available from only 11 of them. This expenditure is also incurred once in every few years.

Table 6.5: Distribution of Dairy Farmers According to the Type of Other Capital Expenditure and the Year in which it was Incurred

Type of capital expenditure	Year of Expenditure							Total
	One year back	2 years	3 years	4 years	5 years	6 to 9 years	Not stated	
	No. of Dairy Farmers Reporting							
Cattle shed	13	19	8	14	8	11	-	73
Buckets	44	48	32	25	15	4	73	241
Chains & Ropes	5	4	2	-	-	-	239	250
Total	62	71	42	39	23	15	-	-

sale was other than the cow being dry/old/not in good health, dairying in loss/inadequate feed, fodder or funds. As such it may be that most of these sales were made with a view to earn from breeding C-B cows. Similar is the position in respect of the C-B calves.

Shortage of green fodder was the reason for sale in 13 cases, and shortage of dry fodder in another 5 cases. Out of a total of 73 sales, <sup>in</sup> only 3 sales, loss in dairying was reported as the reason for sale. Old age was the reason for sale in respect of three C-B cows and 3 more were sold as they went dry.

It may be recalled that 44 per cent of the dairy farmers had no irrigated land and another about 10 per cent were landless. Yet in respect of the sales reported, shortage of green fodder was reported as reason for sale in respect of 13 per cent sales and shortage of dry fodder in another 13 per cent of the total sales. Thus it appears that the dairy farmers did not consider shortage of green fodder, as a serious constraint.

The villagewise position of sales of milch and draught animals is shown in Table 6.7. It will be noted from the Table that the sales at Nandre were the highest followed by Mandrup. In this connection, it may be stated that in the late 'seventies, dairy farmers from Nandre and neighbouring villages used to bring C-B cows from Bangalore. However, they found that such cows did not give the same yield of milk as they gave before

**Table 6.7: Villagewise Sales of Milch Cattle and Draught Cattle  
During the Years 1981-82, 1982-83 and 1983-84**

Animals	Kalamb		Ranjani		Umadi		Nandre		Mandrup		Antroli	
	1	2	1	2	1	2	1	2	1	2	1	2
	1 = No. of Dairy Farmers Reporting Sales 2 = No. of Sales											
1 C-B cows	8	11	6	8	-	-	29	36	11	15	3	3
2 C-B bulls	1	1	-	-	1	1	2	2	-	-	-	-
3 C-B male calves	5	7	1	1	5	5	4	5	7	8	2	2
4 C-B female calves	1	1	2	3	-	-	10	12	8	12	4	4
5 Other cows	3	3	2	2	1	1	1	1	2	2	6	6
6 Bulls of local breeds	1	2	3	3	2	2	2	2	2	2	-	-
7 Male calves of other cows	3	5	2	3	-	-	6	6	5	5	3	4
8 Female calves of other cows	-	-	2	4	-	-	-	-	2	2	4	5
9 Buffaloes including young stock	5	7	8	18	6	6	19	22	7	8	5	6
10 Other animals	-	-	-	-	-	-	-	-	-	-	4	7
Total No. of sales	27	37	26	42	15	15	73	86	44	54	31	37
Total No. of families reporting		24		22		11		51		29		22
Total No. of dairy farmers		38		41		19		86		44		45

purchase and did not keep as fit as they were before. The reason for low yield and lack of physical fitness they attributed to the climatic and other conditions. Hence they thought of home-breeding cows with A.I. Within a period of five to six years, they started breeding C-B cows in large numbers. As a result, we were told that, the trend is now reversed and the buyers from Karnataka buy C-B cows from Nandre and surrounding villages. At Mandrup, the facilities for crossbreeding with A.I. are excellent. However, due to shortage of green fodder and kadba, dairy farmers like to sell C-B cows. The sale of C-B cows and female calves is comparatively lower in the remaining four villages, the lowest at Umadi being perhaps due to the small size of our sample in that village as also it being located in a drought prone area.

#### Average Price per Animal Sold

The data regarding the milch and draught animals sold in the years 1981-82 to 1983-84 and the average price per animal sold are given in Table 6.8. It is seen from the Table that the average price received per C-B cow declined from Rs. 4,550 in 1981-82 to Rs. 3,563 in 1983-84. However, we did not ask information about the age of the animal sold and do not have any information to explain the decline in the sale prices. The average sale price of C-B female calves did not show any trend, being Rs. 2,280 in 1981-82 and Rs. 1,275 and Rs. 1,826 in the following two years respectively. Compared to this, the C-B male calves received much lower price, though here also the year to

purchase and did not keep as fit as they were before. The reason for low yield and lack of physical fitness they attributed to the climatic and other conditions. Hence they thought of home-breeding cows with A.I. Within a period of five to six years, they started breeding C-B cows in large numbers. As a result, we were told that, the trend is now reversed and the buyers from Karnataka buy C-B cows from Nandre and surrounding villages. At Mandrup, the facilities for crossbreeding with A.I. are excellent. However, due to shortage of green fodder and kadba, dairy farmers like to sell C-B cows. The sale of C-B cows and female calves is comparatively lower in the remaining four villages, the lowest at Umadi being perhaps due to the small size of our sample in that village as also it being located in a drought prone area.

#### Average Price per Animal Sold

The data regarding the milch and draught animals sold in the years 1981-82 to 1983-84 and the average price per animal sold are given in Table 6.8. It is seen from the Table that the average price received per C-B cow declined from Rs. 4,550 in 1981-82 to Rs. 3,563 in 1983-84. However, we did not ask information about the age of the animal sold and do not have any information to explain the decline in the sale prices. The average sale price of C-B female calves did not show any trend, being Rs. 2,280 in 1981-82 and Rs. 1,275 and Rs. 1,826 in the following two years respectively. Compared to this, the C-B male calves received much lower price, though here also the year to

purchase and did not keep as fit as they were before. The reason for low yield and lack of physical fitness they attributed to the climatic and other conditions. Hence they thought of home-breeding cows with A.I. Within a period of five to six years, they started breeding C-B cows in large numbers. As a result, we were told that, the trend is now reversed and the buyers from Karnataka buy C-B cows from Nandre and surrounding villages. At Mandrup, the facilities for crossbreeding with A.I. are excellent. However, due to shortage of green fodder and kadba, dairy farmers like to sell C-B cows. The sale of C-B cows and female calves is comparatively lower in the remaining four villages, the lowest at Umadi being perhaps due to the small size of our sample in that village as also it being located in a drought prone area.

#### Average Price per Animal Sold

The data regarding the milch and draught animals sold in the years 1981-82 to 1983-84 and the average price per animal sold are given in Table 6.8. It is seen from the Table that the average price received per C-B cow declined from Rs. 4,550 in 1981-82 to Rs. 3,563 in 1983-84. However, we did not ask information about the age of the animal sold and do not have any information to explain the decline in the sale prices. The average sale price of C-B female calves did not show any trend, being Rs. 2,280 in 1981-82 and Rs. 1,275 and Rs. 1,826 in the following two years respectively. Compared to this, the C-B male calves received much lower price, though here also the year to

purchase and did not keep as fit as they were before. The reason for low yield and lack of physical fitness they attributed to the climatic and other conditions. Hence they thought of home-breeding cows with A.I. Within a period of five to six years, they started breeding C-B cows in large numbers. As a result, we were told that, the trend is now reversed and the buyers from Karnataka buy C-B cows from Nandre and surrounding villages. At Mandrup, the facilities for crossbreeding with A.I. are excellent. However, due to shortage of green fodder and kadba, dairy farmers like to sell C-B cows. The sale of C-B cows and female calves is comparatively lower in the remaining four villages, the lowest at Umadi being perhaps due to the small size of our sample in that village as also it being located in a drought prone area.

#### Average Price per Animal Sold

The data regarding the milch and draught animals sold in the years 1981-82 to 1983-84 and the average price per animal sold are given in Table 6.8. It is seen from the Table that the average price received per C-B cow declined from Rs. 4,550 in 1981-82 to Rs. 3,563 in 1983-84. However, we did not ask information about the age of the animal sold and do not have any information to explain the decline in the sale prices. The average sale price of C-B female calves did not show any trend, being Rs. 2,280 in 1981-82 and Rs. 1,275 and Rs. 1,826 in the following two years respectively. Compared to this, the C-B male calves received much lower price, though here also the year to



## CHAPTER VII

### DAIRY ENTERPRISE OF SAMPLE DAIRY FARMERS

In the present chapter we propose to consider the results of the working of the dairy enterprise during the reference year, namely, November 1983 to December 1984 in respect of the sample dairy farmers. We shall first consider the inter-calving period, lactation length, lactation yield and milk yield per day of the H.F. C-B and Jersey C-B cows and other cows and buffaloes, total milk production and its disposal and production of dung and its disposal. Thereafter we shall consider the receipts and expenditure and the resultant net position of the irrigated dairy farmers and others classified according to the composition of the herd of their milch animals. We shall also examine the results villagewise in respect of the sample villages. Finally, we shall consider the possibilities of increasing productivity of milch animals and expansion of dairy enterprise.

#### Inter-Calving Period

We noted from our survey data information regarding inter-calving period in respect of the C-B cows where information about full inter-calving period was available. Of the 114 H.F. C-B and 41 Jersey C-B cows with the irrigated dairy farmers and 83 H.F. C-B and 40 Jersey C-B cows with the other dairy farmers, such information was available for 61 H.F. C-B cows with irrigated farmers and 39 such cows with others. As regards the Jersey C-B cows, the information was available for

21 and 16 cows respectively in two groups of dairy farmers. Since the data related to different calvings the milch animals had until the present survey, one animal is reported more than once, if it had two or more calvings until December 1984. Hence the frequency of reported cases in the tables is greater than the actual number of cows the dairy farmers had in their stock. However, for the purposes of finding out the inter-calving period and lactation length, the method of treating the frequency in the above mentioned manner is considered useful. While commenting on the data, we have to keep in mind the fact that these frequencies are greater than the actual number of cows. The data are presented in Tables 7.1 and 7.2.

It is seen from Table 7.1 that in respect of the H.F. C-B cows, the average inter-calving period and also dry period gradually declined from the first to the subsequent calvings. The only difference is that the intercalving period as also dry months were slightly higher in the case of C-B cows owned by the irrigated farmers.

As regards the Jersey C-B cows, it is seen from Table 7.2 that the inter-calving period in respect of the first two calvings was slightly longer than in the case of H.F. C-B cows. We have small number of cases in the third and subsequent calvings and as such it is not possible to comment further in this regard.

**Table 7.1: Inter-Calving Period and Dry Period of H.F.C-B Cows  
Owned by Irrigated Dairy Farmers and Others**

Inter-Calving period from	Irrigated Dairy Farmers			Other Dairy Farmers		
	No. of cows	Average inter- calving period months	Average dry period months	No. of cows	Average inter- calving period months	Average dry period months
1st-2nd	51	13.3	3.2	29	11.9	2.2
2nd-3rd	34	12.6	3.0	26	11.8	2.4
3rd-4th	14	11.8	2.9	14	11.2	2.0
4th-5th	6	11.5	2.5	3	11.0	2.0
5th-6th	5	11.4	2.4	1	10.0	3.0
6th-7th	4	11.2	2.5			
7th-8th	1	10.0	2.0			
8th-9th	1	10.0	8.0			
9th-10th	1	9.0	1.0			
Total	61	12.6	3.0	39	11.7	2.3

**Table 7.2: Inter-Calving Period and Dry Period of Jersey C-B Cows  
Owned by Irrigated Dairy Farmers and Others**

Inter-Calving period from	Irrigated Dairy Farmers			Other Dairy Farmers		
	No. of cows	Average inter- calving period months	Average dry period months	No. of cows	Average inter- calving period months	Average dry period months
1st-2nd	17	12.8	3.2	12	12.5	3.2
2nd-3rd	10	13.0	2.9	8	12.3	3.5
3rd-4th	6	12.8	2.8	6	12.8	4.0
4th-5th	4	13.0	3.0	5	12.8	4.2
5th-6th	4	13.0	3.0	3	13.0	5.0
6th-7th		13.0	3.0	1	13.0	9.0
7th-8th				2	13.0	6.0
8th-9th				1	13.0	9.0
Total	21	12.9	3.0	16	12.6	4.1

The average inter-calving period as also dry period/lactation period of the H.F. C-B cows owned by the sample dairy farmers compares well with the expected norms, namely 9 to 10 months of lactation plus 2 to 3 months of dry period that is a total of 11 to 12 months. It was slightly higher in the case of the Jersey C-B cows owned by the other dairy farmers.

Average Lactation Length  
and Average Lactation Yield

We had recorded for each milch animal, its period in milk (Lactation Length) after each calving and milk yield therefrom (Lactation Yield). For each type of milch animal, we worked out the average lactation yield. As against the norm of '2000 lts. in the first to third lactation', the H.F. C-B cows had an average lactation yield of up to about 2350 lts. It was, however, lower in the case of Jersey C-B cows, being about 1500 lts. to 2050 lts., on an average in the first three lactations. Perhaps the lower lactation yield may be one of the reasons why there is a lesser number of Jersey C-B as compared to H.F. C-B cows with the sample dairy farmers. The data are presented in Tables 7.3 to 7.7 and are considered in the following paragraphs.

H.F. Crossbred Cows:

We found more than 25 cases of cows at each of the first three calvings, with the irrigated dairy farmers and others.

The number of cases in the fourth and subsequent calvings was about 10 or less and is not considered as representative. It is seen from Table 7.3 that the average lactation length was only a little longer in respect of the cows owned by the irrigated dairy farmers than by the others. It was 10.0, 9.7 and 10.6 months in the first three calvings respectively in the case of the former as against 9.6, 9.5 and 9.8 months in the case of the latter. The average milk yield was about 9 per cent more, being 2,244 lbs., in the case of cows in their first calving with the irrigated dairy farmers as compared to 2,037 lbs., in the case of cows with others. The milk yield was generally higher than in the first calving in respect of the cows in their second and third calving.

Table 7.3: H.F. Crossbred Cows : Average Lactation Length and Average Lactation Yield

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average lactation length (months)	Average lactation yield lbs.	No. of cases of cows	Average lactation length (months)	Average lactation yield lbs.
1st	63	10.0	2,244	42	9.6	2,037
2nd	44	9.7	2,168	40	9.5	2,054
3rd	28	10.6	2,341	27	9.8	2,326
4th	12	9.4	2,234	11	9.6	2,045
5th	6	8.8	2,017	5	9.4	2,228
6th & subsequent	10	7.9	1,767	2	10.0	2,415
Overall	163	9.7	2,202	127	9.6	2,118

Jersey Crossbred CowsTable 7.4: Jersey Crossbred Cows : Average Lactation Length and Average Lactation Yield

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average lactation length (months)	Average lactation yield lts.	No. of cases of cows	Average lactation length (months)	Average lactation yield lts.
1st	24	9.3	1,575	22	10.1	1,631
2nd	15	9.8	1,788	8	10.0	1,473
3rd	9	10.1	2,052	8	10.2	1,800
4th	7	10.0	1,799	4	9.7	1,672
5th	4	10.0	2,101	1	10.0	1,920
6th	3	9.7	2,534	1	10.0	2,790
Overall	62	9.7	1,801	44	10.5	1,670

We note from Table 7.4 that the average lactation length as also average lactation yield in the first calving was more in the case of cows owned by others as compared to the cows owned by the irrigated dairy farmers. In respect of the cows, in the second and third calving, though there was not much difference in the average lactation length, the average lactation yield was more in the case of cows owned by irrigated dairy farmers, being 1788 lts. and 2052 lts., respectively as compared to that of the cows of others where it was 1473 lts. and 1800 lts., respectively.

As compared to the H.F. C-B cows, the average lactation yield of Jersey C-B cows was lower both in the case of cows owned

by the irrigated dairy farmers and others. The overall average lactation length of the H.F. C-B cows came to about 9.7 months in the case of both the irrigated dairy farmers and others. The corresponding figures for the Jersey C-B cows were 9.7 and 10.5 months. It is also noted from the Table that in the case of H.F. C-B cows, the lactation yield of practically all the cows varied between 2,000 lbs. to 2,300 lbs. It may be recalled that we had collected the data in a single visit and sought information about the lactation length and lactation yield in respect of the past calvings. Interestingly enough, there is considerable uniformity in the observations, which is worth noting, particularly as the data were obtained by oral enquiry, after considerable time after the happening of the actual event.

#### Other Cows and Buffaloes

We do not have large enough number of cases of such animals in our sample. However, from whatever data we have, it will be seen from Table 7.5, that in respect of other cows in the first two calvings, the average lactation yield varied between 474 lbs., to 592 lbs., while the lactation length was only about 7 months.

In respect of buffaloes (Table 7.6) the lactation length was about 8 months and the average lactation yield was about 700 lbs. and 800 lbs., in the first and second calving respectively so far as the irrigated dairy farmers are concerned. However, the lactation yield was about 15 to 25 per cent more in the case of others.

Though the average lactation yield was more in the case of buffaloes and other cows owned by others, as compared to that of the irrigated dairy farmers, it must be borne in mind that the number of cases is not large enough to explain this situation.

Table 7.5: Other Cows : Average Lactation Length and Average Lactation Yield

Lactation no.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average lactation length (months)	Average lactation yield (lbs.)	No. of cases of cows	Average lactation length (months)	Average lactation yield (lbs.)
1st	9	7.1	592	12	6.9	474
2nd	7	7.0	544	9	7.0	592
3rd	2	5.5	307	7	7.1	707
4th	-	-	-	5	6.2	567
5th	-	-	-	4	5.8	619
6th & subsequent	-	-	-	2	5.5	585
Overall	18	6.9	542	39	6.7	575

Table 7.6: Buffaloes : Average Lactation Length and Average Lactation Yield

Lactation no.	Irrigated Dairy Farmers			Others		
	No. of cases of Buffaloes	Average lactation length (month)	Average lactation yield (lbs.)	No. of cases of Buffaloes	Average lactation length (month)	Average lactation yield (lbs.)
1st	23	7.9	711	9	10.1	1,010
2nd	14	8.0	791	10	9.2	907
3rd	7	7.7	717	8	9.6	956
4th	3	5.3	627	3	9.3	732
5th	2	4.5	655	1	8.0	750
Overall	49	7.6	914	31	9.5	927



We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,

We next consider the lactation length and lactation yield for different animals in different calvings. In Tables 7.7 to 7.11, we have given the data separately for irrigated dairy farmers and others.

As regards the H.F. C-B cows, it is seen from Table 7.8 that there were 162 such cases with irrigated farmers and 127 cases with others. More than 80 per cent of them are found in the first three calvings. The percentage of cows in milk for ten or more months was higher in the case of irrigated farmers. For instance, of the cases in the first calving, 63 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 45 per cent owned by others. As regards the cows in their second calving, the corresponding percentages are 62 per cent and 46 per cent respectively, and for the third calving, 79 per cent and 49 per cent respectively.

As regards the Jersey C-B cows, the number of cases is small. It is seen from Table 7.9 that in the case of Jersey C-B cows also, the cows owned by the irrigated farmers were in milk for longer duration, though this phenomenon is not as marked as in the case of H.F. C-B cows.

In comparison with the C-B cows, the other cows and buffaloes were in milk for much shorter period, whether owned by the irrigated dairy farmers or others. It is seen from Table 7.10 that most of the buffaloes were in milk up to 7 months,



and there were not many which were in milk for 10 months or more. Similarly, in respect of other cows it is seen from Table 7.11 that the cows in milk for a period of 10 months or more formed a very small proportion. The data do not show any remarkable difference in the lactation length of the buffaloes and other cows whether owned by the irrigated dairy farmers or others.

Milk Yield on the Day Prior to the  
Field Investigator's Visit

We had asked the respondents to report the milk yield on the day prior to the Field Investigator's visit. The data in respect of the 147 H.F. and 65 Jersey C-B cows, which were in milk on that day are given lactationwise in Table 7.12. It was reported that those which had recently calved had a higher milk yield while those nearer the end of the lactation had yield of about 2 to 3 lpd (litres per day). The milk yield per day of the H.F. C-B cows in the first three lactations was more than that of the Jersey C-B cows. The trend is not clearly evident in respect of the cows in the fourth to seventh lactation due to the small number of cows. It is also seen that the daily milk yield increased from the first to the third lactation from 6.2 lpd. to 8.8 lpd in respect of the H.F. C-B cows. In respect of the Jersey C-B cows, the increase was greater, from 5.7 lpd. in the first lactation to 8.1 lpd. in the third lactation. Thereafter it declined in the fourth lactation and at a much faster rate in the fifth and sixth lactation. Being few in number the cases in the sixth and seventh lactation which showed

and there were not many which were in milk for 10 months or more. Similarly, in respect of other cows it is seen from Table 7.11 that the cows in milk for a period of 10 months or more formed a very small proportion. The data do not show any remarkable difference in the lactation length of the buffaloes and other cows whether owned by the irrigated dairy farmers or others.

Milk Yield on the Day Prior to the  
Field Investigator's Visit

We had asked the respondents to report the milk yield on the day prior to the Field Investigator's visit. The data in respect of the 147 H.F. and 65 Jersey C-B cows, which were in milk on that day are given lactationwise in Table 7.12. It was reported that those which had recently calved had a higher milk yield while those nearer the end of the lactation had yield of about 2 to 3 lpd (litres per day). The milk yield per day of the H.F. C-B cows in the first three lactations was more than that of the Jersey C-B cows. The trend is not clearly evident in respect of the cows in the fourth to seventh lactation due to the small number of cows. It is also seen that the daily milk yield increased from the first to the third lactation from 6.2 lpd. to 8.8 lpd in respect of the H.F. C-B cows. In respect of the Jersey C-B cows, the increase was greater, from 5.7 lpd. in the first lactation to 8.1 lpd. in the third lactation. Thereafter it declined in the fourth lactation and at a much faster rate in the fifth and sixth lactation. Being few in number the cases in the sixth and seventh lactation which showed

and there were not many which were in milk for 10 months or more. Similarly, in respect of other cows it is seen from Table 7.11 that the cows in milk for a period of 10 months or more formed a very small proportion. The data do not show any remarkable difference in the lactation length of the buffaloes and other cows whether owned by the irrigated dairy farmers or others.

Milk Yield on the Day Prior to the  
Field Investigator's Visit

We had asked the respondents to report the milk yield on the day prior to the Field Investigator's visit. The data in respect of the 147 H.F. and 65 Jersey C-B cows, which were in milk on that day are given lactationwise in Table 7.12. It was reported that those which had recently calved had a higher milk yield while those nearer the end of the lactation had yield of about 2 to 3 lpd (litres per day). The milk yield per day of the H.F. C-B cows in the first three lactations was more than that of the Jersey C-B cows. The trend is not clearly evident in respect of the cows in the fourth to seventh lactation due to the small number of cows. It is also seen that the daily milk yield increased from the first to the third lactation from 6.2 lpd. to 8.8 lpd in respect of the H.F. C-B cows. In respect of the Jersey C-B cows, the increase was greater, from 5.7 lpd. in the first lactation to 8.1 lpd. in the third lactation. Thereafter it declined in the fourth lactation and at a much faster rate in the fifth and sixth lactation. Being few in number the cases in the sixth and seventh lactation which showed

higher yield can not really be taken as representative.

**Table 7.12: Milk Yield on the Day Prior to the Field Investigator's Visit of H.F. and Jersey Crossbred Cows in Different Lactations Owned by Irrigated Dairy Farmers and Other Dairy Farmers**

Lactation no.	H.F. C-B cows				Jersey C-B cows			
	Irrigated Dairy Farmers		Others		Irrigated Dairy Farmers		Others	
	No. of cows	Milk yield lts.	No. of cows	Milk yield lts.	No. of cows	Milk yield lts.	No. of cows	Milk yield lts.
1	20	6.2	14	6.2	9	6.0	13	5.5
2	23	7.5	17	6.9	12	5.6	8	5.4
3	11	7.8	23	9.2	5	8.4	6	7.8
4	19	6.6	9	6.7	1	8.0	4	7.0
5	4	5.5	2	7.0	1	4.0	-	-
6	3	4.7	-	-	2	10.5	1	3.0
7	-	-	2	9.0	2	6.0	1	8.0
Overall	80	6.8	67	7.6	32	6.5	33	6.1

There were 60 buffaloes which included two Jafarabadi and two Murrah. The two Jafarabadi buffaloes were in their second and third lactation respectively and the milk yield on the day prior to the field investigator's visit was 5.11 lts. and 6 lts. respectively. The two Murrah buffaloes in their second lactation gave 2.5 lts. of milk on that day. The milk yield of the remaining 56 buffaloes in the first six lactations was 3.20 lts., 3.00 lts., 2.75 lts., 2.75 lts., 4.00 lts., and 4.00 lts., respectively.

Among the 21 cows, with the dairy farmers at the time of the survey, there were 3 Gir cows in their 4th, 5th and 8th lactation and their milk yield was 5, 3 and 10 litres respectively. Of the 18 other cows, 8 of them were dry. Of the remaining 10, all except two, were in their first to third lactation. Their milk yield varied between one to three litres on the day prior to the Field Investigator's visit.

Though the number of buffaloes and other cows in our sample is small, it is good enough to indicate that the milk yield of C-B cows is more than double the milk yield of buffaloes and more than three times that of the other cows.

#### Rate Per Litre of Milk Sold

We had asked the respondents to state the fat content of milk or the price they received per litre of milk they sold on the day prior to the Field Investigator's visit. However, none of them could tell the fat content of the milk. For buffalo milk, 19 dairy farmers received Rs. 4 per litre except two others who reported Rs. 3.50 per litre. In the case of cow milk, the rate was reported to be Rs. 2.80 per litre by 16 dairy farmers, Rs. 2.00 per litre by one, Rs. 2.25 per litre by two more while the remaining 144 dairy farmers stated it as Rs. 3.00 per litre. The rate for purchase under the Government Milk Scheme is Rs. 3.00 per litre in the flush season and Rs. 3.40 per litre in the lean season for cow milk with 4.5 per cent fat content and 8.5 per cent S.N.F. (Non-Solid Fat).

The rate is appropriately revised for different combinations of fat content and N.S.F. The purchase price for buffalo milk with 7 per cent fat content and 9 per cent N.S.F. calculated in the above manner comes to Rs. 4.18 per litre. (vide Government of Maharashtra, Agriculture and Cooperation Department, Resolution No. MLK-1883 (1368)/ADF-7 dated the 27th April 1983).

Delivery of Milk  
to the Milk Cooperative

We had asked the dairy farmers to state the number of times in a day they delivered milk to the Milk Cooperative. In reply 179 out of 253 dairy farmers stated that they delivered milk twice a day while 38 others delivered only once a day. The remaining 36 did not reply. It may be noted in this connection that the milk tanker under the Government Milk Scheme went round most of these villages twice a day to collect milk but in some of the villages situated away from the milk-collection-route, it was collected only once a day.

When asked to state whether milk was rejected by the Milk Cooperative at any time during the reference year, 132 dairy farmers stated that they did not face any difficulty. 68 other dairy farmers stated that on occasions the Milk Cooperative refused to accept milk. Of these 68 dairy farmers, 43 belonged to the two villages from Pune district, 20 from 2 villages from Sangli district and only 5 from the two villages in Solapur district. We, however, did not get adequate data regarding reasons for rejection and disposal of such milk.

Out of 253 dairy farmers, 200 of them stated that they delivered milk in the village itself. The remaining 53 did not reply. Of these, 53 non-respondents, 41 dairy farmers were from Mandrup where a Milk Cooperative was defunct, and milk was collected by private individuals and sold at Solapur. The sample dairy farmers had no difficulty in transport of milk for delivery to the Milk Cooperative. Only 11 respondents used a bicycle while the rest of the dairy farmers went on foot to deliver milk at the cooperative. The expenditure they incurred in delivering milk was up to Re. one in 44 cases while the remaining 209 dairy farmers did not report any expenditure as most of them went on foot to the Milk Cooperative.

#### Dung Production and Disposal

The dairy farmers used the animal dung mainly for conversion into dung manure. We asked the respondents to state the total dung manure and also indicate separately the dung manure from milch animals, sale of dung manure, dung manure used on farm and dung used for fuel cakes during the reference year. The information reported is given in Table 7.13.

Table 7.13: Dung Production and Disposal

	No. of dairy farmers reporting	No. of cartloads
Dung manure from milch animals	249	2,361
Total dung manure	253	3,387
Of which i) sold	38	264
ii) used on own farm	217	3,064
iii) in stock	9	59
Dung used for fuel cakes	129	483
Dung manure not stated	9	-

It is seen from the Table that a major part of dung manure, 70 per cent of the total, was received from the milch animals. Of the total dung manure, about ninety per cent was used on own farm, eight per cent was sold and about two per cent remained in stock. The sale of dung manure was reported by only about 15 per cent of the dairy farmers, on an average, about 7 cart-loads per reporting case. It is important to note that nearly half of the dairy farmers used, on an average, four cart-loads of dung for making fuel cakes. A cart load of dung manure fetched between Rs. 25 to Rs. 30.

The dairy farmers received on an average about 13 cart loads of dung-manure. The quantity of dung manure naturally increased with the size and composition of the herd of their milch and draught animals.

#### Gobar Gas

The dairy farmers who own C-B cows could be considered as those receptive to new ideas and innovations. Gobar gas plants have been installed in large numbers in certain parts of Western Maharashtra. We sought information from our respondents if they had installed a Gobar gas plant and if not, the reason for not installing it. Only 10 out of 253 dairy farmers had a Gobar gas plant and 8 more dairy farmers stated that they intended to install one soon. 38 other farmers did not reply. The difficulties stated by the remaining 197 were as follows:



<u>Reason for not installing a Gobar Gas Plant</u>	<u>No. of respondents</u>
1) Inadequate supply of dung	24
2) Inadequate supply of dung as also financial difficulties	33
3) Cattle shed on the farm, away from residence	45
4) Gobar gas is uneconomic	1
5) Residential structure not pucca or other reasons	10
6) Financial difficulties	84
	----- 197 -----

It will be thus seen that it is not possible for 112 dairy farmers to instal a Gobar gas plant due to inadequate supply of dung or cattle shed being away from their residence, etc. However, in respect of the remaining 84 dairy farmers, it may be possible to install a gobar gas plant by enabling them to get a loan for that purpose. The sample dairy farmers used about 14 per cent of dung production for fuel purposes. If Gobar Gas plants are installed by them, they will be able to use entire dung production for manuring purposes.

#### Total Milk Production

Before we consider the receipts and expenditure of the sample dairy farmers on account of their dairy enterprise, we may consider their total milk production and its disposal. 244 out of 253 dairy farmers had milch animals during the reference year. The total milk production during the year of

reference from all milch animals was as follows:

Dairy farmers	No. of farmers	Total milk production (Lts.)	Value of milk production Rs.
Irrigated	112	2,95,446	9,16,144
Others	132	3,23,409	9,87,915
Total	244	6,18,855	19,04,059

The disposal of milk was as follows:

Dairy farmers	Sold to Milk Coop.	Sold to others	Consumed at home	Fed to calves	100 per cent =
	%	%	%	%	Lts.
Irrigated	75	8	13	4	2,95,446
Others	66	16	14	4	3,23,409
Total	70	12	14	4	6,18,855

Villagewise disposal of milk is shown in Table 7.14. It is seen from the Table that about 82 per cent of milk was sold, 14 per cent was consumed at home and 4 per cent was fed to calves. There is no wide difference in the pattern of disposal of milk by the irrigated dairy farmers and others. Of the total milk sold, 85 per cent was sold to the Milk Cooperatives and the remaining 15 per cent to others. At Mandrup, a Milk Cooperative being defunct, 91 per cent of the milk was sold to others and only 9 per cent to the Milk Cooperative. If we exclude Mandrup and consider the remaining villages, we find that 99 per cent of the milk was sold to the Milk Cooperatives.

reference from all milch animals was as follows:

Dairy farmers	No. of farmers	Total milk production (Lts.)	Value of milk production Rs.
Irrigated	112	2,95,446	9,16,144
Others	132	3,23,409	9,87,915
Total	244	6,18,855	19,04,059

The disposal of milk was as follows:

Dairy farmers	Sold to Milk Coop.	Sold to others	Consumed at home	Fed to calves	100 per cent =
	%	%	%	%	Lts.
Irrigated	75	8	13	4	2,95,446
Others	66	16	14	4	3,23,409
Total	70	12	14	4	6,18,855

Villagewise disposal of milk is shown in Table 7.14. It is seen from the Table that about 82 per cent of milk was sold, 14 per cent was consumed at home and 4 per cent was fed to calves. There is no wide difference in the pattern of disposal of milk by the irrigated dairy farmers and others. Of the total milk sold, 85 per cent was sold to the Milk Cooperatives and the remaining 15 per cent to others. At Mandrup, a Milk Cooperative being defunct, 91 per cent of the milk was sold to others and only 9 per cent to the Milk Cooperative. If we exclude Mandrup and consider the remaining villages, we find that 99 per cent of the milk was sold to the Milk Cooperatives.

The average value of total milk production was in Rs. 8,180 in respect of irrigated dairy farmers and Rs. 7,484 in respect of other dairy farmers. It was the maximum at Antroli, being Rs. 14,511 and Rs. 9,494 for irrigated dairy farmers and others respectively. It may be recalled that Antroli is situated in Solapur district with about 6 per cent of gross cropped area under irrigated crops. The annual rainfall is about 575 mms. Next ranked Nandre, where about one-third of the gross-cropped area was under sugarcane. The average value of milk production for irrigated dairy farmers and others came to Rs. 9,724 and Rs. 8,144 respectively. At the other extreme is the village Umadi situated in a drought-prone area, with an annual rainfall of about 500 mms. Only about 3 per cent of the gross cropped area is under irrigated crops. In this village as also in Kalamb from Pune district, the average value of milk production during the reference year in respect of other dairy farmers was Rs. 3,701 at Umadi and Rs. 2,566 at Kalamb respectively as against the overall average of Rs. 7,484 for the six villages.

An important point that may be noted is the magnitude of cash flow in the villages due to dairy enterprise during the reference year, the value of milk sold by the 244 dairy farmers who had milch animals came to Rs. 15,74,149 or on an average Rs. 6,451 per dairy farmer during the twelve months' period or about Rs. 535 per month.

As for the milk consumed at home we do not propose to go into details. However, we may state that the 244 families

consumed on an average 355 litres of milk during the reference year, that is, a little less than a litre per day. Considering the average size of family of 5.4 persons, the per capita milk consumed comes to 180 ml/day. This is no doubt lower than the desired level as per nutritional requirements. However, the dairy farmer is the best judge to decide how much milk to consume at home and how much to sell to meet the dairy's and household cash expenses.

Total Milk Production  
with One/Two Crossbred Cows

In order to find out the milk production of C-B cows during the reference year, we decided to consider only those dairy farmers who had C-B cows with or without C-B calf, but other milch animals. In Table 7.15 we have given villagewise data regarding lactation months, average milk yield per lactation month and value of milk production per dairy farmer.

In our sample, there were 117 dairy farmers who had one C-B cow (with or without calf) and another 40 who had two C-B cows (with or without calf). The average lactation months per cow during the reference year came to 8.8 months where only one C-B cow was owned and 7.9 months where there were two C-B cows. The average value of milk production in respect of those having two C-B cows came to Rs. 5,611 per cow and is not much higher than the value of milk production of Rs. 5,581 in the case of those having only one C-B cow. One reason for higher lactation yield in the case of the former is that those having two C-B cows, may have at least one of them in its second or third lactation. We have earlier noted that themilk yield increased

**Table 7.15:** Total Milk Production and Lactation Months During the Reference Year, Yield per Lactation Month and Value of Milk Production Reported by the Dairy Farmers from six Villages Having only One or Two Crossbred Cows

	No. of dairy farmers	Lactation months	Dry months	Total milk yield lts.	Yield per lactation month lts.	Average value of milk production per dairy farmer
<u>Dairy Farmers having one C-B cow</u>						
Kalamb	22	159	105	25,293	159	3,512
Ranjani	18	153	57	27,211	178	4,604
Umadi	5	34	5	5,055	149	3,080
Nandre	27	287	37	64,173	223	7,039
Mandrup	25	229	69	51,255	224	6,081
Antroli	20	173	60	45,204	261	6,768
Total	117	1,035	333	2,18,191	211	5,581
<u>Dairy Farmers having two C-B cows</u>						
Kalamb	4	63	11	16,600	263	11,752
Ranjani	6	95	36	18,328	193	9,320
Umadi	4	44	8	9,045	205	7,118
Nandre	13	221	36	49,020	222	11,465
Mandrup	2	26	-	7,810	300	11,805
Antroli	11	183	27	45,390	248	13,190
Total	40	632	118	1,46,193	231	11,223

from the first to the third lactation. Villagewise, we find large differences in yield per lactation month but we could not analyse the reasons therefor.

Classification of Dairy Farmers According to the  
Composition of Their Herd of Milch Animals

For the purposes of studying the receipts and expenditure of the dairy enterprise, we classified the dairy farmers according to the number of C-B cows in their herd and further according to the holding of C-B calves, other cows and buffaloes and their calves. The number of dairy farmers in each type of holding of milch animals is shown in Table 7.16. In the first four types there is no C-B cow, in types 5 to 12 there is one C-B cow, in types 13 to 15 there are two C-B cows, in types 16 to 18 there are three C-B cows, and in type 19 four C-B cows. We had separately noted the expenditure on calves. Hence, for finding out the receipts and expenditure on C-B cows, it is possible to combine type 5 with 6, type 13 with 14 and type 16 with 17 after deducting expenditure on C-B calf in types 6, 14 and 17. In the following sections we shall consider the receipts and expenditure of dairy farmers according to the types referred to above.

Receipts from and Expenditure  
on Dairy Enterprise.

We shall now consider the receipts from and expenditure on dairy enterprise during the reference year in respect of (a) irrigated dairy farmers and (b) other dairy farmers. The data is presented in Tables 7.17 to 7.20.

On the receipts side, we have included value of total milk production and dung manure from milch animals and also receipts from sale of milch animals and other animals. On the

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253



**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253



Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

**Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )**

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

Table 7.16: Classification of Dairy Farmers According to  
Composition of Their Herd of Milch Animals  
( Calves = Female Calves )

Composition of the Herd of Milch Animals	Irrigated dairy farmers	Other dairy farmers	Total
1. C-B calf/calves	3	6	9
2. C-B calf/calves, other cows and calves	-	6	6
3. C-B calf/calves, buffaloes and calves	1	1	2
4. C-B calf/calves, other cows, buffaloes and calves	2	2	4
5. C-B cow	6	30	36
6. C-B cow and C-B calf/calves	38	43	81
7. C-B cow, other cows and calves	4	-	4
8. C-B cow, buffaloes and calves	7	7	14
9. C-B cow, C-B calf/calves, other cows and calves	5	5	10
10. C-B cow, C-B calf/calves, buffaloes and calves	21	10	31
11. C-B cow, C-B calf/calves, other cows, buffaloes and calves	1	-	1
12. C-B cow, other cows, buffaloes and calves	1	2	3
13. Two C-B cows	1	9	10
14. Two C-B cows and C-B calf/calves	18	12	30
15. Two C-B cows, C-B calf/calves and buffaloes	4	2	6
16. Three C-B cows	1	-	1
17. Three C-B cows and C-B calves	1	2	3
18. Three C-B cows, C-B calf/calves and buffaloes	1	-	1
19. Four C-B cows and C-B calf/calves	1	-	1
Total	116	137	253

expenditure side, we have included expenditure on feed, fodder and concentrates including the value of farm produced fodder, transport of milk, veterinary aid and medicines, insurance premium, salary of servants, if any, imputed wages of family labour and other expenditure which included purchases of chains, ropes, buckets, etc., which need to be replaced in an year or two.

The overall resultant position from the Tables is summarised below:

	Irrigated dairy farmers	Other dairy farmers
1. No. of dairy farmers	116	137
	Rs.	Rs.
2. Total receipts	10,65,442	11,38,899
3. Total expenditure	8,32,428	8,37,803
4. Total surplus	2,33,014	3,01,096
5. Average surplus per dairy farmer	2,009	2,198
6. Total surplus gross and imputed wages of family labour	4,01,774	4,77,699
7. Average surplus per dairy farmer gross of imputed wages of family labour	3,464	3,487

It is seen from the aggregate level data that the surplus with other dairy farmers is about 9 per cent more as compared to the irrigated dairy farmers. After excluding the

imputed wages of family labour from total expenditure, however, it is seen that the surplus of other dairy farmers is about the same as that of the irrigated dairy farmers. It must, however, be remembered that some of them had, besides one or more C-B cows, buffaloes and other cows as also calves. The resultant surplus position is thus not exclusively that of the dairy enterprise with C-B cows.

To get some idea regarding the dairy enterprise with C-B cows alone, let us refer to the categories of dairy farmers according to the composition of the herd of their milch animals.

(1) Where the dairy farmers had only C-B calves with/without other milch animals (first four categories of Table 7.16), of the 21 such dairy farmers only one was left with a net surplus. However, if we deduct expenditure on calves from the total expenditure, we find that the deficit gets reduced and actually some dairy farmers are left with a surplus. Further, if imputed wages of family labour are also excluded from the total expenditure, then all such dairy farmers show a surplus. The range is, of course, very wide. The average surplus ranges between Rs. 213 in the case of dairy farmers owning only C-B calf/calves to Rs. 5,391 where a dairy farmer had along with C-B calf/calves, other cows and buffaloes in milk.

(2) The remaining 232 dairy farmers who had C-B cows, with or without calf/calves, buffaloes and other cows showed a

surplus, even after including in the total expenditure, the expenditure on feed, fodder and concentrates for the calves as also imputed wages of family labour. As expected, because of the holding of other milch animals also, the average surplus per dairy farmer varied within a very wide range. The minimum average surplus of Rs. 393 was found in the group of 38 irrigated dairy farmers who had one C-B cow along with C-B calf/calves. If the expenditure on calves is deducted from the total expenditure, the average surplus comes to Rs. 1,008. Further, if imputed wages of family labour are also deducted from the total expenditure, the average surplus increases to Rs. 2,572.

The maximum surplus of Rs. 16,777 is in the case of an irrigated dairy farmer having three C-B cows.

(3) If we consider those having only C-B cows with or without C-B calves and consider the surplus after deducting the expenditure on C-B calves, we find the average surplus per dairy farmer as follows:

Dairy farmers having:	Irrigated dairy farmers		Other dairy farmers	
	No.	Average surplus per dairy farmer (Rs.)	No.	Average surplus per dairy farmer (Rs.)
1. One C-B cow	44	966	73	2,726
2. Two C-B cows	19	2,916	21	3,845
3. Three C-B cows	2	9,068	2	4,587
4. Four C-B cows	1	31,030	-	-
Total	66	2,228	96	3,010



Our data thus show that the other dairy farmers were left with a greater surplus, whether they owned one or two C-B cows. It is only in those few cases of irrigated dairy farmers who had three or four C-B cows that we find a larger average surplus as compared to the other dairy farmers.

We may repeat that the surplus depends upon total milk production (that is, number of lactation months and lactation yield of C-B cows during the reference period) and also on the expenditure side, the quantum of feed, fodder and concentrates as also the other expenses each dairy farmer chooses to incur on the C-B cows. We had noted data regarding sale of milk from the Milk Cooperative. Hence the receipts data are considered reliable unless the irrigated dairy farmers purposely did not report sale of milk to others. As regards the expenditure we have applied uniform price to farm produced fodder and actual cash expenditure where the inputs were purchased. Hence the resultant surplus could be considered as reliable.

We may also recall that the total expenditure includes imputed wages of family labour. If we deduct along with the expenditure on feed, etc., for the calves, the imputed wages of family labour from the total expenditure, the average surplus per dairy farmer stands enhanced as follows:

Dairy farmers having	Irrigated dairy farmers		Other dairy farmers	
	No.	Average surplus per dairy farmer (Rs.)	No.	Average surplus per dairy farmer (Rs.)
1. One C-B cow	44	2,535	73	3,910
2. Two C-B cows	19	4,211	21	5,131
3. Three C-B cows	2	10,085	2	6,285
4. Four C-B cows	1	33,065	-	-
	66	3,709	96	4,226

The data thus show that dairy farmers who do not have irrigated land can also successfully run the dairy enterprise provided; of course, they are able to buy fodder, and give water and other care the C-B cows need.

#### Cost of Milk Production

The price paid by the State Government under its Milk Supply Scheme to the milk producers has been attracting considerable attention in the newspapers and also in the meetings of the milk producers. During the reference year, the sample dairy farmers received Rs. 3 per litre of cow milk. We therefore, thought of examining their cost of production per litre of milk on the basis of the data collected during the survey. We took into consideration those dairy farmers who had one or more C-B cows only.

	<u>Irrigated dairy farmers</u>	<u>Other dairy farmers</u>
1. No. of dairy farmers having one or more C-B cows only	66	96
2. No. of C-B cows	91	121
3. Total milk production during the reference year	1,54,896 lts.	2,38,605 lts.
4. Total expenditure excluding imputed wages of family labour	Rs. 2,83,211	Rs. 4,09,176
5. Cost of production per litre of milk	Rs. 1.83	Rs. 1.71
6. Cost of production per litre of milk after deducting value of dung manure from (4) above	Rs. 1.68	Rs. 1.62
7. Total expenditure after including imputed wages of family labour	3,80,941	5,26,014
8. Cost of production per litre including imputed wages of family labour in total expenditure	2.46	2.20
8. Cost of production per litre in (8) above after deducting value of dung manure from total expenditure	2.31	2.11

We have not considered the expenditure on calves, salaried servant and interest on loan in working out the cost of production of milk. However, it is seen that, at the sale price of Rs. 3.00 per litre even after including the imputed wages of family labour,

the irrigated dairy farmers are left with 69 paise per litre while others are left with 85 paise per litre of cow milk. The average annual milk production came to 1702 lts. per cow in the case of irrigated dairy farmers and 1972 lts., in the case of other dairy farmers. Hence, after meeting the cost of production including imputed wages of family labour, the irrigated dairy farmers and other dairy farmers left with a surplus of Rs. 1,174 and Rs. 1,755 respectively. In view of this, the surplus or net profit indicated above on an investment of Rs. 4,300 for H.F. C-3 or Rs. 3,300 for Jersey C-B cow is considered large enough to justify the dairy enterprise with C-B cows.

#### In-coming and Out-going Cash

It is also necessary to estimate the cash balance left with the dairy farmer after meeting the cash expenditure from the sale proceeds of milk, with a view to find out if the balance would be adequate, at least, to pay the instalment of loan taken for purchase of a C-B cow. The data are presented in Table 7.21.

In the cash receipts, we have included only receipts from sale of milk. The reason for not including receipts from the sale of calves or other milch or draught animals is that such calves really become a part of the cattle breeding enterprise. As for dung, we have earlier noted that only 11 per cent of dung manure from milch animals was sold during the reference

the irrigated dairy farmers are left with 69 paise per litre while others are left with 85 paise per litre of cow milk. The average annual milk production came to 1702 lts. per cow in the case of irrigated dairy farmers and 1972 lts., in the case of other dairy farmers. Hence, after meeting the cost of production including imputed wages of family labour, the irrigated dairy farmers and other dairy farmers left with a surplus of Rs. 1,174 and Rs. 1,755 respectively. In view of this, the surplus or net profit indicated above on an investment of Rs. 4,300 for H.F. C-3 or Rs. 3,300 for Jersey C-B cow is considered large enough to justify the dairy enterprise with C-B cows.

#### In-coming and Out-going Cash

It is also necessary to estimate the cash balance left with the dairy farmer after meeting the cash expenditure from the sale proceeds of milk, with a view to find out if the balance would be adequate, at least, to pay the instalment of loan taken for purchase of a C-B cow. The data are presented in Table 7.21.

In the cash receipts, we have included only receipts from sale of milk. The reason for not including receipts from the sale of calves or other milch or draught animals is that such calves really become a part of the cattle breeding enterprise. As for dung, we have earlier noted that only 11 per cent of dung manure from milch animals was sold during the reference

year. Since majority of the dairy farmers do not sale but use dung for manuring their farm, we preferred not to include receipts from dung manure in cash receipts.

As regards the expenditure in cash, we included the expenditure on feed, fodder, concentrates, veterinary services, medicines, A.I., salary of the servant, expenditure on transport of milk, cattle insurance, other expenditure and, in those cases where loan was taken for purchase of milch animals, we have included interest on loan paid or due outstanding to be paid in the cash expenditure.

It is seen from the Table that, on the whole, the irrigated dairy farmers had a cash surplus of Rs. 3,300 on an average, while the others had only Rs. 2,420. However, this does not appear uniformly in all the types of herds. For instance, in the case of those having only one C-B cow without a calf, the other dairy farmers were left with more cash (Rs. 2,510) as compared to the irrigated dairy farmers (Rs. 727). It is not so where the dairy farmers had only two C-B cows, the cash balance with the irrigated dairy farmers and others being Rs. 9,948 and Rs. 4,187 respectively.

The excess of cash receipts over expenditure depends on the type of milch animal, its lactation months, total milk production and milk sold as also purchases of feed and fodder, if homegrown fodder is inadequate. The quantum of cattle feed also varies depending upon the quantity they decide to give

every day to the milch animals. Hence the overall position of cash balance given in the Table shows the resultant position of the sample dairy farmers.

#### Potential for Repayment of Loan

With a view to find out if the cash surplus would be adequate to repay the loan taken for purchase of a C-B cow, we found out the annual instalment of loan repayable at 11 per cent interest per annum. For this we used the Capital Recovery Factor, that is, the Annual Repayment that will repay the specific amount of the loan in a specified number of years with compound interest rate on unpaid balance. (Compounding and Discounting Tables for Project Analysis with a guide to their application, by J. Price Gittinger. The Johns Hopkins University Press, Baltimore, 1984, p.23). The amount payable is as follows:

Purchase Price of a C-B cow	Annual instalment of loan repayable at 11 per cent interest per annum in		
	3 years	4 years	5 years
	Rs.	Rs.	Rs.
H.F.C-B Rs.4300	1,760	1,386	1,163
Jersey C-B Rs.3300	1,350	1,064	893

While finding out the cash surplus, we had included in the cash expenditure, payment of interest on account of loan taken by dairy farmers, if any. However, for the purpose of finding out their potential to repay the loan, we must deduct it from total cash expenditure and find out the average

cash surplus. As will be noted from Table 7.18 and 7.19, only 23 irrigated dairy farmers and 53 others, reported payment of interest on loan. Taking this payment into account, the average cash surplus per dairy farmer works out as follows for the dairy farmers owning only C-B cows with or without calves:

Type of holding	Irrigated dairy farmers		Other dairy farmers	
	No. of dairy farmers	Average cash surplus Rs.	No. of dairy farmers	Average cash surplus Rs.
One C-B cow	6	803	30	2,656
One C-B cow with calf/calves	38	1,103	43	1,503
Two C-B cows	1	10,834	9	4,449
Two C-B cows with calf/calves	18	4,875	12	3,706
Three C-B cows	1	17,306	-	-
Three C-B cows with calf/calves	1	6,713	2	10,584
Four C-B cows with calf/calves	1	27,179	-	-
Overall per day	66	2,977	96	2,604
Overall per cow	92	2,136	121	2,065

We did not work out separately cash surplus for H.F. C-B and Jersey C-B cows. It, however, appears that the other dairy farmers are left with enough cash surplus to repay the loan in three annual instalments and also to meet some personal expenses.



As far as the irrigated dairy farmers owning only one C-B cow with or without calves are concerned, the cash surplus is not adequate to repay the loan in three years but just enough to repay it in five years. This finding is contrary to our expectations because the irrigated farmers are expected to perform better than others. However, it may be that they incur more expenditure in rearing C-B cows as compared to other dairy farmers or the latter have more cash receipts as compared to the former. We propose to examine this issue in the following section.

Cash Receipts and Expenditure  
on Feed, Fodder and Concentrates,  
per Crossbred Cow

We shall consider only those dairy farmers who had only C-B cows with or without calves. In Table 7.22 we have shown average total expenditure as also average cash expenditure on feed, fodder and concentrates per cow during the reference period. It is seen that the other dairy farmers incurred more expenditure per cow on an average and the component of the cash expenditure in the total expenditure was also higher, as compared to the irrigated dairy farmers.

In Table 7.23 we have shown the average cash receipts per C-B cow during the reference year. Considering the average cash expenditure, the greater cash surplus in the case of other dairy farmers is due to larger cash receipts as compared to irrigated dairy farmers. This in effect means that the former were able to obtain more lactation yield during the reference year

As far as the irrigated dairy farmers owning only one C-B cow with or without calves are concerned, the cash surplus is not adequate to repay the loan in three years but just enough to repay it in five years. This finding is contrary to our expectations because the irrigated farmers are expected to perform better than others. However, it may be that they incur more expenditure in rearing C-B cows as compared to other dairy farmers or the latter have more cash receipts as compared to the former. We propose to examine this issue in the following section.

Cash Receipts and Expenditure  
on Feed, Fodder and Concentrates,  
per Crossbred Cow

We shall consider only those dairy farmers who had only C-B cows with or without calves. In Table 7.22 we have shown average total expenditure as also average cash expenditure on feed, fodder and concentrates per cow during the reference period. It is seen that the other dairy farmers incurred more expenditure per cow on an average and the component of the cash expenditure in the total expenditure was also higher, as compared to the irrigated dairy farmers.

In Table 7.23 we have shown the average cash receipts per C-B cow during the reference year. Considering the average cash expenditure, the greater cash surplus in the case of other dairy farmers is due to larger cash receipts as compared to irrigated dairy farmers. This in effect means that the former were able to obtain more lactation yield during the reference year

Table 7.23: Average Cash Receipts per Crossbred Cow During the Reference Year as Reported by Irrigated Dairy Farmers and Other Dairy Farmers

	Irrigated dairy farmers		Other dairy farmers	
	No. of dairy farmers	Average cash receipts per cow Rs.	No. of dairy farmers	Average cash receipts per cow Rs.
One C-B cow	6	3,205	30	5,821
One C-B cow and calves	38	3,314	43	4,706
Two C-B cows	1	8,977	9	4,842
Two C-B cows and calves	18	4,868	12	4,392
Three C-B cows	1	8,754	-	-
Three C-B cows and calves	1	2,814	2	4,106
Four C-B cows and calf/calves	1	7,767	-	-
Overall for 92 & 121 cows of irrigated dairy farmers and others respectively	66	4,393	96	4,911

The higher lactation yield is perhaps due to higher expenditure on feed, fodder and concentrates per cow reported by the other dairy farmers.

One input which increases milk yield is concentrates such as Oil-cake, Sugras cattle feed and wheat/ricebran. Since the concentrates are purchased we decided to examine the expenditure on purchases of concentrates per cow reported during the reference period. The reported purchases are as follows:

Type of holding	Expenditure on purchases of concentrates			
	Irrigated dairy farmers		Other dairy farmers	
	No. of dairy farmers	Average per C-B cow Rs.	No. of dairy farmers	Average per C-B cow Rs.
One C-B cow	6	947	30	1,464
One C-B cow and calf/calves	38	1,003	43	1,382
Two C-B cows	1	2,170	9	1,480
Two C-B cows and calf/calves	18	1,176	12	1,410
Three C-B cows	1	2,290	-	-
Three C-B cows and calf/calves	1	436	2	997
Four C-B cows and calf/calves	1	875	-	-
Over all for 92 and 121 cows of irrigated dairy farmers and others respectively	66	1,103	96	1,403

Thus we find that most of the other dairy farmers spent on an average about 30 to 40 per cent more on concentrates per cow as compared to the irrigated dairy farmers, resulting in greater lactation yield.

We decided to probe further by examining the expenditure on feed and fodder. We must state that we had collected the data in a single visit to the dairy farmers. We had saught

information regarding the quantity of feed, fodder and concentrates given daily in the latest calving cycle, in the first three months after calving, in the fourth to sixth month, from the seventh month till it went dry and during dry period till next calving. From these data we arrived at the total expenditure on feed fodder and concentrates, by supplying a uniform price for each item. We are aware that, though the price offered by the State Government for milk is the same everywhere, the prices of fodder vary from village to village, particularly the villages situated in different districts. However, we thought that there was an advantage in applying a uniform price.

In Table 7.24 we have given per C-B cow expenditure (including value of farm produced fodder) on dry fodder and green fodder. It is seen from the Table that the expenditure on dry and green fodder does not differ as markedly as the expenditure on concentrates; may be the other dairy farmers are able to get higher milk yields by giving their cows a larger ration of concentrates.

(Continued on next page)

Table 7.24: Expenditure per Crossbred Cow During the Reference Year on Dry and Green Fodder Reported by Irrigated Dairy Farmers and Other Dairy Farmers

Type of holding	Irrigated dairy farmers		Other dairy farmers	
	No. of dairy farmers	Average expenditure on dry & green fodder per cow Rs.	No. of dairy farmers	Average expenditure on dry & green fodder per cow Rs.
One C-B cow	6	2,169	30	2,063
One C-B cow and calf/calves	38	1,785	43	1,891
Two C-B cows	1	890	9	1,623
Two C-B cows and calf/calves	18	1,555	12	1,238
Three C-B cows	1	1,198	-	-
Three C-B cows and calf/calves	1	1,881	2	1,777
Four C-B cows and calf/calves	1	1,435	-	-
Overall for 92 and 121 cows of irrigated dairy farmers and others respectively	66	1,669	96	1,759

Composition of Ration and Expenditure Thereon

The ration given during the reference year to the C-B cows in lactation consisted of dry fodder, green fodder and cattle feed, except four per cent cows whom no green fodder was given. In respect of 39 per cent of the 195 cows, for which

information regarding the quantity of feed, fodder and concentrates given daily in the latest calving cycle, in the first three months after calving, in the fourth to sixth month, from the seventh month till it went dry and during dry period till next calving. From these data we arrived at the total expenditure on feed fodder and concentrates, by supplying a uniform price for each item. We are aware that, though the price offered by the State Government for milk is the same everywhere, the prices of fodder vary from village to village, particularly the villages situated in different districts. However, we thought that there was an advantage in applying a uniform price.

In Table 7.24 we have given per C-B cow expenditure (including value of farm produced fodder) on dry fodder and green fodder. It is seen from the Table that the expenditure on dry and green fodder does not differ as markedly as the expenditure on concentrates; may be the other dairy farmers are able to get higher milk yields by giving their cows a larger ration of concentrates.

(Continued on next page)

Table 7.24: Expenditure per Crossbred Cow During the Reference Year on Dry and Green Fodder Reported by Irrigated Dairy Farmers and Other Dairy Farmers

Type of holding	Irrigated dairy farmers		Other dairy farmers	
	No. of dairy farmers	Average expenditure on dry & green fodder per cow Rs.	No. of dairy farmers	Average expenditure on dry & green fodder per cow Rs.
One C-B cow	6	2,169	30	2,063
One C-B cow and calf/calves	38	1,785	43	1,891
Two C-B cows	1	890	9	1,623
Two C-B cows and calf/calves	18	1,555	12	1,238
Three C-B cows	1	1,198	-	-
Three C-B cows and calf/calves	1	1,881	2	1,777
Four C-B cows and calf/calves	1	1,435	-	-
Overall for 92 and 121 cows of irrigated dairy farmers and others respectively	66	1,669	96	1,759

Composition of Ration and Expenditure Thereon

The ration given during the reference year to the C-B cows in lactation consisted of dry fodder, green fodder and cattle feed, except four per cent cows whom no green fodder was given. In respect of 39 per cent of the 195 cows, for which



data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

data regarding expenditure on feed and fodder could be obtained, the green fodder included sugarcane tops also. It will be interesting to know how the total expenditure per litre of milk as also on various items varied in respect of H.F. C-B and Jersey C-B cows as also between the expenditure reported by the irrigated dairy farmers and others. Since the number of cases of cows at different calvings is not large, we have worked out the averages for the total number of cows owned by each group of dairy farmers. The data are given in Table 7.25. It will be seen from the Table that on the whole the lactation yield of the H.F. C-B cows owned by the other dairy farmers was more than that of the irrigated dairy farmers. In the case of the Jersey C-B cows, however, the latter reported a slightly higher lactation yield as compared to the other dairy farmers.

Total expenditurewise, the irrigated dairy farmers who gave green fodder with sugarcane tops incurred the least expenditure per litre of milk, namely, Rs.1.26. The other dairy farmers giving similar ration spent Rs. 1.37 per litre because they spent a little more on dry fodder and cattle feed to make up the deficiency in green fodder.

The next lowest is the expenditure of Rs. 1.40 per litre reported by the irrigated dairy farmers who did not give any green fodder. There were only seven cows in this group and this small number may not be considered as adequate to make generalizations. Still, it may be noted that their expenditure on cattle feed is about the same as reported by the other dairy

farmers and yet the lactation yield is higher than that reported by the irrigated dairy farmers who gave green fodder without sugarcane tops.

The inclusion of sugarcane tops in the ration seems to have resulted in greater lactation yield, keeping the overall expenditure on dry as well as green fodder low, as compared to most of the other categories. It must, however, be kept in mind that our sample is small and this conclusion, that has emerged from our data on 58 cows, needs to be substantiated by an adequately large sample.

Yet another interesting observation may be made regarding green fodder. The other dairy farmers reported in the total expenditure very low expenditure ranging from Rs.0.05 to Rs. 0.25 as against Rs.0.18 to Rs.0.62 by the irrigated dairy farmers. Yet the lactation yield was more in the case of H.F. C-B cows owned by the other dairy farmers.

The information on the composition of ration shows that dairying with small ration of green fodder does not adversely affect the lactation yield or the total expenditure per litre of milk. No doubt the lactation yield in our sample cases is lower than what the H.F. C-B cows can give under ideal conditions. As we have observed earlier, if for any reason the lactation yield of the cows owned by the irrigated dairy farmers is under-reported, their performance would excel that of other dairy farmers. Yet profitabilitywise, our survey results

show that other dairy farmers, who spend less on green fodder, are able to conduct dairying as efficiently or even better than the irrigated dairy farmers.

#### Dairy Enterprise of Landless Dairy Farmers

In the analysis so far, we had included the landless dairy farmers in the group of other dairy farmers. We shall examine in the present section the dairy enterprise of the landless with reference to certain important indicators.

In our total sample of 253 dairy farmers, we had 25 landless dairy farmers, mainly landless labourers. Nineteen of them had agricultural labour as the main and dairying as a subsidiary occupation. Four others (including two with female heads of families who had no subsidiary occupation) reported dairying as the main occupation. Besides, one was a petty trader and the remaining one worked in a Milk Cooperative and both them pursued dairying as a subsidiary occupation.

Of the 25 landless, 2 had only C-B calves. Three others had two C-B cows each while the remaining had one C-B cow each with or without C-B calves and other milch animals. The 23 landless had in all 26 C-B cows, seven of which were homebred. In respect of the 19 purchased cows, the average price came to Rs. 4,737 for H.F. C-B and Rs. 4,164 for Jersey C-B cow, which is much higher than the overall average of Rs. 4,265 for H.F. C-B and Rs. 3,300 for Jersey C-B C-B cow. The higher price may be due to subsidy under the IRDP. For 11 C-B cows, they



show that other dairy farmers, who spend less on green fodder, are able to conduct dairying as efficiently or even better than the irrigated dairy farmers.

#### Dairy Enterprise of Landless Dairy Farmers

In the analysis so far, we had included the landless dairy farmers in the group of other dairy farmers. We shall examine in the present section the dairy enterprise of the landless with reference to certain important indicators.

In our total sample of 253 dairy farmers, we had 25 landless dairy farmers, mainly landless labourers. Nineteen of them had agricultural labour as the main and dairying as a subsidiary occupation. Four others (including two with female heads of families who had no subsidiary occupation) reported dairying as the main occupation. Besides, one was a petty trader and the remaining one worked in a Milk Cooperative and both them pursued dairying as a subsidiary occupation.

Of the 25 landless, 2 had only C-B calves. Three others had two C-B cows each while the remaining had one C-B cow each with or without C-B calves and other milch animals. The 23 landless had in all 26 C-B cows, seven of which were homebred. In respect of the 19 purchased cows, the average price came to Rs. 4,737 for H.F. C-B and Rs. 4,164 for Jersey C-B cow, which is much higher than the overall average of Rs. 4,265 for H.F. C-B and Rs. 3,300 for Jersey C-B C-B cow. The higher price may be due to subsidy under the IRDP. For 11 C-B cows, they

We shall next compare the average total receipts and total expenditure in respect of the dairy enterprise of the landless with the rest of the dairy farmers. The position is summed up below:

1)	<u>Landless</u>	<u>Irrigated</u>	<u>Others</u>
1) No. of dairy farmers	25	116	112
2) Average surplus for dairy farmer	Rs.	Rs.	Rs.
a) including imputed wages of family labour in total expenditure	1,932	2,009	2,257
b) excluding imputed wages of family labour in total expenditure	3,123	3,463	3,568

On the face of it, it appears that the average surplus per landless dairy farmer is not very much lower than that for the rest of the dairy farmers. It must, however, be mentioned that the total receipts of Rs. 1,89,314 of the landless labourers included Rs. 25,601 on account of sale of milch animals and other animals. We may, therefore, consider the surplus by considering the value of milk production and dung manure on the receipts side. On the expenditure side we shall consider expenditure on feed, fodder and concentrates (excluding such expenditure on calves), veterinary services, medicines, cattle insurance, other expenditure and interest paid or payable on loan taken for the purchase of milch animals, if any. We shall work out the surplus (a) including and (b) excluding value of imputed

We shall next compare the average total receipts and total expenditure in respect of the dairy enterprise of the landless with the rest of the dairy farmers. The position is summed up below:

1)	<u>Landless</u>	<u>Irrigated</u>	<u>Others</u>
1) No. of dairy farmers	25	116	112
2) Average surplus for dairy farmer	Rs.	Rs.	Rs.
a) including imputed wages of family labour in total expenditure	1,932	2,009	2,257
b) excluding imputed wages of family labour in total expenditure	3,123	3,463	3,568

On the face of it, it appears that the average surplus per landless dairy farmer is not very much lower than that for the rest of the dairy farmers. It must, however, be mentioned that the total receipts of Rs. 1,89,314 of the landless labourers included Rs. 25,601 on account of sale of milch animals and other animals. We may, therefore, consider the surplus by considering the value of milk production and dung manure on the receipts side. On the expenditure side we shall consider expenditure on feed, fodder and concentrates (excluding such expenditure on calves), veterinary services, medicines, cattle insurance, other expenditure and interest paid or payable on loan taken for the purchase of milch animals, if any. We shall work out the surplus (a) including and (b) excluding value of imputed

others. If we consider only the expenditure on feed, fodder and concentrates per cow in respect of those having only one C-B cow, it was Rs. 3,514 for the landless, Rs. 2,898 for the irrigated dairy farmers and Rs. 3,336 for others. Obviously, the irrigated dairy farmers incurred less expenditure per cow as compared to others. As we have said earlier, the other dairy farmers perhaps devoted more attention and fed their cows better because the income from dairying was vital to them, unlike the irrigated dairy farmers who could get income from irrigated agriculture and perhaps tended to pay less than desired attention to dairying.

We may next consider the case surplus. If we consider the receipts from milk production and dung manure in respect of 17 landless dairy farmers who had one C-B cow and their cash expenditure (excluding the expenditure on calves) the position is as follows:

	Rs.
Sale of milk	85,790
Dung manure	3,465
Total cash receipts	<u>89,255</u>
Cash expenditure	<u>66,364</u>
Cash surplus for 17 cows	22,891
Average cash surplus per C-B cow	1,346

Since the landless get a subsidy equivalent to fifty per cent of the purchase price, the repayment of the balance of

loan, if taken for purchase of milch animals, could be met from cash surplus. Assuming the purchase price of Rs. 4,750, which price is close to the average for the landless dairy farmers' purchases of H.F. C-B cows, the amount of the loan repayable after deducting 50 per cent subsidy will come to Rs. 2,375. The annual instalment of repayment of Rs. 2,375 in three years at the rate of interest of 11 per cent per annum will be Rs. 972 and if repayable in four years, Rs. 765 per annum. Our survey data showed that most of them had paid or were repaying regularly the bank loan from sale proceeds of milk.

To conclude, we may state that the landless agricultural labourers can also successfully carry on dairy enterprise with C-B cows provided, of course, enough feed and fodder is available in the market for purchase.

Increase in Productivity: The respondents were asked to state if they had any difficulty in raising the productivity of milk of C-B cows. In reply, only 11 per cent of them stated that they had no difficulty while another 7 per cent did not reply. The remaining 82 per cent, i.e. 203 dairy farmers stated their difficulties as follows: Shortage of Green Fodder (129), Shortage of Cattle feed and fodder (39), Shortage of capital (6), Shortage of water (33) and No specific reason (31).

Shortage of green fodder thus appeared to be a constraint in increasing productivity in respect of about two-thirds of the dairy farmers in the sample villages. In particular their

percentage was as high as 89 per cent at Umadei, which is situated in a drought prone area with little irrigated land.

Working Capital: In most of the Milk Cooperatives payment is made to the dairy farmers every fortnight for the milk sold during that period. Most of these cooperatives sold cattle feed on credit and some of them also gave advance to meet household expenses. The instalment for repayment of loan taken, if any, for purchase of milch animals as also dues on account of cattle feed and personal advance are deducted from the fortnightly payment. As we have noted earlier, about 90 per cent of the dairy farmers cultivated land and had some farm produced fodder.

We had asked the dairy farmers to report how they meet their requirement of working capital. About 70 per cent of them could meet day-to-day expenses on dairying from their own resources. About 16 per cent got funds from the Milk Cooperative and another 6 per cent from the tea-shops or traders to meet their working capital requirements. The remaining 8 per cent did not reply and presumably had no difficulty. Thus working capital did not appear to be a constraint in the dairy enterprise.

Expansion of Dairy Enterprise: The respondents were asked to state if they had any plans of expanding their dairy business. 199 out of 253 dairy farmers did not reply. Only 45 dairy farmers stated that they would like to expand it but had some

difficulties. Twenty of them reported shortage of capital, 21 others reported shortage of fodder, 2 more reported shortage of man-power and non-profitability of dairy enterprise as the reason for their inability to expand. Only 9 out of 253 dairy farmers stated that they have no difficulty in expansion of their dairy business. Thus their replies indicate that only about three per cent have no difficulty and about eighteen per cent like to expand their dairy business but cannot do so because of certain constraints. Non-response to the question by the remaining 79 per cent could be presumed as their desire for status quo.

To conclude, we may state that if we are to take the results of the present survey as representative of the situation, they suggest that other dairy farmers including the landless conduct their dairy enterprise more efficiently than irrigated dairy farmers. The possibility that many of the irrigated dairy farmers might have in fact higher milk production and might have sold also to private traders and consumers but not reported it, cannot be ruled out. If such is the situation, the receipts of the irrigated dairy farmers and consequently their surplus will be larger than what appears in the results of the present survey. The other plausible reason is that those who do not have any irrigated land try to get more income from dairying by managing it better than the irrigated dairy farmers.

## CHAPTER VIII

### ECONOMICS OF DAIRYING WITH CROSSBRED COWS (Benefit : Cost Analysis)

We shall consider in the present chapter economics of dairying with C-B cows. One of the objectives of our study is to find out the conditions under which dairying becomes profitable. In that context we propose to work out the benefit:cost ratio for H.F. C-B as well as for Jersey C-B cows owned by the irrigated dairy farmers and others.

#### Benefit:Cost Analysis

For the purpose of benefit:cost analysis at the dairy farmer's level, we will assume that a C-B cow about to calve/ recently calved for the first time is purchased and retained until the end of its fourth lactation. While projecting the population of C-B cows in Maharashtra, the maximum lactations available per cow are considered to be five (Statistical Diary 1980:50). The cow's life expectancy is reckoned at about 12 years out of which about 10 years are productive. In her life time, she may have six to nine calvings. However, we like to consider the period only upto the end of fourth lactation because the dairy farmers in our sample had a majority of the C-B cows in their first to fourth calving. There were few C-B cows in their fifth to ninth calving and were considered inadequate to give representative estimates of inputs and lactation yield. Besides, it is argued that cows, whether C-B or not, are less likely to conceive, whether by A.I. or by



natural cover, after four or five calvings. The other consideration is that by the time the C-B cow reaches the end of the fourth lactation, the dairy farmer may have a second generation homebred C-B cow from the parent cow and may prefer to keep it and dispose off the parent cow.

Keeping the above considerations in mind, we give below the methodology we propose to adopt for the purposes of the benefit:cost analysis.

#### Period of Reference

The period of reference is from the beginning of the first lactation till the end of the fourth lactation of a C-B cow.

#### Prices

We will use the 1984-85 prices (that is, the prices relating to the reference period of the present survey) in respect of all items of receipts and expenditure for the entire period of analysis. We are aware of the limitations of basing the exercise on constant prices but we feel that even then the purpose of the study will be served, namely, to demonstrate the conditions under which dairying with C-B cows becomes profitable.

#### Purchase Price of a Crossbred Cow

We will use the survey data regarding purchases of the C-B cows in their first calving. As noted in Chapter VI,

natural cover, after four or five calvings. The other consideration is that by the time the C-B cow reaches the end of the fourth lactation, the dairy farmer may have a second generation homebred C-B cow from the parent cow and may prefer to keep it and dispose off the parent cow.

Keeping the above considerations in mind, we give below the methodology we propose to adopt for the purposes of the benefit:cost analysis.

#### Period of Reference

The period of reference is from the beginning of the first lactation till the end of the fourth lactation of a C-B cow.

#### Prices

We will use the 1984-85 prices (that is, the prices relating to the reference period of the present survey) in respect of all items of receipts and expenditure for the entire period of analysis. We are aware of the limitations of basing the exercise on constant prices but we feel that even then the purpose of the study will be served, namely, to demonstrate the conditions under which dairying with C-B cows becomes profitable.

#### Purchase Price of a Crossbred Cow

We will use the survey data regarding purchases of the C-B cows in their first calving. As noted in Chapter VI,

reared by the dairy farmer and that this female calf will have its first calving, a male calf, in 30 months and that the male calf does not survive. It is further assumed that the third calf of the parent cow is a male and sold for Rs. 40 (on the basis of the reported sales of male calves in 1984-85) within few days after birth. It is further assumed that the fourth calf is a female and would be less than one year old by the time the parent cow reaches the end of the fourth lactation. Based on the data regarding inter-calving period we summarise below our above mentioned assumptions.

Calf born in the month from purchase of the parent cow	Sex of the calf of the parent cow	Irrigated farmers		Others	
		H.F. C-B	Jersey C-B	H.F. C-B	Jersey C-B
1st calf	Male	Born in a few days after purchase			
2nd calf born in	Female	14th	14th	13th	13th
3rd calf born in	Male	27th	27th	25th	25th
4th calf born in	Female	39th	40th	30th	38th
The second (female) calf calves for the first time in the		43rd	43rd	42nd	42nd
<b>M O N T H S</b>					
and will be in milk until the end of the 4th lactation of parent animal for		4	6	2	4
The age of the 4th (female) calf until the end of the 4th lactation of the parent animal will be		9	10	8	8
Total period for the benefit:cost exercise		47	49	44	46

Value of the Parent Cow and Female Calves  
at the End of 4th Lactation

As for the parent cow, we have only a few cases of purchases of cows in their fifth calving but a slightly larger number of cases in the fourth calving. From Chapter VI, Table 6.3 we find that there were 23 purchases of H.F. C-B and 5 purchases of Jersey C-B cows in their fourth calving. Taking these into consideration we decided in a somewhat arbitrary way, the value of the H.F. C-B cow at the end of the 4th lactation as Rs. 3,500 and of the Jersey C-B cow as Rs. 3,000.

As regards the C-B cow of the second generation, since it would be in its first calving at the end of the fourth lactation of the parent cow, the value of the H.F. C-B and Jersey C-B cow is assumed to be Rs. 4,300 and Rs. 3,300 respectively (which is the same as the purchase price of the parent cow).

As regards the other female calf which would be about 9 months old towards the end of the fourth lactation of the parent animal, we have assumed that the expenditure on rearing during that period will be Rs. 900. On the basis of Table 5.3 we noted that, of the female calves born, about 18 per cent died. We do not have data regarding percentage of deaths in the first, second or third year. Hence we will add 18 per cent of Rs. 900 to cover the risk factor, bringing the value of the calf to about Rs. 1065.

reared by the dairy farmer and that this female calf will have its first calving, a male calf, in 30 months and that the male calf does not survive. It is further assumed that the third calf of the parent cow is a male and sold for Rs. 40 (on the basis of the reported sales of male calves in 1984-85) within few days after birth. It is further assumed that the fourth calf is a female and would be less than one year old by the time the parent cow reaches the end of the fourth lactation. Based on the data regarding inter-calving period we summarise below our above mentioned assumptions.

Calf born in the month from purchase of the parent cow	Sex of the calf of the parent cow	Irrigated farmers		Others	
		H.F. C-B	Jersey C-B	H.F. C-B	Jersey C-B
1st calf	Male	Born in a few days after purchase			
2nd calf born in	Female	14th	14th	13th	13th
3rd calf born in	Male	27th	27th	25th	25th
4th calf born in	Female	39th	40th	30th	38th
The second (female) calf calves for the first time in the		43rd	43rd	42nd	42nd
<u>MONTHS</u>					
and will be in milk until the end of the 4th lactation of parent animal for		4	6	2	4
The age of the 4th (female) calf until the end of the 4th lactation of the parent animal will be		9	10	8	8
Total period for the benefit;cost exercise		47	49	44	46

Value of the Parent Cow and Female Calves  
at the End of 4th Lactation

As for the parent cow, we have only a few cases of purchases of cows in their fifth calving but a slightly larger number of cases in the fourth calving. From Chapter VI, Table 6.3 we find that there were 23 purchases of H.F. C-B and 5 purchases of Jersey C-B cows in their fourth calving. Taking these into consideration we decided in a somewhat arbitrary way, the value of the H.F. C-B cow at the end of the 4th lactation as Rs. 3,500 and of the Jersey C-B cow as Rs. 3,000.

As regards the C-B cow of the second generation, since it would be in its first calving at the end of the fourth lactation of the parent cow, the value of the H.F. C-B and Jersey C-B cow is assumed to be Rs. 4,300 and Rs. 3,300 respectively (which is the same as the purchase price of the parent cow).

As regards the other female calf which would be about 9 months old towards the end of the fourth lactation of the parent animal, we have assumed that the expenditure on rearing during that period will be Rs. 900. On the basis of Table 5.3 we noted that, of the female calves born, about 18 per cent died. We do not have data regarding percentage of deaths in the first, second or third year. Hence we will add 18 per cent of Rs. 900 to cover the risk factor, bringing the value of the calf to about Rs. 1065.

### Lactation Yield

We have used the data in Tables 7.3 and 7.4 regarding lactation yield to estimate the milk yield. For the sake of convenience we have rounded it off to ten's of litres.

### Value of Milk Production

During the reference period the price received for cow milk by the dairy farmers was Rs. 2.80 to Rs. 3.00 per litre. We have assumed it as Rs. 3 per litre to arrive at the value of the total milk production.

### Value of Dung Manure

We calculated from the survey data the average value of dung manure per C-B cow. It came to Rs. 260 per C-B cow per year in the case of the irrigated dairy farmers and Rs. 185 in the case of others.

Similarly the average value of dung manure in the case of calves was worked out. It came to Rs. 230 and Rs. 175 in the case of the irrigated dairy farmers and others respectively. We decided to take the annual average value of the dung manure of the female calves during the reference period without making any distinction in its annual variation. We are aware that the value would increase from year to year but, rather than estimating it in an arbitrary manner, we thought we may take the annual average value for the period under reference.

Cost of Feed, Fodder and Concentrates

This includes value of home-grown as well as purchased fodder and expenditure on cattle feed and concentrates. We have used the survey data as shown in Table 8.1 regarding expenditure on rearing C-B cows and female calves (Ref. Chapter V) reported by the sample dairy farmers.

**Table 8.1:** Expenditure on Feed, Fodder and Concentrates per Month in Different Lactations in Respect of H.F. and Jersey Crossbred Cows Owned by Irrigated Dairy Farmers and Other Dairy Farmers

Lactation	Expenditure on Feed, Fodder and Concentrates			
	Irrigated Dairy Farmers		Other Dairy Farmers	
	H.F. C-B	Jersey C-B	H.F. C-B	Jersey C-B
	av. p.m.	av. p.m.	av. p.m.	av. p.m.
	Rs.	Rs.	Rs.	Rs.
First	274	231	276	283
Second	311	219	303	300
Third	303	239	338	262
Fourth	380	290	318	342

Value of Milk Fed to Calves

The value of milk fed to female calves since birth for some months is included in the cost of feed, fodder and concentrates given to them.

Other Expenditure

The dairy farmers incurred expenditure on such items as A.I., veterinary services, insurance, transport and other



miscellaneous items. In the total expenditure incurred, the other expenditure excluding imputed wages of family labour, salaries of servants in the dairy enterprise and interest on loan for purchase of milch animals formed about eight per cent of the total expenditure in the case of irrigated dairy farmers and seven per cent in respect of others. Hence we have calculated the other expenditure as a percentage of the expenditure on feed, fodder and concentrates as above and included it in the item of feed, fodder and concentrates.

Depreciation on Capital Expenditure  
Excluding Crossbred Cow

The dairy farmers had incurred capital expenditure on construction of cattle sheds in one of the years in the past fifteen years. Besides, the construction of cattle sheds was not uniform, some structures being pucca and others temporary. As such it was not possible to calculate with fair accuracy and include depreciation on cattle sheds in the present exercise.

The other items of capital expenditure included purchases of ropes and chains and expenditure on breeding cows. This type of expenditure except on A.I. was reported to have been incurred once in every few years. Hence it was included in other expenditure and subsequently in the total expenditure.

Depreciation/Appreciation in the  
Value of Crossbred Cows

We have earlier indicated the manner in which we propose to consider the value of the parent animal and its female calves.

As such value takes into account depreciation or appreciation of the cow and calves, it is felt that it is not necessary to consider separately depreciation or appreciation in their value in the interim period.

#### Imputed Value of Family Labour

In Chapter IV, we have given information regarding the number of days the members of the family worked in the dairy enterprise. We arrived at the imputed value of family labour by applying a wage rate of Rs. 10 a day for male labour and Rs. 5 a day for female labour. On an average each family had one male and one female adult working in dairy enterprise and each of them worked for 85 days and 100 days respectively in a year on an average. The imputed wages of family labour per year came to Rs. 850 for male labour and Rs. 500 for female labour i.e. total Rs. 1,350. This includes rearing the calf/calves of the parent cow. We are aware of the fact that a majority of the dairy farmers had other milch animal also. However, the work load does not increase in the same proportion as increase in the number of milch and draught animals. We are also aware of the fact that the average number of days of family labour we assume in the present exercise is slightly an overestimate. However, we can keep this in mind when we consider the benefit:cost ratios worked out separately (a) net of, and (b) gross of imputed value of family labour in the total expenditure.

Annual Farm Servants:

There were only 22 annual farm servants reported in a sample of 253 dairy farmers. It is not essential to appoint a servant for dairying if there is enough labour force in the family. Hence in the present analysis we have not included expenditure on annual farm servants.

Items of Receipts and Expenditure

We have indicated in the preceding paragraphs as to how we propose to deal with various items of receipts and expenditure. In the final analysis we have included the following items:

Receipts Side : Milk yield and dung manure of the Parent Animal, Sale of male calf, milk yield of the second generation and dung manure of the second and third generation and finally value of the parent animal, cow of the second generation and the female calf of the third generation at the end of the fourth lactation of the parent cow.

Expenditure Side: Expenditure on purchase of a C-B cow, expenditure on feed, fodder and concentrates including other expenditure on the parent cow, the second generation cow and the female calf and finally, imputed value of family labour.

Benefit:Cost Ratio : We have added the various items of receipts and expenditure and found out the annual discounted value at an interest rate of 11 per cent to know the present worth of the total benefit. The reason for discounting at 11 per cent is that the rate of interest on loans taken for purchase of C-B cows from

the banks varied between 10 to 12 per cent per annum. The data are presented in Tables 8.2 to 8.5.

By dividing the present worth (annual discounted values) of benefit by the present worth of cost, we arrived at the following benefit:cost ratios :

Benefit:cost Ratio as Discounted at an Interest  
Rate of 11 per cent

	<u>H.F. C-B cows</u>	<u>Jersey C-B cows</u>
Irrigated dairy farmers	1.49	1.45
Other dairy farmers	1.52	1.19

The benefit:cost ratio of about 1.5 in respect of H.F. C-B cows is about the same in respect of both the irrigated dairy farmers as well as other dairy farmers. This suggests that those who do not have any irrigated land can also manage their dairy enterprise as efficiently as the irrigated dairy farmers, provided of course, there is enough feed and fodder available for purchase in the market.

The benefit:cost ratio for Jersey C-B cows is also about 1.5 in respect of irrigated dairy farmers but only a little lower i.e. 1.2 in respect of other dairy farmers. This may be due to

the banks varied between 10 to 12 per cent per annum. The data are presented in Tables 8.2 to 8.5.

By dividing the present worth (annual discounted values) of benefit by the present worth of cost, we arrived at the following benefit:cost ratios :

Benefit:cost Ratio as Discounted at an Interest  
Rate of 11 per cent

	<u>H.F. C-B cows</u>	<u>Jersey C-B cows</u>
Irrigated dairy farmers	1.49	1.45
Other dairy farmers	1.52	1.19

The benefit:cost ratio of about 1.5 in respect of H.F. C-B cows is about the same in respect of both the irrigated dairy farmers as well as other dairy farmers. This suggests that those who do not have any irrigated land can also manage their dairy enterprise as efficiently as the irrigated dairy farmers, provided of course, there is enough feed and fodder available for purchase in the market.

The benefit:cost ratio for Jersey C-B cows is also about 1.5 in respect of irrigated dairy farmers but only a little lower i.e. 1.2 in respect of other dairy farmers. This may be due to

As is to be expected, after including in the total expenditure imputed wages of family labour, we come up with a lower benefit:cost ratio. Even then, except in the case of other dairy farmers with Jersey C-B cows, where it is almost 1.0, in all other cases it is about 1.2. This indicates that even with Jersey C-B cows, dairy enterprise is profitable, whether or not the dairy farmers have irrigated land.

As is to be expected, after including in the total expenditure imputed wages of family labour, we come up with a lower benefit:cost ratio. Even then, except in the case of other dairy farmers with Jersey C-B cows, where it is almost 1.0, in all other cases it is about 1.2. This indicates that even with Jersey C-B cows, dairy enterprise is profitable, whether or not the dairy farmers have irrigated land.

Table 8.2: (Continued)

(B) Expenditure (in Rs.)

	Lactation No.				Total
	First	Second	Third	Until the end of 4th lactation	
Period in months	13	13	12	9	47
<u>Parent Animal</u>					
Purchase of a C-B cow	4,300	-	-	-	4,300
Feed, fodder and concentrates and other expenditure	3,846	4,365	3,928	3,694	15,833
<u>2nd Generation</u>					
C-B cow : milk fed, feed, fodder, concentrates and other expenditure	-	1,125	1,451	1,789	4,365
<u>3rd Generation</u>					
Female calf: milk fed, feed, fodder, concentrates and other expenditure	-	-	-	753	753
Total expenditure	8,146	5,490	5,379	6,236	25,251
<u>Present Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	11 months of 4th	
Rs.	6,774	4,279	3,895	4,645	19,593



Table 8.2: (Continued)

(B) Expenditure (in Rs.)

	Lactation No.				Total
	First	Second	Third	Until the end of 4th lactation	
Period in months	13	13	12	9	47
<u>Parent Animal</u>					
Purchase of a C-B cow	4,300	-	-	-	4,300
Feed, fodder and concentrates and other expenditure	3,846	4,365	3,928	3,694	15,833
<u>2nd Generation</u>					
C-B cow : milk fed, feed, fodder, concentrates and other expenditure	-	1,125	1,451	1,789	4,365
<u>3rd Generation</u>					
Female calf: milk fed, feed, fodder, concentrates and other expenditure	-	-	-	753	753
Total expenditure	8,146	5,490	5,379	6,236	25,251
<u>Present Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	11 months of 4th	
Rs.	6,774	4,279	3,895	4,645	19,593

Table 8.3: (Continued)

(B) Expenditure (in Rs.)

	Lactation No.				
	First	Second	Third	Until the end of 4th lactation	Total
Period in months	12	12	11	9	44
<u>Parent Animal</u>					
Purchase of a C-B cow	4,300	-	-	-	4,300
Feed, Fodder, concentrates and other expenditure	3,543	3,893	3,981	3,060	14,477
<u>2nd generation</u>					
C-B cow : milk fed, feed, fodder, concentrates and other expenditure	-	995	1,318	1,430	3,743
<u>3rd generation</u>					
Female calf : milk fed, feed, fodder, concentrates and other expenditure	-	-	-	746	746
Total expenditure	7,843	4,888	5,299	5,236	23,266
<u>Total worth (annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	8 months of 4th	
Rs.	7,066	3,967	4,300	3,115	18,448

**Table 8.4:** Receipts and Expenditure During the Reference Period of a Jersey Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Irrigated Dairy Farmers

(A) Receipts (in Rs.)

	Lactation No.				
	First	Second	Third	Until end of 4th	Total
Period in Months	13	13	13	10	49
<u>Parent Animal</u>					
Milk production	4,725	5,364	6,156	5,397	21,642
Dung manure	282	282	282	217	1,063
<u>2nd Generation C-B Cow</u>					
Milk production	-	-	-	2,362	2,362
Dung manure	-	190	190	188	568
<u>3rd Generation Female Calf</u>					
Dung manure	-	-	-	146	146
Sale of male calf	-	-	40	-	40
Value of Parent Cow and the Calves at the end of 4th Lactation	-	-	-	7,365	7,365*
Total receipts	5,007	5,836	6,668	15,675	33,186
<u>Present Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	4th and One month of 5th	
Rs.	4,135	4,346	4,407	5,940 5,241	24,069

\* Including Rs. 3,000 being the value of the parent cow, Rs. 3,300 of the second generation crossbred cow and Rs. 1.065 of the second female calf.

Table 8.4: (Continued)

(B) Expenditure (in Rs.)

	Lactation No.				
	First	Second	Third	Until end of 4th	Total
Period in Months	13	13	13	10	49
<u>Parent Animal</u>					
Purchase of a C-B cow	3,300	-	-	-	3,300
Feed, Fodder and Concentrates and Other Expenditure	3,240	3,079	3,352	3,132	12,803
<u>2nd Generation</u>					
C-B Cow : Milk fed, Feed, Fodder, Concentrates and Other Expenditure	-	1,125	1,572	1,981	4,678
<u>3rd Generation</u>					
Female Calf : Milk fed, Feed, Fodder, Concentrates and Other Expenditure	-	-	-	837	837
Total Expenditure	6,540	4,204	4,924	5,950	21,618
<u>Present Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	4th and one month of 5th	
Rs.	5,439	3,295	3,242	4,276	16,630
				378	

**Table 8.5: Receipts and Expenditure During the Reference Period of a Jersey Crossbred Cow and Its Followers and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of Other Dairy Farmers**

(A) Receipts (in Rs.)

	Lactation No.				
	First	Second	Third	Until end of 4th	Total
Period in Months	12	12	13	9	46
<u>Parent Animal</u>					
Milk Production	4,893	4,419	5,400	5,016	19,728
Dung Manure	260	260	282	195	997
<u>2nd Generation</u>					
<u>C-B Cow</u>					
Milk Production	-	-	-	1,631	1,631
Dung Manure	-	175	190	160	525
<u>3rd Generation</u>					
<u>Female Calf</u>					
Dung Manure	-	-	-	131	131
Sale of Male Calf	-	-	40	-	40
Value of Parent Cow and its Calves at the End of 4th Lactation	-	-	-	7,365	7,365*
Total Receipts	5,153	4,854	5,912	14,498	30,417
<u>Present Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	10th months of 4th	
Rs.	4,624	3,940	3,657	9,827	22,048

\* Including Rs. 3,300 being the value of the parent cow, Rs. 3,000 of the second generation crossbred cow and Rs. 1,065 of the second female calf.

Table 8.5: (Continued)

(B) Expenditure (in Rs.)

	Lactation No.				
	First	Second	Third	Until end of 4th	Total
Period in months	12	12	13	9	46
<u>Parent Animal</u>					
Purchase of a C-B Cow	3,300	-	-	-	3,300
Feed, Fodder, Concentrates and Other Expenditure	3,634	3,852	4,763	3,101	15,350
<u>2nd Generation</u>					
C-B Cow : Milk Fed, Feed, Fodder, Concen- trates and Other Expenditure	-	995	1,558	1,810	4,363
<u>3rd Generation</u>					
Female Calf : Milk fed, Feed, Fodder, Concen- trates and Other Expenditure	-	-	-	746	746
<u>Total Expenditure</u>	6,934	4,847	6,321	5,657	23,759
<u>Total Worth (Annual Discounted Value at 11%)</u>					
Year	1st	2nd	3rd	10th months of 4th	
Rs.	6,247	3,934	4,296	4,037	18,514

## CHAPTER IX

### SUMMARY

The present study regarding Economics of Dairying with Crossbred Cows in Western Maharashtra was taken up in December 1984 in the Agro-Economic Research Centre of the Ministry of Agriculture located at the Gokhale Institute of Politics and Economics, Pune. The objectives of the study were (1) to take a stock of A.I. and Crossbreeding services rendered by the State Government, RAIF and other agencies since 1970-71 when the crossbreeding programme was introduced and (2) to carry out a sample survey of dairy farmers in Western Maharashtra who conduct dairying with C-B cows to find out (i) the conditions under which dairying becomes profitable, (ii) cost of rearing C-B calves until their first calving, (iii) veterinary and other care such cattle need, (iv) financial and other constraints and (v) examine conditions under which it is not possible to successfully conduct dairying with such cattle and (vi) in particular, to examine the performance of dairy farmers having some irrigated land vis-a-vis those who have only dry land or those who are landless and who own C-B cows.

For the purposes of review of work done by the State Government and other agencies, data from their records was obtained for the period 1970-71 to 1984-85. Though the programme of A.I. and crossbreeding was taken up by the A.H. Department in 1970-71, it gathered momentum after 1975, and

particularly in the 'eighties. In 1984-85, about 6.8 lakhs A.I. were done by the A.H. Department. A fair estimate of the work done by the other agencies could not be worked out but it is estimated to be about two lakh A.I. in that year. For each successful conception, three to four A.I. are required to be given on an average. Of the total C-B calves born in a year, about 30 per cent of them reach their first calving in about thirty months. In the work done by the A.H. Department, about 1,46,000 C-B calves were reported born in 1984-85 which means that after about thirty months, these will add about 43,800 C-B cows to the existing stock. To this, we may add another about 17,500 C-B cows coming from A.I. done by other agencies in 1984-85. Thus, as a result of about eight lakh A.I. done in 1984-85, about 61,300 C-B cows will be added in the year 1987-88.

As per the Livestock Census of 1982, there were 2,08,174 C-B cows in Maharashtra State, of which about sixty per cent were in milk. The A.I. and crossbreeding programme was mainly carried out in Western Maharashtra. The intensification of the programme, particularly in other parts of the State, will depend upon the number of C-B cows the feed and fodder resources can sustain and whether it will be possible to market incremental milk that may be obtained due to intensification of the crossbreeding programme. The Government will have to review the situation and take necessary policy decisions in this regard.



For the purpose of the survey, a sample of 253 dairy farmers having C-B cows/calves from six villages in Pune, Sangli and Solapur districts was selected. 116 of these dairy farmers had some irrigated land, 112 were dry land cultivators and 25 were landless. Information regarding their dairy enterprise for the period December 1983 to November 1984 was obtained between December 1984 and June 1985 in a single visit by canvassing a schedule. Three of the sample villages have an annual rainfall of less than 600 mms. The area under irrigated crops in these villages formed between one to six per cent of the gross-cropped area. In the remaining three villages, the area under irrigated crops formed between 16 to 36 per cent of the gross-cropped area. Except one village where the Milk Cooperative was defunct, in all the other villages the Milk Cooperatives were functioning efficiently.

Dairy was reported as subsidiary occupation by 95 per cent of the dairy farmers. Most of them (90 per cent) had taken to dairying in the 'seventies. On an average 2 persons per family worked in the dairy enterprise. The average number of days they worked in a year in dairying was 85 days in the case of male and 100 days in the case of female adults. Almost all of them continued to work in their previous occupations after they took to dairying. Hence the opportunity cost of their labour is considered zero.

Of the 253 dairy farmers in the sample, 21 dairy farmers had only C-B calves, with or without other milch animals.

Of the remaining, 78 per cent had one C-B cow, 20 per cent had two C-B cows and in the remaining 2 per cent, 5 dairy farmers had 3 each and only one dairy farmer had four C-B cows along with or without other milch animals.

Of the 228 cultivator-dairy farmers, 52 had upto one ha. of land while 71 others had upto 2 ha. land i.e. 53 per cent were small or marginal farmers. About 40 per cent had between 2 ha. to 5 ha. of cultivated holding.

112 of the total dairy farmers had irrigated land, 51 per cent having upto one ha., 33 per cent between one and two ha. and the remaining having more than 2 ha. of irrigated land. The dairy enterprise during the reference year showed that 92 per cent of the dairy farmers had excess of income over expenditure. The remaining 8 per cent, who showed deficit, had either only C-B calves or their milch animals were not in milk for most of the period during the reference year.

The facilities for A.I. were available locally or at a nearby village. The average number of A.I. per conception came to 1.7 of the C-B cows owned by the sample dairy farmers. Normally, as reported by the A.H. Department, 3 to 4 A.I. are required per conception. Most of the dairy farmers had their C-B cows in the first to fourth calving and as such they had no experience to state whether or not such cows conceive by A.I. after the fourth calving.

Only eight dairy farmers owned C-B bullocks. Most of the others considered that C-B bullocks were not suitable as draught cattle. Hence the male calves were neglected. About sixty per cent of the male calves born died and the remaining were sold or given away free. In the case of the female calves born, only 19 per cent died, 55 per cent were retained at home and the rest were sold. The cost of rearing C-B calves until their first calving upto about 30 months same to Rs. 3,000 per calf. Of this, about 40 per cent was in cash.

As regards veterinary and other care of the C-B cows, most of them were kept in cattle sheds, though majority of the structures were temporary. Except the vaccination and frequent bathing, no special care was taken of the C-B cows.

Of the total of 291 C-B cows, the dairy farmers had in November 1984, 82 were homebred and 209 cows were purchased. The average purchase price of Holstein-Friesien (H.F.) and Jersey C-B cows at first calving was Rs. 4,265 and Rs. 3,300 respectively. Of the total expenditure on purchases of C-B cows, one-third was met from own resources, 55 per cent from loans from the banks/Government and the remaining from sale of cattle or short term borrowings. 33 C-B cows and 19 C-B calves were sold in 1984 at an average price of Rs. 3,563 and Rs. 1,826 respectively.

The average inter-calving period of H.F. C-B cows was 12.6 months in the case of irrigated dairy farmers and 11.7

Only eight dairy farmers owned C-B bullocks. Most of the others considered that C-B bullocks were not suitable as draught cattle. Hence the male calves were neglected. About sixty per cent of the male calves born died and the remaining were sold or given away free. In the case of the female calves born, only 19 per cent died, 55 per cent were retained at home and the rest were sold. The cost of rearing C-B calves until their first calving upto about 30 months same to Rs. 3,000 per calf. Of this, about 40 per cent was in cash.

As regards veterinary and other care of the C-B cows, most of them were kept in cattle sheds, though majority of the structures were temporary. Except the vaccination and frequent bathing, no special care was taken of the C-B cows.

Of the total of 291 C-B cows, the dairy farmers had in November 1984, 82 were homebred and 209 cows were purchased. The average purchase price of Holstein-Friesien (H.F.) and Jersey C-B cows at first calving was Rs. 4,265 and Rs. 3,300 respectively. Of the total expenditure on purchases of C-B cows, one-third was met from own resources, 55 per cent from loans from the banks/Government and the remaining from sale of cattle or short term borrowings. 33 C-B cows and 19 C-B calves were sold in 1984 at an average price of Rs. 3,563 and Rs. 1,826 respectively.

The average inter-calving period of H.F. C-B cows was 12.6 months in the case of irrigated dairy farmers and 11.7

on an average four cart loads, for fuel. Only 10 out of 253 dairy farmers had a Gobar Gas Plant and 8 more stated that they proposed to install one soon.

During the reference year, the average milk production reported by an irrigated dairy farmer was about 2,640 lts. and 2,450 lts. in the case of others. Eighty two per cent of total milk production was sold, 14 per cent was consumed at home and the remaining 4 per cent was fed to calves.

As regards the receipts from and expenditure on dairy enterprise, we included in the receipts, value of total milk production and of dung of milch animals, as also receipts from sale of milch and other animals. On the expenditure side we included expenditure on feed and fodder, transport of milk, veterinary aid and medicines, insurance premium, salary of servants if any, imputed wages of family labour and expenditure on ropes, buckets, etc., which need to be replaced in a year or two. On an average, the irrigated dairy farmers were left with a cash surplus of Rs. 2,136 and other dairy farmers Rs. 2,065. After excluding the imputed value of family labour from the total expenditure, the average total surplus stood enhanced to Rs. 3,464 in the case of the former and Rs. 3,487 in the case of the latter. The average surplus in the case of those who had only C-B cows was also higher in the case of other dairy farmers. These results are contrary to our expectation and also contrary to survey data regarding lactation yield in previous lactations where it was seen that the irrigated dairy farmers reported

greater lactation yield as compared to other dairy farmers. We had no authentic record of sale of milk to others. It is likely that the irrigated dairy farmers failed to report, intentionally or otherwise, sale of milk to others. The other reason is, perhaps the other dairy farmers considered dairy enterprise as an important source of supplementary income and as such tried their best to get maximum income therefrom. The average cash surplus during the reference year per C-B cow came to Rs. 2,136 in the case of irrigated dairy farmers and Rs.2,065 in the case of others. For the landless, it was Rs. 1,306. The cash surplus was adequate to repay the loan in three years taken for purchase of the cow and yet they had some cash surplus to meet the family expenditure.

The cost of milk production came to about Rs. 1.80 per litre as against Rs. 2.80 to 3.00 per litre at which milk was purchased by the Cooperatives under the Government Milk Scheme. The cash surplus indicated that the other dairy farmers can repay loan (Rs. 4,300 for H.F. and Rs. 3,300 for Jersey C-B cows) in three annual instalments at the rate of interest at 11 per cent per annum. As our survey data revealed smaller cash surplus, the irrigated dairy farmers would need five years to repay the loan. However, as stated earlier, the irrigated dairy farmers might have under-reported their sales of milk to others and as such they should also be in a position to repay the loan in three years.

As regards the landless, their performance was a shade inferior to that of the dry land dairy farmers but they could also run the dairy enterprise profitably. Since they were eligible for 50 per cent subsidy on purchase of C-B cow, they were also in a position to repay the loan in three years and yet left with a few hundred rupees for family expenditure.

Finally, we consider the benefit:cost ratio in respect of the C-B cows. We assumed purchase of a C-B H.F. cow at Rs. 4,300/- and Jersey C-B cow at Rs. 3,300/- recently calved or due to calve for the first time and estimated the receipts and expenditure upto the end of its fourth lactation.

On the receipts side, we included for the reference period value of total milk production and dung of the parent cow and cow of the second generation and dung of the female calf of the third generation and also sale of the male calf born of the fourth calving. The male calf born at the first calving was assumed dead. At the end of the fourth lactation, we included the re-sale value of the parent cow, cow of the second generation and female calf of the third generation.

On the expenditure side, we included the expenditure on the parent animal and the female calves born in the second and third generation on feed, fodder and concentrates (including farm produced fodder) and other expenditure. We also included the capital expenditure on purchase of cow on the expenditure side. We did not include interest on loan, depreciation on

cattle shed, etc., and imputed wages of family labour or salary of servant assuming that the dairy enterprise can be managed by family labour.

We found out the present worth of the total receipts and total expenditure at an interest rate of 11 per cent at which the bank loans for purchase of milch animals are given. By dividing the present worth of benefit by present worth of cost, we arrived at the benefit:cost ratio. It came to about 1.5 for H.F. and Jersey C-B cows in respect of the irrigated dairy farmers. It was 1.5 for H.F. and about 1.2 for Jersey C-B cows in the case of other dairy farmers. After including the imputed wages of family labour in the total expenditure, the benefit:cost ratio declined to 1.2, except in the case of Jersey C-B cows with other dairy farmers where it was about 1.00.

The present survey thus revealed that the dry land farmers as also the landless can conduct dairy enterprise with C-B cows profitably. The major constraint is green fodder. All the C-B cows except four per cent, whether owned by the irrigated dairy farmers or others, were given green fodder. However, of the latter, who did not give as much green fodder as the former gave to their cows, seem to have made up the deficiency partly by giving cattle feed and concentrates. Our data also shows that dairying with C-B cows seems to have been accepted by the dairy farmers. The A.I. work being done by the A.H. Department of the State Government, the BAIF and other agencies also shows that



crossbreeding of cows is now accepted in Western Maharashtra. However, it is necessary for the State Government to take a policy decision in the matter of intensification of the crossbreeding programme in the light of the availability of the fodder supply and problem of marketing of cow milk.

crossbreeding of cows is now accepted in Western Maharashtra. However, it is necessary for the State Government to take a policy decision in the matter of intensification of the crossbreeding programme in the light of the availability of the fodder supply and problem of marketing of cow milk.