

**ECONOMICS OF DAIRYING WITH CROSS-  
BRED COWS IN WESTERN MAHARASHTRA**

**AGRO-ECONOMIC RESEARCH CENTRE  
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## Preface

The present study regarding Economics of Dairying with Cross-bred Cows in Western Maharashtra was taken up in December 1984 in the Agro-Economic Research Centre of the Ministry of Agriculture located at our Institute. We were prompted to take up this study as an earlier study we had carried out, namely, Evaluation of an Integrated Dairy Development Programme in Warnanagar, Kolhapur district, Maharashtra State, revealed that dairying with milch animals of local non-descript breeds, particularly cows was not economic. However, a small number of cross-bred cows in the sample indicated that returns from dairying with such cattle would be rewarding. In recent years, as a result of the efforts of the State Government and other agencies, the number of cross-bred cows, particularly in Western Maharashtra, has been increasing rapidly. We, therefore, thought that it will be useful to take a stock of the Artificial Insemination and Cross-Breeding programmes of the State Government and other agencies, particularly in the last ten years and study the conditions under which dairying with cross-bred cows becomes profitable and also the reasons which prevent many of the milk producers from buying such cattle.

Originally we had thought of examining the economics of graded-up buffaloes also. However, it was not possible to select a sample of villages where we could get in adequate numbers cross-bred cows as well as graded-up buffaloes. Hence we had to confine the present study to cross-bred cows. Our sample of dairy farmers includes cultivators having some irrigated land, also those who cultivate only

dry land and some landless agricultural labourers.

During the course of fieldwork we found that some of the farmers were unable to tell whether the cross-bred cow they had was Holstein or Jersey. Many of them had also difficulty in reporting with fair accuracy the lactation length and lactation yield, particularly in respect of the lactations preceding the years of the survey. Our field staff tried to collect as much reliable information as they could possibly get. A solution to such a problem is to use the Cost Accounting Method which is both time consuming and expensive and can cover only a small sample within limited resources. Hence we feel that the results of the present sample survey of about 250 dairy farmers would be of interest and use in understanding the economics of dairying with cross-bred cows and constraints and conditions under which it is not possible to successfully conduct dairying with such cattle.

The Field Inspector and Field Investigators in the Agro-Economic Research Centre carried out the fieldwork. The staff in the Statistical Section carried out computer processing and some hand-tabulation of data. Without these staff members and the typists who rendered their cooperation and services, it would not have been possible for me to complete the research project within the stipulated period of fourteen months. I am thankful to all of them.

I also like to thank the staff of the Animal Husbandry Department of the State Government at its Directorate as also the officers and staff at the selected districts, the Bharatiya Agro Industries Foundation and others who extended their cooperation and made available necessary information for the purpose of the present study.

D.P.Apte

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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 Warananagar in Kolhapur district of Maharashtra State was carried out in 1981 (Apte: 1982). It revealed that dairying with a cow of local, non-descript breed is not economic. In respect of the cross-bred cows, however, it was found that returns from dairying were more than adequate for repayment of loan taken, if any, for the purchase of a cross-bred cow. The sample selected for the Warna Study was small and did not have in it adequate numbers of exotic or cross bred cows. As such it was not possible to examine in that study the economics of dairying under artificial insemination (A.I.) and cross bred cows. A study of this problem deserves attention also because of the government's policy during the last fifteen years to improve the breeds of cows with a view to generate more milk supply under the Operation Flood Programme. In Maharashtra State, the Directorate of Animal Husbandry of the State Government has been carrying out on a large scale programme of A.I. and cross-breeding of cows and grading up of buffaloes. Besides, the Bharatiya Agro Industries Foundation (BAIF), situated at Uruli Kanchan in Pune district is also engaged in such a programme in different parts of the country including Maharashtra State. A few Sugar 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 cross-bred cows are to be

found only in certain pockets in some of the districts and not uniformly all over the State. During the last ten years, under various schemes of finance (for purchase of milch cattle) 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 the cross-bred animals, their inability 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 cross-bred cows becomes profitable and the reasons which prevent many of the milk producers from buying such cattle and rearing calves born of cross-bred animals 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 cross-breeding services rendered by the State Government, the BAIF, the Cooperative Sugar Factories and such other agencies in Maharashtra State during the last ten years and review the performance.

2. To carry out a sample survey, in select rural areas of Maharashtra State, of the 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 exotic/cross-bred cows and graded-up buffaloes. The sample 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 calves born from A.I./cross-breeding until their first calving, the veterinary and other care such cattle need, financial and other constraints and examine conditions under which it is not possible to successfully conduct dairying with such cattle. In particular, we propose to examine the performance of dairy farmers having some irrigated land vis-a-vis those who have only dry land as also the landless, who own cross-bred cows.

### Scope of the Study

As far as the programmes of A.I. and cross breeding carried out under the schemes of the State Government BAIF and other agencies are concerned, it was proposed to collect whatever data available from their records for the last

10 to 15 years. The State Government's programmes of A.I. and cross-breeding include (1) Intensive Cattle Development Programme, (2) Key Village Centres, (3) District AI Centres, (4) Veterinary Hospitals, (5) Veterinary Polyclinics and (6) A.I. Sub Centres of Zilla Parishads.

Conventionally, 'cross-breeding' is considered to include cross-breeding with exotic cows, such as for instance, Holstein cows with local breeds. The cross-breeding with high yielding Indian breeds of cows with local non-descript breeds is considered as 'grading up'. In this sense there is no cross-breeding in the case of buffaloes but it is 'grading up' only with Mehsana, Surti and such other high yielding buffaloes. The schemes of the Directorate of Animal Husbandry of the State Government include the programme of grading up of buffaloes also. Hence, it was decided to take a stock of the work done by the State Government, B.A.I.F. and other agencies in Maharashtra and review their performance in the matter of A.I. and cross-breeding, veterinary aid, etc. Data are available in adequate details for the years 1976-77 to 1983-84. As for the years prior to 1976-77 it was decided to use whatever data available for the purpose of the review.

As for the sample survey of the dairy farmers, who conduct dairying with exotic, cross-bred cows and up-graded buffaloes, it was proposed to confine it to a sample of 250 dairy farmers in select areas in Western Maharashtra. The data regarding A.I. by the government agencies for the year 1982-83 indicate that majority of the calves born are reported in Ahmednagar, Pune, Satara, Sangli and Kolhapur districts. Hence the sample survey is confined to some

selected pockets in Pune and Sangli districts and for dairying in dry-regions to a sample regions from Solapur district.

### Methodology

1) For the purpose of review of the work done by the Directorate of Animal Husbandry, Maharashtra State, the BAIF and other agencies, the data already published as also data available in their records was obtained. The research staff also discussed with the officers of these agencies the problem to benefit from their experience in the matter of their A.I. and cross-breeding programmes. Though it was proposed to carry out a few case studies of the AI sub-centres/centres of the State Government, B.A.I.F. and the Cooperative Sugar Factory at Akluj in Malshiras taluka in Solapur district to get information about implementation of the programme, it was not possible to do so for various reasons.

2) For the purpose of the sample survey, it was decided to select a sample of about 250 dairy farmers who owned cross-bred cows and/or calves and/or graded-up buffaloes. It was reported during discussions with the Deputy Director of Animal Husbandry at Pune as also at Miraj and Solapur that a majority of those who own cross-bred 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 cross-bred animals is not as profitable as in the irrigated areas, some dairy farmers in the dry regions find it worthwhile and have

begun rearing cross-bred 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 as one of the irrigated crops. With a view to find out whether absence of sugarcane tops in the green fodder affects productivity and expenditure, we decided to select two villages from Pune district where potato is one of the irrigated crops. Further, to know the economics of dairying with cross-bred cows 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 Animal Husbandry Department to identify the villages which had the above mentioned characteristics.

After selecting six villages from 3 districts, namely Pune, Sangli and Solapur, we proceeded to select a sample of dairy farmers therefrom. In the two villages from Pune district, <sup>Kalamub and Ranjant from Ambegaon tahsil,</sup> we sent our Field Investigators to make a complete census and note against each family <sup>the</sup> and land owned and area irrigated, if any and the number of cross-bred cows and calves and other cows and buffaloes owned by each family. Then we prepared a list of these families which owned cross-bred cows and calves in a descending order according to the number of cross-bred 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 listing in 2 villages from Pune district having about 900 households took 16 man-days. Hence it was not convenient to follow the same method in the two sample villages from Sangli district as the number of households in the two villages was about 2,800 and it would have taken a number of days to carry out the work of listing. We, therefore, asked our investigators to note the names of the dairy farmers who sold milk to the Milk Producers' Cooperatives in the villages and arrange these in a descending order according to the quantity of milk sold by them to the cooperative on the day prior to the Field Investigator's visit to the cooperative for preparing such a list. After preparing such a list at Umadi and drawing the sample, it was found that the sample 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 cross-bred cows and/or calves. However, when the fieldwork was completed in Umadi, it was found that out of the sample of 45 dairy farmers, to whom the schedule was canvassed, only 19 of them owned cross-bred cows and/or calves. Hence in the other village from Sangli district, viz., Nandre, we asked our investigator to sit in the two dairy cooperatives in the village and, when the farmers came to deliver milk, note whether they were local residents of Nandre and whether they owned cross-bred cows and/or calves and/or buffaloes, and the quantity of milk delivered for sale by each farmer on that day. After noting this information from the two dairy cooperatives in the village, we prepared a list of farmers owning (a) one cross-bred cow and (b) two or more cross-bred cows and drew a proportionate random sample of



dairy farmers from (a) and (b).

During discussions with the staff of the Directorate of Animal Husbandry in Solapur District, we were told that the cross-bred 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 cross-bred cows are to be found in large numbers at village, Mandrup, where the State Government's Dry Land Farming Centre is located. Hence, we selected village Mandrup for the purpose of the sample survey. The other village, Antrolli, which is adjacent to Mandrup, was selected because we were told that some, among both dry and irrigated, farmers in this village owned cross-bred cows. The villages finally selected, the number of dry and irrigated sample dairy farmers in each of them and the composition of the herd of their milch cattle, such as, cross-bred cows and calves, local cows and buffaloes owned by them is shown in Table No.1.1 It may be reiterated that though we wanted to study the economics of up-graded buffaloes, our sample did not contain any of such animals. Hence, we could not examine this issue in the present study.

#### 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 <sup>was</sup> is December 1, 1983 to November 30, 1984. The purpose <sup>was</sup> is to work out the receipts and expenditure, net profit, labour days, etc., for

**Table 1.1 : No. of Irrigated Dairy Farmers and Other Dairy Farmers in the Selected Villages According to Number of Cross-bred Cows**

**1 = Irrigated Dairy Farmers**

**2 = Other Dairy Farmers**

No. of cross-bred cows in the herd with or without cross-bred calves and Cows and Buffaloes of Local, Non-descript Breeds	Pune district				Sangli district				Solapur district				Total	
	Kalamb		Ranjani		Umadi		Nandre		Mandrup		Antroli		1	2
	1	2	1	2	1	2	1	2	1	2	1	2		
No cross-bred cow but cross-bred calf/calves	2	3	3	4	1	1	-	-	-	6	-	1	6	15
One cross-bred cow	22	3	18	8	8	5	19	32	12	24	5	24	84	96
Two cross-bred cows	6	-	6	1	3	1	4	11	1	1	3	9	23	23
Three cross-bred cows	2	-	-	-	-	-	-	-	-	-	1	2	3	2
Four cross-bred cows	-	-	1	-	-	-	-	-	-	-	-	-	1	-
<b>Total No. of Dairy Farmers</b>	<b>32</b>	<b>6</b>	<b>28</b>	<b>13</b>	<b>12</b>	<b>7</b>	<b>23</b>	<b>43</b>	<b>13</b>	<b>31</b>	<b>9</b>	<b>36</b>	<b>117</b>	<b>136</b>
														<b>=253</b>

a period of one year. In most of the field investigations the reference year is the agricultural year, viz., June to May or April to March. However, as it was not possible to take up the proposed sample 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 land cultivated and area irrigated, if any; fodder produced on his farm; family members and other working in dairy enterprise, their labour-input for dairying; livestock holding in December 1983 and November 1984; details regarding cross-bred cows and calves, cows of local breed and buffaloes, and, in particular, information regarding purchases of such animals, feeding practices, feed and fodder purchased and cost of feeding and maintenance of the calves from birth until their first calving, as also cost of feeding a milch cattle in one calving cycle as also for the reference period, milk production of each animal in each calving; total milk produced during the reference period and its disposal by way of sale to the Milk Cooperative and private consumers, milk consumed at home and fed to calves; dung manure, sale and death of cattle in the years 1981-82 to 1983-84, cattle insurance, disposal of dead cattle, facilities and experience regarding cross-breeding and A.I. services, 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. The schedule canvassed to the sample families is reproduced in Appendix to Chapter I.

### Time Schedule

The study was designed in August 1984 and our research proposal was sent 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. In the meantime we collected some data from the Directorate of Animal Husbandry and the BAIF. The schedule to be canvassed for the dairy farmers was finalised in November 1984. The field work of the study 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 mainly carried out by the Field Inspector and one Field Investigator.

Though originally we had thought of starting tabulation of data as soon as field-work in one district was complete, we could not do so as the fieldstaff 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 schedules 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 after the schedules were completed in all respects. However, the staff had to be delegated for the field-work of another research project in the Agro-Economic Research Centre. As such 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 <sup>March</sup> February 1986.

The total time taken from the commencement of field-work in December 1984 till completion of the study was about 16 months as <sup>against 14 months</sup> 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 cross-breeding done by the Directorate of Animal Husbandry, the B.A.I.F. and other agencies.

## Appendix to Chapter I

## Schedule Canvassed for the Sample of Dairy Farmers

Dairying with Exotic and Cross-breed Animals in  
Western Maharashtra

(Reference period : December 1, 1983 to November 30, 1984)

- 
- |  |                                |          |          |
|--|--------------------------------|----------|----------|
| 1 Village  | Taluka                         | District | F.S. No. |
| 2 Name of the Respondent   | Date                           |          |          |
| 3 Caste and Religion   | Name of the Field Investigator |          |          |
| 4 Main Occupation of the Family:                                       | Subsidiary Occupation :        |          |          |
| 5 Since when are you in dairy business?                                |                                |          |          |
| 6 What prompted you to start dairying?                                 |                                |          |          |
| 7 Are you a member of the Primary Milk Producers' Cooperative Society? |                                |          |          |
- 

<u>Land</u>	Acres Gunthas	Acres Gunthas
1 Total cultivated Land		2 Of which, area irrigated

Area under crops (Rabi Crops of 1983 and summer and kharif crops of 1984)

Crop	Irrigated or Dry	Area	Type of fodder*	Quantity		
				Bundles	Cart loads	hs.

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1  
2  
etc.

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\* Kadaba (Jowar), Sarnad (Bajra), Dry Grass Grass, Maize, Kadwal (Jowar), Sugarcane tops, Lucerne, Green Grass, Other Green Fodder, Grazing land etc.

In which months do you give Green Fodder to Exotic/Cross-breed Animals?

Why not in other months?

Family Members (Residing in the Village): For each individual :

(1) Name (2) Male/Female (3) Relation with the Head of the Family  
(4) Age (5) Education (6) Occupation - Main/Subsidiary

Those working in your dairy business during the reference period:

Nature of work and Daily hours of work	Family Members			Servants	
	1	2	3	1	2

- 1 Name of the person
- 2 Grazing, Rearing
- 3 Milking
- 4 Cleaning the cattle shed
- 5 Sale of Milk
- 6 Other Work
- 7 Total No. of days of work in dairy business this year
- 8 What work were you doing prior to purchase of exotic/cross-bred animals?
- 9 What was your income from such work?

- 1 Work done on Farm etc. in addition to work re. dairy animals  
Name (of work) & Nature  
No. of hours of work
- 2 Annual Remuneration+perquisites

If the work re. dairy animals is done along with rearing of plough cattle, indicate the number of persons who do such work as also the number of hours they work daily for looking after the milk cattle and plough cattle, then indicate what proportion of their time is spent on dairy animals and indicate the proportion of their annual emoluments that may be charged to dairying.

Livestock as on 1st December 1983 and 30th November 1984

Type of Animal	Number		Type of Animal	Number	
	Dec. 1983	Nov. 1984		Dec. 1983	Nov. 1984

Cows: Exotic  
Cross-bred bycross

- 1 Holstein
- 2 Jersey
- 3
- 4

Non-exotic(Local)  
Young Stock of CowsCross-bred with

- 1 Holstein
- 2 Jersey
- 3
- 4

Young stock of  
she-buffaloes

- Jaffarabadi  
Surti  
Mehsana  
Other (by breed)  
Local

Young stock cross-  
bred according to  
crossOld, dry buffaloes

contd.

Type of Animal	Number		Type of Animal	Number	
	Dec. 1983	Nov. 1984		Dec. 1983	Nov. 1984
Non-exotic(Local) Old, dry cows			<u>Plough Cattle</u> Bullocks Of which cross- bred		
<u>Buffaloes</u>			Young-ones of buffaloes Of which cross- bred		
Jaffarabadi			He Buffaloes		
Surti			Young stock of he-buffaloes		
Mehsana			Goats		
Other (by breed)					
Local					
If cross-bred, accord- ing to cross of local buffalo with Jaffara- badi or such other breed-state					

**Reasons for increase/decrease in numbers**

About the dairy cattle with you today

1

2

Please state which dairy animal (cow/  
young cow, she-buffalo/young one of  
she-buffalo)

Name of the animal

Milk Yield Yesterday (in lt.)

The Fat content (or rate per lt. Rs.)

Do you milk them once/twice a day?

If cross-bred, cross with which breed?

In which lactation today?

If purchased

1 Month and Year of Purchase

2 Place of purchase, distance from  
the village, taluka/district

3 Whether from cattle market or from  
relation, farmers, traders, etc.  
Give details

4 Age at purchase

5 In which calving at that time?

6 Whether dry/in milk/just calved/  
pregnant at the time of purchase

7 If in milk at purchase, for how many  
months thereafter did she yield milk?



- 8 If pregnant at purchase, after how many months thereafter did she calve?
- 9 Who were present at purchase?  
Bank Officers, Office-bearers of  
Cooperative, Veterinary Doctor,  
Yourself
- 10 Purchase Price Rs.
- 11 Expenditure on travel for purchase
- 12 Expenditure on food and stay at the time of purchase
- 13 Expenditure on transport of the animal
- 14 Expenditure on certificate, branding, etc.
- 15 Insurance
- 16 Expenditure on vaccination
- 17 Amount spent on account of officers at purchase
- 18 Other Expenditure (Give details)

Total Expenditure on purchase of the animal

---



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State how the expenditure on purchase was met

1                      2

- 1 From your own funds
- 2 If from borrowings, from whom and the amount borrowed?
- 3 From sale of milch animal or other animal: which animal did you sell? Price received Rs.
- 4 From sale of assets: what did you sell? Sale Price
- 5 From temporary loans or other borrowings
- 6 Total expenditure on purchase
- 7 Loan for purchase of Milch Animal  
State the scheme under which you got the loan
- Amount of loan Rs.
- When did you get it? Month      Year
- Subsidy received, if any Rs.

Was the subsidy adjusted against your loan account or did you receive it directly?

- 8 Did anybody suggest you to take the loan?
- 9 Rate of Interest, percent per annum
- 10 Instalment of repayment and frequency weekly/fortnightly/monthly
- 11 Amount of instalment Rs.  
Amount repaid so far
- 11 Was the repayment through recovery of sale proceeds of milk or in any other manner? State.
- 12 If instalments were not paid when due, give reasons
- 13 For the feed and fodder given to cross-bred animals,
  - a) Did you receive any subsidy? how much?
  - b) Did you receive any loan? how much?
  - c) Rate of interest thereon, per cent per annum
  - d) In how many instalments is the loan repayable?
- 14 Why did you buy a cross-bred animal?
- 15 After getting a loan for buying the first milch animal, did you ask for loan for the purchase of second animal?

If you had asked for it, did you get it?

If you did not ask for it, why did not you?

If the milch cattle is not purchased

- 1 Was a cross-bred animal born to the cattle you owned?
- 2 When was the first cross-bred calf born?
- 3 With which breed was it crossed?
- 4 Did the animal conceive after giving the first dose of A.I. or it needed two or more doses? State.

- 5 Did the calf born to the cross-bred animal survive or did it die after birth?
- 6 A.I. at which Centre?  
Expenditure on A.I.
- 7 Who suggested you regarding A.I.?
- 8 Did you give A.I. in the second and subsequent calving of the cross-bred animal?
- 9 Do you experience that cross-bred animal does not conceive after 3 or 4 calvings?
- 10 Are the cross-bred male calves/bullocks/he-buffaloes as efficient for farm work as those of the local breed?
- 11 If you do not give A.I. to your milch cattle, State reasons

Did you insure the milch cattle after purchase/after its first calving, if your own?

Did you renew the insurance cover every year?

If not, state reasons for not renewing the insurance cover

Milk Production	Cow/Buffalo: Name	Breed	S.No.
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Yearwise from 1984-85 to 1977-78

Calving No.

Milk Production

Monthwise from April to March

Total milk production in one year (lts.)

Its value (Rs.)

Calf born male/female

Do you have it now?

If not, was it sold or it died

Sale (Rs.)

When did the calf reach its first lactation?

**Cow/Buffalo :** Total Expenditure on feed and fodder during the last calving cycle (from the last calving to the next calving, estimate the monthly expenditure therefrom as also the total expenditure during the reference period)

Reference Period	Jewar Fodder	Other Dry Fodder	Green Fodder Lucerne Maize/ Jewar	Green Grass	Sugarcane Tops	Cotton Seed	Oil Cake & Cattle Feed Type and Kg	Rs.
1 After calving - 1st 3 months 4 to 6 months After 6 months till the animal went dry No. of months								
2 During dry period until calving No. of Months								
3 Total calving cycle No. of months Total expenditure								
4 From the above information note the total expenditure on feed and fodder for the period 1st December 1983 to 30th November 1984								

State whether male/female calf of cow/shebuffalo

Milk fed daily in the first six weeks after birth or if less, for how many days? How much a day?

Was the milk fed from the calf's mother or was it of some other cattle?

If you did not feed enough milk to the calf during this period, state reasons.

From which week did you start giving fodder?

How much a day?

Expenditure on food and fodder in the first year

	Daily	No. of Days	Total during the year
	Rs.	Rs.	Rs.
Milk fed			
Jowar Fodder			
Green Fodder			
Cattle Feed			
Other Feed and Fodder			

Expenditure in the second year and thereafter until it calved?

Total expenditure since birth till calving Rs.

Cattleshed

1 Do you keep the cattle in your residence or a cattleshed?

Is the Cattle-shed in your residential premises or on the farm?

2 Do you practice stall-feeding?

3 If you have a cattleshed, did you construct it after you had crossbred cattle?

4 Is the cattle-shed temporary or pucca construction?

5 Is it on a plinth or at the ground level?

Area of the cattleshed

6 If the cattleshed is newly constructed, when? Year Month

7 Expenditure on construction of cattle-shed

8 How did you meet this expenditure?

9 How many animals you have today in the cattle-shed:  
Bullocks      Cows      Buffaloes      Young Stock

Water

1 What is the facility for drinking water for the milch animals?

2 Is there a well? Is it near the house or on the farm?

Do you take the animals to the river?

- 3 Is adequate water available for the milch animals during summer?
- 4 How often do you bathe the animals? Where?

Other Information

- 1 What special care do you take of exotic/crossbred animals?
- 2 Do you have any plans to expand your dairying business? Do you see any difficulties in executing your plan?
- 3 Is it possible to raise productivity of your milch animals?
- 4 How do you meet the current expenditure on dairying? How much did you borrow last year to meet the current expenditure on dairying?
- 5 Did the exotic/crossbred animals have any illness during the last year?

Type of illness	Duration of illness	Extent of decline in milk yield during illness
-----------------	---------------------	--

- 6 Which doctor/hospital do you take your exotic/crossbred animals<sup>to</sup> in case veterinary aid is needed?
- 7 Is the veterinary aid adequate and satisfactory?
- 8 Do you experience the milk cooperative not accepting milk when you take it for sale? How many time was it rejected last year? What were the reasons for not accepting milk?

9 About Milk Sold

How many times a day?  
 Where do you have to deliver it? Distance  
 How do you transport it? On foot or on bicycle?  
 How many hours' are spent daily in delivering milk and returning home?  
 Daily expenditure on transport of milk  
 Annual expenditure on transport of milk

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Dung Manure (during reference year)

- 1 Cart-loads of dung manure produced?
- 2 Of which, sold: No. of carts      Sale proceeds Rs.
- 3 Used on own farm: No. of cartloads,      Rs.
- 4 Used for dung cakes, value of dung, Rs.
- 5 Do you have a Gobar Gas plant? Quantity of dung used daily for the plant?
- 6 How much of the total dung manure from the milch animals?
- 7 If you do not have a Gobar Gas Plant, state reasons:

**Sale of Livestock during the last three years (State if exotic/cross bred animals were sold)**

	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>
1 Type of Animal, its breed			
2 When?			
3 Reason for sale			
4 Sale Proceeds Rs.			

<u>Animals died during the last three years</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>
---	----------------	----------------	----------------

- 1 Type of Animal, its breed
- 2 Died of which disease?
- 3 When?
- 4 Did it receive veterinary aid? What were the difficulties?
- 5 How was it disposed off?
- 7 Price received for hides and skin Rs.
- 8 If insured, amount of insurance received
- 9 If you had taken a loan for the purchase of animal which died, when?

State the amount of loan Rs.

Amount outstanding repayable at the time of death? Rs.                      When & how was it repaid?

- 1 Is lucerne for dairy cattle available in the village? From whom? What are the difficulties in its supply?
- 2 Is Maise/Jowar (Kadval) for dairy cattle available in the village? From whom? What are the difficulties in its supply?
- 3 Is Sugarcane tops for dairy cattle available in the village? From whom? What are the difficulties in its supply?
- 4 Which cattle feed do you give to your milch cattle? Where do you buy it? Are there any difficulties in its supply.

Feed and Fodder Purchased and Other Expenditure during the year under reference: Information re. following items:

1. Jowar Fodder    2. Bajra Fodder    3. Grazing land    4. Green Fodder
5. Sugarcane Tops    6. Oil cake    7. Cattle Feed, Cotton seed, etc.
8. Rearing charges    9. Veterinary aid    10. Cattle insurance
11. Other expenditure (give details)

<u>Quantity</u>	<u>Rs.</u>	<u>Place of purchase</u>	<u>Distance</u>
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1 State reasons for difference between the fodder produced on farm and total fodder to the milch cattle

2 Is the fodder for milch cattle available in the village? From whom? In case of drought or crop failure, is fodder available in the village? What are the difficulties?

Capital Expenditure, (Other than purchase of milch cattle) for Dairying

<u>Item of Expenditure</u>	<u>Rs.</u>	<u>Which year?</u>	<u>How was the expenditure met?</u>	<u>Annual Depreciation</u>
1 Construction of cattle shed				
2 Silo/Godown for storage of fodder and feed				
3 Buckets				
4 Chains, Ropes etc.				
5 Breeding Bull-Fees				
6 Artificial Insemination				
7 Other Expenditure (give details)				

Total

Milk Production (lts.) during 1.12.83 to 30.11.84 from all Milch Animals, Disposal of Milk and Receipts from Sale of Milk (Rs.)

Monthwise information from December 1983 to November 1984

1. Daily
2. Monthly
3. Of which sold
4. Fed to young stock
5. Consumed at home
6. Converted into Milk products and sold
7. Split Milk  
Milk sold to milk-cooperative/Sangh:
8. 1st fortnight Lts. Rs.
9. 2nd fortnight Lts. Rs.
10. Net receipts
11. Deductions: Reasons for deductions  
Milk sold to others  
Sold to others
12. Whom?
13. Lts.
14. Rs.





## CHAPTER II

REVIEW OF A.I. AND CROSS-BREEDING 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 cross-breeding of cows by the Government of Maharashtra through its Animal Husbandry (A.H.) Department (Directorate of Animal Husbandry), the Bharatiya Agro Industries Foundation (BAIF) and other agencies in Maharashtra State. The cross-breeding programme of cows was taken up by the A.H. Department in 1970. Hence it is proposed to review the work done in the years 1970-71 to 1984-85, which is the latest year for which information is available.

Livestock Census

We may begin by considering the 1978 livestock census data for Maharashtra State. The percentages 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 buffaloes in milk (42,75,000) exceeded the number of cows in milk (18,70,000) by about 129 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 a little over one-third 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, followed by Parbhani, Pune and Nashik Districts which had about five per cent each of the total cows in milk.

**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>Total Bombay Region</b>	<b>10.0</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>Total 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>Total Pune Region</b>	<b>13.9</b>	<b>16.8</b>	<b>34.5</b>	<b>39.2</b>

District	% of Total cattle	% of Total cows in milk	% of Total buffaloes	% of Total buffaloes in milk
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
Wanded	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>Total Aurangabad Region</b>	<b>21.9</b>	<b>26.0</b>	<b>18.5</b>	<b>18.1</b>
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
Yectmal	5.0	4.4	2.6	2.1
<b>Total Amraoti Region</b>	<b>16.2</b>	<b>16.0</b>	<b>9.9</b>	<b>9.6</b>
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
<b>Total Nagpur Region</b>	<b>18.1</b>	<b>14.8</b>	<b>9.7</b>	<b>6.7</b>
<b>Total Maharashtra State</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>100% =</b>				
<b>(in thousands)</b>	<b>15,218</b>	<b>1,870</b>	<b>3,899</b>	<b>4,275</b>

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

In Table 2.2 we have shown districtwise and region-wise cross-bred 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 cross-bred adult females over 2 years in the entire State, 35,780 of them being in milk. The cross-bred cows in milk formed only about 1.9 per cent of the total cows in milk in the State. The cross-bred 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 cross-bred cows in milk as also adult females. The remaining 20 per cent of the cross-bred cows in milk as also 25 per cent of adult females were found in the other four regions.

Districtwise, concentration of cross-bred 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 buffaloes as well as of cross-bred cows in Western Maharashtra. The small percentage of cross-bred cows in milk in the total cows in milk as per the 1978 Census does not reflect any large scale impact of the cross-breeding programmes of the State Government, BAIF and other agencies which were in operation since the early 'seventies. However, the programme seems to have gathered momentum as is evidenced from the 1982 Census.

As regards the 1982 Census, it may be stated that the adults have been defined as 'over two and a half years' as against '3 years' in respect of adult males

Sr. No.	Name of the District	Adult Males (over 3 years)	Adult Females (over 2 years)		Young Stock		Total Cross-bred Cattle		
			In-milk	Total	Males	Females	Males	Females	Total
1.	Gr. Bombay	16	448	477	87	182	114	659	773
2.	Thane	75	806	1,199	526	738	601	1,937	2,538
3.	Raigad	51	131	330	294	326	345	656	1,001
4.	Ratnagiri	175	485	1,040	603	896	778	1,936	2,714
5.	Sindhudurg	17	59	120	151	245	168	365	533
Total Bombay Region		334	1,929	3,166	1,672	2,387	2,006	5,553	7,559
6.	Nashik	635	1,204	2,507	1,396	1,394	2,031	3,901	5,932
7.	Dhule	327	378	1,226	1,555	1,599	1,882	2,825	4,707
8.	Jalgaon	233	387	984	1,157	1,070	1,390	2,054	3,444
9.	Ahmednagar	412	9,800	16,458	2,470	15,735	2,882	32,193	35,075
Total Nashik Region		1,607	11,769	21,175	6,578	19,798	8,185	40,973	49,158
10.	Pune	3,020	5,708	10,867	8,176	8,988	11,196	19,855	31,051
11.	Satara	291	1,656	2,846	1,183	1,875	1,474	4,721	6,195
12.	Sangli	382	4,240	5,535	1,664	3,206	2,046	8,741	10,787
13.	Solapur	254	1,648	2,562	800	1,514	1,054	4,076	5,130
14.	Kolhapur	289	3,690	4,901	1,109	2,469	1,398	7,370	8,768
Total Pune Region		4,236	16,942	26,711	12,932	18,052	17,168	44,763	61,931
15.	Aurangabad	634	903	2,331	2,256	2,180	2,890	4,511	7,401
16.	Jalna	327	395	1,443	789	608	1,116	2,051	3,167

Continued

Table 2.2: Districtwise Cross-bred cattle in the Maharashtra State as per 1982 Census.

District	Adult males over 2½ yrs.	Adult Females over 2½ yrs.		Young Stock		Total Cross-bred Cattle		
		In milk	Total	Males	Females	Males	Females	Total
1. Gr. Bombay	57	283	398	66	262	123	660	783
2. Thane	2265	1863	3782	1220	2045	1485	5827	9312
3. Raigad	594	605	1079	776	944	1370	2023	3393
4. Ratnagiri	1116	2621	4132	1396	2422	2512	6554	9066
5. Sindhudurg	564	990	1581	561	1145	1125	2726	3851
<b>Total Bombay Region</b>	<b>4596</b>	<b>6362</b>	<b>10972</b>	<b>4019</b>	<b>6818</b>	<b>8615</b>	<b>17790</b>	<b>26405</b>
6. Nashik	4637	3479	7220	3297	4071	7934	11291	19225
7. Dhule	2139	2364	4760	2752	3933	4891	8693	13584
8. Jalgaon	2577	3104	5369	2996	4227	5573	9596	15169
9. Ahmednagar	12982	21495	39456	11632	21654	24614	61110	85724
<b>Total Nashik Region</b>	<b>22335</b>	<b>30442</b>	<b>56805</b>	<b>20677</b>	<b>33885</b>	<b>43012</b>	<b>90690</b>	<b>133702</b>
10. Pune	12484	22683	35904	10648	21807	23132	57711	80843
11. Satara	5175	13397	20422	4260	9969	9435	30391	39826
12. Sangli	5346	15560	20994	4237	11331	9583	32325	41908
13. Solapur	1802	4290	6812	2434	5232	4236	12044	16280
14. Kolhapur	4190	12152	17459	2221	8230	6411	25689	32100
<b>Total Pune Region</b>	<b>28997</b>	<b>68082</b>	<b>101591</b>	<b>23800</b>	<b>56969</b>	<b>52797</b>	<b>158160</b>	<b>210957</b>
15. Aurangabad	2513	2639	5268	2541	3921	5054	9189	14243
16. Jalna	1090	777	1633	1007	1181	2097	2814	4911
17. Parbhani	1205	1310	2687	1669	2354	2874	5041	7915
18. Beed	1757	2862	4988	2083	3227	3840	8215	12055
19. Nanded	1047	1098	2213	1461	2147	2508	4360	6868
20. Osmanabad	1245	1686	2966	896	1840	2141	4806	6947
21. Latur	1720	1501	3092	1758	2561	3478	5623	9131
<b>Total Aurangabad Region</b>	<b>10577</b>	<b>11873</b>	<b>22847</b>	<b>11415</b>	<b>17231</b>	<b>21992</b>	<b>40078</b>	<b>62070</b>
22. Buldhana	199	356	1136	2999	2923	3198	4059	7257
23. Akola	338	743	2410	1791	1975	2129	4385	6514
24. Amravati	656	1148	1948	2093	2498	2749	4446	7195
25. Yavatmal	461	783	1419	834	1330	1292	2349	4041
<b>Total Amravati Region</b>	<b>1654</b>	<b>3030</b>	<b>6913</b>	<b>7714</b>	<b>8726</b>	<b>9368</b>	<b>15639</b>	<b>25007</b>
26. Wardha	542	1111	2032	957	1807	1499	3839	5338
27. Nagpur	986	1795	1305	1691	3204	2677	6509	9186
28. Bhandara	1069	1236	2314	1819	2642	2888	4956	7844
29. Chandrapur	988	349	1057	625	906	1613	1863	1476
30. Gadchiroli	43	185	338	89	156	132	494	626
<b>Total Nagpur Region</b>	<b>3628</b>	<b>4676</b>	<b>9046</b>	<b>5181</b>	<b>8615</b>	<b>8809</b>	<b>17661</b>	<b>26470</b>
<b>Total Maharashtra State</b>	<b>71787</b>	<b>124465</b>	<b>208174</b>	<b>72806</b>	<b>131844</b>	<b>144593</b>	<b>340018</b>	<b>484611</b>

and '2 years' in respect of adult females in the 1978 Census. This change in definition does not make the two series strictly comparable. Still, the substantial increase in numbers in all categories of cross-bred 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 cross-bred cattle by about three times.

As was seen from the 1978 Census, there was concentration in 1982 of cross-bred cows in milk in Ahmednagar, Pune, Sangli and Kolhapur districts, though their share in the total declined from 65 per cent in 1978 to 58 per cent in 1982. Even by 1982, the A.I. and cross-breeding programme did not have much of an impact in Bombay, Amraoti, Aurangabad, and Nagpur divisions.

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

Animal Husbandry (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 Animal Husbandry Offices (D.A.H.O.) and other institutions. The statistics regarding the number of A.I. done and calves born in the State in the years 1970-71 to 1984-85 is given in Tables 2.3 to 2.6.

Out of about 2,700 A.I. Centres in the State, facility for A.I. by frozen semen is available at about 1,300 Centres. 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



**Table 2.3 : Number of Artificial Inseminations Done and Calves Born in the State  
Since 1970-71 to 1984-85**

Sr. No.	Year	No. of artificial inseminations done by semen of					Calves born			
		Exotic	Cross-bred	Indigen-ous	Buffaloes	Total	Cross-bred	Indigenous	Buffaloes	Total
1	2	3	4	5	6	7	8	9	10	11
1.	1970-71	17,948	-	66,427	48,675	1,33,050	1,467	12,617	8,679	22,763
2.	1971-72	35,832	-	64,903	66,642	1,67,377	3,919	10,457	8,689	23,065
3.	1972-73	53,544	-	43,345	58,271	1,55,160	8,037	10,877	10,371	29,285
4.	1973-74	92,082	826	45,629	76,861	2,15,398	9,067	12,573	10,279	31,919
5.	1974-75	1,32,538	3,417	26,309	78,038	2,40,302	18,024	6,493	13,107	37,624
6.	1975-76	1,66,667	12,294	23,618	89,791	2,92,370	20,340	9,013	13,016	42,369
7.	1976-77	2,63,080	3,108	25,959	1,00,085	3,92,232	34,129	4,915	14,049	53,093
8.	1977-78	2,49,513	5,640	21,110	77,172	3,53,435	44,917	3,443	17,287	65,647
9.	1978-79	2,81,493	11,437	20,276	94,606	4,07,812	43,741	3,391	15,676	62,808
10.	1979-80	3,75,314	11,947	13,715	1,10,401	5,11,377	56,266	3,971	20,360	80,597
11.	1980-81	4,19,807	19,304	17,773	1,23,419	5,80,033	77,379	3,782	23,023	1,04,184
12.	1981-82	4,50,759	25,802	15,230	1,31,958	6,23,749	87,024	3,600	23,595	1,14,219
13.	1982-83	5,28,821	37,969	17,128	1,39,543	7,23,461	1,05,166	3,298	27,444	1,35,908
14.	1983-84	5,36,566	90,096	15,586	1,61,467	8,03,715	1,24,874	4,201	31,002	1,60,077
15.	1984-85	5,28,022	1,51,615	9,046	1,48,796	8,37,479	1,43,010	3,035	29,925	1,75,970

**Table 2.4: Number of Artificial Inseminations Done by Semen of Exotic/Cross-bred Bulls and Cross-bred Calves Born in the State Through Various Institutions of the Department Since 1970-71 to 1984-85**

Sr. No.	Year	I.C.D.Ps.		K.V.Cs.		D.A.N.Os.		Other Institutions		Total	
		A.I. done by Exotic/cb semen	Cross-bred calves born	A.I. done by Exotic/CB semen	Cross-bred calves born	A.I. done by Exotic/CB semen	Cross-bred calves born	A.I. done by Exotic/CB semen	Cross-bred calves born	A.I. done by Exotic/CB semen	Cross-bred calves born
1	2	3	4	5	6	7	8	9	10	11	12
1.	1970-71	11,739	631	1,134	460	3,793	223	1,282	153	17,948	1,467
2.	1971-72	20,327	1,851	3,312	780	8,176	883	4,017	405	31,832	3,919
3.	1972-73	24,068	3,276	12,612	1,704	12,780	2,375	4,084	682	53,544	8,037
4.	1973-74	35,158	2,899	21,833	2,226	28,257	2,927	7,660	1,015	92,908	9,067
5.	1974-75	48,539	5,975	31,028	4,692	47,124	5,618	9,264	1,739	1,35,955	18,024
6.	1975-76	64,526	8,515	36,321	5,951	66,298	3,732	11,816	2,142	1,78,961	20,340
7.	1976-77	93,458	11,974	55,122	7,069	1,04,631	13,302	12,977	1,784	2,66,188	34,129
8.	1977-78	85,844	16,013	51,481	9,280	1,05,434	17,512	12,394	2,112	2,55,153	44,917
9.	1978-79	1,03,466	16,373	57,414	9,253	1,17,373	15,652	14,677	2,463	2,92,930	43,741
10.	1979-80	1,39,317	20,558	74,581	11,379	1,57,117	21,133	16,246	3,196	3,87,261	56,266
11.	1980-81	1,65,713	29,406	83,517	16,385	1,73,244	27,754	16,367	3,834	4,38,841	77,379
12.	1981-82	1,81,358	33,582	92,582	18,451	1,87,366	31,364	15,255	3,627	4,76,561	87,024
13.	1982-83	1,91,174	37,184	1,09,202	21,974	2,51,292	42,727	15,122	3,281	5,66,790	1,05,166
14.	1983-84	2,01,320	41,933	1,24,405	25,746	2,85,403	53,930	15,534	3,265	6,26,662	1,24,874
15.	1984-85	1,99,999	44,847	1,35,870	30,783	3,28,124	63,490	15,644	3,890	6,79,637	1,43,010

**Table 2.5: Districtwise Artificial Insemination done in the State since 1970-71 to 1984-85.**

Sr. No.	District	Artificial Insemination Done				Total
		Exotic	Cross-bred	Indigen- X-ous	Buffa- loes	
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
<b>Total Bombay Region</b>		<b>1,69,422</b>	<b>14,808</b>	<b>7,520</b>	<b>69,138</b>	<b>2,60,888</b>
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
<b>Total Nashik Region</b>		<b>9,50,742</b>	<b>1,07,774</b>	<b>81,527</b>	<b>1,12,949</b>	<b>12,52,992</b>
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
<b>Total Pune Region</b>		<b>16,17,980</b>	<b>1,58,340</b>	<b>2,55,707</b>	<b>10,44,869</b>	<b>30,76,896</b>
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.	Handed	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
<b>Total Aurangabad Region</b>		<b>7,21,442</b>	<b>31,976</b>	<b>32,639</b>	<b>83,115</b>	<b>8,69,172</b>
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
<b>Total Amravati Region</b>		<b>2,94,704</b>	<b>22,172</b>	<b>30,024</b>	<b>1,55,493</b>	<b>5,02,393</b>
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
<b>Total Nagpur Region</b>		<b>3,77,696</b>	<b>38,115</b>	<b>18,637</b>	<b>40,161</b>	<b>4,74,609</b>
<b>Total Mahara- shtra State</b>		<b>41,31,986</b>	<b>3,73,185</b>	<b>4,26,054</b>	<b>15,05,725</b>	<b>64,36,950(*)</b>

**Note:** Some of Intensive Cattle Development Projects in the State cover more than one district. Progress of work districtwise is not separately available for these I.C.D.Ps. upto 1978-79 & as such the figures of A.I. done in respect of these I.C.D.P. areas are shown for the district where the H.Q. of these ICDP are located.

\* Break-up not available.

**Table 2.6 : Districtwise calves born in the State since 1970-71 to 1984-85**

Sr. No.	District	Calves born			Total
		Cross-bred	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
<b>Total Bombay Region</b>		<b>28,478</b>	<b>2,571</b>	<b>13,489</b>	<b>44,538</b>
6.	Nashik	29,787	1,311	2,118	33,216
7.	Dhule	31,737	2,139	12,581	46,457
8.	Jalgaon	16,815	1,886	6,408	25,109
9.	Ahmednagar	1,05,743	5,776	1,035	1,12,554
<b>Total Nashik Region</b>		<b>1,84,082</b>	<b>11,112</b>	<b>22,142</b>	<b>2,17,336</b>
10.	Pune	1,47,463	4,893	21,295	1,73,651
11.	Satara	51,899	24,120	17,664	93,683
12.	Sangli	76,543	11,836	73,759	1,62,138
13.	Solapur	14,872	12,857	3,235	30,964
14.	Kolhapur	60,676	1,813	69,777	1,32,266
<b>Total Pune Region</b>		<b>3,51,453</b>	<b>55,519</b>	<b>1,85,730</b>	<b>5,92,702</b>
15.	Aurangabad	34,538	914	2,511	37,963
16.	Jalna	6,961	-	75	7,036
17.	Parbhani	10,939	781	2,137	13,857
18.	Beed	21,036	2,035	2,742	25,813
19.	Nanded	8,457	2,169	2,009	12,635
20.	Osmanabad	17,694	3,342	2,592	23,628
21.	Latur	6,289	-	-	6,289
<b>Total Aurangabad Region</b>		<b>1,05,914</b>	<b>9,241</b>	<b>12,066</b>	<b>1,27,221</b>
22.	Buldhana	15,732	2,042	10,149	27,923
23.	Akola	8,292	2,286	8,821	19,399
24.	Amravati	13,558	3,703	3,846	21,107
25.	Yavatmal	8,027	1,509	3,446	12,982
<b>Total Amravati Region</b>		<b>45,609</b>	<b>9,540</b>	<b>26,262</b>	<b>81,411</b>
26.	Wardha	13,538	4,108	1,032	18,678
27.	Nagpur	32,862	1,485	2,199	36,546
28.	Bhandara	10,712	579	860	12,151
29.	Chandrapur	4,652	1,511	2,666	8,829
30.	Gadchiroli	60	-	56	116
<b>Total Nagpur Region</b>		<b>61,824</b>	<b>7,683</b>	<b>6,813</b>	<b>76,320</b>
<b>Total Maharashtra State</b>		<b>7,77,360</b>	<b>95,666</b>	<b>2,66,502</b>	<b>11,39,528</b>

**Note :** Some of Intensive Cattle Development Projects in the State cover more than one District. Progress of work district-wise is not separately available for these Intensive Cattle Development Projects upto 1978-79 as such the figures of calves born in respect of these I.C.D.Ps. areas are shown for the districts where the head quarters of these I.C.D.Ps. are located.

as also in economising on the use of semen.

It was indicated during the course of discussion with the staff of the A.H. department that if one lakh cross-bred cows are required to be produced by A.I., it will be necessary to administer ten lakh doses of A.I. The reasons stated were (a) 3 to 4 A.I. are needed per cow for effective conception, (b) fifty per cent of the calves born will be female calves and (c) 15 per cent annual calf mortality upto one year, 5 per cent annual mortality for one to two years and 3 per cent thereafter.

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 tripled 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 cross-bred animals was not available. However, during the last decade, the availability of semen from cross-bred 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 cross-bred bull in the total is increasing and that of A.I. from semen of exotic bulls is gradually decreasing. The proportion of A.I. done from semen of cross-bred 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 seven of exotic bulls, the number of A.I. done from cross-bred 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 from Table, the number of cross-bred calves born in each year. Starting with 1,467 calves born in 1970-71, the number increased to 18,024 in 1974-75, 60,000 in 1979-80, and 1,46,000 in 1984-85. The district-wise data given in Table 2.6 regarding calves born also shows concentration of cross-bred calves in Western Maharashtra, the Pune region alone accounting for 51 per cent of the total calves born during the decade ending 1979-80.

We may estimate the number of cross-bred cows the A.I. and cross-breeding may produce in the years to come. Assuming 50:50 sex ratio, half the calves born would be female calves. Their number would get reduced due to mortality until they reach the first calving in about 30 months. It was stated that about thirty per cent of the total calves born enter the category of female calves due to calve for the first time.

Thus out of about 1,46,000 calves born in 1984-85, there will be an addition of about 43,800 cross-bred cows in a period of about thirty months. Even after replacing the cross-bred cows from the existing stock, which may die assuming three per cent mortality, the present programme will add every year a sizeable number of cross-bred cows.

The planners will have to estimate the number of cross-bred cows we can afford to support on the available feed and fodder resources. It will also have to be noted that the use of cross-bred bullocks as draught animals is still conspicuous by their absence. The farmers would, therefore, like to keep in large numbers cows of local breeds for producing plough cattle, besides, of course, for

whatever milk they can get from such cows. The other important problem is the disposal of milk the additional stock of cross-bred cows would yield. Even at present, the market for cow milk looks as if it is saturated. Until we develop market for liquid milk and ways of using milk for making milk products and market therefor, it will not be prudent to push hard the A.I. and cross-breeding programme. Taking into consideration these constraints, once the targets are fixed by the State Government it will be possible to gear up the machinery for doing A.I. and cross-breeding.

Eharatiya Agro-Industries Foundation (BAIF)

The B.A.I.F., situated at Urali Kanchan in Pune District in Maharashtra State, is a non-Government 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. Though established in August 1967, its work of A.I. and cross-breeding 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 recommend to the Government of India to declare the BAIF's programme of cross-breeding as a part of the National Integrated Rural Development Programme. 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 main feature of the BAIF's programme is that it does not require the farmer to take a loan but if he had a non-descript cow, he could use it as seed-bed for the semen of selected sires of exotic dairy breeds for the production of cross-bred cow. Such cross-breeding introduces early puberty among the female calves, shorter inter-calving period, higher milk yield and longer lactation.

The BAIF (as stated in its brochure) was the pioneer in India in the use of high quality frozen semen of proven sires. It was also the first in providing A.I. service right at the villager's door step. Besides, the BAIF was the first to introduce in the country the practice of examining each inseminated cow for pregnancy diagnosis.

The BAIF also undertook to provide adequate animal health cover by undertaking research at its own ultra-modern laboratories for developing and making available at reasonable rates veterinary biologicals for preventing and treating a wide variety of animal diseases.

Besides the cattle breeding programme through its A.I. centres, the BAIF has (1) a Cattle Breeding Farm to produce excellent breeding bulls of exotic dairy breeds viz. Jersey and Holstein Friesian, (2) Frozen Semen Bank where semen is collected from select farm bulls, processed, tested and frozen. (3) Research Laboratories well-equipped to undertake applied as well as fundamental research not only to improve existing technology but also for further developing newer techniques and technologies, (4) Fodder and Forrage Development on a farm extending over 200 ha. of land to enable identification and development of fodder and forrage plants capable of yielding optimum results



from arid land with inadequate water in adverse agro-climatic zones. A typical example is the cultivation of diverse species of Hawaiian giant (Subabul); (5) Training Institute for training its staff as well as to give skills-oriented training to a number of linkmen as well as farmers in economic milk production; (6) Energy Recycling by means of a huge bio-gas plant of improved design. It is capable of producing 300 cu. meters of gas and five tonnes compost per day and (7) Water Resources Development and Management as a part of its programme of rural development.

In Table 2.7 we have given data regarding the number of centres of the BAIF, number of A.I. done, number of pregnancies checked, number of cross-bred 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 and are given in Table 2.8. 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 B.A.I.F. did about 1.06 lakhs. However, rather than judging the performance by the number of A.I. done, it will be better to consider the number of cattle cross-bred as also the number of A.I. per cow for successful pregnancy as also the number of calves born. However, necessary data was not available for such a comparison.

The information regarding the work done by the 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,

**Table 2.7 : Work done by the BAIF in Cattle Breeding Centres since Inception upto March 1983**

Year	No. of Centres	No. of Cattle Bred	Inseminations Done			Pregnancy Exam.		
			First	Repeat	Total	Exam.	Preg.	Female calves born
Upto March 77	80	74,706	70,394	29,214	99,608	44,868	28,071	9,929
April 77-March 78	110	29,924	29,924	11,391	41,315	22,232	15,000	4,464
April 78-March 79	124	38,618	38,618	14,787	53,405	26,851	18,030	5,777
April 79-March 80	220	88,617	80,617	24,441	1,05,058	47,584	31,681	7,151
April 80-March 81	293	1,30,898	1,30,898	42,158	1,73,056	1,00,428	66,337	15,345
April 81-March 82	380	1,53,247	1,53,247	48,325	2,01,572	1,23,958	82,713	N.A.
April 82-March 83	184	1,02,310	1,02,310	32,895	1,35,205	83,283	57,213	N.A.
April 83-March 84	193	94,015	N.A.	N.A.	1,23,710	69,884	48,158	N.A.

**Table 2.8: Work done by BAIF in Maharashtra during April 1979 - 1983.**

Year	Centre	A.I. Done			Pregnancies	
		First	Repeat	Total	Examined	Pregnant
<b>April 1979 to March 1980</b>						
A. 1. I.R.D. Centres = (A.I. Done to the cows of small/marginal farmers)	145	18,035	3,993	22,028	8,301	5,386
2. Non I.R.D. Centres = (A.I. Done to the cows of other farmers)	145	30,760	8,259	39,019	18,549	11,547
B. Other Centres = (Centres sponsored by various agencies)	40	22,910	10,159	33,068	13,520	10,054
Total Work =	185	71,705	22,411	94,116	40,370	26,987
<b>April 1980 to March 1981</b>						
A. 1. I.R.D. Centres =	271	44,663	12,398	57,061	31,507	21,903
2. Non I.R.D. work =	271	47,206	15,016	62,222	42,552	25,439
B. Other Centres =	21	25,166	11,768	36,934	15,763	12,327
Total work	292	1,17,035	39,182	1,56,217	89,822	59,669
<b>April 1981 to March 1982</b>						
A. 1. I.R.D. Centres =	270	71,358	23,620	94,978	56,702	38,027
2. Non-I.R.D. work =	270	31,694	6,499	38,193	29,544	17,992
B. Other Centres =	24	26,082	12,728	38,810	18,981	14,553
Total Work =	294	1,29,134	42,847	1,71,981	1,05,227	70,572
<b>April 1982 to March 1983</b>						
A. 1. I.R.D. Centres =	66	15,356	4,607	19,963	14,339	9,446
2. Non-I.R.D. work =	66	23,955	6,936	30,891	22,880	15,676
B. Other Centres =	32	38,875	16,179	55,054	28,080	20,333
Total Work =		78,186	27,722	1,05,908	65,299	45,455

Ltd., situated at Shinganapur in Kopergaon tahsil of Ahmednagar district, had introduced the scheme regarding A.I. and cross-breeding 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 Primary Milk Producers' 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 <sup>that</sup> 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 into 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 of a milk cooperative, under these circumstances, is not able to render A.I. successfully. As a result, the Sugar Cooperative decided to abandon its scheme and requested the BAIF to render the services through its centres.

About the year 1970, the BAIF took up a research project in animal genetics. As a condition of sanctioning the grant, the ICAR had desired that the BAIF should have some 6,000 cows for the proposed experiment. As the BAIF found it difficult to meet this condition, it proposed to the ICAR that it will persuade the cultivators to make their cattle available for the purpose of the experiment. The ICAR acceded to this proposal. The BAIF, thereupon, approached some of the sugar cooperatives and requested the management to persuade their members to make available their cows for the experiment. Since a part of the inputs, such as semen, was received as gift by the BAIF, it had to incur expenditure on such items as vehicles, living accommodation and salaries of the staff. The sugar cooperatives were requested to make available, as their contribution accommodation, vehicles, etc., for the A.I. Centres located in their area of operation. Thus, out of the total expenditure of about Rs. 40,000 per centre, half the contribution came from the sugar cooperatives. The centre served about 2,000 cows and the actual expenditure the BAIF incurred in those days was only about Rs. 10 per cow per annum. The annual expenditure of the Centre now stands revised to Rs. 60,000 per annum mainly because the semen has to be purchased. The expenditure on establishment has also increased. To reduce the expenditure on vehicles, motor cycles are used instead of jeeps.

We were told that the sugar cooperatives at Pravara-nagar 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/<sup>Sugar</sup>Cooperative. In August 1984, the BAIF was rendering the A.I. services in the areas of the following Sugar Cooperatives with their assistance.

District	No. of Sugar Cooperatives	No. of Sugar Cooperatives where the BAIF rendered A.I. services
Basik	6	2
Ahmednagar	13	8
Pune	6	3
Satara	6	1
Sangli	7	Not stated
Solapur	6	3
Kolhapur	10	5
	<u>54</u>	<u>22</u>

The following 27 sugar cooperatives, it was stated, did not invite the BAIF to start the A.I. Centre. Dhule (4), Jalgaon (3), Parbhani (3), Buldhana (1), Aurangabad (5), Jalna (1), Beed (4), Nanded (2), Osmanabad and Latur (3), Yotmal (1).

As the BAIF runs the A.I. Centres in the area of operation of some sugar cooperatives, except the three

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

Other Agencies:

We have already referred to the efforts of the State Government and the B.A.I.F. in the matter of A.I. and cross-breeding. Compared to the efforts of these two agencies, the work done by other agencies is on a very small scale. As an illustration, in this section, we will refer to the work done by 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 131 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 cross-bred 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 cross-bred calves born in the years 1974-75 to 1984-85 is given in

Table 2.9. It is seen from the Table that with 113 A.I. Centres and 5,614 A.I. done in 1983-84, 4524 cross-bred 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 programmes. The Federation has 863 Milk Cooperatives as its members. In relation to the number of Milk Cooperatives, the number of cross-bred calves born from A.I. appears to be quite small. However, the information about the Federation given in this section will enable one to appreciate the efforts made by other agencies. If such efforts are made in each district, it will be possible to have one lakh cross-bred calves born in each year in the entire State through the work of such other agencies.

**Table 2.9: Jalgaon Zilla Sahkari Doodh Utpadak Sangh Ltd. Jalgaon : Number of A.I. Centres, Number of Cows Treated with A.I. and Number of Cross-bred Cows born in 1974-75 to 1984-85.**

Year	No. of A.I. Centres	No. of Cows treated with A.I.	No. of Cross-bred 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



To conclude, we may observe that in the past few years, the A.H. Department of the State Government is doing A.I. in very large numbers. The B.A.I.F. and other agencies are also carrying out A.I. and cross-breeding on a significant scale. The total work of non-governmental agencies would also have substantial impact on the number of cross-bred cows in the State.

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 and cross-bred cows such resources can sustain. Besides, in the near future 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 cross-bred 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 <sup>with</sup> the concrete plan and policies and set targets for A.I. to be done during the next decade or so.

CHAPTER IIISAMPLE VILLAGES AND MILK COOPERATIVES

We have given in the present chapter some information about the sample villages as also about the Milk Cooperatives situated therein. It is hoped that this information will be useful in appreciating the findings of the present study.

Sample Villages

The method of selecting the sample villages is described in Chapter I. In the following paragraphs is given a brief description of the sample villages as it will help in appreciating the findings of the present survey of dairy farmers who <sup>were</sup> are carrying on dairying under different agro-climatic conditions. Information regarding the number of households as per the 1971 Population Census and data from the Village Records regarding the total geographical area, land utilisation, cropping pattern in 1984-85 and the number of milch cattle is shown for each of the six sample villages in Table 3.1. Detailed notes on the Milk Cooperatives in the sample villages are given in the section following the notes on the sample villages.

Kalamb, Ambegaon Tahsil, Pune District

Kalamb is situated on the Pune-Nashik highway, about 70 kms. from Pune. The average annual rainfall is about 2000 to 3000 mm. Of the total geographical area of 1,641 ha., about 20 per cent is classified as forest, 5 per cent as grazing land and 3 per cent under other uses. The remaining 72 per cent of the area is cultivable land. About 22 per cent of the gross cropped area is irrigated by wells.

Kharif bajra and Rabi jowar are the main crops, accounting for 83 per cent of the gross cropped area. About

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

	Pune District		Sangli District		Solapur District	
	Kalamb	Ranjani	Umadi	Nandre	Mandrup	Antroli
<b>No. of Households as per 1971 Population Census</b>	470	414	1,009	1,526	1,310	189
<b>Total Geographical Area (ha.)</b>	1,641	1,757	7,402	3,139	7,431	N.A.
<b>Cultivable Area as per cent of Total Geographical Area</b>	72.0	79.0	94.0	96.0	96.0	N.A.
<b>Gross Cropped Area</b>	1,215	1,632	5,088	2,878	6,673	871
<b>Area Irrigated as per cent of Gross Cropped Area (ha.)</b>	22.4	16.5	3.1	38.2	1.5	6.1
<b>Cropping Pattern 1984-85 (ha.)</b>						
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
Groundnut	30	17	48	147	114	14
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	-	-
Maise	3	9	4	4	2	3
Kadwal (Jowar for Green Fodder)	-	23	8	15	2	5
Sheori	-	-	-	5	-	-
Lucerne	7	53	-	-	-	-
Gajaraj Grass	-	5	-	-	-	-
<b>Grazing Land</b>	9	19	16	23	27	N.A.
<b>Milch Cattle</b>						
Cross-bred 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-Buffaloes	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 as appearing in the Village Records and the number noted by our field staff.

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10 ha. is under lucerne and maize which is the main source of green fodder. Groundnut (30 ha.) is also another source of green fodder upto a certain extent. Potato (26 ha.), though an irrigated crop, is not useful as a source of green fodder for dairy cattle.

The number of households as per the 1971 Population Census was 470. 46 per cent of the 422 families included in the preliminary listing in the village owned cross-bred cows and/or cross-bred calves. It may be highlighted that, out of the 247 families in the listing which reported that they owned milch cattle, 78 per cent owned cross-bred cows and/or calves. About 60 per cent of those who did not own cross-bred cows/calves, reported shortage/absence of green fodder as the reason for not keeping such cattle. A milk cooperative established in the village in 1979 collected about 1000 lts., of milk a day on an average during 1983-84.

Ranjani, Ambegaon Tahsil, Pune District

The other village from Pune district, Ranjani is situated to the east of Kalamb, off the Pune-Kashik 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 mm. to 3000 mm.

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, the area under 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.), Gajraj grass (5 ha.) and maize (9 ha.), that is, fodder crops, was much larger and formed 5.5 per cent of the gross cropped area. The area under crops irrigated by wells formed 16.5 per cent of the gross cropped area. The area under potato (65 ha.) and chilli, tomato and other vegetables and fruit orchards (18.6 ha.) accounted for 15 per cent of the gross cropped area.

There were 414 households at Ranjani as per the 1971 Population Census. In the listing done to note the families owning milch cattle, we listed 454 households. Of these, 314 families owned milch cattle and 82 per cent of them had cross-bred cows and/or calves. The Milk Cooperative establishment in the village in 1978 collected on an average 1500 litres of milk a day during 1983-84.

Both the Milk Cooperatives, at Kalamb and Ranjani, sold milk to the Pune district Cooperative Milk Producers' Union situated at Pune.

#### Umadi, Jath Tahsil, Sangli District

Jath Tahsil, in the eastern part of Sangli district, is classified as drought-prone area. The annual rainfall is about 500 mm. Since we wanted to study dairying with cross-bred cows in a drought-prone area, we selected the village Umadi. It is situated about 70 kms to the north-east of Jath. Umadi 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 land classified as grazing ~~and~~ 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 accounting for about 72 per cent of the gross-cropped area. Bajra and gram - arhar - other pulses each occupy 11 per cent of the gross cropped area. 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. The Milk Cooperative at Umadi purchased 1552 litres of milk from 270 households on 8th February 1985 when our field investigator visited the Cooperative to make a list of those who sold milk to the Cooperative.

#### Nandre, Miraj Tahsil, Sangli District

Nandre, from Sangli district, is situated at a distance of about 12 kms. from Sangli, on the road between Sangli and Bhilawadi. A number of State Road Transport Buses as well as Sangli City Buses bring this village within easy reach of the Cooperative Dairy at Miraj as also Sangli, the district headquarters. The village is situated in an area which has an annual rainfall of about 750 cms.

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 of the total geographical area, is cultivable land. The area under well irrigation is about 460 ha., but another 600 ha. of

land is irrigated under 7 schemes of lift irrigation. 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. Gram, arhar and pulses (13 per cent), groundnut (5 per cent) and vegetables, other oilseeds and other crops (9 per cent) account for the rest of the gross-cropped area, with maize, Kadwal and sheeri occupying only one per cent of the gross cropped area.

Handre is one of the few villages from the Sangli-Kalhapur area where some of the dairy farmers started buying between 1975-79 in large numbers cross-bred cows from Bangalore. Thereafter, many of them started cross-breeding with A.I. on a commercial scale. It was reported that in the past few years, cross-bred cows from Handre and neighbouring villages are purchased by buyers from Bangalore and resold as 'Bangalore cross-bred cows' to buyers from Maharashtra.

The two Milk Cooperatives in the village purchased on an average 4700 litres of milk a day during 1983-84. On the day in March 1985 our field investigator visited the two societies, 514 households came to the Cooperative to sell about 1900 lts., of milk, about two-thirds by one cooperative and one-third by the other cooperative. About two-thirds of the total milk received on that day was cows' milk and that too from cross-bred cows. Among the sample villages, the sale of milk reported at Handre is the maximum. Our listing for preparing a sampling frame revealed that about 290 households owned 470 cross-bred cows and 281 cross-bred calves together with 243 she-buffaloes. Besides 9 more households owned only cross-bred cows together with 9 she-buffaloes. Another about 200 households engaged in dairying

owned only a few cows of non-descript breeds and 230 buffaloes.

Both at Mandre and Umadi, the dairy farmers stated that due to decline in annual rainfall in the past few years, the number of cross-bred cows in this area is declining.

Mandrup, South Solapur Tahsil, Solapur District

Mandrup, as also Antroli, from Solapur district lies in the rainfall shadow zone with a scanty annual rainfall of about 575 mms. Mandrup is located on the Solapur-Bijapur highway, to the south of Solapur, at a distance of about 24 kms. The Dry Land Farming Research Station is located at Mandrup.

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, gram, arhar and other 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.

The village records mentioned 240 cross-bred cows in the village. There were two Milk Cooperatives in the village until June 1984, one of which ceased to function thereafter. The total milk purchased by the two Milk Cooperatives during 1983-84 was about 600 litres a day on an average. Since one of the Milk Cooperatives had become defunct at the time of the study, it was found that a few milk traders/agents in the village had each employed 5-6 small farmers/landless labourers from Mandrup and a few villages in its neighbourhood to collect



milk from the dairy farmers in the village and to take it on bicycles for delivery at Solapur. Some such persons also milked the cows owned by the dairy farmers. Such persons were paid Rs. 8 to 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 Milk Cooperatives even after considering the seasonal variation in the rate paid by the private traders, (c) there is no rejection of milk whereas in the case of the Milk Cooperatives, milk was refused, particularly in summer, stating that it was not fit for sale and was purchased, if at all, at Rs. 0.50 per litre by the Milk Cooperative, and (d) payment is made regularly by the traders/agents once in ten days (every day in a few cases) for the milk purchased from the dairy farmers, which also is considered a better arrangement, as the Milk Cooperative some times take a longer period to make payment.

Antroli, South Solapur Tahsil, Solapur District

Antroli is connected to Mandrup by an all weather road and is situated at a distance of about 15 kms. from Mandrup. Of the total cultivable area of the village, 88 per cent of the area was under crops, including 6.1 per cent of which was irrigated by wells. Jowar occupied 56 per cent of the gross cropped area, followed by other oilseeds (22 per cent), and gram, arhar and other pulses (13 per cent) as major crops. In the remaining 9 per cent of the gross cropped area was sugarcane (34 ha.), groundnut (14 ha.), wheat (12 ha.) and maize and kadwal (8 ha.).

There were 189 households in the village. On the day of the visit of our field staff, the Milk Cooperative had purchased 960 litres of milk from about 100 dairy farmers and sold it to the Government Milk Scheme at Solapur.

### Milk Cooperatives in the Sample Villages

There were 8 Milk Cooperatives in the six sample villages, one of which (at Mandrup) had become defunct from 30th June 1984. 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, the number of members on 30th June 1980 being 153. During 1983-84, the average milk sales came to about 1000 lts. a day. 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 was increasing from year to year in spite of shortage of fodder. The sale of cattle feed had also increased from Rs. 38,000 in 1980-81 to Rs. 1,11,000 in 1983-84. Consequently the net profit increased 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. 58,807 which included Rs. 44,747 on account of Building Fund. One of its members had donated about 1000 sq.ft. of land to the cooperative

**Table 3.2: Milk Cooperatives in the Sample 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**

	Kalamb	Ranjani	Umadi (for 1982-83)	Nandre (Nandre Coopera- tive)	Nandre (Mahavir Coopera- tive)	Mandrup (Shri Mal- siddha Coopera- tive)	Mandrup (Multi- purpose Coopera- tive)	Antroli
Year of Establishment	16-12-78	7-2-78	8-6-79	13-12-57	2-11-79	10-11-74	5-12-73	1974
No. of Members as on 30-6-84	241	197	141	1,438	626	N. A.	N. A.	about 125
Sale of milk during 1983-84	Rs. 8,13,825	Rs. 15,17,835	Rs. 6,40,223	Rs. 38,96,290	Rs. 18,70,550	Rs. 3,70,065	Rs. 1,68,146	N. A.
Sale of cattle-feed during 1983-84	1,10,684	5,504	-	16,71,850	8,55,607	2,052	3,045	N. A.
Net profit during 1983-84	58,807	76,959	10,993	65,622	46,921	- 1,005	- 6,204	N. A.
Paid-up Share Capital as on 30-6-1984	4,575	2,970	4,860	2,01,330	60,890	N. A.	N. A.	N. A.
Reserve Funds as on 30-6-1984	46,958	1,98,810	10,577	3,00,260	87,782	N. A.	N. A.	N. A.
							Defunct from 1-7-84	

to construct its building. However, the building construction work had not commenced until January 1985. The cooperative sold milk to the Poona District Cooperative Milk Producers' Union which sent its vehicle twice a day to collect milk from the cooperative.

2) Shri Narasinha Dudh Vyavasyik Sahakari Sanstha  
Maryadit, Ranjani

The Milk Cooperative at Ranjani was registered on 7th February 1978. The number of members remained constant at 197 since 1981-82. The milk sold during 1983-84 amounted to Rs. 15,17,833, which recorded an increase of about 25 per cent over the preceding two years. In its Annual Report for 1983-84 it stated that the Pune District Cooperative Milk Producers' Union started sending its tanker to Ranjani to collect milk every evening from the year 1983-84. As such the dairy farmers have to bring milk for delivery early in the afternoon. Though this arrangement is not very convenient, they have accepted it as it will reduce proportion of split milk and losses arising out of it to the dairy farmers.

The Milk Cooperative earned a net profit of Rs. 76,959 during 1983-84 as compared to Rs. 45,955 in 1981-82. Over the years, it had built reserve funds amounting to Rs. 1,98,810 as on 30th June 1984. The Milk Cooperative, which had created a Building Fund amounting to Rs. 47,833, and took up the construction of its building in 1983-84. The construction was still in progress in January 1985 when the field work of the present study was carried out in this village.

3) Nandre Dudh Puravatha Sahakari Society Limited, Nandre

This Milk Cooperative is one of the oldest and progressive societies in Sangli district. Registered on

13th December 1957, that is prior to the introduction of cross-bred cows, with 92 members, the number of members stood at 1438 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 is made to the dairy farmers on the basis of fat content of milk they bring for sale. The cooperative made rapid progress after 1973-74 as can be seen from Table 3.3.

**Table 3.3: Progress of Nandre Dudh Puravatha Sahakari Society, Limited, as Revealed by Statistics for the Years 1973-74, 1976-77, 1980-81 and 1983-84**

Year	1973-74	1976-77	1980-81	1983-84
No. of members	551	939	1,394	1,418
Milk Purchased Lts.	1,66,842	10,02,462	15,99,862	11,83,180
Paid-up Share Capital	Rs. 5,740	31,220	1,29,930	1,79,235
Reserve and Other Funds	Rs. 11,493	N.A.	N.A.	2,65,516
Net Profit	Rs. 6,625	40,150	75,199	41,621
Divident Declared	Rs. 6%	9%	9%	9%

It will be noted from the Table, that as compared to the year 1980-81, the milk purchased as also the net profit in 1983-84 has declined. This is due to the establishment of another Milk Cooperative in this village in November 1979. It may also be mentioned that in the year 1979-80, some 75 cross-bred cows died of 'bulkandi' (diarrhoea) and the dairy

farmers had to sustain heavy losses. The Mandre Milk Cooperative had planned a target of 5,000 lts. of milk collection a day by 1977-78 and hence had enabled about 85 members to get loans to buy some 180 cross-bred cows. As a result its average milk collection in 1980-81 reached 4,383 lts. a day but it declined to 3241 lts. a day in 1983-84.

The Cooperative is also engaged in the sale of cattle feed. The sale of cattle feed by the cooperative during 1983-84 was about Rs. 16.71 lakhs as against Rs. 11.0 lakhs in 1981-82.

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

The Cooperative is housed in its own spacious building with ample space for milk collection and testing, godown for cattle feed and adequate space for 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 Mandre Gram Panchayat. The Cooperative persuaded the Gram Panchayat to install a chaff cutter<sup>y</sup> for cutting kadba. This facility is used by a number of dairy farmers. The Milk Cooperative celebrated its Silver Jubilee in 1982 at which the then Chief Minister of Maharashtra State was the Chief Guest.

The Milk Cooperative, like most of the other Milk Cooperatives, 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. However, besides this, the Milk Cooperative has not extended any significant assistance for development of the village or for the village community as such, or to the non-dairy farmers. It used its good offices to get veterinary care, A.I. facilities, etc., from the government department and also enabled the dairy farmers to get loans from the banks to buy cross-bred cattle. Thus, in these and other ways, it helped them in their dairy enterprise.

The Milk Cooperative's Fixed Assets in Buildings, Dead-stock and Furniture stood at Rs.2.80 lakhs as on 30th June 1984. However, <sup>for</sup> from a cooperative of over 25 years' standing, one expects greater contribution to the village community. It may also be noted that its net profit, as compared to its turnover, is also low. For instance, the sample Milk Cooperatives at Ranjani in Pune district earned about the same amount of net profit with less than half of the turnover of the Mandre Milk Cooperative.

4) Shree Mahavir Duddh Utpadak Sahakari Society, Limited,  
Mandre

The State Government normally does not encourage establishment of two or more Milk Cooperatives in a single village. However, at Mandre, 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 within a span of five years can be appreciated from the following statistics for the years 1979-80 and 1983-84.

	<u>1979-80</u>	<u>1983-84</u>
No. of members	354	626
	Rs.	Rs.
Paid-up Share Capital	14,150	60,880
Reserve and Other Funds	360	27,786
Net Profit	- 5,872	46,921
Loans given to the members during the year for purchase of Milk Cattle (upto Rs.1000) and for purchase of 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. ~~So also,~~ the sale of cattle feed increased from Rs.6,73,900 in 1981-82 to Rs.8,55,610 in 1983-84. The decline in milk collection is attributed to adverse natural factors, rise in the cost of maintaining milch cattle due to increase in prices of feed and fodder and consequent sale of milch cattle, and inadequate replacement by fresh purchases due to these adverse factors. This phenomenon is also witnessed in the case of the other Milk Cooperative in the village.

The Mahavir Milk Cooperative also thought of buying an electronic milk tester but had to give up the idea due to non-availability of the liquid materials necessary for milk testing. This, however, has not detracted the dairy farmers from selling milk to the cooperative as is evident from the large quantities of its milk purchases. It paid 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. This resulted in increase in its milk collection but reduced the net profit. It also enabled a number of dairy farmers to obtain loan from the commercial and cooperative banks to purchase a milch animal.

5) Umadi Sahakari Dudh Vyavasayik Sanstha, Maryadit, Umadi

The Milk Cooperative at Umadi 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. Hence, from the general information schedule and the statements of accounts, it is noted that as on 30th June 1983, the position was as follows:

Number of Members : 141

Reserves and Building Fund : Rs. 10,577.00

Annual Milk Collection : 2,20,720 lts.  
1982-83 (i.e. 604 lts. a day  
on an average)

Net Profit during the  
year ended 30th June  
1983 : Rs. 10,993.18

The sale of medicines amounted to Rs.700/- while no sales of cattle feed were reported during the year 1982-83. It may be noted that the Milk Cooperative at Umadi is situated in the drought-prone area of Sangli district. Hence its performance, in comparison with the two Milk Cooperatives at Handre which lies in the milkshed area of Sangli district, is poor.

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 lts. of milk a day, at the time of the present survey in 1985, only 15 persons brought milk for sale to the Cooperative. Of these, 5 persons belonged to one family. With the closure of the other Milk Cooperative in the village, and for the reasons stated in the note on village Mandrup in the preceding section, the present tendency of the dairy farmers is to sell milk to the private traders/agents and not to the Milk Cooperative. In the circumstances, it appears that 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 established 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 has become defunct.

8) Antroli Dudh Utpadak, Purayatha 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 payments is made according to the fat content of milk it accepts for sale. The cooperative collects about 900 lts. of milk a day in summer and about 2,000 lts. a day in flush season, and sells it to the Government Milk Scheme

at Solapur. The practice, observed at Mandrup, of selling milk to private traders/agents rather than to the milk cooperative, is absent in Antroli, though situated near Mandrup. The cooperative sells cattle feed but many of the members prefer to buy oil cake and wheat-bran from Solapur. The cooperative has also enabled a number of members to obtain loan from the commercial/cooperative 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 which 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 cross-breed 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. The cattle feed is given to female calves from the fourth month until their first calving, in about 30 to 32 months, under the scheme as follows:

Age of the calf	Cattle feed kg. per day
4 months	1.00
5 months	1.50
6 months	1.75
7 - 8 months	2.00
9 - 32 months	2.50

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 IVSAMPLE 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. In Chapter I, we have described the method of selecting the villages as also of drawing a sample of dairy farmers therefrom for the purpose of the present study. We selected a sample from six villages of 253 dairy farmers having cross-bred cows and/or calves which included irrigated dairy farmers and other dairy farmers as shown below:

	Irrigated Dairy Farmers	Other Dairy Farmers	Total
<u>Pune District</u>			
Kalamb	32	6	38
Ranjani	28	13	41
<u>Sangli District</u>			
Umadi	12	7	19
Mandre	23	43	66
<u>Solapur District</u>			
Mandrup	13	31	44
Antroli	9	36	45
<b>Total</b>	<b>117</b>	<b>136</b>	<b>253</b>

Thus our sample 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.

While presenting the data and its analysis, depending upon the point under consideration, we have considered all

the dairy farmers together or according to the irrigated dairy farmers and others, or according to the composition of herd of their milch animals, or such other variables.

To begin with, we shall consider the Caste and Religion of the sample families with a view to find out if dairying with cross-bred cows is confined to any advanced community.

### Caste and Religion

For the sake of classification by caste and religion, we divided the sample dairy farmers into 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 given their distribution according to caste and religion.

Table 4.1: Caste and Religionwise Distribution of Sample Families

Caste and Religion	No. of families	Per cent
<u>Hindu</u>		
Brahmin	4	1.58
Maratha	98	38.73
Mali	9	3.56
Artisan Castes	7	2.77
Trading Communities	17	6.72
Scheduled Castes	4	1.58
Scheduled Tribes	3	1.19
Other Hindu Castes	31	12.25
Nava Boudha	78	30.83
Muslims	2	0.79
<b>Total</b>	<b>253</b>	<b>100.00</b>

It is seen from the Table that the largest group was that of the families of Maratha Caste, which accounted for about 39 per cent of the total sample 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. This in a way indicates that as far as rearing of cross-bred cows is concerned, caste is not a barrier. The remaining, about 28 per cent of the total families, belonged to other castes among the Hindus.

#### Main and Subsidiary Occupation of the Family

With a view to find out if the dairy enterprise was the main or subsidiary occupation of the family, we asked the respondents to report the occupation of the family which they considered as the Main and also Subsidiary Occupation, if any. We classified the occupations into seven broad categories as follows: Cultivators, Agricultural labourers, Dairying, Trade, Village Artisans, Service and Educands. The distribution of sample families according to the main and subsidiary occupation of the family is given in Table 4.2. As is to be expected, it will be noted from the Table that 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.

As regards the main occupation of the family, we find that as many as 86 per cent of the dairy farmers pursued cultivation as their main occupation. Agricultural labour

families engaged in dairying as subsidiary occupation formed 9.5 per cent of the total sample. The remaining, about 5 five per cent, pursued an occupation, other than cultivation or dairying, as their main occupation.

**Table 4.2: Distribution of Sample Families According to the Main and Subsidiary Occupation of the Family**

Main occupation	Subsidiary Occupation					Total
	Culti- vators	Agri. labour	Dairying	Arti- sans & Traders	None	
No. of Families						
Cultivation	-	1	210	1	4	217
Agri. Labour	-	-	24	-	-	24
Dairying	-	2	-	-	2	4
Trading	-	-	1	-	-	1
Artisans	1	-	1	-	-	2
Service	-	-	4	-	-	4
Educands	1	-	-	-	-	1
<b>Total</b>	<b>2</b>	<b>3</b>	<b>240</b>	<b>1</b>	<b>6</b>	<b>253</b>

#### Year of Starting Dairy Enterprise

In Table 4.3 we have given data regarding the year in which the dairy farmers started dairying as an enterprise and whether they were members of a milk cooperative. We have noted in Chapter II, that cross-breeding of cows received impetus during the last 15 years and particularly, dairying with cross-bred cows caught up during the last decade. The data reveals that about 10 per cent of the dairy farmers were following dairy business even before 1970 and the rest of the sample families had taken to dairying in the last 15 years. In fact, almost two-thirds of the families had taken to dairying during the five years preceding the survey.



### Membership of Milk Cooperative

As stated in Chapter III, except village Mandrup where the milk cooperative was dormant, at all other sample villages, the milk cooperatives were working efficiently. During the sample survey, we found that 80 per cent of the dairy farmers were members of the milk cooperatives.

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

How long in Dairy Enterprise?	Membership of Milk Cooperative			Total no. of sample families
	Member	Not member	Not stated	
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>

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

The 253 sample <sup>dairy</sup> farmers had 1367 members. The average size of the family came to 5.4 persons per family. The distribution of families according to size was as follows:

<u>No. of persons in the family</u>	<u>No. of families</u>
One	1
Two	11
Three	16
Four	45
Five	66
Six	49
Seven	38
Eight	17
Nine	10
	-----
Total	253
	-----

The classification of family members by sex and age (i.e. adults 15 years and above, and non-adults 14 years and below) was as follows:

	<u>Per cent of total</u>
Male adults	37.0
Male non-adults	18.0
Female adults	30.0
Female non-adults	15.0

The Male : Female Ratio came to 55 : 45.

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 and also whether they had to give up some occupation which they were pursuing before taking to dairying.

#### 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. On an average, 2 persons per family worked in dairying. Of the total such persons, 62 per cent were males and 38 per cent were females. The average number of persons in dairy enterprise was the lowest, 1.68 per family where

there was no cross-bred cow and it increased to 2.09, 2.22, 2.20 and 3.0 where there were one, two, three and four cross-bred 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 tabulated the relevant data and presented 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 89 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 16 per cent, among the males. About 15 per cent of the total were educated upto the fourth standard and another 23 per cent upto the seventh standard. There were only 15 per cent who had studied upto 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 upto the fourth standard (they together formed 50 per cent of the total) shows that dairying with cross-bred cows was not confined to those who had higher formal education.

#### Annual Employment in Dairy Enterprise

It may be mentioned that from the information the respondents gave regarding the number of hours spent on various work relating to dairying, the field investigators enabled the respondents to report (by converting the total

number of hours in a year into days by dividing the total hours by eight) the number of days each person worked during the reference year. The data regarding the number of the family members or annual farm servants <sup>who</sup> worked in the dairy enterprise is presented in Table 4.5.

**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	Upto 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 & 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>

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

Family members and annual farm servants	Total hours worked daily							Total no. of persons
	One hour	Two hours	Three hours	Four hours	Five hours	Six hours	Seven to nine hours	
No. of persons								
Male of age 15 and more	75	102	57	25	7	2	1	269
Male of age 14 and below	6	3	2	2	1	1	-	15
Female of age 15 and more	39	64	60	33	11	3	-	210
Female of age 14 and below	8	2	2	-	-	-	-	12
Annual farm servants	1	1	2	3	1	1	13	22
<b>Total</b>	<b>129</b>	<b>172</b>	<b>123</b>	<b>63</b>	<b>20</b>	<b>7</b>	<b>14</b>	<b>528</b>

It is seen from the Table that except the annual farm servants, all others worked part-time round the year in dairy enterprise. In all 522 males/females, adults/non-adults among the 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 (i.e. 784 hours) per person on an average. The average number of days in a year was about 85 in the case of male adults and ~~100 in the case of male adults~~ and 100 in the case of female adults, there being 269 male adults and 210 female adults among family members engaged in dairying. Besides the 22 farm servants, on an average, worked 270 days in a year, that is, almost as full time workers in dairying.

There were only 15 male non-adults who worked on an average for about 96 days and 12 female non-adults who worked 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 will be seen from Table 4.5 that about 24 per cent spent upto one hour a day and another 33 per cent upto 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 4 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 non-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.

#### Daily Hours Spent in Grazing

It will be 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 (61 per cent) and lower among the male adults (52 per cent). <sup>About three-fourths of them spent upto 2 hours a day in grazing and</sup> The time spent on grazing varies with the availability of grazing facilities as also distance of the grazing site from the residence. Besides, it also depends upon the workload in agriculture or other employment, as they tend to spend more time on grazing the cattle, if they have no other work to do.

#### 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 one person per family) were engaged in milking. All of them except one spent upto one 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 accounted for the remaining. It may be noted that milking is done twice a day, early in the morning and in the evening. Thus, normally it would not clash with other economic pursuits in which such persons may be engaged.

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

Family members and annual farm servants	Daily Time Spent in Taking Milch Animals Out for Grazing						Total no. of persons
	One hour	Two hours	Three hours	Four hours	Five hours	Not spending any time	
	No. of Persons						
Male of age 15 and more	48	66	21	3	1	130	269
Male of age 14 and below	4	4	1	1	-	5	15
Female of age 15 and more	44	53	22	5	3	83	210
Female of age 14 and below	3	1	-	-	-	8	12
Annual farm servants	2	4	3	6	5	2	22
<b>Total</b>	<b>101</b>	<b>128</b>	<b>47</b>	<b>15</b>	<b>9</b>	<b>228</b>	<b>528</b>



**Table 4.7: Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Milking the Milch Animals**

Family members and annual farm servants	Daily Time Spent in Milking the Milch Animals			Total no. of persons
	One hour	Two hours	Not spending any time	
	No. of persons			
Male of age 15 and more	135	1	133	269
Male of 14 and below	5	-	10	15
Female of age 15 and more	83	-	127	210
Female of age 14 and below	2	-	10	12
Annual farm servants	18	-	4	22
<b>Total</b>	<b>243</b>	<b>1</b>	<b>284</b>	<b>528</b>

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

The work of cleaning the cattle shed also does not conflict with other work as it can be done during the day whenever one is free. As seen from Table 4.8 about 46 per cent (that is one person per family) of the total persons did this work. A majority of them, were female adults, forming two-thirds of the total persons engaged in cleaning the cattle shed. About 96 per cent took one hour a day, while the remaining took 3 to 4 hours a day to clean the cattle sheds.

#### Daily Hours Spent in Selling Milk

By selling milk, we really mean delivering milk at the Milk Cooperative to which most of the milk was sold. It will be seen from Table 4.9 that only 186 persons reported that they spent upto one hour in this task. The remaining 26 per cent

**Table 4.8: Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Cleaning the Cattle Shed**

Family members and annual farm servants	Daily time spent in cleaning the cattle shed					Total no. of persons
	One hour	Two hours	Three hours	Four hours	Not spending any time	
	No. of Persons					
Male of age 15 and more	45	2	1	-	221	269
Male of age 14 and below	4	-	-	-	11	15
Female of age 15 and more	159	3	-	1	47	210
Female of age 14 and below	8	-	-	-	4	12
Annual farm servants	18	2	-	-	2	22
<b>Total</b>	<b>234</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>285</b>	<b>528</b>

**Table 4.9: Distribution of Persons Working in Dairy Enterprise According to Daily Time Spent in Selling Milk**

Family members and annual farm servants	Daily time spent in selling milk			Total no. of persons
	One hour	Two hours	Not spending any time	
	No. of persons			
Male of age 15 and more	126	4	139	269
Male of age 14 and below	8	-	7	15
Female of age 15 and more	36	1	173	210
Female of age 14 and below	2	-	10	12
Annual farm servants	8	1	13	22
<b>Total</b>	<b>180</b>	<b>6</b>	<b>342</b>	<b>528</b>

of the total families did not have milk to sell during the reference year. It may be recalled that 7.5 per cent of the total families did not own a cross-bred cow and half of them did not have any milch animal during the reference year.

The work of delivering milk was done mainly by males and they formed about 79 per cent of those who were engaged in delivering milk. In most of the cases milk was delivered twice a day. Thus they spent upto half an hour in the morning as well as in the evening, and mostly outside the hours of work of their other economic pursuits.

#### Daily Time Spent in Other Work

It will be seen from Table 4.10 that only 9 per cent of the total persons engaged in dairying reported that they spent upto an hour in doing some other work relating to the dairy enterprise. Most of such persons were males.

#### 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 cross-bred cows. In case they had to give up some such employment, we asked them to indicate how much they had earned in a year in that occupation, prior to starting dairying with cross-bred cows. In reply, 203 out of 506 family members, who were engaged in dairy enterprise at the time of the survey, stated that they were not doing anything before. 45 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 occupations. However, out of 210 female adults except for 10

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

Family members and annual farm servants	Daily time spent in other work			Total no. of persons
	One hour	Two hours	Not spending any time	
	No. of persons			
Male of age 15 and more	22	-	247	269
Male of age 14 and below	2	-	13	15
Female of age 15 and more	10	-	200	210
Female of age 14 and below	1	-	11	12
Annual farm servants	11	3	8	22
<b>Total</b>	<b>46</b>	<b>3</b>	<b>479</b>	<b>528</b>

female adults who were working as agricultural labourers and had ceased to do that work after buying the cross-bred cows, all others, whether male or female continued to pursue their previous occupation, even after taking to the dairy enterprise.

As for the 10 female adults, who had ceased to work as agricultural labourers, they earned on an average Rs.550 as wages in a year prior to their entry in dairy enterprise. These women could have continued to work as agricultural labourers even after buying the milch animals. It is likely that they thought that the additional income they may get from dairying may be more than compensate for the income from wages they may have to sacrifice. Besides, there could be an element of social or status consciousness, namely, the dairy enterprise had made them self-employed and as such they need not go about in search of employment as wage earners, even if incremental income from dairying may not be equivalent to the wages they used to earn.

It may be stated that the work of milking the animals, early in the morning and late in the evening, does not conflict with the work regarding their other economic pursuits.

Grazing the cattle, cleaning the cattle-shed, washing the animals, etc., can also be done during their leisure. As 98 per cent of the family members were not required to sacrifice income from the occupation which they were pursuing before buying the cross-bred cows, the opportunity cost of family labour engaged in dairy enterprise is considered as zero.

#### Milch Animals with the Sample Dairy Farmers

We had noted some information regarding the milch animals the sample dairy farmers had at the time of the survey. Of these, some were purchased and the remaining were home-bred. While selecting the sample, except for about 4 per cent of them, we had selected the dairy farmers having one or more cross-bred cows along with/without cows and buffaloes of local non-descript breeds. The composition of the sample dairy farmers according to their holding of milch animals was as follows:

<u>No. of cross-bred cows and/or cows and buffaloes of Non-descript breeds</u>	<u>No. of dairy farmers</u>
No cross-bred cow but one or more cross-bred calves	21
One cross-bred cow	180
Two cross-bred cows	46
Three cross-bred cows	5
Four cross-bred cows	1
Total	253

There were 21 dairy farmers who did not have cross-bred cows but only a cross-bred calf, but twelve of them had cows and/or buffaloes of local non-descript breeds also. We had selected these families to get some information on rearing cross-bred calves and the expenditure incurred on such calves, since birth till their first calving. Majority of them were landless or small farmers.

As for the number of cross-bred cows in the composition of the herd in respect of the remaining 232 dairy farmers, as many as 78 per cent of the dairy farmers had one cross-bred cow and about 20 per cent other dairy farmers had two cross-bred cows. In the remaining two per cent, only 5 dairy farmers had 3 cross-bred cows and one had 4 cross-bred 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 cross-bred cow varied between 58 to 64 per cent, those having 2 cross-bred cows, between 23 and 29 per cent while that of those having three or more cross-bred 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 cross-bred cow and lower representation of those having 2 or more cross-bred cows.

As stated earlier, we had selected some dairy farmers who had some irrigated land while others were either dry land cultivators or landless. In Table 4.11 we have given their holding of milch animals, according to ~~purchased or home-bred,~~ as also ~~according to breed.~~

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

1 = No. of Dairy Farmers in December 1983; 2 = No. of Animals in December 1983, 3 = No. of Dairy Farmers in November 1984  
4 = No. of Animals in December 1984

Type of Livestock	Kalamb				hanjani				Umadi				Nandre				Mandrup				Antroli				Total			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Cross-bred Cows</b>																												
Holstein	15	22	18	23	22	30	22	31	3	4	5	6	49	64	49	56	24	28	26	26	30	40	40	56	143	188	160	198
Jersey	12	17	14	17	11	12	12	13	4	4	15	15	21	21	20	20	9	9	13	13	2	2	2	3	59	65	76	81
Red Den	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	5	5	3	3	4	4	7	7	9	9
Danish	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	2	2	2	2
Brown-Swiss	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	1	1	1	1
Not stated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	1	1	1	1
<b>Cross-bred Female Calves</b>																												
Holstein	12	13	16	18	18	22	21	27	-	-	3	3	26	29	31	40	17	19	18	18	12	16	19	22	85	99	108	128
Jersey	12	17	17	25	6	7	12	13	5	5	9	9	5	5	4	4	4	4	7	7	-	-	1	1	32	38	50	59
Red Den	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	4	4	-	-	1	1	1	1	5	5
Danish	-	-	1	1	-	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	2	2	3	3
Brown Swiss	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	1
<b>Cross-bred Bullocks</b>																												
	1	1	1	1	-	-	-	-	2	4	2	4	2	2	2	2	1	1	1	1	-	-	-	-	6	8	6	8
<b>Cross-bred Male Calves</b>																												
	3	4	4	5	2	2	6	6	1	1	2	3	4	4	9	9	-	-	-	-	-	-	1	1	10	11	22	24
<b>Other Cows Gir</b>																												
Local Non-descript breeds	10	10	8	8	6	6	4	4	2	2	3	3	1	1	-	-	3	4	3	4	3	3	2	2	25	26	20	21
<b>Female Calves Gir</b>																												
Local Non-descript breeds	1	1	-	-	1	1	2	2	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2	4	4
<b>Bullocks</b>																												
	23	53	28	62	19	36	19	36	6	15	7	12	19	30	16	26	18	40	18	40	12	24	12	24	99	198	100	200
<b>Bullocks Young Stock</b>																												
	6	10	5	6	5	6	6	6	4	4	1	1	-	-	4	4	2	2	2	2	3	3	3	4	20	25	21	25
<b>Buffaloes</b>																												
Jafarabadi	3	5	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	4	6	5	6
Pandharpuri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	2	-	-	-	-	1	2	1	2
Local Non-descript	2	2	2	2	3	3	4	4	7	6	6	7	24	26	22	24	6	6	8	8	7	7	8	8	49	54	50	53
Graded-up	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	1	1	1	1	-	-	-	-	3	3	3	3
<b>Buffaloes Young Stock</b>																												
Jafarabadi	2	2	3	3	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	5	5	6	6
Local Non-descript breeds	1	1	1	1	1	1	4	4	3	4	4	5	8	9	11	11	1	1	7	7	2	2	3	3	16	18	30	31
<b>He-buffaloes</b>																												
	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
<b>He-buffaloes Young Stock</b>																												
	-	-	1	1	-	-	-	-	-	-	-	-	2	2	3	3	-	-	1	1	-	-	-	-	2	2	5	5
<b>Old cows</b>																												
	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	2	2
<b>Old Buffaloes</b>																												
	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1
<b>TOTAL</b>																												
	107	162	127	184	94	126	112	146	39	51	60	71	169	203	180	208	99	129	122	146	78	105	100	134	586	776	701	889

4.11: Livestock Holding in December 1983 and November 1984, of the Sample Dairy  
 1 = No. of Dairy Farmers in December 1983; 2 = No. of Animals in December 1983  
 3 = No. of Animals in December 1984

Type of Livestock	Kalamb				Ranjani				Umadi				Ranjani	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2
<b>Red-bred Cows</b>														
stein	15	22	18	23	22	30	22	31	3	4	5	5	49	64
sey	12	17	14	17	11	12	12	13	4	4	15	15	21	21
Den	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ish	-	-	-	-	-	-	-	-	-	-	-	-	2	2
wn-Swiss	-	-	-	-	-	-	-	-	-	-	-	-	1	1
stated	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Red-bred Female Calves</b>														
stein	12	13	16	18	18	22	21	27	-	-	3	3	26	29
sey	12	17	17	25	6	7	12	13	5	5	9	9	5	5
Den	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ish	-	-	1	1	-	-	-	-	-	-	-	-	2	2
wn Swiss	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Red-bred Bullocks</b>														
	1	1	1	1	-	-	-	-	2	4	2	4	2	2
<b>Red-bred Male Calves</b>														
	3	4	4	5	2	2	6	6	1	1	2	3	4	4
<b>Cows Gir</b>														
al Non-descript breeds	10	10	8	8	6	6	4	4	2	2	3	3	1	1
<b>Female Calves Gir</b>														
al Non-descript breeds	1	1	-	-	1	1	2	2	-	-	2	2	-	-
<b>Bullocks</b>														
	23	53	28	62	19	36	19	36	8	15	7	12	19	30
<b>Bullocks Young Stock</b>														
	6	10	5	8	5	6	6	6	4	4	1	1	-	-
<b>Goats</b>														
arabadi	3	5	4	5	-	-	-	-	-	-	-	-	-	-
dharpuri	-	-	-	-	-	-	-	-	-	-	-	-	-	-
al Non-descript	2	2	2	2	3	3	4	4	7	8	6	7	24	28
ded-up	-	-	-	-	-	-	-	-	-	-	-	-	2	2
<b>Goats Young Stock</b>														
arabadi	2	2	3	3	-	-	-	-	-	-	-	-	1	1
al Non-descript breeds	1	1	1	1	1	1	4	4	3	4	4	5	8	9
<b>Buffaloes</b>														
	-	-	1	1	-	-	-	-	-	-	1	1	-	-
<b>Buffaloes Young Stock</b>														
	-	-	1	1	-	-	-	-	-	-	-	-	2	2
<b>Cows</b>														
	3	3	2	2	-	-	-	-	-	-	-	-	-	-
<b>Buffaloes</b>														
	1	1	1	1	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>														
	107	162	127	184	94	126	112	146	39	51	60	71	169	203



dairying with cross-breed cows, particularly at Nandre and Mandrup, are also engaged in breeding cross-bred cows as a part of their enterprise.

As regards the buffaloes, about 83 per cent of them were of local non-descript breeds. In November 1984, the number of Jafarabadi, Pandharpuri and Upgraded 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 cross-bred 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 there being 198 bullocks in December 1983 and 200 in November 1984. The young stock of bullocks remained unchanged at 25. Since our sample included only those dairy farmers who had cross-bred cows, most of them do not require other cows (of local non-descript breeds) for breeding home-bred cross-bred cows with A.I. The other cows are useful for obtaining bullocks rather than as milch animals. Most of the sample farmers do not use cross-bred 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 home-bred bullocks and may have to buy for use as draught animals.

Land Cultivated

It is often argued that irrigated dairy farmers can conduct dairying with cross-bred 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 cross-bred cows with reference to irrigated dairy farmers and others. To know the holding of cross-bred cows among the irrigated dairy farmers and others, we have classified them according to their land holding and the number of cross-bred cows and other milch animals they had. The data is presented in Table 4.12. We have also classified the data according to the size of irrigated land and presented it in Table 4.13. The data in Table 4.12 and 4.13 is summarised below.

Number of cross-bred cows (and/or cows and Buffaloes of local non-descript breeds) with dairy farmers	Dairy Farmers					Total no.
	Land owners	Landless	Total no.	Irrigated	Others	
No cross-bred cow but one or more cross-bred calves	19	2	21	6	15	21
One cross-bred cow	160	20	180	84	96	180
Two cross-bred cows	43	3	46	23	23	46
Three cross-bred cows	5	-	5	3	2	5
Four cross-bred cows	1	-	1	1	-	1
<b>Total</b>	<b>228</b>	<b>25</b>	<b>253</b>	<b>117</b>	<b>136</b>	<b>253</b>

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

**Table 4.12: Classification of Dairy Farmers According to the Composition of the Herd of Their Milch Animals and Size of Their Cultivated Holding**

No. of cross-bred cows (and/or cows and buffaloes of local, non-descript breeds) with dairy farmers	Size of cultivated holding										Total no. of Dairy Farmers
	Upto 0.4 ha.	0.4 to 1.0 ha.	1.1 to 2.0 ha.	2.1 to 3.0 ha.	3.1 to 4.0 ha.	4.1 to 5.0 ha.	5.1 to 7.0 ha.	7.1 to 10.0 ha.	10 ha. and more	Landless	
No cross-bred cow but one or more cross-bred calves	4	-	8	3	1	-	1	2	-	2	21
One cross-bred cow	11	22	57	25	22	7	6	7	3	20	180
Two cross-bred cows	2	12	5	9	5	3	3	4	-	3	46
Three cross-bred cows	-	1	1	-	2	1	-	-	-	-	5
Four cross-bred cows	-	-	-	-	-	-	1	-	-	-	1
<b>Total</b>	<b>17</b>	<b>35</b>	<b>71</b>	<b>37</b>	<b>30</b>	<b>11</b>	<b>11</b>	<b>13</b>	<b>3</b>	<b>25</b>	<b>253</b>

**Table 4.13: Classification of Dairy Farmers According to the Composition of the Herd of Their Milch Animals and Size of the Irrigated Area**

No. of cross-bred cows (and/or cows and buffaloes of local, non-descript breeds) with dairy farmers	Size of Irrigated Area								Total no. of dairy farmers
	Upto 0.4 ha.	0.41 to 1.0 ha.	1.1 to 2.0 ha.	2.1 to 3.0 ha.	3.1 to 4.0 ha.	4.1 to 5.0 ha.	5.1 ha. and more	No irrigated area	
No. of Dairy Farmers									
No cross-bred cows but one or more cross-bred calves	2	2	2	-	-	-	-	15	21
One cross-bred cow	14	31	28	6	4	1	-	96	180
Two cross-bred cows	3	6	8	-	4	-	2	23	46
Three cross-bred cows	-	-	-	2	1	-	-	2	5
Four cross-bred cows	1	-	-	-	-	-	-	-	1
<b>Total</b>	<b>20</b>	<b>39</b>	<b>38</b>	<b>8</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>136*</b>	<b>253</b>

\* Including the 25 landless.

Among the 228 cultivator-dairy farmers, 52 were marginal farmers cultivating upto one ha., while 71 others were small farmers, cultivating upto 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 upto 2 ha. of land, indicates that dairying with cross-bred cows is not necessarily confined to the medium and large farmers but is also significantly evident among the group of landless, marginal and small farmers.

It will, also, be observed from the Table that a majority of the landless as also the marginal and small farmers had only one cross-bred cow/cross-bred calf/calves <sup>with</sup> and/or <sup>without</sup> other milch animals. Only about 6 per cent of them had two cross-bred cows and less than 2 per cent had three cross-bred cows. At the same time it will also be noted from the Table that dairy farmers owning two or more cross-bred cows were not necessarily large farmers, as out of 52 such dairy farmers, only 12 had more than 4 ha. of cultivated area.

We shall next consider the size of their irrigated land. At the outset it must be mentioned that we had purposively selected the sample village, according to irrigated area, some of them having more of it and the others from dry land cultivation or drought prone area. As a result we find from Table 4.13 that our sample of 253 dairy farmers included 111 dairy farmers who did not have any irrigated area, 117 others who had some irrigated area and the remaining

25 dairy farmers who were landless.

If we consider the dairy farmers without any irrigated land, we find that their holding of cross-bred cows was not radically different from those who had some irrigated land. Among those who owned two or more cross-bred cows also, we find that those without any irrigated land accounted for almost half of such dairy farmers.

Among the 117 dairy farmers who had irrigated area, it is worth noting that as many as 97 of them had only upto 2 ha. of irrigated land. Our data that thus shows that dairying with cross-bred cows is not necessarily restricted to ~~among~~ those who have irrigated land.

#### Fodder Resources: Farm Produced and Purchased Fodder

Having considered the milch animals and land holding, we shall next consider fodder resources. With a view to find out the extent of dependence of the dairy farmers on purchases of fodder, we had 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 28 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,

**Table 4.14: Farm Produced and Purchased Fodder  
During the Reference Year**

	Farm Produced Rs.	Purchased Rs.
Jowar kadba	4,42,391	1,92,610
Bajra fodder	74,870	13,497
Other dry fodder	17,386	-
Green fodder - Jowar	23,240	90
- Maize	42,220	3,965
- Sugarcane	38,350	61,945
- Lucerne	91,705	3,352
- Groundnut	4,560	-
- Other	8,660	17,790
<b>Total</b>	<b>7,43,382</b>	<b>2,93,249</b>

we find that the purchased kadba accounted for about 39 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 19 per cent and jowar 11 per cent. The remaining 6 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 the sugarcane cultivators, for any reason, refuse to sell sugarcane

tops to the dairy farmers. As for Lucerne, it was generally not available for sale as the cultivators needed it for their own milch cattle.

The grazing facilities on payment seemed to be non-existent as only one dairy farmer reported expenditure on that item.

Thus fodder, both dry and green, may become a severe limiting factor in the growth of dairying, if the cultivators, who have farm produced fodder, take to dairying in larger numbers as also with more milch animals than at present, and if no serious attempts are made to increase the production of fodder.

#### Place of Obtaining Feed and Fodder

The respondents were asked to state the place from where they could obtain, lucerne, maize/jowar green fodder, sugarcane tops and kadba.

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 the 49 others purchased it from the neighbouring farmers. In this connection it may be recalled that 117 out of 253 dairy farmers had some irrigated land but only about one-third of such irrigated farmers 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 had their own production of green fodder from maize or jowar.



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 in the village.

Thus in the matter of green fodder, a majority of the farmers depended upon maize and jowar.

As regards kadba (Jowar fodder - dry), except in the case of about 2 per cent of the total, all other dairy farmers reported that it was either available on their own farm or with the neighbouring 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. 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 animal was in milk. The remaining, about 30 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 to give

to their milch animals 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<sup>as</sup> its non-availability in the village or lack of enough water in the wells to raise green fodder.

In this connection it may be recalled that 54 per cent of the total dairy farmers did not have irrigated land and 23 per cent others had only upto 1 ha. of irrigated land. As a result, 77 per cent of them really had no or little of farm produced green fodder.

#### Loan or Subsidy for Fodder

Only five dairy farmers received subsidy for buying fodder while six other dairy farmers got loan to buy fodder. It may be stated that the State Government had a scheme to give subsidy for fodder and for rearing calves of cross-bred cows. However, this scheme was implemented in very limited areas. Only Solapur district, from out of the three districts we had selected for the survey, was included in the scheme. It may be recalled that we had selected a sample of 89 dairy farmers from two villages from Solapur district.

#### Cattle Feed

The respondents were asked to report the kind of cattle feed they gave to their cross-bred 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 bran along with it. 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/-. 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 cross-bred calves but no cross-bred cows.

As regards the source of supply, 60 per cent of the dairy farmers stated that cattle feed was available in the Milk Cooperative in the village. The remaining 40 per cent, that is 108 dairy farmers which included 44 of them from Mandrup (where the Milk Cooperative was <sup>almost</sup> defunct), stated that they obtained cattle feed from the traders situated in 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 cross-bred cows separately, in the present section we propose to examine the extent to which dairy enterprise brought income to dairy farmers. It may be mentioned that, except 56 dairy farmers who owned cross-bred cows and/or cross-bred calves only the remaining 197 dairy farmers had

in their herd non-descript cows and/or buffaloes along with cross-bred cows. The income from dairying is shown in Table 4.15 and it includes income from cross-bred cows as also other milch animals in the reference year.

On the receipts side we have included the value of total milk production, dung manure, sales of milch and other animals of hides and skin of the dead animals. On the expenditure side, we have included the expenditure on feed and fodder, transport of milk, insemination, veterinary care, cattle insurance, salary of paid servant, if any, expenditure on grazing land and interest on loan taken, if any, for purchase of milch animals. We have not included depreciation of 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 Table that out of 253 dairy farmers, 92 per cent showed excess of receipts over expenditure. Among the 8 per cent who showed a deficit, about one-fourth of them did not have any cross-bred cow or other milch animal while most of the remaining who showed a deficit 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 38 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 13 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/-.

**Table 4.15: Classification of Dairy Farmers According to the Composition of the Herd of Their Milch Animals and Income from Dairying During the Reference Year**

No. of cross-bred cows (and/or cows and buffaloes of local non-descript breeds) in the herd of their milch animals	Loss	Income from dairying during the reference year (Rs.)								Total no. of dairy farmers
		Upto Rs. 500	501 to 1000	1001 to 1500	1501 to 2000	2001 to 2500	2501 to 3500	3501 to 5000	More than Rs. 5000	
No cross-bred cow but one or more cross-bred calves	13	2	-	2	-	-	1	1	2	21
One cross-bred cow	28	10	14	13	15	10	20	24	46	180
Two cross-bred cows	6	-	2	1	3	1	4	4	25	46
Three cross-bred cows	-	-	-	-	-	-	1	1	3	5
Four cross-bred cows	-	-	-	-	-	-	-	-	1	1
<b>Total</b>	<b>47</b>	<b>12</b>	<b>16</b>	<b>16</b>	<b>18</b>	<b>11</b>	<b>26</b>	<b>30</b>	<b>77</b>	<b>253</b>

It may be reiterated that we have arrived at the income for the herd of milch animals as a whole and not exclusively for cross-bred cows. We have also not included depreciation or appreciation in the value of cross-bred cows/calves, and imputed value of family labour in the total expenditure. Taking into consideration these limitations, it is worth noting that 92 per cent of the dairy farmers showed a surplus of various magnitude during the reference year.

We also classified the data regarding income from dairy enterprise separately for the irrigated farmers and others. The data is presented in Tables 4.16 and 4.17.

About 20 per cent of the irrigated dairy farmers incurred a loss whereas only about 18 per <sup>cent</sup> from among the other dairy farmers sustained loss during the reference year.

Similarly, if we consider those getting an income exceeding Rs. 2,500 from dairying they formed about 45 per cent among irrigated dairy farmers and in fact a higher percentage, 57 per cent, among others (one-fifth of whom were landless).

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

**Table 4.16 : Distribution of Irrigated Dairy Farmers According to Income from Dairying During the Reference Year**

Size of cultivated holding	Loss	Income from dairying during the reference year (Rs.)								Total no. of irrigated dairy farmers
		Upto 500	501-1000	1001 to 1500	1501 to 2000	2001 to 2500	2501 to 3500	3501 to 5000	More than 5000	
No. of Dairy Farmers										
Upto 0.4	4	-	-	-	-	-	-	1	2	7
0.4 to 1.0	2	3	1	1	1	-	1	1	8	18
1.1 to 2.0	6	1	2	4	4	3	-	2	5	27
2.1 to 3.0	1	4	-	1	1	2	1	3	7	20
3.1 to 4.0	2	-	3	-	1	-	5	2	6	19
4.1 to 5.0	2	-	-	-	2	1	-	-	3	8
5.1 to 7.0	1	-	-	1	1	-	1	-	4	8
7.1 to 10.0	5	-	1	-	-	-	-	-	1	7
More than 10 ha.	-	-	-	-	-	-	-	1	1	2
Not stated	-	-	-	-	-	-	-	1	-	1
<b>Total</b>	<b>23</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>10</b>	<b>6</b>	<b>8</b>	<b>11</b>	<b>37</b>	<b>117</b>



**Table 4.17 : Distribution of Other Dairy Farmers According to Income from Dairying During the Reference Year**

Size of cultivated holding	Less	Income from dairying during the reference year (Rs.)								Total No. of irrigated dairy farmers
		Upto 500	501 to 1000	1001 to 1500	1501 to 2000	2001 to 2500	2501 to 3500	3501 to 5000	More than 5000	
No. of Dairy Farmer										
Landless	5	1	2	2	1	-	3	3	7	24
Upto 0.4	1	-	-	-	1	-	1	3	4	10
0.4 to 1.0	3	-	-	-	-	1	5	2	6	17
1.1 to 2.0	9	3	5	5	1	2	2	7	10	44
2.1 to 3.0	2	-	-	-	2	1	3	2	7	17
3.1 to 4.0	2	-	1	-	1	1	1	1	4	11
4.1 to 5.0	1	-	1	-	-	-	1	-	-	3
5.1 to 7.0	-	-	-	1	1	-	-	-	1	3
7.1 to 10	-	-	-	1	1	-	2	1	1	6
More than 10 ha.	1	-	-	-	-	-	-	-	-	1
<b>Total</b>	<b>24</b>	<b>4</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>18</b>	<b>19</b>	<b>40</b>	<b>136</b>

CHAPTER VCROSS-BREEDING AND SPECIAL CARE  
OF THE CROSS-BRED COWS AND CALVES

In the present chapter we propose to note the experience of the dairy farmers in the matter of cross-breeding their cows of local, non-descript breeds by A.I. We shall later on note the sex and mortality of the calves born and whether the calves were retained by the dairy farmers or sold. With a view to find out if it is economical to rear a female cross-bred calf, from its birth until its first calving, vis-a-vis buying a cross-bred cow in its first calving, we shall examine the data on rearing cross-bred calves. The cross-bred cows, it is often emphasised, need special care and attention. We propose to consider from our survey data the type of special care the dairy farmers took and the veterinary treatment they gave to their cross-bred cows. Finally, we shall consider the deaths of milch animals, the reported causes of death and also information on cattle insurance.

Home-bred, Cross-bred Cows

In respect of the home-bred, cross-bred animals, 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 cross-bred cows do not conceive after the third or fourth calving, (iii) whether they considered that the cross-bred bullocks/young-stock are as efficient as the indigenous bullocks of local breed, (iv) if no longer resorting to A.I., reasons therefore, and (v) whether they insured the cattle every year and if not, reasons for not insuring. In fact we should have asked these questions also to the

dairy farmers who had only purchased cross-bred cows. <sup>with them</sup>  
 However, through oversight, these questions remained to be incorporated in the set of questions regarding the purchased cross-bred cows. Hence we have information on the above mentioned items only in respect of the dairy farmers who had at the time of the survey home-bred, cross-bred cows.

The distribution of 78 home-bred, cross-bred cows is given in Table 5.1. It is seen from the Table that <sup>of the 57 Holstein & 21 Jersey cross-bred cows</sup> about 75 per cent of them had their first cross-bred calf born sometime in the years 1982 to 1984. Of the 78 such cows, 48 were owned by the irrigated farmers and the remaining 30 by others.

**Table 5.1: Distribution of Home-bred, Cross-bred Cows According to Year in Which Their First Cross-bred Calf Was Born**

Year in which their first cross-bred calf was born	Holstein		Jersey		Total
	Unirri-gated dairy farmers	Irrigated dairy farmers	Unirri-gated dairy farmers	Irrigated dairy farmers	
1984	6	6	2	3	17
1983	4	12	5	6	27
1982	7	12	-	1	20
1981	2	5	1	-	8
1980	-	1	-	-	1
Prior to 1980	-	-	-	2	2
Not stated	2	-	1	-	3
<b>Total</b>	<b>21</b>	<b>36</b>	<b>9</b>	<b>12</b>	<b>78</b>

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, as the cows did not conceive by A.I., they were covered with a cross-bred bullock.

To those who did not practice A.I., when asked to state why they did not resort to A.I., six farmers felt that the cows do not conceive by A.I. and need a natural cover. Two others stated that cross-bred 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. 57.5 per cent) <sup>conceived</sup> 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. 4.3 per cent) after the fourth insemination. The Directorate of Animal Husbandry, Maharashtra State (Statistical Diary 1980 : 100) has given the statistics relating to the average number of A.I. required per cross-bred calf born in the State, which show that 5 A.I. are required on an average per cross-bred calf born. However, in our study the average A.I. per cross-bred calf born, came to 1.7 in respect of 66 calves born. We have not considered the cases where the cows had to be covered by bulls because they failed to conceive by A.I. However, our finding comes close to the study of 30-cow Demonstration Unit of the National Dairy Research Institute where the average number of A.I. per conception was 1.6 (Gupta J.N. & R.K.Patel, 1985 : 36) (Indian Journal of

As regards the use of A.I. at second and subsequent calving only one dairy farmer stated that for the second calving of his home-bred, cross-bred cow, he did not resort to A.I. In the case of fifty cross-bred cows, A.I. was given at their second and subsequent calving also. In respect of 16 other cows which had recently calved or were due to calve for the first time, they 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 of their cross-bred cows.

When asked to state if the cross-bred cows conceived even after third or fourth calving, 14 dairy farmers stated that the cross-bred cows do conceive by A.I., even after their third or fourth calving. Eight others gave a negative reply. In the case of the remaining 51 cross-bred cows, as the cows were still in their first to third calving, the dairy farmers could not express their opinion either way. We had incorporated this question as some dairy farmers feel that the problem with the cross-bred cows is that they do not conceive after their third or fourth calving. However, the number of cases in our study is small and such it is not possible to come up with any definite conclusion in this regard.

As regards the efficiency as draught cattle of cross-bred male calves, 10 dairy farmers expressed that such calves were as efficient as the male calves born of local breeds. Four others expressed their opinion to the contrary. The remaining dairy farmers stated that they have no experience and as such could not opine. With reference to this question also, a very small number of dairy farmers

replied. However, the fact that the dairy farmers had only 7 cross-bred bullocks but about 175 bullocks of local breeds indicates that the cross-bred bullocks are not considered suitable as draught animal.

As for insurance, only 6 out of 78 home-bred cross-bred cows were insured every year while the remaining of them were not insured. The dairy farmers did not give any reason for not insuring their cattle.

Only 7, out of 69 dairy farmers, reported expenditure on cross-breeding. It was very low and varied between Rs. 5 and Rs. 20.

The dairy farmers have to accept the concept of cross-breeding their cows of local, non-descript breeds by means of A.I. both 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 cross-breeding. 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 the dairy farmers to resort to cross-breeding. In the remaining 8 cases, no information was reported as to who persuaded the dairy farmer to breed cross-bred cows from the cows of local non-descript breeds they owned.

We shall next consider the cross-bred calves born, particularly their sex, mortality and also disposal of calves.

#### Sex of the Calves

We have tabulated the information regarding the sex of the calves born at each calving in respect of the cross-bred

cows as also cows and buffaloes of local, non-descript breeds. The data has been tabulated separately for the milch animals owned by the irrigated dairy farmers and others and is presented 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
	%	%	%	%	%	%		
Holstein cross-bred cows	48	59	51	40	1	1	166	124
Jersey cross-bred cows	50	61	48	39	2	-	62	44
Cows of local non-descript breeds	56	41	44	59	-	-	18	39
Buffaloes	65	51	35	39	-	-	49	31

First we shall consider the Holstein cross-bred cows. The irrigated dairy farmers reported 166 cases in different calvings of which 48.5 per cent were males and the remaining 51.5 per cent were females. In respect of others, out of 122 cases, 59.8 per cent were male calves and the remaining 40.2 per cent were female calves.

In respect of Jersey Cross-bred cows also, 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, 61.4 per cent were male calves. In the cases reported by irrigated

dairy farmers, however, the male calves formed 50.8 per cent of the total calves born.

We have no data to explain the higher proportion of male calves reported by others. From <sup>Whatever</sup> ~~whether~~ data we have, we find that the proportion of male calves always 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, it might have given higher sex ratio of males in the case of the cross-bred cows owned by others. Otherwise there is no reason why the sex ratio of male and female calves should be very different from 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 55.5 per cent in the 18 cases reported by irrigated dairy farmers. In the case of such cows owned by the others, the proportion was only 41.0. Similarly, in the case of buffaloes, the male calves formed 63.0 per cent out of 46 calves reported by the irrigated dairy farmers. The proportion was 55.5 per cent in the case of 31 cases reported by the 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.

#### Mortality of the Calves

The data regarding mortality of calves is given in Table 5.3. 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 cows of local, non-descript breeds. In the case of Holstein cross-bred 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, 47.5 in the case of male calves of irrigated dairy farmers and 83.6 per cent in the case of male calves of others. Similar is the situation in the case of the male calves of Jersey cross-bred cows. About 29 per cent of the male calves of irrigated dairy farmers were reported dead as against 63 per cent deaths of male calves of others. This suggests that the unirrigated dairy farmers tended to neglect the male calves and this, perhaps, because of the resource constraints, that is, shortage of milk and green fodder to be given in their tender age.

**Table 5.3: Percentage of Male and Female Calves Reported Dead to Total Calves Born**

1 = Reported by Irrigated Dairy Farmers

2 = Reported by Others

Calves of	Male calves		Female calves	
	1	2	1	2
	%	%	%	%
Holstein cross-bred cows	47	84	28	14
Jersey cross-bred cows	29	63	10	6
Cows of local, non-descript breeds	70	31	-	-
Buffaloes	55	73	41	33

The Animal Husbandry Department of the State Government had fixed a norm of 5 per cent for cattle calves born at its cattle Breeding Farms. (Performance Budget, 1984-85 : 177) Even if we consider the mortality among the female calves born, which for all cross-bred cows (i.e. Holstein and Jersey) 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 cows and buffaloes of local non-descript breeds also to a certain extent. For instance, no death was reported in the 10 male calves born of the 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 calves of buffaloes owned by others.

In the case of female calves born, the mortality was much low as compared to that of the male calves. It will be seen from the Table that in respect of female calves of Holstein cross-bred cows, the calves reported dead formed 28 per cent in the case of irrigated dairy farmers and as low as 14 per cent in the case of others. In the case of calves of Jersey cross-bred cows, 10 per cent of the calves were reported dead by the irrigated dairy farmers and only 6 per cent by others.

No deaths were reported of female calves of cows of local non-descript breeds, 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 only 33 in the case of others.

We have no data to explain lower mortality of female calves born 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 is given in Tables 5.4 and 5.5. As far as the male calves of cross-bred cows are concerned, it is seen from Table 5.4 that the irrigated dairy farmers reported larger percentage of sales as compared to others. This is due to lower mortality reported by them and consequently larger number of calves being available for disposal. However, as far as keeping the male cross-bred calves for their own use is concerned, we find from the Table that of the total calves born, hardly upto 10 per cent of the male calves were with the dairy farmers. This finding is consistent with their belief that the cross-bred bullocks are not suitable or efficient for use as plough cattle and hence they do not like to keep the male calves to grow as draught animals.

In the case of female calves, it is seen from Table 5.5 that in respect of the Holstein cross-bred cows, the irrigated dairy farmers sold 18 per cent of the total calves born and retained 50 per cent at home. The corresponding figures in respect of the others were a little higher, being 32 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 cross-bred cows. The irrigated dairy farmers

**Table 5.4: Percentage Distribution of Disposal of Male Calves**

	1 = Reported by Irrigated Dairy Farmers,				2 = Reported by Others				Total 100 per cent=	
	Retained at home		Died		Sold		Given free			
	1	2	1	2	1	2	1	2	1	2
	%	%	%	%	%	%	%	%		
<b>Male calves of</b>										
Holstein cross-bred cows	7	-	48	84	39	10	6	6	80	73
Jersey cross-bred cows	13	11	29	63	55	11	3	15	31	27
Cows of local, non-descript breeds	30	6	-	31	70	50	-	13	10	16
Buffaloes	-	-	-	73	-	27	-	-	-	15

**Table 5.5: Percentage Distribution of Disposal of Female Calves**

	1 = Reported by Irrigated Dairy Farmers,				2 = Reported by Others				Total 100 per cent=	
	Retained at home		Died		Sold		Given free			
	1	2	1	2	1	2	1	2	1	2
	%	%	%	%	%	%	%	%		
<b>Female calves of</b>										
Holstein cross-bred cows	51	53	28	14	19	33	2	-	85	49
Jersey cross-bred cows	70	59	10	6	13	29	7	6	30	17
Cows of local, non-descript breeds	88	44	-	-	12	52	-	4	8	23
Buffaloes	-	42	-	50	-	-	-	8	-	12

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 calves of cows of local, non-descript breeds, there are not many cases of births reported. The irrigated dairy farmers did not sale any but kept 87 per cent of the female calves born while the others sold 52 per cent and retained 43 per cent.

In the case of female calves, the irrigated dairy farmers reported sale of 15 per cent and retained 87 per cent. The others did not sale any and kept 41 per cent of the calves born.

The percentage of calves given free was less than ten in most of the cases, whether male/female calves of cross-bred cows or of other cows and buffaloes.

We shall next consider the cost of rearing a female cross-bred calf from its birth till its first calving with a view to compare the expenditure on rearing with the ~~expenditure on purchase~~ <sup>price</sup> of a cross-bred cow, about to calve or recently calved for the first time.

#### Cost of Rearing Cross-bred Female Calves Until Their First Calving

We had asked the respondents to report the expenditure they incurred on rearing cross-bred 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/Holstejn cross-bred female calves for one full year and for 83 of them, for varying

durations in the second and third year for a total period of 965 months in their second or third year.

From the information obtained as above, 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, on an average, 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 of the calf 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 ( $\text{Rs. } 112 \times 18 = \text{Rs. } 2,016$ ), 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 month 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 further a total expenditure of about Rs. 1,000 from the 13th to 30th month. Thus out of the total estimated expenditure, about 40 per cent

would 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 we consider may not be significant. We have also not imputed value of family labour as the rearing of calves would need no extra labour - that is, the calves would be taken care of, along with the rest of the milch and other animals the dairy farmers may have.

As for the feeding practices in respect of female calves of cross-bred cows, it was found that in all the cases milk was fed to the calf for a few months 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 first was as follows: upto 100 lts. 5 calves, 180 lts. 16 calves, 270 lts. 37 calves, 360 lts. 17 calves, 540 lts. 23 calves and 800 lts. to 1080 lts. 8 calves.

Besides milk fed in the first year, expenditure on green fodder was reported by every cultivator except on 5 out of 106 calves. The average expenditure per calf on green fodder came to Rs. 212/-. It was between Rs.150 to Rs.250 in 40 per cent of the calves, while in 33 per cent of the calves 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 per calf 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 res-  
pected another 25 per cent of the total calves.

The expenditure on cattle feed and other 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 the first year. Compared to the provision of 1900 kg. of cattle feed under the Milk Production Programme of the State Government for cross-bred heifer from the age of 4 months to 32 months, the cattle feed given to the cross-bred heifers in the present survey appears to be staggeringly low. (Performance Budget, 1984-85 : 315).

As stated earlier, we did not record details of expenditure on different items of feed and fodder but noted the total expenditure incurred by the dairy farmers from the second year onwards till the Field Investigator's visit in respect of such calves. The ration of milk, green fodder and kadba as also cattle feed to be given to the female cross-bred calves would depend upon the judgement of the dairy farmers with regard to the optimum ration to be given to each milch animal as also their resources. 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 in cash and in kind, as also its break-up under different types of feed and fodder, the dairy farmers incur since birth till the first calving of female cross-bred calves.

Reference may also be made to the price paid at purchase of cross-bred 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 Holstein cross-bred cows in their first calving, the average purchase price was Rs. 4,265. It was Rs. 3,277 in respect of the Jersey cross-bred 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 data regarding sales of cross-bred cows.

From the sales of cross-bred cows reported by sample dairy farmers, 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 cross-bred cow, that is from the birth of the female calf till its first calving, vis-a-vis the reported purchase/sale prices, it is seen that the dairy farmers stand to gain by rearing the calves to grow as cross-bred cows.

Ofcourse, there is an element of risk. If by any chance, the female calf succumbs to death, the dairy farmer will suffer loss on account of the time and expenditure incurred in the calf until its death. However, it is a part of the game and <sup>if</sup> of the dairy farmers want to benefit from rearing the calves rather than buying a cross-bred cow, they must take the risk also.

### Cattle Sheds

About 90 per cent of the dairy farmers kept their milch animals in cattle shed. While 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 cross-bred 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 cattle sheds, the floor was at the ground level. Only 39 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 on the date of our investigator's visit and the area of the cattle 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 5.6. It will be 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 double the desired space. As per (I.R.D.P., Mandrup : 3) desired specification each cross-bred cow needs an area of about 5.75 sq.mt. As is to be expected the area per animal was larger, about 136 sq.ft., where there was only one animal in the cattle shed. It varied between <sup>4.8</sup> 4.8 sq.mt. to 6.9 sq.mt. per animal when the number of animals per cattle shed was between 6 to 9 animals.

**Table 5.6: Distribution of Dairy Farmers According to the Number of Milch and Draught Animals in the Cattle Shed and Average Area Per Animal in the Cattle Shed**

No. of animals per cattle shed	No. of dairy farmers reporting a cattle shed	Total no. of animals in the cattle sheds	Average area per animal (in sq.mt.)
1	30	30	12.6
2	43	86	8.1
3	43	129	7.1
4	41	164	6.6
5	23	115	6.4
6	22	132	5.9
7	8	56	6.9
8	4	32	4.8
9	8	72	5.0
<b>Total</b>	<b>222</b>	<b>816</b>	<b>6.8</b>

#### Animal Health, Veterinary Care and Services

The respondents were asked to state whether during the reference year their cross-bred cows suffered from any illness; and whether they could give necessary veterinary treatment to such cattle. About 47 per cent of the dairy farmers reported that they were not required to give any veterinary treatment. Another 49 per cent of the total dairy farmers stated that they had to give veterinary treatment to their cross-breed cows during the reference year and that the veterinary services were satisfactory. About 2 per cent did not reply while the remaining about one per cent stated that they were not required <sup>to</sup> give any veterinary care during the reference period but at the same time they 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. 168 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 cross-bred 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 <sup>vaccination</sup> doses of feed and fodder and timely veterinary care. Of the remaining 54 dairy farmers, the special care they took was as follows:

	No. of dairy farmers reporting
Cleanliness	11
Vaccination	5
Adequate feed & fodder	16
Veterinary care	17
No reply	5
Total	----- 54 -----

Thus it is seen that almost every dairy farmer took special care of the cross-bred cows they owned.

#### Frequency of Bathing Cross-bred Cows

It is often emphasised that cross-bred cattle need special care, particularly bathing and giving them 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 their cross-bred cows. The data regarding source of water supply and frequency of bathing their cross-bred cows is given in Table 5.7. It will be seen from the Table that about 40 per cent of the dairy farmers bathed their cross-bred cows every day, about 16 per cent others every alternate day, about 10 per cent once in 3 to 5 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 and these were the dairy farmers 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 Solapur district, which is a drought-prone area, cross-bred cows were bathed daily whereas in the two villages in Pune district, a majority of the cross-bred cows were bathed once in a week/fortnight. Hence bathing the cross-bred 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 propose to consider in the following sections data regarding deaths of milch animals, reported causes of deaths and also note if such animals were insured.

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

The data regarding deaths of milch animals which ~~died~~ in the years 1981-82 to 1983-84 is presented in Table 5.8.

**Table 5.7: Source of Water Supply and Frequency of Bathing Animals : Sourcewise and Villagewise Distribution**

Sourcewise	Frequency of Bathing Animals									Total
	Daily	2 days	3 days	4 days	6 days	7 days	Fortnight	Month	Not stated	
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>Villagewise</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>

**Table 5.8: 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
Cross-bred cows	8	14	4
Cross-bred bullocks	4	1	-
Other bullocks	3	1	1
Cross-bred male calf	22	54	76
Other male calf	4	1	2
Cross-bred female calf	8	14	18
Other female calves	1	1	-
Bullocks	6	4	1
Other animals	12	13	19
<b>Total</b>	<b>68</b>	<b>103</b>	<b>121</b>

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 cross-bred male calves. It may be recalled that only a few dairy farmers had reported cross-bred bullocks in their cattle holding, both in November 1983 and December 1984. Besides, the dairy farmers had reported that they did not consider that cross-bred bullocks are as efficient as the bullocks of local breeds. Hence it appears that most of them neglected the young male cross-bred cows and let them die. On the other hand there were smaller number of deaths of female cross-bred calves as they take better care of the female calves.

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.

When asked to state whether necessary veterinary care could be given to the animals which died, 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.

As for the Death Rate we do not have necessary <sup>data</sup> to work out the Death Rate in respect of the milch animals owned by the dairy farmers.

#### Causes of Deaths of Milch Animals

We had asked the respondents to report the cause of death in the case of their milch animals which died in the years 1981-82 to 1983-84. The data is given in Table 5.9. We have already noted that the maximum deaths reported were of male cross-bred calves (52 per cent of the total), followed by deaths of female calves. (16 per cent of the total). About 21 per cent of such deaths were still birth, 14 per cent, particularly of the male cross-bred calves, were due to under feeding of milk, 12 per cent due to stomach trouble while in 29 per cent cases, the cause of death of the male/female cross-bred calves was not known. The remaining, 24 per cent died of fever or other ailment. Thus it appears that the cause of death in the case of male calves <sup>could</sup> ~~was~~ really be the lack of interest to keep them alive rather than any disease.

In the case deaths of cross-bred cows as also of other milch animals, stomach trouble or fever appear to be the main



**Table 5.9: Distribution of Milch Animals Reported Dead in 1981-82 to 1983-84 by Cause of Death**

Type of animal	Cause of Death									Total
	Still birth	Died while calving	Under/over feeding milk	Stomach trouble	Rinder-pest	Poisoning	Fever or heat	Leg fractured or Gangrene	No diagnosis	
1. Cross-bred cows	-	1	-	10	-	2	2	5	6	26
2. Cross-bred female calves	9	1	3	5	-	-	9	2	11	40
3. Cross-bred male calves	31	-	33	19	6	3	12	4	44	152
4. Local Non-descript breed cows	-	-	-	4	-	-	1	-	-	5
5. Local Non-descript breed Female calves	-	-	-	1	-	-	-	-	1	2
6. Local Non-descript breed Male calves	2	-	1	2	-	-	-	-	2	7
7. Local Non-descript breed Bullocks	-	-	-	3	-	-	1	-	1	5
8. Buffaloes	-	-	-	5	-	-	2	-	4	11
9. Other animals	7	-	3	1	1	-	2	3	27	44
<b>Total</b>	<b>49</b>	<b>2</b>	<b>40</b>	<b>50</b>	<b>7</b>	<b>5</b>	<b>29</b>	<b>14</b>	<b>96</b>	<b>292</b>

causes. The cause of death of about 45 per cent of such animals was not known.

The information on the causes of death suggests that the veterinary care is not available adequately. It also supports the view that, like the male calves of buffaloes, the male calves of cross-bred cows are neglected and allowed to die as the cultivators perhaps feel that cross-bred bullocks are not suitable as plough cattle. It is worth considering whether such male cross-bred calves could be reared profitably as beef cattle. However, a critical examination of this problem is not possible in the present study.

Only one dairy farmer from Nandre reported that he received Rs.30/- on account of skin of a Holstein cross-bred cow which died in 1982. It, therefore, seems that 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.

#### 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 three dairy farmers from Antroli and two from Mandrup reported that they had insured their milch animals. On the death of the animal, they received the amount for 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 cross-bred cows insured for Rs. 5,000/- each.

In this connection it may be recalled that during the three years, deaths of 26 cross-bred cows were reported. Further only 66 dairy farmers had reported that they had paid the insurance premium during the reference year, though in most of the cases, the insurance premium was paid at the time of purchase when a bank loan was taken for purchase of cross-bred cow and perhaps not paid in later years. May be our investigators failed to obtain information or the respondents failed to report receipts from insurance. But if majority of the dairy farmers are not insuring cross-bred cows, efforts need to be made to bring home the need for insurance of the cross-bred cows.

PURCHASES AND SALES OF CROSS-BRED  
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 cross-bred cows and other milch animals and also other capital expenditure reported by them. We have already noted in the previous chapter rearing practices in respect of cross-bred cows in the area of the present survey. The data considered in the present chapter regarding the prices paid at purchase for different types of cross-bred cows in different lactations as also data on sales and other capital expenditure will be useful in studying the economics of cross-bred 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 of cross-bred cows.

Milch Animals Purchased:

Of the milch animals the dairy farmers had at the time of our field investigators' visit, we had asked the respondents to give detailed information in respect of those they had purchased. It was found that in all they owned 209 cross-bred cows which they had purchased. Their classification by breed was as follows: Holstein 140, Jersey 60, Red-Den 7, Danish and Brown Swiss one each. Of the 7 cross-bred female calves purchased, 3 each were

Holstein and Jersey and the remaining one was Red-Den.

Among the 28 buffaloes purchased, 25 were of local breed, and of the remaining, 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. Information on 7 female calves of cross-bred cows reported as purchased was not correctly given.

#### Reason for Purchase

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

#### Year of Purchase

The data regarding the year of purchase of cross-bred cows, other cows and buffaloes is given in Table 6.1. It is seen from the Table that about 90 per cent of the cross-bred cows were purchased during the years 1981 to 1984. Most of the cows of local non-descript breeds and buffaloes were purchased between 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

**Table 6.1 : Year of Purchase of Cross-bred Cows and Other Cows and Buffaloes**

Type of animal	No. of Animals Purchased							Total
	1984	1983	1982	1981	1980	1977 to 1980	1976 or before not stated	
Cross-bred Holstein cows	46	47	15	17	5	10	-	140
Cross-bred Jersey cows	23	16	9	4	5	3	-	60
Other cross-bred cows	3	2	3	1	-	-	-	9
Cows: local, non-descript breed	2	2	2	-	-	1	-	7
Gir cows	-	-	1	1	1	1	-	4
Buffaloes Jafarabadi	1	1	-	-	-	-	-	2
Buffaloes Pandharpuri	1	-	-	-	-	-	-	1
Buffaloes: local, non-descript breed	14	4	4	2	1	-	-	25
Buffaloes female calves	-	2	-	1	1	-	-	4
Female calves of cross-bred cows	Year Not correctly reported				-	-	7	7
<b>TOTAL</b>	<b>90</b>	<b>74</b>	<b>34</b>	<b>26</b>	<b>13</b>	<b>15</b>	<b>7</b>	<b>259</b>

desire to buy milch animals for starting dairy enterprise or to expend it. On account of both these reasons we find purchases of cross-bred cows in large numbers reported in recent years by the sample dairy farmers.

#### Place of Purchase

Of the 209 cross-bred 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. None of the cross-bred cows was purchased at the nearby weekly cattle market. Of the remaining, 23 were purchased from Bangalore, which is an important market for cross-bred 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 cross-bred 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 30 percent of the cows were purchased from traders or others in the cattle market while the remaining 70 percent were bought from the dairy farmers for the reasons stated in the previous paragraph. The same holds

true in respect of buffaloes and other cows of local non-descript breeds.

#### Age and Number of Calvings at Purchase

The information relating to the age at purchase revealed that about 80 per cent of the cross-bred cows were between 2 to 5 years of age at the time of purchase. Only about 7 per cent were less than 2 years old and the remaining 13 per cent were about 6 to 9 years old when they were purchased.

The dairy farmers when purchasing an animal prefer one which is about to calve or had calved recently. Of the 209 cross-bred cows, 138 were purchased at their first calving, while 19 others were purchased as calves. The cross-bred cows in the second and third calvings were 27 and 17 only and in the fourth and fifth calving, five each. Thus the data shows that only about 25 per cent of the animals 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 cross-bred 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 cross-bred <sup>cows</sup> ~~asses~~ 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					
	1st	2nd	3rd	4th	5th to 9th	Total
No. of animals						
Cross-bred 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 cross-bred 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.

Most of the cows which had calved some days before purchase or those which calved some days after purchase, gave milk for about 8 to 9 months.

Of the 209 cross-bred cows, 115 cows calved within nine months from purchase, 55 of them having calved within a month, 28 calved within two months, 21 calved within 3 to

5 months and the remaining 11 calved between 6 to 9 months. This indicates preference for buying the animals which are due to calve within a few weeks from the purchase.

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 or officers of a bank or milk cooperative.

#### Expenditure on Purchase of Milch Animals

In respect of the milch animals the respondents <sup>had</sup> ~~the~~ purchased, we had asked them to report the purchase price as also incidental expenditure on purchase, such as travel upto and lodging and boarding <sup>and</sup> the 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 time of purchase is given in Table 6.3.

It is seen from the Table that Holstein cross-bred cows, which accounted for about two-thirds of the cross-bred cows purchased, 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 <sup>or</sup> ~~and~~ subsequent calving at the time of purchase

**Table 6.3 : Average Purchase Price of Milch Animals According to Their Number of Calvings at the Time of Purchase**

Type of Animal	1st Calving		2nd Calving		3rd Calving		4th Calving		5th Calving		6th to 9th Calving	
	No.	Average price	No.	Average price	No.	Average price	No.	Average price	No.	Average price	No.	Average price
		Rs.		Rs.		Rs.		Rs.		Rs.		Rs.
<b><u>Cross-bred cows:</u></b>												
Holstein	32	4,265	34	4,045	35	4,799	23	3,703	8	5,373	8	3,639
Jersey	19	3,277	17	3,589	13	3,619	5	3,148	2	5,085	4	4,552
Red-Den	3	4,793	1	6,990	1	4,250	2	5,295	-	-	-	-
Danish	-	-	-	-	-	-	1	3,110	-	-	-	-
Brown-Swiss	-	-	-	-	-	-	-	-	1	4,550	-	-
<b><u>Other cows:</u></b>												
Gir	-	-	-	-	1	2,100	1	2,430	1	2,500	1	2,120
Local Non-descript breeds	3	603	1	950	1	900	-	-	-	-	1	110
<b><u>Buffaloes:</u></b>												
Jafarabadi	-	-	2	3,955	-	-	-	-	-	-	-	-
Pandharpuri	1	4,260	-	-	-	-	-	-	-	-	-	-
Local non-descript breeds	8	1,536	5	2,604	3	2,683	4	2,410	2	1,455	1	2,010
Goularu	1	4,410	-	-	-	-	-	-	-	-	-	-

does not show any trend, may be because our sample size is small. The average price of the cows in the third calving was as high as Rs. 4,800. This could be due to higher milk yield in respect of the cows in their third calving. (Please refer to Table No.        regarding daily milk yield). 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 Holstein cross-bred cow was higher than that of a Jersey cross-bred cow. This could be due to greater productivity of the former. (Please refer to Table No.        regarding daily milk yield).

Except in a few cases of Jersey cross-bred 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 Jersey cross-bred cows in their first to fourth calving.

We have only 7 purchases reported of Red-Den cross-bred cows. Their average purchase price is seen to be much higher than that of the Holstein and Jersey cross-bred cows.

Our data shows that the Gir cows cost almost two to three times the local cows of non-descript breeds. Similarly, the average price of Pandharpuri or Goularu buffaloes is almost twice that of the buffaloes of local non-descript breeds. However, except for the Holstein and Jersey cross-bred cows, we have not many cases of purchases of other milch animals. Hence we have no observations to make in the price differences observed in the purchase price of different types of milch animals.

From the information regarding the other expenditure, which expenditure is included in the average purchase price shown in Table No. 6.3, it is found that 135 dairy farmers reported expenditure which exceeded Rs.100. The remaining dairy farmers incurred less than Rs. 100 on purchase of milch animals. In respect of 135 purchases, on an average, such expenditure came to about Rs. 350/- per cross-bred cow. It was upto Rs.250/- in 32 cases, from Rs. 251 to Rs. 500 in 72 cases, between Rs.501/- Rs.750/- in 19 cases and between Rs. 751/- to Rs.1,100 in the remaining 12 cases.

On an average about half of the other expenditure was on account of transport of the cow from the place of purchase to the village of residence of the dairy farmers and the remaining was mainly on account of cattle insurance. The expenditure on vaccination, ear-marking, etc., was negligible.

Though it is in the interest of the dairy farmers that they should insure their milch animals, in our sample we find a low percentage of the cows insured at the time of the survey. The justification for including cattle insurance in the purchase price 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. Hence we have considered the payment of insurance premium at the time of purchase as capital expenditure and included it in the 'other expenditure' incurred at the time of purchase.

Sources of Finance for Purchases:

Of the total expenditure of about Rs.8,72,500 on purchases of 209 cross-bred cows, about one-third was met from their own resources by the dairy farmers, about 55 per cent from loans from the banks, about 7 per cent by selling one of the animals 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 cross-bred cows.

	No. of cows
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 Bank Loan	34
Own Resources and Sale of Milch or Other Animal	8
Own Resources, Bank Loan, Other Loan, etc.	54
TOTAL:	209

Thus it is seen that about half the purchases of cross-bred cows were from their own resources while in respect of the remaining the dairy farmers availed of loan from the banks, particularly under the I.R.D.P. or other sources.

As regards buffaloes, 16 buffaloes were purchased from own resources, 10 were purchased from own resources supplemented by sale of a milch animal or temporary borrowing and only one buffalo was purchased from bank loan.

The purchases of other cows were entirely from their own resources.

Loan for Buying Milch Animals:

Loans for buying milch animals were reported in the case of 49 purchases. The rate of interest per annum on such loans was Rs. 10 to 12 per cent per annum in 40 cases, between Rs. 6 to Rs. 9 per cent per annum in one case only and Rs. 17 and Rs. 18 per cent per annum in two and three other cases respectively. Since most of the loans were obtained from a cooperative or commercial bank and 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.

Who Proposed the Dairy Farmers to Take Loan?

Of the 49 cases of loan, in 20 cases the owner himself approached the cooperative/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 cross-bred cows, one cross-bred 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 of the purchase price 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. In all the cases the amount of 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 loan was fortnightly in 6 cases, monthly in 10 cases and every 10 days in 27 cases. Two dairy farmers stated that they 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 or Rs. 300 when payable monthly and was Rs. 100 or Rs. 200, when it was 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 the 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 deductions from the amount due on account of 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. However, we did not collect any <sup>further</sup> farmer data regarding non repayment of loan and as such have no further information in this regard.

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 the remaining 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 cross-bred 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.

It is felt that because the calving cycle of a cross-bred cow is only about 12 to 13 months and the dry period is only about 2 to 3 months the dairy farmers did not consider it necessary to apply for a loan to buy another cross-bred cow. Perhaps within their resources, they could manage the dairy enterprise with only one cross-bred cow.

#### 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, 117 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 have taken to dairying with cross-bred 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 the unirrigated dairy farmers. The irrigated dairy farmers incurred much higher expenditure, being about Rs. 4,500 on an average.

**Table 6.4 :** Distribution of Dry and Irrigated Dairy Farmers According to the Capital Expenditure Incurred on Different Items (except Milch Animals) of Dairying

Size of irrigated land (in ha.)	Cattleshed		Buckets		Chains, Ropes etc.		Breeding Fees		Other Expenditure	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Nil	49	80,940	132	5,990	135	4,160	26	350	1	20
Upto 0.4	3	15,490	17	1,070	20	1,040	1	10	-	-
0.4 - 1.0	8	22,290	37	1,690	38	1,350	11	197	-	-
1.1 - 2.0	7	36,480	37	1,750	36	1,870	4	70	-	-
2.1 - 3.0	2	11,990	7	380	8	590	-	-	-	-
3.1 - 4.0	3	15,000	8	500	10	780	1	10	-	-
4.1 - 5.0	-	-	1	100	1	50	-	-	-	-
5.1 - 6.0	1	7,000	2	110	2	130	-	-	-	-
<b>Total</b>	<b>73</b>	<b>189,190</b>	<b>241</b>	<b>11,590</b>	<b>250</b>	<b>9,970</b>	<b>43</b>	<b>637</b>	<b>1</b>	<b>20</b>

No. = No. of Reporting Dairy Farmers,

Rs. = Expenditure in Rs.

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

The next common expenditure was on account of chains and ropes which also needs to be incurred every few years. All, except one dairy farmer, reported such expenditure. Here also the irrigated 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 unirrigated 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 capital expenditure was incurred on different items is given in Table 6.5. It will be seen from the Table that about 30 per cent of the total dairy farmers reported capital expenditure on cattle sheds which they had incurred in one of the years during the last decade. The expenditure on buckets, which need to be replaced after every few years, was reported by 95 per cent of the dairy farmers. However, the year of purchase was reported by only 66 per cent of the total dairy farmers. In their case, the expenditure was incurred in one of the

preceeding four years. Though 115 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.

Having considered the capital expenditure incurred by the dairy farmers, we shall proceed to consider in the following section their sales of milch and draught animals. The analysis of sales data is not for examining disinvestment but for the purposed of understanding the motive behind such sales and average sale price received.

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

Type of capital expenditure	Year of Expenditure						Total
	One year back	2 years ago	3 years ago	4 years ago	5 years ago	6 to 9 years ago	
	No. of Dairy Farmers Reporting						
Cattle shed	13	19	8	14	8	11	- 23
Buckets	11	10	32	25	15	4	73 241
Chains and Ropes	5	4	2	-	-	-	239 250
<b>TOTAL</b>	<b>62</b>	<b>71</b>	<b>42</b>	<b>39</b>	<b>23</b>	<b>15</b>	<b>- -</b>

#### Sale of Milch and Draught Animals

The dairy farmers were asked to report their sales, if any, of milch and draught animals during the three years

preceding the survey, namely, 1981-82, 1982-83 and 1983-84. We were particularly interested in finding out the extent of sale of cross-bred cows and calves. The data regarding the sales according to the year of sale and reason for sale is given in Table 6.6.

It will be seen from the Table that the sales reported in 1982-83 are almost double the sales reported in 1981-82 and the sales reported in 1983-84 are 30 per cent more than the sales reported in 1982-83. One reason for higher sales in later years could be lack of memory on the part of the respondents to report with accuracy the year of sale. The other reason, particularly, with regard to sale of cross-bred cows and calves as also buffaloes, is perhaps resource constraints vis-a-vis the size of the herd of their animals and hence sales made with a view to earn additional income there from.

The 271 sales reported in the three years may be summarised as follows:

Sale of cross-bred cows	73	
Sale of cross-bred female calves	32	
Sale of cross-bred male calves	28	
Sale of cross-bred bulls	<u>4</u>	137
Sale of buffaloes including young stock		67
Sale of other cows, bulls and young "		60
Other animals		<u>7</u>
		271

In respect of sale of 73 cross-bred cows, the reason for sale was not reported in respect of 17 cows

**Table 6.6 : Milch and Draught Animals Sold by the Dairy Farmers Classified According to the Year of Sale and Reason for Sale**

	Year	Reason not stated	Animal dry	Old animal	Animal not in good health	Dairy-ing in loss	Inade-quate green fodder	Inade-quate dry fodder	Inade-quate funds to buy feed & fodder	Other reasons	Total	
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Cross-bred cows</b>	1	2	1	-	1	-	2	1	-	2	9	
	2	4	1	-	-	1	6	2	-	15	29	
	3	11	1	3	-	2	5	2	-	11	35	
<b>Female calves of cross-bred cows</b>	1	-	1	-	-	-	1	-	-	3	5	
	2	3	-	-	-	-	1	1	-	1	6	
	3	9	-	-	1	-	3	1	-	5	19	
<b>Cross-bred bulls</b>	1	-	-	-	-	-	-	-	-	-	-	
	2	1	-	-	-	-	1	-	-	-	2	
	3	-	-	-	-	-	1	-	-	1	2	
<b>Cross-bred Male Calves</b>	1	2	-	-	-	-	1	-	-	1	4	
	2	2	-	-	2	-	2	2	-	4	10	
	3	4	-	-	-	-	2	1	-	7	14	
<b>Cows of non-descript breed</b>	1	-	-	-	-	-	1	-	-	-	1	
	2	-	1	-	-	-	1	1	-	4	7	
	3	-	1	-	-	-	2	1	-	3	7	

**Table 6.6 : (contd.)**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Female calves of other cows</b>		1	-	-	-	-	-	-	2	-	-	2
		2	-	-	-	-	-	-	2	-	5	7
		3	-	-	-	-	-	1	-	-	1	2
<b>Bulls of other breeds</b>		1	-	-	1	-	-	-	1	-	-	1
		2	-	-	-	-	-	-	-	-	-	-
		3	1	-	2	-	-	-	-	-	6	9
<b>Male calves of other cows</b>		1	-	-	-	-	-	1	1	-	-	2
		2	4	-	-	-	-	-	4	-	-	8
		3	5	-	-	-	-	1	4	-	3	13
<b>Buffaloes including young stock</b>		1	8	-	2	1	-	2	1	-	1	15
		2	11	1	-	-	-	2	3	-	8	25
		3	4	3	2	2	-	1	5	-	10	27
<b>Other animals</b>		1	2	-	-	-	-	-	-	-	-	2
		2	3	-	-	-	-	-	-	-	-	3
		3	2	-	-	-	-	-	-	-	-	2

\* 1 = 1981-82

2 = 1982-83

3 = 1983-84



while in respect of 29 other cross-bred cows the reason for sale was other than the cow being dry/old/not in good health, dairying in loss/inadequate feed, fodder or funds. As such it is seen that most of these 46 sales of cross-bred cows were made with a view to earn from breeding cross-bred cows. Similar is the position in respect of 23 out of 32 sales of cross-bred female calves and 20 out of 28 sales of cross-bred male calves.

Shortage of green fodder was the reason for sale in 13 cases, and shortage of dry fodder in respect of another 5 cases. Out of a total of 73 sales, in respect of only 3 sales, loss in dairying was reported as the reason for sale. Old age of the cows was the reason for sale in respect of three cross-bred cows and 3 more <sup>0</sup>cross-bred cows were sold as they went dry.

It may be recollected that 44 per cent of our sample was of the dairy farmers without any 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 fodder in respect of another 13 per cent of the total sales. Thus it appears that the dairy farmers do 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.

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

Animals sold	Kalamb		Ranjani		Umadi		Nandre		Mandrup		Antroli	
	1	2	1	2	1	2	1	2	1	2	1	2
1 Cross-bred cows	11		8		-		36		15		3	
2 Cross-bred bulls	1		-		1		2		-		-	
3 Cross-bred Male calves	7		1		5		5		8		2	
4 Cross-bred Female Calves	1		3		-		12		12		4	
5 Cows of Non-descript breed	3		2		1		1		2		6	
6 Bulls of other breeds	2		3		2		2		2		-	
7 Male Calves of other cows	5		3		-		6		5		4	
8 Female calves of other cows	-		4		-		-		2		6	
9 Buffaloes including young stock	7		18		6		22		8		5	
10 Other animals	-		-		-		-		-		7	
<b>TOTAL</b>	<b>37</b>		<b>42</b>		<b>15</b>		<b>86</b>		<b>54</b>		<b>37</b>	

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 truck-loads of cross-bred cows from Bangalore. However, they found that such cows did not give the same yield of milk as they gave in Bangalore and also did not keep as fit as they were in Bangalore area. The reason for the low yield and lack of physical fitness they attributed to the climatic and other conditions. Hence they thought of ~~cross-bred~~ home-breeding cows with A.I. Within a period of five to six years, they started breeding cross-bred cows in large numbers. As a result, we were told that, the trend is now reversed and the buyers from Karnataka buy cross-bred cows from Mandre and surrounding villages. At Mandrup, the facilities for cross-breeding with A.I. are excellent. However, due to shortage of green folder and kadba, dairy farmers like to sell cross-bred cows. The sale of cross-bred cows and cross-bred female calves is comparatively lower in the remaining four villages, the lowest at Umadi being perhaps due the small size of our sample in that village.

#### 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 is given in Table 6.8. It will be seen from the Table that the average price received was the maximum in respect of the cross-bred cows. It declined from Rs. 4,550 in 1981-82 to Rs. 3,563 in 1983-84. We, however, do not have any information to explain the decline in the sale prices. The average sale price of cross-bred 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.

**Table 6.8 : Sales of Milch and Draught Animals in the Years 1981-82, 1982-83 and 1983-84 and Average Price per Animal Sold**

Type of Animal	1981-82		1982-83		1983-84	
	No. of sales	Average price per animal sold	No. of sales	Average price per animal sold	No. of sales	Average price per animal sold
		Rs.		Rs.		Rs.
<u>Cross-bred Cows</u>	9	4,550	29	4,096	35	3,563
Female calves	5	2,280	8	1,275	19	1,826
Bullocks	-	-	2	3,500	2	3000
Male calves	4	937	10	275	14	581
<u>Non-descript Breeds: Cows</u>	1	400	7	1,014	7	625
Female calves	2	600	8	332	2	225
Bullocks	2	1,450	0	-	9	1,389
Male calves	2	150	8	250	13	531
Buffaloes	15	793	24	859	27	1,050
Other animals	2	40	3	270	2	47

Compared to this, the cross-bred male calves received much lower price, though here also the year to year variation is high, the reason being perhaps the age of the calf sold. It is also not known whether such male calves were purchased for rearing or slaughtering. Only 4 sales of cross-bred bullocks were reported, average sale price being Rs. 3,000 to Rs. 3,500. We do not know if such bullocks were sold for breeding purposes or for use as draught animal.

There were not many sales of other cows, female calves and bullocks and their average sale price was lower than that obtained for cross-bred cattle.

The sale price per buffalo was also low, about Rs. 600 to Rs. 1,000 and was perhaps due to such animals being old and of local breed.

In the present chapter as also the preceding three chapters we have considered data on various items regarding the dairy enterprise of the sample dairy farmers. In the next chapter we shall consider the functioning of their dairy enterprise with cross-bred cows during the reference year.

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 and lactation yield and milk yield per day of the Holstein and Jersey cross-bred cows and other cows of local non-descript breeds, 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 different groups of dairy farmers classified according to the composition of the herd of their milch animals and also according to irrigated dairy farmers and others. 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 on the basis of the views expressed by the sample dairy farmers.

Inter-Calving Period

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

**Table 7.1 : Inter-Calving Period of Holstein Cross-bred 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 calving	51	13.3	3.2	29	11.9	2.2
2nd-3rd calving	34	12.6	3.0	26	11.8	2.4
3rd-4th calving	14	11.8	2.9	14	11.2	2.0
4th-5th calving	6	11.5	2.5	3	11.0	2.0
5th-6th calving	5	11.4	2.4	1	10.0	3.0
6th-7th calving	4	11.2	2.5			
7th-8th calving	1	10.0	2.0			
8th-9th calving	1	10.0	8.0			
9th-10th calving	1	9.0	1.0			
<b>TOTAL</b>	<b>61</b>	<b>12.6</b>	<b>3.0</b>	<b>39</b>	<b>11.7</b>	<b>2.3</b>

**Table 7.2 : Inter-Calving Period of Jersey Cross-bred Cows Owned by Other Dairy Farmers**

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 calving	17	12.8	3.2	12	12.5	3.2
2nd-3rd calving	10	13.0	2.9	6	12.3	3.5
3rd-4th calving	6	12.8	2.8	6	12.8	4.0
4th-5th calving	4	13.0	3.0	5	12.8	4.2
5th-6th calving	4	13.0	3.0	3	13.0	5.0
6th-7th calving		13.0	3.0	1	13.0	9.0
7th-8th calving				2	13.0	6.0
8th-9th calving				1	13.0	9.0
<b>TOTAL</b>	<b>21</b>	<b>12.9</b>	<b>3.0</b>	<b>16</b>	<b>12.6</b>	<b>4.1</b>

of cases in the third and subsequent calvings and as such it is not possible to arrive at any firm conclusions on the basis of such a small sample.

The average inter-calving period as also dry period/lactation period and lactation yield of the cross-bred cows owned by the sample dairy farmers compares well with the expected norms. For instance, in the Cattle Breeding Farms of the Animal Husbandry Department of the State Government, the norm regarding inter-calving period for cross-bred Jersey and Holstein cows is given as 'not more than 14 months'. (Performance Budget 1984-85 : 178) It is lower by a month or six weeks in the case of the cross-bred cows in our sample. As we will note in the subsequent section, the lactation period is more than nine months in our sample cases as compared to norm of 'not less than six months'. As for lactation yield, as against the norm of '2000 lts. in the first to third lactation', the Holstein cross-bred cows in our sample had an average lactation yield of upto 2350 lts. It was, however, in the case of Jersey cross-bred 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 are less number of Jersey as compared to Holstein cross-bred cows with the sample dairy farmers.

#### Average Lactation Length and Average Lactation Yield

In respect of the milch animals the dairy farmers had at the time of the survey, we had recorded for each 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 length of the period in milk after each calving as also the average milk yield during that period in respect of the animals owned by the irrigated dairy farmers and others. The data is presented in Tables 7.3 to 7.7 and is considered in the following paragraphs separately for each type of animal.

Holstein Cross-bred Cows:

We found more than 25 cases of cows at each of the first three calvings, with the irrigated farmers and others. The number of cases in the fourth and subsequent calvings was about 10 or less and as such may not be considered as representative. It is seen from Table 7.3 that the average lactation length was only a little more in respect of the cows owned by the irrigated dairy farmers as compared with the cows with others. It was 9.9, 9.7 and 10.6 months in the first, second and third calving respectively as against 9.6, 9.5 and 9.8 months in the case of cows with others. However, the average milk yield was about 9 per cent more, being 2,237 lts. in the case of cows in their first calving with the irrigated dairy farmers as compared to 2,043 lts. in the case of cows with others. The milk yield was, however, only 6 per cent more in respect of the cows in the second calving and only 2 per cent more in respect of the cases in the third calving, owned by the irrigated farmers.

Our data showed wide variation in total milk yield. It is seen from the Table 7.7 that about half the cows had a total milk yield of upto 2000 lts., that is upto 7.0 lts. a day, considering the average period of milk of 9.5 months.

**Table 7.3 : Holstein Cross-bred Cows : Average Lactation Length and Average Lactation Field**

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average No. of months in milk	Average lactation yield in milk lts.	No. of cases of cows	Average No. of months in milk	Average lactation yield in milk lts.
1st	64	9.9	2,237	41	9.6	2,043
2nd	45	9.7	2,168	39	9.5	2,051
3rd	29	10.6	2,359	26	9.8	2,306
4th	12	9.4	2,234	11	9.6	2,045
5th	6	8.8	2,017	6	9.4	2,228
6th & subsequent	10	7.9	1,767	2	10.0	2,415

**Table 7.4 : Jersey Cross-breed Cows: Average Lactation Length and Average Lactation Yield**

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average No. of months in milk	Average lactation yield in milk lts.	No. of cases of cows	Average No. of months in milk	Average lactation yield in milk 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

From whatever data we have, it thus appears that, as far as the average lactation length and average lactation yield are concerned, there is not much difference between the cows owned by the irrigated dairy farmers and others. It will be necessary to examine the expenditure incurred by the irrigated dairy farmers and others to find out whether on the whole the farmer find dairying with cross-bred cows more profitable as compared to the latter. Of course, when we think in terms of profitability at the individual dairy farmer's level, rather than the average lactation yield the actual milk yield of the cow with him is relevant.

#### Jersey Cross-bred Cows

There was a lesser number of Jersey cross-bred cows as compared to Holstein cross-bred cows. We must keep this fact in mind when 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 1786 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 Holstein cross-bred cows, the average lactation yield of Jersey cross-bred cows was lower by about 13 to 30 per cent. From this point of view also, it will be necessary to compare the expenditure on these two types of cows to find out their profitability.

Buffaloes and Cows of Local Non-descript Breeds

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 7.6, that in respect of buffaloes in the first two calvings, the average lactation yield varied between 474 lts., to 592 lts., while the lactation length was only about 7 months.

In respect of cows of local non-descript breeds, the lactation length was about 8 months and the average lactation yield was about 700 lts. and 800 lts., 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 the cows owned by others.

Though the average lactation yield was more in the case of buffaloes and cows of local non-descript breeds 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.

We may consider the lactation length monthwise for different animals. In Tables 7.8 to 7.11, we have given percentage distribution of Holstein cross-bred cows, Jersey Cross-bred cows, Buffaloes of Local, Non-descript breeds and cows of local non-descript breeds respectively, according to the number of months in which they were in village. We have presented the data separately for irrigated dairy farmers and others.

**Table 7.5 : Cows of Local Non-descript Breeds : Average Lactation Length and Average Lactation Yield**

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of Buffaloes	Average No. of months in milk	Average Lactation yield lts.	No. of cases of Buffaloes	Average No. of months in milk	Average Lactation yield lts.
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

**Table 7.6 : Buffaloes of Local, Non-descript Breeds: Average Lactation Length and Average Lactation Yield**

Lactation No.	Irrigated Dairy Farmers			Others		
	No. of cases of cows	Average No. of months in milk	Average lactation yield lts.	No. of cases of cows	Average No. of months in milk	Average lactation yield lts.
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

**Table 7.7 :** Distribution of Milch Animals According to Variation in Lactation Yield at Different Lactations (in lts.)

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

Lactation No.	Upto 500		500 to 1000		1001 to 1500		1501 to 2000		2001 to 2500		2501 to 3000		3001 to 3500		3501 to 4000		4001 and above		Total	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
<b>Holstein Cross-bred Cows</b>																				
1st	-	-	4	3	15	11	14	10	8	5	8	5	6	3	6	3	3	1	64	41
2nd	-	-	9	3	9	11	9	6	11	10	4	4	4	2	4	1	1	2	45	39
3rd	-	-	1	1	3	7	10	5	5	6	3	2	3	-	3	2	1	3	29	26
<b>Jersey Cross-bred Cows</b>																				
1st	-	-	6	4	7	8	4	3	4	5	2	1	-	1	1	-	-	24	22	
2nd	-	-	2	1	6	3	2	3	3	1	1	-	-	-	-	-	1	15	8	
3rd	-	-	1	1	2	1	2	3	3	3	-	-	-	-	-	-	1	9	8	
<b>Cows Local, Non-descript Breeds</b>																				
1st	4	6	4	6	1	-	-	-	-	-	-	-	-	-	-	-	-	9	12	
2nd	3	5	3	2	1	2	-	-	-	-	-	-	-	-	-	-	-	7	9	
3rd	2	3	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	2	7	
<b>Buffaloes</b>																				
1st	7	2	12	3	2	3	2	1	-	-	-	-	-	-	-	-	-	23	9	
2nd	3	-	8	2	2	2	1	1	-	-	-	-	-	-	-	-	-	14	10	
3rd	1	-	5	6	1	1	-	1	-	-	-	-	-	-	-	-	-	7	8	



**Table 7.10 : Percentage Distribution of Buffaloes in Different Calvings According to Lactation Length**

1 = Irrigated                      2 = Others

Buffaloes	Upto 7 months		8 months		9 months		10 months		11 months		12 months		13 months		14 or more months		Total No. of cows 100 percent	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
	No. of Buffaloes																	
1st calving	48	34	17	11	9	-	17	11	9	-	-	33	-	-	-	11	23	9
2nd calving	44	20	14	30	14	10	14	10	14	10	-	20	-	-	-	-	14	10
3rd calving	29	-	-	39	57	12	-	12	14	25	-	12	-	-	-	-	7	8
4th calving	67	-	-	33	33	-	-	67	-	-	-	-	-	-	-	-	3	3
5th or subsequent calving	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	2	1

**Table 7.11 : Percentage Distribution of Cows of Local Non-descript Breeds in Different Calvings According to Lactation Length**

No. of Cows

Cows in	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
1st calving	67	84	-	-	33	-	-	8	-	-	-	8	-	4	-	9	12
2nd calving	57	78	-	-	43	11	-	-	-	-	-	11	-	-	-	7	9
3rd calving	100	72	-	14	-	-	-	-	-	-	-	14	-	-	-	2	7
4th calving	-	60	-	20	-	-	-	-	-	-	-	-	-	-	-	-	5
5th or subsequent calving	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6



As regards Holstein cross-bred cows, it is seen from Table 7.8 that there were 65 such cows with irrigated farmers and 124 cows with others. More than 80 per cent of cases fall in the first, second or third calving. The percentage of cows in milk for 10 or more months was higher in the case of irrigated farmers. For instance, of the 64 cows in the first calving, 61 per cent of them owned by irrigated farmers were in milk for 10 months or more, as compared to 46 per cent of 41 cows in their first calving 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 80 per cent and 46 per cent respectively.

As regards the Jersey cross-bred cows, the number of cases is smaller as compared to Holstein cross-bred cows. However, from whatever number of cases we have, it is seen from Table 7.9 that in the case of Jersey cross-bred 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 Holstein cross-bred cows.

In comparison with the cross-bred cows, the cows and buffaloes of local non-descript breeds were in milk for much shorter period, whether they were owned by the irrigated farmers or others. It will be seen from Table 7.10 that most of the buffaloes were in milk upto 7 months, and there were not many which were in milk for 10 months or more.

Similarly, in respect of the cows of local non-descript breeds, 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 length of period in milk in respect of the buffaloes and cows of local non-descript breeds owned by the irrigated farmers as compared to those owned by the others.

#### Milk Yield Per Day

We had asked the respondents to report the milk yield on the day prior to the Field Investigator's visit from each cross-bred cow the dairy farmers had - whether homebred or purchased. The data in respect of the 147 Holstein and 65 Jersey cross-bred cows, which were in the milk on that day is given according to different lactations in Table 7.12. It may be noted that these cows were in different months of lactation. Hence those which had recently calved had a higher milk yield while those nearer the end of the lactation had a yield of about 2 to 3 lts./day. It is seen from the Table that the milk yield per day of the Holstein cross-bred cows in the first three lactations was more than that of the Jersey cross-bred cows. The trend is not clearly evident in respect of the cows in the fourth to seventh lactation due to the small number of cases in each of such lactations. It is also seen that the daily milk yield increased with each lactation from the first to the third lactation. It was 6.2 lts./day in the first lactation and increased to 8.8 lts./day in the third lactation in respect of the Holstein cross-bred cows. In respect of the Jersey cross-bred cows, the increase was greater, from 5.6 lts./day in the first lactation to 8.1 lts./day in the third

**Table 7.12 :** Milk Yield Per Day in Respect of Holstein and Jersey Cross-bred Cows in Different Lactations

Lactation No.	Cross-bred cows			
	No. of cows	Milk yield litres/day	No. of cows	Milk yield litres/day
1st	34	6.2	22	5.7
2nd	40	7.2	20	5.5
3rd	34	8.8	11	8.1
4th	28	6.7	5	7.2
5th	6	6.0	1	4.0
6th	3	4.7	3	8.0
7th	2	9.0	3	6.7

lactation. Thereafter it declined in the fourth lactation and at a much faster rate in the fifth and sixth lactation. A few cases in the sixth seventh lactation which showed higher yield can not really be taken as representative on account of such cases being few.

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 investigators visit was 5lts. 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.

Gir Cows and Cows of Non-descript Breeds:

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 cows of local non-descript breeds, 8 of them were dry. Of the remaining 10, all except two, were in their first, second or third lactation. Their milk yield was about one to three litres on the day prior to the Field Investigator's visit.

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

We thought it will be useful to compare the milk yield on the day prior to the Field Investigator's visit, in respect of the milch animals in different lactations owned by the irrigated farmers and other the data is presented in Table 7.13. It is seen from the Table that the milk yield of the cross-bred cows was about one to two litres more in the case of cows owned by the irrigated farmers as compared to those owned by others. The reason for higher milk yield in the case of cross-bred cows owned by the irrigated farmers may be the farm-produced green fodder as also greater supplies of kadba which they have, as compared to the dry farmers, besides, of course, the fact that the irrigated farmers are in a position to give necessary ration of cattle feed and better veterinary care.

**Table 7.13 :** Milk Yield Per Day of Holstein and Jersey Cross-bred Cows in Different Lactations Owned by Irrigated Dairy Farmers and Other Dairy Farmers

Lactation No.	Holstein cross-bred cows				Jersey cross-bred cows			
	Irrigated Dairy Farmers		Others		Irrigated Dairy Farmers		Others	
	No. of cows	Milk yield	No. of cows	Milk yield	No. of cows	Milk yield	No. of cows	Milk yield
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	12	7.8	22	9.3	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

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 in respect of milk they sold on the day prior to the Field Investigator's visit. None of the respondents could tell the fat content of the milk but all of them stated the price they were entitled to receive for milk sold. It was found that for buffalo milk, 19 dairy farmers were to receive Rs.4 per litre except two others who stated that the rate was Rs. 3.50 per litre. In the case of cow milk, whether cross-bred or not, 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's 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. the rate is appropriately revised for different combinations of fat content and S.N.F. The purchase price for buffalo milk with 7 per cent fat content and 9 per cent S.N.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 1963).

Delivery of Milk by the Dairy Farmers 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 other dairy farmers stated that they delivered milk only once a day. The remaining 36 did not reply. It may be noted in this connection that though in most of the villages, the milk tanker under the Government Milk Scheme went round most of these villages twice a day to collect milk, in some of the villages situated away from the milk-collection-route, the milk was collected only once a day.

When they were asked to state whether the milk they took for delivery was rejected by the Milk Cooperative

at any time during the reference year, 132 dairy farmers stated that they did not face any difficulty in delivering whatever milk they took to the Milk Cooperative. 68 other dairy farmers stated that they had experienced during the reference year occasions on which the Milk Cooperative refused to accept milk they had taken to deliver. Of these 68 dairy farmers, 43 belonged to the two sample villages from Pune district and formed 54 per cent of the sample therefrom; there were 20 dairy farmers from 2 villages from Sangli district (i.e. 23 per cent of the sample therefrom) 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.

When asked to state whether they delivered milk in the village where they stayed or at some neighbouring village, 200 out of 253 dairy farmers 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. In this connection it may be recalled that the Milk Cooperative at village Mandrup was almost defunct, and milk was collected by private individuals and sold at Solapur. At all other villages, there functioned a Milk Cooperative. Hence as far as the dairy farmers included in the present survey are concerned, there was no difficulty in transport of milk for delivery to the Milk Cooperative. Only 11 respondents used a bicycle to deliver milk while the rest of the dairy farmers went on foot to deliver milk at the cooperative. The expenditure

they incurred in delivering milk was upto Re. one in 44 cases while the remaining 209 dairy farmers did not report any expenditure on delivery of milk, particularly as most of them went on foot to the Milk Cooperative.

#### Dung Production & Disposal

The dairy farmers used the animal dung mainly for conversion into dung manure. Hence 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 7.14.

Table 7.14 : Dung Manure Production and Disposal

	No. of dairy farmers reporting	No. of Cartloads
Total Dung Manure	253	3,870
Of which Dung Manure from Milch Animals	249	2,361
Dung Manure sold	38	264
Dung Manure Used on Own Farm	217	3,064
Dung Used for Fuel Cakes	129	483

It will be seen that a major part of dung manure, 61 per cent of the total was received from the milch animals. Of the total dung manure, about three-fourth was used by the dairy farmers who cultivated their land.



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 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.

The dairy farmers received on an average about 15 cart loads of dung-manure. The quantity of dung manure naturally increases with the size and composition of the herd of their milch and draught animals and was as high as 70 cartloads in respect of a dairy farmer who owned three cross-bred cows along with other milch and draught animals. He used most of it on his own farm of about 4 hastares of which three fourths was irrigated.

#### Gobar Gas

The dairy farmers who own cross-bred 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 with a view to find out how many of them had installed a Gobar gas plant and in respect of others 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) Can not get loan	1
7) Financial difficulties	83
	-----
	197
	-----

It will be thus seen that it is not possible for 112 dairy farmers to install a Gobar gas plant on account of the difficulties at Sr. Nos. 1 to 5 above, namely, inadequate supply of dung or cattle shed being away from their residence. 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 12 per cent of dung production for fuel purposes. If Gobar Gas plants are installed by them they will be able to use dung for manuring purposes.

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 crossbred cows in their herd and then further according to the holding of cross-bred calves, and cows and calves of local non-descript

breeds and buffaloes. The number of dairy farmers in each type of holding of milch animals is shown in Table 7.15. Though we had classified the dairy farmers into 19 different types, the classification is primarily based on the number of cross-bred cows. In the first four types there is no cross-bred cow, in types 5 to 12 there is one cross-bred cow, in types 13 to 15 there are two cross-bred cows, in types 16 to 18 there are three cross-bred cows, and in type 19 four cross-bred cows. While collating the data regarding expenditure on different items, we had separately noted the expenditure on feed and fodder. Hence, for finding out the receipts and expenditure on cross-bred cows, it will be possible to combine type 5 with 6, type 13 with 14 and type 16 with 17 after deducting expenditure on cross-bred calf/calves in types 6, 14 and 17. Similarly types 11 and 12 can be combined together for the above reason. In the following sections we shall consider the receipts and expenditure of dairy farmers according to the types referred to above.

**Table 7.15 :** Classification of Dairy Farmers According to Composition of Their Herd of Milch Animals

Composition of the Herd of Milch Animals (Cows of local non-descript breeds are referred to the other cows)	Irrigated Dairy Farmers	Other Dairy Farmers	Total
1	2	3	4
1. Cross-bred calf/calves	3	6	9
2. Cross-bred calf/calves and Other Cows & calves	-	6	6
3. Cross-bred calf/calves and Buffaloes and their female calves	1	1	2
4. Cross-bred calf/calves and Other Cows & Buffaloes & their female Calves	2	2	4

Table 7.15 : (contd.)

	1	2	3	4
5. Only one Cross-bred Cow	7	29	36	
6. One Cross-bred Cow and Cross-bred Calf/Calves	38	43	81	
7. One Cross-bred Cow and Other Cows and their female calves	4	-	4	
8. One Cross-bred Cow & Buffaloes and their female calves	7	7	14	
9. One Cross-bred Cow, Cross-bred Calf/Calves & Other Cows and their female Calves	5	5	10	
10. One Cross-bred Cow, Cross-bred Calf/Calves & Buffaloes and their female calves	21	10	31	
11. One Cross-bred Cow, Cross-bred Calf/Calves & Other cows and Buffaloes and their female calves	1	-	1	
12. One Cross-bred Cow, Other Cows and Buffaloes & their female calves	1	2	3	
13. Two Cross-bred Cows	1	9	10	
14. Two Cross-bred Cows and Cross-bred Calf/Calves	18	12	30	
15. Two Cross-bred Cows, Cross-bred Calf/Calves & Buffaloes	4	2	6	
16. Three Cross-bred Cows	1	-	1	
17. Three Cross-bred Cows and Cross-bred Calf & Calves	1	2	3	
18. Three Cross-bred Cows, Cross-bred Calf/Calves & Buffaloes	1	-	1	
19. Four Cross-bred Cows & Cross-bred Calf/Calves	1	-	1	
TOTAL	117	136	253	

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 includes milk from cross-bred cows as also from cows of non-descript breeds and buffaloes was as follows :

	<u>No. of Farmers</u>	<u>Total Milk Production in Lts.</u>	<u>Value of Milk Production Rs.</u>
Irrigated Dairy Farmers	112	2,95,446	9,16,144
Other Dairy Farmers	132	3,23,409	9,87,915
<b>Total</b>	<b>244</b>	<b>6,18,855</b>	<b>19,04,059</b>

The disposal of milk was as follows :

	<u>Sold to Milk Co- operative</u>	<u>Sold to Others</u>	<u>Consumed at Home</u>	<u>Fed to Calves</u>	<u>100 per cent</u>
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>Lts.</u>
Irrigated Dairy Farmers	75	8	13	4	2,95,446
Other Dairy Farmers	66	16	14	4	3,23,409
<b>Total</b>	<b>70</b>	<b>12</b>	<b>14</b>	<b>4</b>	<b>6,18,855</b>

Villagewise disposal of milk is shown in Table 7.16. 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 significant difference in the pattern of disposal of milk by the irrigated dairy farmers and others. Of the total milk sold, 85 per cent was

Table No. 7.16 : Villagewise Disposal of Total Milk Production during the reference year by the Irrigated Dairy Farmers and Others

Village	Type of Dairy Farmer	Number of Dairy Farmers having milch animals	Milk Months	Dry Months	Total Milk Production (Ltrs.)	Value of Milk Production	% Disposal of Milk			
							Sale to Milk Cooperative Society	Sale to Others	Consumed at Home	Fed to calves
Kalamb	1	32	347	161	68,843	2,14,427	82	Neg.	13	5
	2	5	32	40	3,880	12,833	78	-	17	5
	Total	37	379	201	72,723	2,27,260	82	Neg.	13	5
Sanjani	1	26	321	196	63,287	1,90,000	85	1	10	4
	2	9	101	91	17,623	54,553	82	-	12	6
	Total	35	422	287	80,910	2,44,553	84	1	10	5
Umadi	1	11	126	59	21,225	68,830	78	1	16	5
	2	8	67	24	9,570	29,609	59	13	23	5
	Total	19	193	83	30,795	98,439	72	5	18	5
Nandre	1	22	349	95	65,736	2,13,920	81	-	15	4
	2	44	593	115	1,19,147	3,58,350	74	1	20	5
	Total	66	942	210	1,84,883	5,72,270	76	1	18	5
Mandrup	1	13	165	49	36,575	1,12,875	19	64	14	3
	2	30	320	126	63,695	1,90,785	-	80	16	4
	Total	43	485	175	1,00,270	3,03,660	7	74	16	3
Antroli	1	8	165	46	39,780	1,16,092	90	-	8	2
	2	36	459	153	1,09,494	3,41,785	91	-	7	2
	Total	44	624	199	1,49,274	4,57,877	91	-	7	2
Total	1	112	1473	606	2,95,446	9,16,144	75	8	13	4
	2	132	1572	549	3,23,409	9,87,915	66	16	14	4
	Total	244	3045	1155	6,18,855	19,04,059	70	12	14	4

1 - Irrigated Dairy Farmers

2 - Other Dairy Farmers.

sold to the Milk Cooperatives and the remaining 15 per cent to others. We may, however, recall that the Milk Cooperative at Mandrup was defunct and the daily farmers sold milk to private traders locally or Solapur. Hence at Mandrup 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 in the five villages 99 per cent of the milk was sold to the Milk Cooperatives.

The average value of total milk production in respect of 244 families which had some milch animals was 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 mm. At the other extreme is the village Umadi situated in a drought-prone area, with an annual rainfall of about 500 mm. 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 and Rs.2,566 respectively as against the overall average of Rs.7,484 for the six villages. One reason could be the small number of sample of other dairy farmers in these villages and as such they may not be considered as representative of the population.

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 Rs.6,451 per family 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 343 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 174 ml/day. This is no doubt lower than the desired level as per nutritional requirements. However, dairy farmer is the best judge to decide how much to consume at home and how much to sell to meet the dairy's and household cash expenses from the sale proceeds of milk.

Total Milk Production with  
One/Two Cross Bred Cows

In order to find out the milk production of cross-bred cows during the reference year, we decided to consider only these cases of dairy farmers who had a cross-breed cow or two, with or without cross-bred calf, but not having any other milch animals. In Table 7.17 we have given villagewise data regarding lactation months, average milk yield per lactation month and value of milk production per family in respect of these dairy farmers who had one or two cross-bred cows but no other milch animals.

In our sample, we came across 117 dairy farmers who had one cross-bred cow (with or without calf) but no other milch animal and another 40 dairy farmers who had two cross-bred cows (with or without calf) only.

The average lactation months per cow during the reference year came to 8.8 months where only one cross-bred



**Table 7.17 : 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 cross-bred cows**

Village	No. of Dairy Farmers	Lactation Months	Dry Months	Total Milk Yield Lts.	Yield per Lactation month	Average Value of Milk Production per Family Rs.
<b><u>Dairy Farmers having one cross bred cow</u></b>						
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
Handre	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
<b>Total</b>	<b>117</b>	<b>1,035</b>	<b>333</b>	<b>218,191</b>	<b>211</b>	<b>5,581</b>
<b><u>Dairy Farmers having Two Cross-bred Cows</u></b>						
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
Handre	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
<b>Total</b>	<b>40</b>	<b>632</b>	<b>118</b>	<b>146,193</b>	<b>231</b>	<b>11,223</b>

cow was owned and 7.9 months where there were two cross-bred cows. The average lactation yield was slightly more where there were two cross-bred cows, being 211 lbs. in the case of dairy farmers with one cross-bred cow and 231 lbs. in the case of those having two cross-bred cows. One reason for higher lactation yield in the case of the latter is that those having two cross-bred cows, may have at least one of them in its second or third lactation. We have earlier noted that the milk yield increased from the first to the third lactation. Village-wise, we find large differences in yield per lactation month where only one cross-bred cow was owned. However, the phenomenon is not so strikingly evident where two cross-bred cows were owned.

The overall value of milk production in respect of those having two cross-bred 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 cross-bred cow.

#### Receipts from and Expenditure on Dairy Enterprise

In concluding the present chapter, we shall 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 7.16 to 7.21.

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 expenditure side, we have included expenditure on feed, fodder and concentrates including the value

Table 7.18 : Receipts from and Expenditure on Dairy Enterprise During the Reference

Type of Holding of Milch Animals	Milk		Dung Manure	
	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	3	7
Cross-bred calf/calves, Buffaloes and their female calves	1	1,365	1	1
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	4,290	2	7
One cross-bred cow	7	34,630	7	1,
One cross-bred cow and cross-bred calf/calves	37	1,79,411	38	10,
One cross-bred cow, other cows and their female calves	4	23,901	4	2,
One cross-bred cow and buffaloes and their female calves	7	69,919	7	2,
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	42,321	5	1,
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	21	1,80,625	21	7,
One cross-bred cow, cross-bred calf/calves, other cows, Buffaloes and their female calves	1	13,989	1	3
One cross-bred cow, other cows, buffaloes	1	12,435	1	2
Two cross-bred cows	1	19,035	1	3
Two cross-bred cows and cross-bred calf/calves	18	1,61,433	18	7,
Two cross-bred cows, cross-bred calf/calves, buffaloes	4	59,117	4	3,
Three cross-bred cows	1	28,527	1	1,
Three cross-bred cows and cross-bred calf/calves	1	10,115	1	6
Three cross-bred cows, cross-bred calf/calves and Buffaloes	1	31,258	1	1,
Four cross-bred cows and cross-bred calf/calves	1	34,195	1	5
Total	113	8,98,566	117	42,

No. = Number of Reporting Dairy Farmers.

Table 7.18 : Receipts from and Expenditure on Dairy Enterprise during the reference Year in respect of Irrigated Dairy farmers.

Type of Holding of Milch Animals	Receipts									
	Milk		Dung Manure		Sale of milch animals		Sale of other animals		Total receipts	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	3	700	-	-	-	-	3	700
Cross-bred calf/calves, Buffaloes and their female calves	1	1,365	1	100	-	-	1	100	1	1,565
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	4,290	2	750	1	200	-	-	2	5,240
One cross-bred cow	7	34,030	7	1,820	-	-	2	100	7	36,550
One cross-bred cow and cross-bred calf/calves	37	1,79,411	38	10,100	12	28,000	11	3,280	38	2,20,851
One cross-bred cow, other cows and their female calves	4	23,901	4	2,050	1	3,700	1	1,700	4	31,351
One cross-bred cow and buffaloes and their female calves	7	65,919	7	2,255	4	12,000	3	4,150	7	84,324
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	42,321	5	1,840	-	-	2	850	5	45,011
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	21	1,80,625	21	7,065	7	20,200	5	4,100	21	2,12,050
One cross-bred cow, cross-bred calf/calves, other cows, Buffaloes and their female calves	1	13,989	1	300	-	-	1	450	1	14,739
One cross-bred cow, other cows, buffaloes	1	12,435	1	250	-	-	1	1,000	1	13,685
Two cross-bred cows	1	19,035	1	375	-	-	-	-	1	19,410
Two cross-bred cows and cross-bred calf/calves	18	1,61,433	18	7,780	4	18,301	7	10,380	18	1,98,074
Two cross-bred cows, cross-bred calf/calves, buffaloes	4	55,117	4	3,110	3	6,750	3	3,450	4	68,427
Three cross-bred cows	1	28,527	1	1,500	-	-	-	-	1	30,027
Three cross-bred cows and cross-bred calf/calves	1	10,115	1	600	-	-	1	50	1	10,765
Three cross-bred cows, cross-bred calf/calves and Buffaloes	1	31,258	1	1,400	-	-	1	35	1	32,693
Four cross-bred cows and cross-bred calf/calves	1	34,195	1	500	1	8,000	-	-	1	42,695
Total	113	8,98,560	117	42,555	33	97,151	37	27,705	117	10,68,157

No. = Number of reporting dairy farmers.

One family having Rs.180 from milk products.

Table 7.18 :(contd) Expenditure on Dairy Enterprise during the reference Year in respect of Irrigated Dairy Farmers

Type of Holding of Milch Animals	Feed, fodder & concentrates for milch animals		Feed, fodder & concentrates for female calves		Transport of milk		Veterinary aid and medicines		Insurance Premium		Salaried servants		Imputed wages of family labour		Other expenditure		Interest on loan for purchase of milch animals		Total	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	3	3865	-	-	-	-	-	-	-	-	3	1805	2	60	-	-	3	5730
Cross-bred calf/calves and buffaloes & their female calves	1	1260	1	750	1	25	-	-	-	-	-	-	1	1135	1	40	-	-	1	3210
Cross-bred calf/calves, other cows & buffaloes & their female calves	2	4280	2	900	-	-	-	-	-	-	-	-	2	3030	2	55	-	-	2	8865
One-cross-bred cow	7	22801	1	1650	2	140	3	400	1	300	-	-	7	10780	7	404	2	588	7	37063
One cross-bred cow and cross-bred calf/calves	37	105932	31	23390	10	875	18	2805	3	850	2	4500	37	57430	20	5109	9	2947	38	205903
One cross-bred cow, other cows and their female calves	4	14795	1	1350	2	150	1	100	-	-	-	-	4	5635	4	180	-	-	4	22210
One cross-bred cow and buffaloes and their female calves	7	37400	3	1725	1	50	4	455	1	450	1	4000	8	8955	7	220	-	-	7	53315
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	23616	5	3399	3	200	3	315	2	410	1	1500	4	7720	5	180	2	492	5	37832
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	21	104088	21	21501	6	450	15	2675	3	875	4	7720	19	27415	18	1300	2	480	21	167104
One cross-bred cow, cross-bred calf/calves, other cows, buffaloes and their female calves	1	10230	1	770	1	100	-	-	-	-	-	-	1	2275	1	75	-	-	1	13450
One cross-bred cow, other cows, buffaloes	1	7540	1	400	-	-	1	150	1	300	-	-	1	1365	1	28	1	444	1	10227
Two cross-bred cows	1	6120	-	-	-	-	1	300	1	280	1	2200	-	-	-	-	1	886	1	5786
Two cross-bred cows, and Cross-bred calf/calves	18	98309	14	11425	8	650	11	1405	6	2290	7	12070	14	24600	16	9882	6	3090	18	163721
Two cross-bred cows, cross-bred calf/calves, buffaloes	4	27063	4	6240	2	180	3	580	1	300	1	4500	4	8385	2	340	-	-	4	47588
Three cross-bred cows	1	10475	-	-	-	-	1	400	1	825	1	1500	-	-	1	50	-	-	1	13250
Three cross-bred cows and cross-bred calf/calves	1	6951	1	810	1	125	2	270	-	-	-	-	1	2035	1	25	-	-	1	10216
Three cross-bred cows, cross-bred calf/calves and buffaloes	1	8539	1	1005	-	-	1	400	-	-	-	-	1	2710	1	5248	1	480	1	18382
Four cross-bred cows and cross-bred calf/calves	1	9240	1	300	1	100	1	150	-	-	-	-	1	2035	1	140	-	-	1	11965
<b>Total</b>	<b>113</b>	<b>499299</b>	<b>91</b>	<b>79480</b>	<b>38</b>	<b>3045</b>	<b>65</b>	<b>10405*</b>	<b>20</b>	<b>6885</b>	<b>18</b>	<b>37790</b>	<b>106</b>	<b>167870</b>	<b>95</b>	<b>23241</b>	<b>24</b>	<b>9407</b>	<b>117</b>	<b>839817</b>

No. = No. of Reporting Dairy Farmers

\* Including Rs.80 on A.I. reported by six Dairy Farmers.

**Table 7.19 : Receipts from and Expenditure on Dairy Enterprise During the Reference Year in respect of other Dairy farmers**

Type of holding of Milch Animals	Milk		Dung Manure		Sale of Milch animals		Sale of other animals		Total receipts	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
	Cross-bred calf/calves	-	-	6	1,050	1	5,500	-	-	6
Cross-bred calf/calves and other cows and calves	4	14,400	6	1,355	1	200	3	6,035	6	21,990
Cross-bred calf/calves and buffaloes and their female calves	1	7,912	1	240	-	-	-	-	1	8,152
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	10,918	2	475	-	-	2	140	2	11,533
One cross-bred cow	29	1,87,031	29	5,840	6	18,800	8	19,750	29	2,31,421
One cross-bred cow and cross-bred calf/calves	43	2,63,157	43	10,100	10	43,051	4	3,450	43	3,20,218
One cross-bred cow and buffaloes and their female calves	7	53,850	7	1,840	4	12,200	2	140	7	68,030
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	31,717	5	1,385	3	6,750	1	600	5	40,452
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	10	83,141	10	2,870	3	4,400	2	5,075	10	95,486
One cross-bred cow, other cows, buffaloes	2	24,947	2	1,550	-	-	1	350	2	26,847
Two cross-bred cows	9	1,09,782	9	2,900	2	2,300	3	3,600	9	1,18,582
Two cross-bred cows and cross-bred calf/calves	12	1,23,200	12	2,935	1	500	3	1,100	12	1,27,735
Two cross-bred cows, cross-bred calf/calves, buffaloes	2	22,506	2	550	1	500	1	2,000	2	25,556
Three cross-bred cows and cross-bred calf/calves	2	26,700	2	825	1	-	-	-	2	27,525
<b>Total</b>	<b>128</b>	<b>9,59,261</b>	<b>136</b>	<b>33,975</b>	<b>42</b>	<b>94,201</b>	<b>30</b>	<b>42,640</b>	<b>136</b>	<b>11,30,077</b>

No. = Number of Reporting Dairy Farmers.

Table 7.14 (contd): Expenditure on Dairy Enterprise During the Reference Year in respect of Other Dairy Farmers

Type of holding or milch animals	Feed, fodder and concentrates for milch animals		Feed, fodder and concentrates for female calves		Transport of milk		Veterinary aid and medicines		Insurance premium	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	6	7,780	-	-	4	100	1	300
Cross-bred calf/calves and other cows and calves	6 <sup>(a)</sup>	10,790	6	5,870	-	-	3	310	-	-
Cross-bred calf/calves and buffaloes and their female calves	1	1,344	1	400	1	50	1	100	1	150
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	6,372	2	2,200	1	50	1	100	-	-
One cross-bred cow	29	1,01,932	-	-	1	50	21	2,305	15	4,350
One cross-bred cow and cross-bred calf/calves	43 <sup>(b)</sup>	1,40,760	35	27,818	4	110	23	3,020	8	2,200
One cross-bred cow and buffaloes and their female calves	7	33,167	3	2,700	-	-	3	400	2	600
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	22,105	4	3,390	1	50	3	450	2	580
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	10	54,974	9	7,095	-	-	5	630	1	300
One cross-bred cow, other cows, buffaloes	2	10,670	1	810	-	-	1	100	1	270
Two cross-bred cows	9	55,850	2	1,320	1	100	8	975	5	1,745
Two cross-bred cows and cross-bred calf/calves	12	63,550	10	5,375	-	-	8	1,580	7	3,090
Two cross-bred cows, cross-bred calf/calves, buffaloes	2	13,520	2	2,040	-	-	1	200	1	300
Three cross-bred cows and cross-bred calf/calves	2	12,500	2	700	-	-	2	1,000	1	880
Total	130	5,27,554 a/	85	67,618	9	410	81	11,330 g/	45	15,371

No. = No. of Reporting Dairy Farmers

a/ = Includes Rs.20 reported by one dairy farmer on grazing land charges

b/ = Includes 2 families each reporting Rs.10 on A.I.

contd.

Table 7.19 : contd.

Type of holding or milch animals	Employed servants		Imputed wages of family labour		Other expenditure		Interest on loan for purchase of milch animals		Total expenditure	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No. of reporting families	Rs.
Cross-bred calf/calves	-	-	6	8,200	3	100	-	-	6	14,480
Cross-bred calf/calves and other cows and calves	-	-	6	9,545	3	70	-	-	6	20,565
Cross-bred calf/calves and buffaloes and their female calves	-	-	1	2,275	1	685	1	432	1	5,430
Cross-bred calf/calves, other cows and buffaloes and their female calves	-	-	2	4,195	2	25	-	-	2	15,002
One cross-bred cow	1	180	29	36,955	25	1,328	17	4,259	29	1,51,489
One cross-bred cow and cross-bred calf/calves	2	6,000	42	46,570	37	1,474	9	2,832	43	2,32,764
One cross-bred cow and buffaloes and their female calves	-	-	7	8,625	6	800	4	981	7	47,333
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	-	-	5	9,300	5	285	3	952	5	37,111
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	-	-	10	12,815	10	500	2	1,001	10	77,321
One cross-bred cow, other cows, buffaloes	-	-	2	3,005	1	45	1	302	2	15,322
Two cross-bred cows	-	-	9	13,480	8	440	5	2,353	9	76,263
Two cross-bred cows and cross-bred calf/calves	-	-	12	15,528	11	5,035	8	3,231	12	95,295
Two cross-bred cows, cross-bred calf/calves, buffaloes	-	-	2	3,745	2	205	1	550	2	20,500
Three cross-bred cows and cross-bred calf/calves	-	-	2	3,395	1	16	1	559	2	19,110
<b>Total</b>	<b>3</b>	<b>6,180</b>	<b>135</b>	<b>1,75,695</b>	<b>115</b>	<b>11,144</b>	<b>52</b>	<b>17,511</b>	<b>136</b>	<b>8,32,791</b>



Table 7.20 : Total Expenditure including Imputed Value of Family Labour and Expenditure on Feed, Fodder etc. for the calf/calves

Composition of the Herd of Milch Animals (Cows of local non-descript breeds are referred to as other cows)	Irrigated Dairy Farmers				Net Surplus Average Per Dairy Farmer	Other Dairy Farmers				Net Surplus Average Per Dairy Farmer
	No. of Dairy Farmers	Total receipts	Total expendi- ture	Net Surplus		No. of Dairy Farmers	Total receipts	Total Expendi- ture	Net Surplus	
1	2	3	4	5	6	7	8	9	10	11
1. Cross-bred Calf/Calves	3	700	5,730	(-5030)	(-1676)	6	6,550	14,480	(-7930)	(-1322)
2. Cross-bred Calf/Calves and Other Cows and Calves	-	-	-	-	-	6	21,990	26,585	(-4595)	(-766)
3. Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	1,565	3,210	(-1645)	(-1645)	1	8,152	5,436	2,716	2,716
4. Cross-bred calf/calves and other Cows and Buffaloes and their Female Calves	2	5,240	8,865	(-3625)	(-1812)	2	11,533	13,002	(-1469)	(-734)
5. Only one Cross-bred Cow	7	36,550	37,063	(-513)	(-73)	29	2,31,421	1,51,489	79,932	2,756
6. One Cross-bred Cow and Cross-bred Calf/Calves	38	2,20,851	2,05,903	14,948	392	43	3,20,218	2,32,784	87,434	2,033
7. One Cross-bred Cow and Other Cows and their Female Calves	4	31,351	22,210	9,141	2,285	-	-	-	-	-
8. One Cross-bred Cow and Buffaloes and their Female Calves	7	84,324	53,315	31,009	4,430	7	68,030	47,333	20,697	2,957
9. One Cross-bred cow, Cross-bred calf/calves and Other Cows and their Female Calves	5	45,011	37,832	7,179	1,436	5	40,452	37,111	3,341	668
10. One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	2,12,050	1,66,549	45,501	2,167	10	95,486	77,321	18,165	1,816
11. One Cross-bred Cow, Cross-bred Calf/calves and Other Cows and Buffaloes and their Female Calves	1	14,739	13,450	1,289	1,289	-	-	-	-	-
12. One Cross-bred Cow, Other Cows and Buffaloes and their Female Calves	1	13,685	10,227	3,458	3,458	2	26,847	15,322	11,525	5,763
13. Two Cross-bred Cows	1	19,410	9,786	9,624	9,624	9	1,18,582	76,263	42,319	4,702
14. Two Cross-bred Cows and Cross-bred Calf/Calves	18	1,98,074	1,63,721	34,353	1,909	12	1,27,735	95,995	31,740	2,645

contd.

Table 7.20 : contd.

	1	2	3	4	5	6	7	8	9	10	11
15. Two Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes		4	68,427	47,138	21,289	5,322	2	25,556	20,560	4,996	2,498
16. Three Cross-bred Cows		1	30,027	13,250	16,777	16,777	-	-	-	-	-
17. Three Cross-bred Cows and Cross-bred Calf/Calves		1	10,765	10,216	549	549	2	27,525	19,110	6,415	4,207
18. Three Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes		1	32,693	18,382	14,311	14,311	-	-	-	-	-
19. Four Cross-bred Cows and Cross-bred Calf/Calves		1	42,095	<del>10,000</del> 11,965	30,730	30,730	-	-	-	-	-
Total		117	10,68,157	8,38,812	2,29,345	1,960	130	11,30,077	8,32,791	2,97,286	2,112

Table 7.21 : Net Surplus per Dairy Farmer a) after excluding expenditure on Calves and b) after excluding Expenditure on Calves and Imputed Wages of Family Labour

Composition of the Herd of Milch Animals (Cows of local non-descript breeds are referred to as other cows)	Irrigated Dairy Farmers					Net surplus after excluding expenditure on calves and imputed wages of Family Labour RS.	Other Dairy Farmers					Net Surplus after excluding expenditure on calves and imputed wages of Family Labour RS.
	No. of Dry Farmers	Net Surplus	Expenditure on Calves	Net Surplus after excluding expenditure on calves	Imputed Value of Family Labour		No. of Dry Farmers	Net Surplus	Expenditure on calves	Net Surplus after excluding expenditure on calves	Imputed Value of Family Labour	
		RS.	RS.	RS.	RS.			RS.	RS.	RS.	RS.	
	1	2	3	4		1	2	3	4			
1. Cross-bred Calf/Calves	3	(-5030)	3,865	(-1165)	1,805	640	6	(-7930)	7,780	(-150)	6,200	6,050
2. Cross-bred Calf/Calves and Other Cross Cows & Buffalo Calves	-	-	-	-	-	-	6	(-4595)	5,870	1,275	9,545	10,820
3. Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	(-1645)	750	(-895)	1,135	240	1	2,716	400	3,116	2,275	5,391
4. Cross-bred Calf/Calves and Other Cows and Buffaloes and their Female Calves	2	(-3025)	900	(-2,725)	3,630	905	2	(-1469)	2,260	791	4,195	4,986
5. Only one Cross-bred Cow	7	(-513)	1,650	1,137	10,780	11,917	29	79,932	-	79,932	36,955	1,10,887
6. One Cross-bred Cow and Cross-bred Calf/Calves	38	14,948	23,390	38,336	59,435	97,773	43	87,434	27,816	1,15,252	48,570	1,63,822
7. One Cross-bred Cow and Other Cows and their Female Calves	4	9,141	1,350	10,491	5,635	16,126	-	-	-	-	-	-
8. One Cross-bred Cow and Buffaloes and their Female Calves	7	31,009	1,725	32,734	8,955	41,689	7	20,697	2,700	23,397	8,025	32,022
9. One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and their Female Calves	5	7,179	9,399	10,578	7,720	18,298	5	3,341	3,390	6,731	9,300	16,031
10. One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	45,501	20,946	66,447	27,415	93,862	10	18,165	7,095	25,260	12,815	38,075
11. One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and buffaloes and their Female Calves	1	1,289	770	2,059	2,275	4,334	-	-	-	-	-	-

contd.

Table 7.21 : contd.

		1	2	3	4		1	2	3	4		
12. One Cross-bred Cow, Other Cows and Buffaloes and their Female Calves	1	3,456	400	3,858	1,365	5,223	2	11,525	810	12,335	3,065	15,400
13. Two Cross-bred Cows	1	9,624	-	-	-	9,624	9	42,319	1,320	43,639	13,480	57,119
14. Two Cross-bred Cows and Cross-bred Calf/Calves	18	34,353	11,425	45,778	24,600	70,378	12	31,740	5,375	37,115	13,528	50,643
15. Two Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	4	21,289	6,240	27,529	7,935	35,464	2	4,996	2,040	7,036	3,745	10,781
16. Three Cross-bred Cows	1	16,777	-	16,777	-	16,777	-	-	-	-	-	-
17. Three Cross-bred Cows and Cross-bred Calf and Calves	1	549	810	1,359	2,035	3,394	2	8,415	760	9,175	3,395	12,570
18. Three Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	1	14,311	1,005	15,316	2,710	18,026	-	-	-	-	-	-
19. Four Cross-bred Cows and Cross-bred Calf/Calves	1	30,730	300	31,030	2,035	33,065	-	-	-	-	-	-
Total	117	2,29,345	78,925	3,08,270	1,69,465	4,77,735	136	2,97,286	67,618	3,64,904	1,75,693	5,40,597

Table 7.18 :(contd) Expenditure on Dairy Enterprise during the Reference Year in re

Type of Holding of Milch Animals	Feed, fodder & concentrates for milch animals		Feed, Fodder & concentrates for <del>female</del> female calves		Transport of Milk		Veterinary aid and medicines	
	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	3	3865	-	-	-	-
Cross-bred calf/calves and buffaloes & their female calves	1	1260	1	750	1	25	-	-
Cross-bred calf/calves, other cows & buffaloes & their female calves	2	4280	2	900	-	-	-	-
One cross-bred cow	7	22801	1	1650	2	140	3	400
One cross-bred cow and cross-bred calf/calves	37	105932	31	23390	10	875	18	2805
One cross-bred cow, other cows and their female calves	4	14795	1	1350	2	150	1	100
One cross-bred cow and buffaloes and their female calves	7	37460	3	1725	1	50	4	455
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	23616	5	3399	3	200	3	315
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	21	104688	21	21501	6	450	15	2675
One cross-bred cow, cross-bred calf/calves, Other cows, buffaloes and their female calves	1	10230	1	770	1	100	-	-
One cross-bred cow, other cows, buffaloes	1	7540	1	400	-	-	1	150
Two cross-bred cows	1	6120	-	-	-	-	1	300
Two cross-bred cows, and Cross-bred calf/calves	18	98309	14	11425	8	650	11	1405
Two cross-bred cows, cross-bred calf/calves, buffaloes	4	27063	4	6240	2	180	3	580
Three cross-bred cows	1	10475	-	-	-	-	1	400
Three cross-bred cows and cross-bred calf/calves	1	6951	1	810	1	125	2	270
Three cross-bred cows, cross-bred calf/calves and Buffaloes	1	8539	1	1005	-	-	1	400
Four cross-bred cows and cross-bred calf/calves	1	9240	1	300	1	100	1	150
Total	113	499299	91	79480	38	3045	65	10405*

No. = No. of Reporting Dairy Farmers

\* Including Rs.80 on

Table 7.19 : Receipts from and Expenditure on Dairy Enterprise During the Reference

Type of Holding of Milch Animals	Milk		Dung Manure	
	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	6	1,0
Cross-bred calf/calves and other cows and calves	4	14,400	6	1,3
Cross-bred calf/calves and buffaloes and their female calves	1	7,912	1	2
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	10,918	2	4
One cross-bred cow	29	1,87,031	29	5,0
One cross-bred cow and cross-bred calf/calves	43	2,63,157	43	10,1
One cross-bred cow and buffaloes and their female calves	7	53,850	7	1,0
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	31,717	5	1,2
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	10	83,141	10	2,0
One cross-bred cow, other cows, buffaloes	2	24,947	2	1,0
Two cross-bred cows	9	1,09,782	9	2,0
Two cross-bred cows and cross-bred calf/calves	12	1,23,200	12	2,0
Two cross-bred cows, cross-bred calf/calves, buffaloes	2	22,506	2	
Three cross-bred cows and cross-bred calf/calves	2	26,700	2	
<b>Total</b>	<b>128</b>	<b>9,59,261</b>	<b>136</b>	<b>33,0</b>

No. = Number of Reporting Dairy Farmer

**Table 7.19 : (contd): Expenditure on Dairy Enterprise During the Reference Year 19**

Type of Holding of Milch Animals	Feed, Fodder and concentrates for milch animals		Feed, Fodder and concentrates for female calves	
	No.	Rs.	No.	Rs.
Cross-bred calf/calves	-	-	6	7,700
Cross-bred calf/calves and other cows and calves	6 <sup>(a)</sup>	10,790	6	5,800
Cross-bred calf/calves and buffaloes and their female calves	1	1,344	1	1,344
Cross-bred calf/calves, other cows and buffaloes and their female calves	2	6,372	2	2,700
One cross-bred cow	29	1,01,932	-	-
One cross-bred cow and cross-bred calf/calves	43 <sup>(b)</sup>	1,40,760	35	27,800
One cross-bred cow and buffaloes and their female calves	7	33,167	3	2,700
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	5	22,105	4	3,200
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	10	54,974	9	7,000
One cross-bred cow, other cows, buffaloes	2	10,670	1	1,000
Two cross-bred cows	9	55,850	2	1,000
Two cross-bred cows and cross-bred calf/calves	12	63,550	10	5,000
Two cross-bred cows, cross-bred calf/calves, buffaloes	2	13,520	2	2,000
Three cross-bred cows and cross-bred calf/calves	2	12,500	2	2,000
<b>Total</b>	<b>130</b>	<b>5,27,334 a/</b>	<b>83</b>	<b>67,000</b>

No. = No. of Reporting Dairy Farmers

a/ = Included Rs.20 reported by one dairy farmer

b/ = Includes 2 families each reporting Rs.1000

Table 7.19 : contd.

Type of Holding of Milch Animals	Salaried servants		Imputed value of family
	No.	Rs.	
Cross-bred calf/calves	-	-	6
Cross-bred calf/calves and other cows and calves	-	-	6
Cross-bred calf/calves and buffaloes and their female calves	-	-	1
Cross-bred calf/calves, other cows and buffaloes and their female calves	-	-	2
One cross-bred cow	1	180	29
One cross-bred cow and cross-bred calf/calves	2	6,000	42
One cross-bred cow and buffaloes and their female calves	-	-	7
One cross-bred cow, cross-bred calf/calves, other cows and their female calves	-	-	5
One cross-bred cow, cross-bred calf/calves, buffaloes and their female calves	-	-	10
One cross-bred cow, other cows, buffaloes	-	-	2
Two cross-bred cows	-	-	9
Two cross-bred cows and cross-bred calf/calves	-	-	12
Two cross-bred cows, cross-bred calf/calves, buffaloes	-	-	2
Three cross-bred cows and cross-bred calf/calves	-	-	2
<b>Total</b>	<b>3</b>	<b>6,180</b>	<b>135</b>



**Table 7.20 : Total Expenditure including Imputed Value of Family Labour and Expenditure**

Composition of the Herd of Milch Animals (Cows of local non-descript breeds are referred to as other cows)	Irrigated Dairy Farmers			
	No. of Dairy Farmers	Total Receipts	Total expendi- ture	Net Surplus
1	2	3	4	5
1. Cross-bred Calf/Calves	3	700	5,730	(-5030)
2. Cross-bred Calf/Calves and Other Cows and Calves	-	-	-	-
3. Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	1,565	3,210	(-1645)
4. Cross-bred calf/calves and other Cows and Buffaloes and their Female Calves	2	5,240	8,865	(-3625)
5. Only one Cross-bred Cow	7	36,550	37,065	(-513)
6. One Cross-bred Cow and Cross-bred Calf/Calves	38	2,20,851	2,05,903	14,948
7. One Cross-bred Cow and Other Cows and their Female Calves	4	31,351	22,210	9,141
8. One Cross-bred Cow and Buffaloes and their Female Calves	7	84,324	53,315	31,009
9. One Cross-bred cow, Cross-bred calf/calves and Other Cows and their Female Calves	5	45,011	37,832	7,179
10. One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	2,12,050	1,66,549	45,501
11. One Cross-bred Cow, Cross-bred Calf/calves and Other Cows and Buffaloes and their Female Calves	1	14,739	13,450	1,289
12. One Cross-bred Cow, Other Cows and Buffaloes and their Female Calves	1	13,685	10,227	3,458
13. Two Cross-bred Cows	1	19,410	9,785	9,624
14. Two Cross-bred Cows and Cross-bred Calf/Calves	18	1,98,074	1,63,721	34,353

Table 7.20 : contd.

	1	2	3	4	5
6. Two Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes		4	68,427	47,130	21,289
6. Three Cross-bred Cows		1	30,027	13,250	16,777
7. Three Cross-bred Cows and Cross-bred Calf/Calves		1	10,765	10,216	549
8. Three Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes		1	32,693	18,382	14,311
9. Four Cross-bred Cows and Cross-bred Calf/Calves		1	42,695	10,865 11,965	30,730
Total		117	10,68,157	8,38,812	2,29,345

**7.21 : Net Surplus per Dairy Farmer a) after excluding Expenditure on Calves and Wages of Family Labour**

Position of the Head of a Animals (Local non-descript cows are referred to as such)	Irrigated Dairy Farmers				Imputed Value of Family Labour	Net Surplus after excluding expenditure on calves and imputed wages of Family Labour
	No. of Dry Farmers	Net Surplus	Expenditure on Calves	Net Surplus after excluding expenditure on calves		
		Rs.	Rs.	Rs.	Rs.	
		1	2	3	4	
Cross-bred Calf/Calves	3	(-5030)	3,865	(-1165)	1,805	6
Cross-bred Calf/Calves and Other Cross Cows & Buffal Calves	-	-	-	-	-	-
Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	(-1645)	750	(-895)	1,135	2
Cross-bred Calf/Calves and Other Cows and Buffaloes and their Female Calves	2	(-3625)	900	(-2,725)	3,630	90
Only one Cross-bred Cow	7	(-513)	1,650	1,137	10,780	11,91
One Cross-bred Cow and Cross-bred Calf/Calves	38	14,948	23,390	38,338	59,435	97,77
One Cross-bred Cow and Other Cows and their Female Calves	4	9,141	1,350	10,491	5,635	16,12
One Cross-bred Cow and Buffaloes and their Female Calves	7	31,009	1,725	32,734	8,955	41,68
One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and their Female Calves	5	7,179	9,399	10,578	7,720	18,29
One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	45,501	20,946	66,447	27,415	93,86
One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and Buffaloes and their Female Calves	1	1,289	770	2,059	2,275	4,33

Calves and Imputed

Net Surplus after excluding expenditure on calves	Imputed Value of Family Labour	Net Surplus after excluding expenditure on calves and imputed wages of Family Labour	
Rs.	Rs.	Rs.	
			--
			--
			400
			119
			643
	4		781
			-
(-150)	6,200	6,050	
			570
1,275	9,545	10,820	
			-
3,116	2,275	5,391	
			-
791	4,195	4,986	597
79,932	36,955	1,16,887	--
1,15,252	48,570	1,63,822	
23,397	8,625	32,022	
6,731	9,300	16,031	
25,260	12,815	38,075	

contd.

**Table 7.21 : Net Surplus per Dairy Farmer a) after excluding Expenditure on Calves Wages of Family Labour**

Composition of the Herd of Milch Animals (Cows of local non-descript breeds are referred to as other cows)	Irrigated Dairy Farmers				Imputed Value of Family Labour	Net surplus after excluding expenditure on calves and put wages of Family Labour
	No. of Dry Farmers	Net Surplus	Expenditure on Calves	Net Surplus after excluding expenditure on calves		
		Rs.	Rs.	Rs.	Rs.	
		1	2	3	4	
1. Cross-bred Calf/Calves	3	(-5030)	3,865	(-1165)	1,805	
2. Cross-bred Calf/Calves and Other Khas Cows & Buffak Calves	-	-	-	-	-	
3. Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	(-1645)	750	(-895)	1,135	
4. Cross-bred Calf/Calves and Other Cows and Buffaloes and their Female Calves	2	(-3625)	900	(-2,725)	3,630	
5. Only one Cross-bred Cow	7	(-513)	1,650	1,137	10,780	1
6. One Cross-bred Cow and Cross-bred Calf/Calves	38	14,948	23,390	38,338	59,435	9
7. One Cross-bred Cow and Other Cows and their Female Calves	4	9,141	1,350	10,491	5,635	1
8. One Cross-bred Cow and Buffaloes and their Female Calves	7	31,009	1,725	32,734	8,955	4
9. One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and their Female Calves	5	7,179	9,399	10,578	7,720	1
10. One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	45,501	20,946	66,447	27,415	9
11. One Cross-bred Cow, Cross-bred Calf/Calves and Other Cows and Buffaloes and their Female Calves	1	1,289	770	2,059	2,275	

ble 7.21 : contd.

		1	2	3	4	
. One Cross-bred Cow, Other Cows and Buffaloes and their Female Calves	1	3,458	400	3,858	1,365	5
. Two Cross-bred Cows	1	9,624	-	-	-	9
. Two Cross-bred Cows and Cross-bred Calf/Calves	18	34,353	11,425	45,778	24,600	70
. Two Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	4	21,289	6,240	27,529	7,935	35
. Three Cross-bred Cows	1	16,777	-	16,777	-	16
. Three Cross-bred Cows and Cross-bred Calf and Calves	1	549	810	1,359	2,035	3
. Three Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	1	14,311	1,005	15,316	2,710	18
. Four Cross-bred Cows and Cross-bred Calf/Calves	1	30,730	300	31,030	2,035	33
<b>Total</b>	<b>117</b>	<b>2,29,345</b>	<b>78,925</b>	<b>3,08,270</b>	<b>1,69,465</b>	<b>4,77</b>

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	117	136
	Rs.	Rs.
2) Total Receipts	10,68,157	11,30,077
3) Total Expenditure	8,39,817	8,32,791
4) Total Surplus	2,28,340	2,97,286
5) Average Surplus per Dairy Farmer	1,952	2,186
6) Total surplus after excluding Imputed Wages of family labour from Total Expenditure	3,96,210	4,72,979
7) Average surplus per dairy farmer after excluding Imputed wages of family labour from Total Expenditure	3,386	3,478

It is seen from the aggregate level data that the surplus with other dairy farmers is about 11 per cent more as compared to the irrigated dairy farmers. Even after excluding the imputed wages of family labour from total expenditure, it is seen that the surplus of other dairy farmers was about 3 per cent more than that of the irrigated dairy farmers. It must, however, be remembered that some of them had, besides one or more cross-bred cows, buffaloes and cows of non-descript breeds as also

calves. The resultant surplus position is thus not exclusively that of the dairy enterprise with cross-bred cows.

To get some idea regarding the dairy enterprise with cross-bred 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 did not have a cross-bred cow but only cross-bred cows along with/without other milch animals (first four categories of Table 7.15), 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 cross-bred calf/calves to Rs.5,391 where a dairy farmer had along with cross-bred calf/calves, other cows and buffaloes in milk.

(2) Among the remaining 242 dairy farmers who had cross-bred cows, except in the holding of one cross-bred cow by irrigated dairy farmers where the total deficit was Rs.513 for seven such dairy farmers in this group, in all other cases of dairy farmers having one cross-bred cow with or without cross-bred calf/calves (categories 5 and 6 of Table 7.15) there was 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 along with the cross-bred cow/cows, the average surplus per dairy farmer varied within a very wide range. The minimum average surplus of Rs.392 was found in the group of 38 irrigated dairy farmers who had one cross-bred cow along with cross-bred 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 increase to Rs.1,564.

The maximum surplus of Rs.16,777 is found in the case of an irrigated dairy farmer who had three cross-bred cows. He had no calves and had a servant to look after the dairy enterprise.

(3) If, as proposed in the previous section, we consider different types of milch animal holding and try to find out the surplus after deducting the expenditure on cross-bred calves, we find the average surplus as follows:

Dairy Farmers having:	Irrigated Dairy Farmers		Other Dairy Farmers	
	No.	Average Surplus (Rs.)	No.	Average Surplus (Rs.)
1) One Cross-bred cow	45	877	72	2,710
2) Two Cross-bred cows	19	2,916	21	3,845
3) Three Cross-bred cows	2	9,068	2	4,587
4) Four Cross-bred cows	1	31,030	-	-
- - - - -	67	2,150	95	3,001

Our data thus shows that the other dairy farmers, who did not own any irrigated land, were left with a greater surplus on an average, whether they owned one or two cross-bred cows. It is only in those few cases of irrigated dairy farmers who had three or four cross-bred 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 cross-bred 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 cross-bred cows. We had noted data regarding sale of milk from the milk cooperative. Hence the receipts data is considered quite 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 ~~resultant~~ surplus could be considered as reliable.

We may also recall that the total expenditure we have considered includes value of farm produced fodder as also imputed wages of family labour. If we deduct 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 (Rs.)	No.	Average Surplus (Rs.)
1) One Cross-bred cow	45	2,437	72	3,899
2) Two Cross-bred cows	19	4,211	21	5,131
3) Three Cross-bred cows	2	10,085	2	6,285
4) Four Cross-bred cows	1	33,065	-	-
	67	3,626	95	4,221

The data thus show that dairy farmers who do not own irrigated land can also successfully run the dairy enterprise, provided of course, they can give fodder, water and other care the cross-bred 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 newspapers and also in the meetings of 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 cross-bred cows only. The survey data revealed the following position:

	<u>Irrigated Dairy Farmers</u>	<u>Other Dairy Farmers</u>
1) No. of Dairy Farmers having one or more cross-bred cows only	66	95
2) No. of cross-bred cows	92	120
3) Total Milk Production during the reference year	1,55,782 lts.	2,35,723 lts.
4) Expenditure on Feed, Fodder and concentrates and where reported, expenditure on transport of milk, veterinary aid and medicines, insurance premium and other expenditure	Rs. 2,87,623	Rs. 4,22,844
5) Cost of production per litre of milk	Rs. 1.85	Rs. 1.79
6) Cost of production per litre of milk after deducting value of dung manure from total expenditure in (4) above	Dung Manure (23,635) Rs. 1.69	Dung Manure (22,660) 1.70
7) Total Expenditure after including Imputed Wages of Family Labour	3,86,508	5,40,772
8) Cost of production per litre including Imputed Wages of Family Labour in total expenditure	2.48	2.29
9) Cost of production per litre in (8) above after deducting value of dung manure from total expenditure	2.33	2.20

We have not considered salaried servant or interest on loan or capital cost in working the cost of production of milk. However, it is seen that even after including the imputed wages of family labour the irrigated dairy farmers are left with 67 paise per litre while other

dairy farmers were left with 80 paise per litre of cow milk. The average annual milk production came to 1693 lts. per cow in the case of irrigated dairy farmers and 1964 lts. per day 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 are left with a surplus of Rs.1,134 and Rs.1,571 respectively. We may also recall that the total expenditure includes the value of farm produced fodder. In view of this, the surplus or net profit indicated above on an investment of Rs.4,300 for Holstein or Rs.3,300 for Jersey cross-bred cow is considered large enough to justify the dairy enterprise with cross-bred cows. Whether or not they are left with enough cash surplus to repay the loan in case the cross-bred cow is purchased by taking a loan will be examined in the following section.

#### Incoming and Out-going Cash

In the study of economics of cross-bred cow, it is necessary also to estimate how much cash would be 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 of cash would be adequate, at least, to pay the instalment of loan taken for purchase of the cow. We propose to examine this issue in the present section. The data is presented in Table 7.22.

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 sales really become a part of the cattle breeding enterprise. As for dung, we have earlier noted

Table 7.2a : 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

Composition of the herd of Milch Animals (Cows or local non-descript breeds are referred to as other cows)	Irrigated Dairy Farmers					Other Dairy Farmers				
	No. of Dairy Farmers	Cash Receipts Rs.	Cash Expenditure Rs.	Balance Rs.	Average per family Rs.	No. of Dairy	Cash Receipts Rs.	Cash Expenditure Rs.	Balance Rs.	Average per family Rs.
1. Cross-bred Calf/Calves	3	-	3,292	(-3292)	(-1097)	0	3,281	10,075	(-6,794)	(-1132)
2. Cross-bred Calf/Calves and Other Cows and Calves	-	-	-	-	-	0	10,365	9,961	404	67
3. Cross-bred Calf/Calves and Buffaloes and their Female Calves	1	910	-	910	910	1	6,472	800	5,672	5,672
4. Cross-bred Calf/Calves and other Cows and Buffaloes & their Female Calves	2	2,495	-	2,495	1,247	2	6,347	1,090	7,257	3,628
5. Only one Cross-bred Cow	7	26,953	18,810	8,143	1,018	29	1,66,911	86,906	78,005	2,717
6. One Cross-bred Cow & Cross-bred Calf/Calves	38	1,25,937	78,868	47,069	1,239	43	2,02,352	1,36,255	66,097	1,537
7. One Cross-bred Cow and other Cows and their Female Calves	4	19,291	6,635	12,656	3,164	-	-	-	-	-
8. One Cross-bred Cow and Buffaloes and their Female Calves	7	54,036	25,235	28,801	4,114	7	41,646	27,507	14,139	2,020
9. One Cross-bred Cow, Cross-bred Calf/Calves and other Cows and their Female Calves	5	26,347	10,026	16,321	3,264	5	30,193	7,870	22,323	4,465
10. One Cross-bred Cow, Cross-bred Calf/Calves and Buffaloes and their Female Calves	21	1,49,141	73,333	75,808	3,610	10	62,760	43,202	19,558	1,956
11. One Cross-bred Cow, Cross-bred Calf/Calves and other Cows and Buffaloes and their Female Calves	1	12,560	1,200	11,360	11,360	-	-	-	-	-
12. One Cross-bred Cow, other Cows and Buffaloes and their Female Calves	1	11,317	4,290	7,027	7,027	2	22,333	11,390	10,943	5,471
13. Two Cross-bred Cows	1	17,954	7,120	10,834	10,834	9	87,165	46,685	40,480	4,498
14. Two Cross-bred Cows and Cross-bred Calf/Calves	18	1,75,245	77,611	97,634	5,424	12	1,05,406	55,893	49,513	4,126
15. Two Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	4	47,395	19,695	27,700	6,925	2	38,496	10,035	28,461	14,230
16. Three Cross-bred Cows	1	26,961	9,605	17,356	17,356	-	-	-	-	-
17. Three Cross-bred Cows and Cross-bred Calf and Calves	1	8,441	1,703	6,738	6,738	2	24,695	3,510	21,185	10,592
18. Three Cross-bred Cows, Cross-bred Calf/Calves and Buffaloes	1	27,675	4,180	23,495	23,495	-	-	-	-	-
19. Four Cross-bred Cows and Cross-bred Calf/Calves	1	31,069	3,750	27,319	27,319	-	-	-	-	-
Total	117	7,63,727	3,45,335	4,18,392	3,576	136	6,10,422	4,53,177*	3,57,245	2,627

\* excluding interest on loan Rs.9,407/- reported by 24 Dairy Farmers.

\* excluding interest on loan Rs.17,511 reported by 52 Dairy Farmers.

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 sale of dung manure in cash receipts.

As regards the expenditure in cash, we included the expenditure on feed, fodder, concentrates, veterinary services and medicines and cattle insurance 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.

The data in the Table has been classified according to composition of the herd of milch animals.

It is seen from the Table that, on the whole, the irrigated dairy farmers had an excess of receipts over expenditure of Rs.3,576 on an average, while the other dairy farmers had only Rs.2,627 on an average. However, this does not appear uniformly in all the types of herds. For instance, in the case of those having one cross-bred cow (with or without calf), the other dairy farmers were left with more cash (Rs.2,717) as compared to the irrigated dairy farmers (Rs.1,018). It is not so where the dairy farmers had only two cross-bred cows, the cash balance with the irrigated dairy farmers and other dairy farmers being Rs.5,424 and Rs.4,126 respectively.

The excess of cash receipts over expenditure depends on the type of milch animal, its lactation months, total milk production and milk sold during the reference year as also on purchases of feed and fodder, if home grown fodder is not adequate. As for the purchase of cattle feed, the quantum of feed varies among the dairy farmers 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 factual resultant position in the case 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 cross-bred cow, we found out the annual instalment of loan repayable at 11 per cent per annum. The amount payable is as follows :

Purchase Price	Annual instalment of loan repayable at 11 per cent per annum in		
	3 years Rs.	4 years Rs.	5 years Rs.
Holstein Cross- bred cow Rs.4300	1,760	1,386	1,163
Jersey Cross- bred cow 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 Tables 7.18 and 7.19, only 24 irrigated dairy farmers and 52 other dairy farmers reported payment of interest on loan. Taking this payment into account, the average cash surplus per dairy farmer works out as follows for the categories of dairy farmers owning exclusively cross-bred cows with or without calves :



	Irrigated Dairy Farmers		Other Dairy Farmers	
	No. of Dairy Farmers	Average cash surplus Rs.	No. of Dairy Farmers	Average cash surplus Rs.
One cross-bred cow	7	1,247	29	2,836
One cross-bred cow with cross-bred calf/calves	38	1,316	43	1,603
Two cross-bred cows	1	11,720	9	4,759
Two cross-bred cows with cross-bred calf/calves	18	5,596	12	4,395
Three cross-bred cows	1	17,536	-	-
Three cross-bred cows with cross-bred calf/calves	1	6,738	2	10,872
Four cross-bred cows with cross-bred calf/calves	1	27,319	-	-

We did not work out separately cash surplus in respect of dairy farmers having Holstein and Jersey cross-bred cows. It, however, appears that as far as the other dairy farmers are concerned, they are left with enough cash surplus to repay the loan in three annual instalments and also with some cash surplus to meet expenses outside their dairy enterprise.

However, our data shows that as far as the irrigated dairy farmers owning only one cross-bred cow with or without cross-bred calves are concerned, the cash surplus is not adequate to repay the loan in three years but just enough to repay it in four years. In their case there would be no cash surplus to meet expenditure outside their dairy enterprise, even if the loan is repaid in four annual instalments. This finding is contrary to

our expectations because the irrigated farmers are expected to perform better than other dairy farmers. However, it may be that the former incur more expenditure in rearing cross-bred 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  
Per Cross-bred Cow on Feed,  
Fodder and Concentrates

We shall consider only those categories of dairy farmers who had exclusively cross-bred cows with or without cross-bred calves. In Table 7.23 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 from the Table that the other dairy farmers incurred more expenditure per cow on an average and the component of the cash expenditure was also higher, about 78 to 88 per cent, as compared to the expenditure reported by irrigated dairy farmers.

In Table 7.24 we have shown the average cash receipts per cross-bred 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. 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 and rice-bran. Since the concentrates are purchased we decided to examine the expenditure on purchases of concentrates

**Table 7.23 : Average Expenditure per Cross-Bred Cow on Feed, Fodder and Concentrates during the Reference Year Reported by Irrigated Dairy Farmers and Other Dairy Farmers**

Type of holding	Irrigated Dairy Farmers			Other Dairy Farmers		
	No. of Dairy Farmers	Average Total Expenditure Rs.	Average cash expenditure Rs.	No. of Dairy Farmers	Average Total Expenditure Rs.	Average cash expenditure Rs.
One cross-bred cow	7	3,257	2,546	29	3,514	2,854
One cross-bred cow with calf/calves	38	2,863	1,766	43	3,273	2,833
Two cross-bred cows	1	3,060	2,170	9	3,103	2,426
Two cross-bred cows with calf/calves	18	2,731	1,548	12	2,648	2,166
Three cross-bred cows	1	3,492	1,147	-	-	-
Three cross-bred cows with calf/calves	1	2,317	436	2	3,125	1,938
Four cross-bred cows with calf/calves	1	2,310	875	-	-	-

**Table 7.24 : Average Cash Receipts Per Cross-bred Cow during the Reference Year as reported by Irrigated Dairy Farmers and Other Dairy Farmers**

Type of holding	Irrigated Dairy Farmers		Other Dairy Farmers	
	No. of Dairy Farmers	Average cash receipts Rs.	No. of Dairy Farmers	Average cash receipts Rs.
One cross-bred cow	7	3,850	29	5,755
One cross-bred cow and calves	38	3,314	43	4,706
Two cross-bred cows	1	8,977	9	4,842
Two cross-bred cows and calves	18	4,868	12	4,392
Three cross-bred cows	1	8,987	-	-
Three cross-bred cows and calves	1	2,814	2	4,116
Four cross-bred cows and calf/calves	1	7,767	-	-

per cow reported during the reference period. The reported purchases are as follows : (Please see next page)

Thus we find that most of the other dairy farmers spent on an average about 30 to 40 per cent more on purchases of concentrates per cow as compared to the reported purchases of 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 sought information regarding the quantity of feed, fodder and concentrates given daily in the latest calving cycle, that is, in the first three months

Type of Milch Cattle Holding	Expenditure on Purchases of Concentrates	
	Irrigated Dairy Farmers Average per cross-bred cow	Other Dairy Farmers Average per cross-bred cow
	Rs.	Rs.
One cross-bred cow	1,070	1,452
One cross-bred cow and calf/calves	1,003	1,382
Two cross-bred cows	2,170	1,480
Two cross-bred cows and calf/calves	1,176	1,410
Three cross-bred cows	2,293	-
Three cross-bred cows and calf/calves	436	306
Four cross-bred cows and calf/calves	675	-

after calving, in the fourth to sixth months, 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 applying 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 for farm produced fodder in all the cases. We have also assumed that whatever feed, fodder and concentrates were purchased were consumed during the reference period. After deducting from the total expenditure on feed, fodder and concentrates, the actual expenditure on purchases of these items, the balance is considered as home produced fodder consumed during the reference year.

In Table 7.25 we have given per cross-bred cow expenditure (including value of farm produced fodder) on dry fodder and green fodder. It is, however, seen from the Table that the expenditure on dry and green fodder per cross-bred cow, does not differ as markedly as the expenditure on concentrates reported by irrigated dairy farmers. The conclusion that emerges from the data is that the other dairy farmers are able to get higher milk yields by giving their cross-bred cows a larger ration of concentrates.

**Table 7.25 : Expenditure Per Cross-bred Cow during the** *Reference*

Type of holding	<i>Irrigated Dairy Farmers &amp; Other Dairy Farmers</i>		<i>Reported by the</i>	
	Irrigated Dairy Farmers	Other Dairy Farmers	No. of Dairy Farmers	Average Expenditure on Dry and Green Fodder per cow
				Rs.
One cross-bred cow	7	2,157	29	2,062
One cross-bred cow and calf/calves	38	1,785	43	1,891
Two cross-bred cows	1	890	9	1,623
Two cross-bred cows and calf/calves	18	1,555	12	1,238
Three cross-bred cows	1	1,198	-	-
Three cross-bred cows and calf/calves	1	1,881	2	1,777
Four cross-bred cows and calf/calves	1	1,435	-	-

Dairy Enterprise of Landless Dairy Farmers

In the analysis of data 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. 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 was working in a milk cooperative and both them pursued dairying as a subsidiary occupation. Thus they were mainly landless labourers depending entirely on purchased feed and fodder for their milch animals.

Of the 25 landless dairy farmers, 2 had cross-bred calves but no cross-bred cows. Three others had two cross-bred cows each while the remaining had one cross-bred cow each with or without cross-bred calves and other milch animals at the time of the present survey.

The 23 landless dairy farmers had in all 26 cross-bred cows, seven of which were home-bred. In respect of the 19 purchased cows, the average price came to Rs.4,737 for Holstein and Rs.4,164 for Jersey cross-bred cows, which is much higher than the overall average of Rs.4,265 for Holstein and Rs.3,300 for Jersey cross-bred cows. The higher price may be due to the element of subsidy under the IEDP. For 11 cross-bred cows, they received subsidy equivalent to one-third of purchase price in 8

cases and one-half of the purchase price in three cases. All these cases are from Solapur district where the governmentscheme for subsidy on cattle feed is also implemented. Subsidy for cattle feed was received by five dairy farmers, each receiving upto Rs.500 during the reference year.

The landless were in dairy enterprise for varying lengths of period. Fifteen of them had started dairy enterprise sometime in 1981-1984, 3 others between 1976-1980 and the remaining seven between 1970-75.

The 23 dairy farmers who had cross-bred cows with or without other milch animals had an average milk production of 2,282 lts. during the reference year. The milk production of cross-bred cows was 1,926 lts. per cow in the case of 17 dairy farmers who had only one cross-bred cow and 1,720 lts. per cow in the case of three others who had two cross-bred cows each. The average milk production per cow was no doubt lower by a few hundred litres than that in the case of irrigated dairy farmers and other dairy farmers.

As regards disposal of milk, 86 per cent of total milk production was sold (as against about 83 per cent by the rest of the dairy farmers), about 2.4 per cent was fed to calves (as against 4 per cent by the rest of the dairy farmers) and about 11.5 per cent was consumed at home. The average per capita consumption of milk in the case of landless dairy farmers came to 139 millilitres a day as against the overall average of 174 millilitres a day for the entire sample.

We shall next compare the average total receipts and total expenditure in respect of the dairy enterprise of



the landless dairy farmers with the rest of the dairy farmers. The position is summed up below :

	<u>Landless Dairy Farmers</u>	<u>Irrigated Dairy Farmers</u>	<u>Other Dairy Farmers</u>
1) No. of Dairy Farmers	25	117	111
2) Average surplus per dairy farmer	Rs.	Rs.	Rs.
a) including imputed wages of family labour in total expenditure	1,932	1,952	2,243
b) excluding imputed wages of family labour in total expenditure	3,123	3,386	3,558

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 wages of family labour in the expenditure side. For the sake of finding out surplus in this manner, we will confine to only such cases where the dairy farmers

had only one cross-bred cow. The surplus so worked out is shown below :

	<u>Landless Dairy Farmers</u>	<u>Irrigated Dairy Farmers</u>	<u>Other Dairy Farmers</u>
No. of Dairy Farmers with one cross-bred cow	17	45	55
	Rs.	Rs.	Rs.
Value of milk production	98,230	2,14,041	3,51,958
Value of dung manure	3,465	11,980	12,535
Total	1,01,695	2,26,021	3,64,493
Expenditure including imputed wages of family labour	85,719	2,06,131	2,70,576
Total surplus	15,976	19,890	93,917
Average surplus per cow	940	442	1,707
Expenditure excluding imputed wages of family labour	66,364	1,42,156	1,78,871
Surplus	35,331	83,825	1,85,622
Average surplus per cow	2,078	1,863	3,375

It will be seen that the performance of the landless dairy farmers was not too low. In fact, they did better than the irrigated dairy farmers. It sounds illogical but the data reveals that the total receipts per cow were Rs.5,982 for the landless, whereas these were only Rs.5,022 for the irrigated and Rs.6,627 for the other dairy farmers. The irrigated dairy farmers had lesser milk production per cow as compared to the landless and other dairy farmers. In the matter of total expenditure excluding imputed wages of family labour, the average expenditure per cow was Rs.3,904 in respect of the landless, Rs.3,160 for irrigated dairy farmers and Rs.3,252 for other dairy

farmers. If we consider only the expenditure on feed, fodder and concentrates per cow, it comes to Rs.3,514 for the landless, Rs.2,861 for the irrigated dairy farmers and Rs.3,326 for other dairy farmers. Obviously, the irrigated dairy farmers incurred less expenditure per cow while the landless incurred about 20 per cent more expenditure on feed, fodder and concentrates consequently receiving in higher milk production. As we have said earlier, the landless 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 the cross-bred cows.

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

	<u>Cash Receipts and expenditure during the reference year for 17 landless dairy farmers who had only one cross-bred cow</u>
	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 cross-bred cow, Rs.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<sup>s</sup> purchases of Holstein cross-bred 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 it is to be repaid 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 through the milk cooperative.

To conclude, we may state that as our data shows, the landless agricultural labourers can also successfully carry on dairy enterprise, 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) cross-bred cows. In reply, about 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 :

<u>Difficulties</u>	<u>Number of Dairy Farmers</u>
Shortage of Green Fodder	129
Shortage of Cattle feed and fodder	39
Shortage of capital	6
Shortage of water	33
No specific reason	31
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Shortage of green fodder appeared to be a constraint in increasing productivity in respect of about two-thirds

of the dairy farmers in the sample villages, and in particular their percentage was as high as 89 per cent at Umadi 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 personal household expenses. The amount payable as instalment to the bank 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, almost 90 per cent of the dairy farmers cultivated land and had some fodder resources. In the circumstances it was not necessary for most of them to raise separate funds to meet their working capital requirements for purchase of feed and fodder.

We had asked the dairy farmers to report how they meet their requirement of working capital. About 70 per cent of the dairy farmers could meet the 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 respond to the question and presumably they did not obtain funds from any source but met the working capital requirements from their own funds. 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, may be because they did not intend to add to their dairy business. However, if it was so, they did not state any reason. Only 48 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 green fodder and kadba, 2 more dairy farmers reported shortage of water and one each 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 positively stated that they have no difficulty in expansion of their dairy business.

Thus the replies by the sample dairy farmers indicate that only about four per cent have no difficulty and about 20 per cent do like to expand their dairy business but cannot do so because of certain constraints. Non-response to the question by the remaining 76 per cent could be presumed as a sign of their desire for status quo.

To conclude the discussion in the present chapter, 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 to our investigators, 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 the very fact that those who do not have any irrigated land try to get more income from dairy enterprise by managing it better than the irrigated dairy farmers.

**CHAPTER VIII****ECCNOMICS OF DAIRYING WITH CROSS-BRED COWS  
(Benefit : Cost Analysis)**

We shall consider in the present chapter economics of dairying with cross-bred cows. We have in our sample survey, two types of cross-bred cows, namely, Holstein and Jersey. One of the objectives of our study is to find out the conditions under which dairying becomes profitable. In that context it is necessary to consider separately the cross-bred cows with the irrigated dairy farmers and others. We propose to work out the benefit: cost ratio for Holstein as well as for Jersey cross-bred cows owned by the irrigated dairy farmers and others.

Benefit : Cost Analysis : For the purposes of benefit : cost analysis at the dairy farmer's level, we will assume that a cross-bred cow about to calve/recently calved for the first time is purchased and is retained until the end of its fourth lactation. While projecting the population of cross-bred 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 our survey data showed that the dairy farmers in our sample had a majority of the cross-bred cows in their first to fourth calving. There were stray cases of cross-bred cows in their fifth to ninth calving and we did not think that such cases were adequate to give representative estimates of inputs and lactation yield.



Besides, it is often argued that cows, whether cross-bred or not, are less likely to conceive whether by A.I. or by natural cover after four or five calvings. Besides, by the time the cross-bred cow reaches the end of the fourth lactation, the dairy farmer may have a second generation home-bred cross-bred cow from the female calf of the parent cow and may prefer to keep the one in the first calving and dispose of 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.

First of all, we indicate in the following paragraphs the concepts and definitions we propose to adopt and the manner in which we will arrive at the estimates of milk production, various items of expenditure, etc., which we propose to utilise in the benefit:cost analysis.

Period of Reference : As stated in the preceding paragraphs, the period of reference will be from the beginning of the first lactation till the end of the fourth lactation of a cross-bred 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 benefit : cost 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 cross-bred cows becomes profitable.

Purchase Price of a Cross-bred Cow : We will use the data from our survey regarding the average purchase price of the cross-bred cows in their first calving. As noted in Table 6.3, the average purchase price of a

Holstein cross-bred cow in its first calving was Rs.4,265 which we have rounded off to Rs. 4,300. The average purchase price for a Jersey cross-bred cow was Rs. 3,277 which we have rounded off to Rs. 3,300. We consider that there is no need to make any distinction in purchase price as far as the irrigated dairy farmers and others are concerned because one who sells a cow does not consider whether the buyer has any irrigated land or not.

Calving Interval : In Chapter VII we have noted the average calving interval separately for the Holstein and Jersey cross-bred cows owned by the irrigated dairy farmers and others. We have rounded off the data as follows for the purpose of the present analysis.

Inter-calving period of cross-bred cows	Irrigated Dairy Farmers		Other Dairy Farmers	
	Holstein	Jersey	Holstein	Jersey
	--Inter-calving period in months--			
1st to 2nd	13	13	12	12
2nd to 3rd	13	13	12	12
3rd to 4th	12	13	11	13
Until end of 4th lactation	9	10	9	9
Total	47	49	44	46

Calves Born : In Chapter V, in Table No. 5.2 we have given the percentage distribution of the calves born according to sex. Since our survey data shows a slightly higher proportion of males, and also a higher mortality rate among male calves, we have assumed that the first calf born about the time the parent cow is purchased is a male and also that it does not survive.

Further it is assumed that the second calf born is a female and is reared by the dairy farmer. This female calf of the second generation will have its first calving, a male calf, in 30 months from its birth and that it does not survive. It is further assumed that the third calf born 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 a few days after birth. It is further assumed that the fourth calf born would be 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 in Table 7.1 regarding inter-calving period we indicate below the outcome of our above mentioned assumptions.

	Sex of the calf of the parent cow	Irrigated Farmers		Others	
		Holstein	Jersey	Holstein	Jersey
		Month from purchase of the parent cow			
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	39th	36th	38th
The second (female) calf calves for the first time in the		43rd	43rd	42nd	42nd
and will be in milk until the end of the 4th lactation of parent animal for		4	6	2	4
		MONTHS			
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 Table No. 6.3 we find that there were 23 purchases of Holstein and 5 purchases of Jersey cross-bred cows in their fourth calving. Taking into consideration the purchase prices of these cows we decided in a somewhat arbitrary way, the value of the Holstein cross-bred cow at the end of the 4th lactation as Rs. 3,500 and of the Jersey cross-bred cow as Rs. 3,000.

As regards the cross-bred 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 Holstein and Jersey cross-bred 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 8 or 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 had 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 Rs. 1062 or say Rs. 1065. The above-mentioned values are assumed to be the same whether the cow is owned by an irrigated or other dairy farmer.

Lactation Yield : We have used the data in Tables 7.3 and 7.4 regarding lactation yield to estimate the milk yield

of the parent animal at each lactation as also of the cross-bred cow of the second generation. For the sake of convenience we have rounded off the data to tens of litres.

Value of Milk Production : During the reference period the price received for cow milk sold by the dairy farmers was Rs. 2.80 to Rs. 3.00 per litre. For the sake of the present exercise we have assumed it as Rs. 3 per litre and arrived at the value of the total milk production at that rate.

Value of Dung Manure : We calculated from the survey data the average value of dung manure per cross-bred cow reported by the dairy farmers having one/two/three/four cross-bred cows. It came to Rs. 260 per cross-bred cow per year in the case of cows owned by the irrigated dairy farmers and Rs. 185 in the case of the 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 calves owned by the irrigated dairy farmers and others respectively. Hence 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 the value of dung manure in the first, second or third year until the first calving. We are aware that the value would increase from the first to the third 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 (Table 8.1) regarding expenditure on rearing

**Table 8.1 :** Expenditure on Feed, Fodder & concentrates per month in different Lactations in respect of Holstein & Jersey Cross-bred Cows owned by Irrigated Dairy Farmers & Other Dairy Farmers

Lactation	<u>Expenditure on Feed, Fodder &amp; Concentrates</u>			
	<u>Irrigated Dairy Farmers</u>		<u>Other Dairy Farmers</u>	
	Holstein av. p.m. Rs.	Jersey av. p.m. Rs.	Holstein av. p.m. Rs.	Jersey av. p.m. Rs.
First	274	231	276	283
Second	311	219	303	300
Third	303	239	338	262
Fourth	380	290	318	342

cross-bred cows and female calves (Ref. Chapter V) reported by the sample dairy farmers.

Value of Milk Fed to Calves : The value of milk fed to female calves is included in the cost of feed, fodder and concentrates (referred to above) given to the calves since birth until the end of the first year.

Other Expenditure : Besides the expenditure on feed, fodder and concentrates, the dairy farmers incurred expenditure on 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 working in the dairy enterprise and interest on loan for purchase of milch animals reported by some dairy farmers formed about eight per cent of the total expenditure in the case of irrigated dairy farmers and seven per cent in respect of other dairy farmers. 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 cross-bred cow

The dairy farmers had incurred capital expenditure on construction of cattle sheds in one of the years in a period of about 15 years prior to the present survey. Besides, the construction of cattle sheds was not uniform as some structures were pucca and others were temporary. As such it was not possible to calculate with fair accuracy depreciation on cattle sheds. Hence we have not included depreciation on cattle sheds in the present exercise.

As for the other items of capital expenditure, these

included purchases of rope and chains and expenditure on A.I. or covering the covering the cows with a bull. This type of expenditure, <sup>except on A.I.</sup> 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 Cross-bred Cows

As stated earlier, the reference period of the analysis is from the purchase of a cross-bred cow at its first calving until the end of its fourth lactation. We have indicated in a previous paragraph in this section the manner in which we propose to consider the value of the parent animal and its female calves as at the end of the fourth lactation. As such value takes into account depreciation and appreciation of the cow and calves, it is felt that it is not necessary to consider separately depreciation or appreciation in the value of the milch animal in the interim period.

#### Imputed Value of Family Labour

In Chapter IV, we have given information regarding the number of days, that is the number of hours of work everyday divided by eight, 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.

It may be mentioned that we have taken into account the average number of days of family labour for the dairy enterprise as found from the present survey. As noted in Chapter IV, on an average each family had one male and one female adult working in dairy enterprise and each of them



worked for <sup>85</sup> 98 days (i.e. ~~784~~ <sup>and 100 days respectively</sup> hours) in a year on an average.

The imputed wages of family labour per year came to Rs. ~~260~~ <sup>850</sup> for male labour and Rs. ~~490~~ <sup>500</sup> for female labour i.e. total Rs. ~~1070~~ <sup>1350</sup>. 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, besides the cross-bred cow/cows. However, their 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 propose to use in the present exercise will be slightly an overestimate. However, we can keep this fact in mind when we consider the benefit:cost ratios worked out separately a) including, and b) excluding the 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 farm servant specially for the purpose of dairying with cross-bred cows if there is enough labour force in the family of the dairy farmer. Hence in the present analysis we have not included any 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 a male calf, milk yield of the second generation and dung manure of the second and third generation and finally present worth, that is, value of the parent animal, cross-bred 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 : Capital Expenditure on purchase of cross-bred cow, Expenditure on Feed, Fodder and Concentrates including other expenditure on (a) the parent cow, (b) the second generation cross-bred cow and (c) the second female calf and finally, Imputed value of family labour.

Benefit:Cost Ratio : We have added the various items of receipts and found out the annual discounted value at an interest rate of 11 per cent to know the present worth of the total benefit. Similarly to arrive at the present worth of cost, we have added all the items on the expenditure side and found out the annual discounted value at 11 percent. The reason for discounting at an interest rate of 11 per cent is that the rate of interest on loans taken for purchase of cross-bred cows <sup>from the bank</sup> varied between 10 to 12 per cent per annum in respect of loans taken by the sample dairy farmers for purchase of cross-bred cows. The data is presented in Tables 8.2 to 8.5.

By taking into consideration the present worth (annual discounted values) of benefit and cost, and by dividing the present worth of benefit by present worth of cost, we have arrived at the following benefit:cost ratios :

<u>Benefit:Cost Ratio at Discounted at an Interest Rate of 11 per cent</u>		
	Holstein Cross-bred cows	Jersey cross- bred cows
Irrigated Dairy Farmers	1.49 <del>1.57</del>	1.49 <del>1.51</del>
Other Dairy Farmers	1.52 <del>1.56</del>	1.19 <del>1.24</del>

Table 8-2 : Receipts and Expenditures and Present Worth

## (A) Receipts (Milk)

Lactation No.	Period in months	Total receipts	Present Worth (Annual Discounted Value at 11%)	
			Year	Rs.
First	13	6,993	1st	5,815
Second	13	6,976	2nd	5,227
Third	12	7,567	3rd	5,396
Until End of 4th lactation	9	18,311	11 months of 4th	12,746
<b>Total</b>	<b>47</b>	<b>39,847</b>		<b>29,184</b>

\* Including Rs. 3,500 being 1,065 of the second female calf.

## (B) Expenditures

Lactation No.	Period in months	Present Worth (Annual Discounted Value at 11%)	
		Year	Rs.
First	13	1st	<del>6,000</del> 6,774
Second	13	2nd	<del>3,000</del> 4,279
Third	12	3rd	<del>3,613</del> 3,895
Until the end of 4th lactation	9	11 months of 4th	<del>4,047</del> 4,645
<b>Total</b>	<b>47</b>		<del>16,500</del> 19,593

Table 82: Receipts and Expenditure During the Reference Period of a Holstein Cross-bred 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.	Period in months	Parent Animal		2nd Generation Cross-bred Cow		3rd Generation Female Calf Dung manure	Sale of male calf	Value of Parent Cow & its calves at the end of 4th lactation	Total receipts	Present Worth (Annual Discounted Value at 11%)	
		Milk production	Dung manure	Milk production	Dung manure					Year	Rs.
First	13	6,711	282	-	-	-	-	-	6,993	1st	5,815
Second	13	6,504	282	-	190	-	-	-	6,976	2nd	5,227
Third	12	7,077	260	-	190	-	40	-	7,567	3rd	5,396
Until end of 4th lactation	9	6,702	195	2,237	181	131	-	8,865	18,311	11 months of 4th	12,746
<b>Total</b>	<b>47</b>	<b>26,994</b>	<b>1,019</b>	<b>2,237</b>	<b>561</b>	<b>131</b>	<b>40</b>	<b>8,865</b>	<b>39,847</b>		<b>29,184</b>

\* Including Rs. 3,500 being the value of the parent cow, Rs. 4,300 of the second generation cross-bred cows and Rs. 1,065 of the second female calf.

## (B) Expenditure (in Rs.)

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow		3rd generation female calf		Total expenditure	Present Worth (Annual Discounted Value at 11%)	
		Purchase of a cross-bred cow	Feed, Fodder, Concentrated & other expenditure	milk fed, feed, fodder, concentrated and other expenditure	milk fed, feed, fodder, concentrated and other expenditure	Year	Rs.			
First	13	4,300	<del>3,500</del> 3,846	-	-	-	<del>2,000</del> 8,146	1st	<del>6,000</del> 6,774	
Second	13	-	<del>4,000</del> 4,365	<del>1,000</del> 1,125	-	-	<del>5,000</del> 5,490	2nd	<del>3,000</del> 4,279	
Third	12	-	<del>3,000</del> 3,928	<del>1,000</del> 1,451	-	-	<del>4,000</del> 5,379	3rd	<del>2,000</del> 3,895	
Until the end of 4th lactation	9	-	<del>2,454</del> 3,694	<del>1,000</del> 1,789	<del>200</del> 753	-	<del>5,000</del> 6,236	11 months of 4th	<del>4,000</del> 4,645	
<b>Total</b>	<b>47</b>	<b>4,300</b>	<b><del>14,720</del> 15,833</b>	<b><del>4,000</del> 4,365</b>	<b><del>200</del> 753</b>	<b>-</b>	<b><del>20,000</del> 25,251</b>		<b><del>10,000</del> 19,593</b>	

Table 83 : Receipts and Expenditure During the Reference Period of a Holstein Cross-bred 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.	Period in months	Parent animal		2nd Generation Cross-Bred Cow		3rd Generation Female Calf Dung manure	Sale of Male calf	Value of Parent cow & its calves at the end of 4th lactation	Total Receipts	Present Worth (Annual Discounted Value at 11%)	
		Milk production	Dung Manure	Milk production	Dung manure					Year	Rs.
First	12	6,129	260	-	-	-	-	-	6,389	1st	5,756
Second	12	6,153	260	-	175	-	-	-	6,588	2nd	5,347
Third	11	6,918	238	-	160	-	40	-	7,356	3rd	6,832
Until and of 4th lactation	9	6,135	195	1,021	145	131	-	8,865	16,492	8 months of 4th	10,119
<b>Total</b>	<b>44</b>	<b>25,335</b>	<b>953</b>	<b>1,021</b>	<b>480</b>	<b>131</b>	<b>40</b>	<b>8,865</b>	<b>36,825</b>		<b>28,051</b>

\* Including Rs. 3,500 being the value of the parent cow, Rs. 4,300 of the second generation cross-bred cows and Rs. 1065 of the second female calf.

(B) Expenditure (In Rs.)

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow milk fed, feed, fodder, concentrated and other expenditure	3rd generation female calf milk fed, feed, fodder, concentrated and other expenditure	Total expenditure	Present worth (Annual Discounted Value at 11%)	
		Purchase of a cross-bred cow	Feed, Fodder Concentrated and other expenditure				Year	Rs.
First	12	4,300	3,543	-	-	7,843	1st	7,066
Second	12	-	3,893	995	-	4,888	2nd	3,967
Third	11	-	3,981	1,318	-	5,299	3rd	4,300
Until the and at 4th lactation	9	-	3,060	1,430	746	5,236	8 months of 4th	3,115
<b>Total</b>	<b>44</b>	<b>4,300</b>	<b>14,477</b>	<b>3,743</b>	<b>746</b>	<b>23,266</b>		<b>18,448</b>

Table 8.4 : Receipts and Expenditure During the Reference Period of a Jersey Cross-bred 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.	Period in months	Parent animal		2nd Generation Cross-bred Cow		3rd Generation Female Calf	Sale of male calf	Value of Parent cow & its calves at the end of 4th lactation	Total receipts	Present Worth (Annual Discounted Value at 11%)	
		Milk production	Dung manure	Milk production	Dung manure	Dung manure				Year	Rs.
First	13	4,725	282	-	-	-	-	-	5,007	1st	4,135
Second	13	5,364	282	-	190	-	-	-	5,836	2nd	4,346
Third	13	6,156	282	-	190	-	40	-	6,668	3rd	4,407
Until and of 4th	10	5,397	217	2,362	188	146	-	7,365	15,675	4th one month of 5th year	5,940 5,241
<b>Total</b>	<b>49</b>	<b>21,642</b>	<b>1063</b>	<b>2,362</b>	<b>378</b>	<b>146</b>	<b>40</b>	<b>7,365</b>	<b>33,196</b>		<b>24,069</b>

\* Including Rs. 3,000 being the value of the parent cow, Rs. 3300 of the second generation cross-bred cows and Rs. 1,065 of the second female calf

(B) Expenditure (In Rs.)

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow	3rd generation female calf	Total expenditure	Present Worth (Annual Discounted Value at 11%)	
		Purchase of a cross-bred cow	Feed, Fodder, concentrated and other expenditure	milk fed, feed, fodder, concentrated and other expenditure	milk fed, feed, fodder, concentrated and other expenditure		Year	Rs.
First	13	3,300	<del>3,000</del> 3,240	-	-	<del>6,300</del> 6,540	1st	<del>5,200</del> 5,439
Second	13	-	<del>3,079</del> 3,079	<del>4,945</del> 1,125	-	<del>3,924</del> 4,204	2nd	<del>3,500</del> 3,295
Third	13	-	<del>3,125</del> 3,352	<del>1,420</del> 1,572	-	<del>4,772</del> 4,924	3rd	<del>3,700</del> 3,242
Until the end of 4th lactation	10	-	<del>3,000</del> 3,132	<del>4,848</del> 1,981	<del>4,404</del> 837	<del>5,000</del> 5,950	4th one month of 5th	<del>4,000</del> 4,150
<b>Total</b>	<b>49</b>	<b>3,300</b>	<del>14,047</del> 12,803	<del>4,213</del> 4,678	<del>4,404</del> 837	<del>20,724</del> 21,018		<del>16,400</del> 10,126

**Table 8.5 :** Receipts and Expenditure During the Reference Period of a Jersey Cross-bred 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.	Period in months	Parent animal		2nd Generation Cross-bred Cow		3rd Generation Female Calf	Sale of Male calf	Value of Parent cow & its calves at the end of 4th lactation	Total receipts	Present Worth (Annual Discounted Value at 11%)	
		Milk production	Dung manure	Milk production	Dung manure	Dung manure	Year			Rs.	
First	12	4,898	260	-	-	-	-	-	5,158	1st	4,624
Second	12	4,419	260	-	175	-	-	-	4,854	2nd	3,940
Third	13	5,400	282	-	190	-	40	-	5,912	3rd	3,657
Until and of 4th lactation	9	5,016	195	1,631	160	131	-	7,365	14,498	10 months of 4th	9,827
<b>Total</b>	<b>46</b>	<b>19,728</b>	<b>997</b>	<b>1,631</b>	<b>525</b>	<b>131</b>	<b>40</b>	<b>7,365</b>	<b>30,417</b>		<b>22,048</b>

\* Including Rs. 3,300 being the value of the parent cow, Rs. 3,000 of the second generation cross-bred cows and Rs. 1,065 of the second female calf.

## (B) Expenditure (In Rs.)

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow	3rd generation female calf	Total expenditure	Present Worth (Annual Discounted Value at 11%)	
		Purchase of a cross-bred cow	Feed, Fodder, Concentrated & other expenditure	milk fed, feed, fodder, concentrated and other expenditure	Year		Rs.	
First	12	3,300	<del>3,400</del> 3,634	-	-	<del>3,400</del> 6,934	1st	<del>3,400</del> 6,247
Second	12	-	<del>3,300</del> 3,852	<del>300</del> 995	-	<del>4,500</del> 4,847	2nd	<del>2,718</del> 3,934
Third	13	-	<del>4,400</del> 4,763	<del>4,400</del> 1,558	-	<del>5,000</del> 6,321	3rd	<del>4,000</del> 4,296
Until the end of 4th lactation	9	-	<del>2,000</del> 3,101	<del>2,700</del> 1,810	<del>700</del> 746	<del>6,000</del> 5,657	10 months of 4th	<del>4,400</del> 4,037
<b>Total</b>	<b>46</b>	<b>3,300</b>	<del>14,400</del> 15,350	<del>5,400</del> 4,363	<b>704</b> 746	<del>20,000</del> 23,759		<del>10,000</del> 18,514

ble 8-2 : Receipts and Expenditure During the Reference Period of a Holstein Cross-bred and Present Worth (i.e. Annual Discounted Value at 11%) in Respect of

(A) Receipts (in Rs.)

Station No.	Period in months	Parent Animal		2nd Generation Cross-bred Cow		3rd Generation Calf
		Milk production	Dung manure	Milk production	Dung manure	
1st	13	6,711	282	-	-	-
2nd	13	6,504	282	-	190	-
3rd	12	7,077	260	-	190	-
4th	9	6,702	195	2,237	181	131
<b>Total</b>	<b>47</b>	<b>26,994</b>	<b>1,019</b>	<b>2,237</b>	<b>561</b>	<b>131</b>

Including Rs. 3,500 being the value of the parent cow, Rs. 4,300 of the second generation female calf.

(B) Expenditure (in Rs.)

Station No.	Period in months	Parent animal		2nd generation cross-bred cow		3rd generation female calf
		Purchase of a cross-bred cows	Feed, Fodder, Concentrated & other expenditure	milk fed, feed, fodder, concentrated and other expenditure	milk fed, fodder, concentrated & other expenditure	
1st	13	4,300	2,593	3,846	-	-
2nd	13	-	4,022	4,365	1,125	-
3rd	12	-	3,623	3,928	1,451	-
4th	9	-	2,454	3,694	1,789	200
<b>Total</b>	<b>47</b>	<b>4,300</b>	<b>14,722</b>	<b>15,833</b>	<b>4,365</b>	<b>200</b>



Table 8-3 : Receipts and Expenditure During the Reference Period of a Holstein Cow (i.e. Annual Discounted Value at 11%) in Respect of Other Dairy Farm

(A) Receipts (In Rs.)

Lactation No.	Period in months	Parent animal		2nd Generation Cross-Bred Cow		3rd Generation Female Cow Dung manure
		Milk production	Dung Manure	Milk production	Dung manure	
First	12	6,129	260	-	-	-
Second	12	6,153	260	-	175	-
Third	11	6,918	238	-	160	-
Until and after 4th lactation	9	6,185	195	1,021	145	181
<b>Total</b>	<b>44</b>	<b>25,385</b>	<b>953</b>	<b>1,021</b>	<b>480</b>	<b>181</b>

Including Rs. 3,500 being the value of the parent cow, Rs. 4,300 of the second generation female calf.

(B) Expenditure (In Rs.)

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow		3rd generation female cow milk fed, fodder, concentrated and other expenditure
		Purchase of a cross-bred cow	Feed, Fodder Concentrated and other expenditure	milk fed, feed, fodder, concentrated and other expenditure		
First	12	4,800	8,044	3,543	-	-
Second	12	-	2,624	3,893	887	995
Third	11	-	2,255	3,981	1,244	1,318
Until the end of 4th lactation	9	-	2,000	3,060	4,007	1,430
<b>Total</b>	<b>44</b>	<b>4,800</b>	<b>12,668</b>	<b>14,477</b>	<b>4,007</b>	<b>3,743</b>

**Table 8.4 : Receipts and Expenditure During the Reference Period of a Jersey Cross (i.e. Annual Discounted Value at 11%) in Respect of Irrigated Dairy Farm**

**(A) Receipts (In Rs.)**

Lactation No.	Period in months	Parent animal		2nd Generation Cross-bred Cow		3rd Generation Female
		Milk production	Dung manure	Milk production	Dung manure	Dung
First	13	4,725	282	-	-	-
Second	13	5,364	282	-	190	-
Third	13	6,156	282	-	190	-
Until and after 4th	10	5,397	217	2,362	188	14
<b>Total</b>	<b>49</b>	<b>21,642</b>	<b>1063</b>	<b>2,362</b>	<b>368</b>	<b>14</b>

Including Rs. 3,000 being the value of the parent cow, Rs. 3300 of the second generation female calf

**(B) Expenditure (In Rs.)**

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow		3rd Generation female
		Purchase of a cross-bred cow	Feed, Fodder, concentrated and other expenditure	milk fed, feed, fodder, concentrated and other expenditure	milk fodder concentrate	expenditure
First	13	3,800	8,000	3,240	-	-
Second	13	-	2,875	3,079	4,915	1,125
Third	13	-	2,123	3,352	2,470	1,572
Until the end of 4th lactation	10	-	2,900	3,132	4,040	1,981
<b>Total</b>	<b>49</b>	<b>3,800</b>	<b>13,898</b>	<b>12,803</b>	<b>11,425</b>	<b>4,678</b>

**Table 8.5 : Receipts and Expenditure During the Reference Period of a Jersey Cross-bred Cow (i.e. Annual Discounted Value at 11%) in Respect of Other Dairy Farms**

**(A) Receipts (In Rs.)**

Lactation No.	Period in months	Parent animal		2nd Generation Cross-bred Cow		3rd Generation Female Calf
		Milk production	Dung manure	Milk production	Dung manure	Dung manure
First	12	4,893	260	-	-	-
Second	12	4,419	260	-	175	-
Third	13	5,400	282	-	190	-
Until and of 4th lactation	9	5,016	195	1,631	160	131
<b>Total</b>	<b>46</b>	<b>19,728</b>	<b>997</b>	<b>1,631</b>	<b>525</b>	<b>131</b>

\* Including Rs. 3,800 being the value of the parent cow, Rs. 3,000 of the second lactation and Rs. 204 of the second female calf.

**(B) Expenditure (In Rs.)**

Lactation No.	Period in months	Parent animal		2nd generation cross-bred cow	3rd generation female calf
		Purchase of a cross-bred cow	Feed, Fodder, Concentrated & other expenditure	milk fed, feed, fodder, concentrated and other expenditure	fed, feed, concentrated and other expenditure
First	12	3,800	<del>0,400</del> 3,634	-	-
Second	12	-	<del>0,000</del> 3,852	<del>000</del> 995	-
Third	13	-	<del>4,400</del> 4,763	<del>4,470</del> 1,558	-
Until the end of 4th lactation	9	-	<del>0,000</del> 3,101	<del>0,700</del> 1,810	<del>000</del> 204
<b>Total</b>	<b>46</b>	<b>3,800</b>	<b>14,400-15,350</b>	<b>5,410-4,363</b>	<b>204</b>

The benefit:cost ratio of <sup>about</sup> a ~~little over~~ 1.5 in respect of Holstein 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 cross-bred cows is also about 1.5 in respect of irrigated dairy farmers but <sup>only</sup> a little lower i.e. 1.2 in respect of other dairy farmers. This may be due to smaller size of sample farmers. Particularly for arriving at the expenditure of feed, fodder and concentrates, we did not have large enough number of cases. The average expenditure on feed, fodder and concentrates was quite high in respect of the Jersey cross-bred cows in our sample, thus adversely affecting the benefit:cost ratio. Still the results indicate that with Jersey cross-bred cows also, those who do not have any irrigated land can ~~also~~ conduct dairy enterprise profitably.

We may consider the benefit:cost ratio after including in the total expenditure imputed wages of family labour.

Benefit-Cost Ratio after Including Imputed Wages of Family Labour

The annual discounted value of expenditure is shown in Tables 8.2 to 8.5. To this we have added the imputed wages of family labour at Rs. <sup>1,350</sup> 1,070 per annum, discounted the same at the interest rate of 11 per cent and added it to the annual discounted value of expenditure. The resultant position is as follows :

	Present worth of imputed wages of family labour	Percent worth of total expendi- ture including imputed wages of family labour	Total present worth of receipts	Benefit: Cost Ratio
	Rs.	Rs.	Rs.	
<u>Irrigated Dairy Farmers</u>				
Holstein cross-bred cows	4,105	23,698	29,184	1.23
Jersey cross-bred cows	4,260	20,386	24,069	1.18
<u>Other Dairy Farmers</u>				
Holstein cross-bred cows	3,901	22,349	28,054	1.25
Jersey cross-bred cows	4,038	22,552	22,048	0.98

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 cross-bred cows, where it is almost 1.0, in all other cases it is about 1.2. This indicates that even with Jersey cross-bred cows, dairy enterprise is profitable, whether or not the dairy farmers have irrigated land.

CHAPTER IXSUMMARY

The present study regarding Economics of Dairying with Cross-bred 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 cross-breeding services rendered by the State Government, B.A.I.F. and other agencies since 1970-71 when the cross-breeding programme was introduced and (2) to carry out a sample survey of dairy farmers in Western Maharashtra who conduct dairying with cross-bred cows to find out the conditions under which dairying becomes profitable, cost of rearing cross-bred calves until their first calving, veterinary and other care such cattle need, financial and other constraints and examine conditions under which it is not possible to successfully conduct dairying with such cattle and 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 cross-bred 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 1983-84. For the purpose of the sample survey, a sample of 253 dairy farmers from six villages in Pune, Sangli and Solapur districts was selected. 117 of these had some irrigated land, 111 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.

Though the programme of A.I. and cross-breeding was taken up in 1970-71, it gathered momentum after 1975. In fact, it reached a large scale in the 'eighties. In 1984-85, about six 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 cross-bred 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 cross-bred calves were reported born in 1984-85 which means that after about thirty months, these will add about 43,800 cross-bred cows to the existing stock. To this, we may add another about 17,500 cross-bred 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 cross-bred cows will be added in the year 1987-1988.

As per the Livestock Census of 1982, there were 2,08,174 cross-bred cows in Maharashtra State, of which about sixty per cent were in milk. The A.I. and cross-breeding programme was mainly carried out in Western Maharashtra. The intensification of the programme, particularly in other parts of the State, will depend upon (a) how many cross-bred cows the present feed and fodder resources can sustain and (b) whether it will be possible to market incremental milk that may be obtained due to intensification of the cross-breeding programme. The Government will have to take necessary policy decisions in this regard.

Three of the sample villages lie in drought prone area with annual rainfall of less than 600 mm. 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 sample 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 occupation after they took to dairying. Hence the opportunity cost of their labour is considered zero.

The composition of the sample dairy farmers according to their holding of milch animals is shown in Table 9.1. We had included 21 dairy farmers who had only cross-bred calves to get information regarding rearing of calves. 12 of them had some other milch animals also. Of the remaining, 78 per cent had one cross-bred cow, 20 per cent had two cross-bred cows with or without other milch animals. In the remaining 2 per cent, 5 dairy farmers had 3 each and one had four cross-bred cows. This, however, does not represent the actual position in the village in the matter of holding of cross-bred cows as we had selected the sample



to suit our investigational convenience. In the six sample villages, about 60 per cent had one cross-bred cow, about 25 per cent had two cross-bred cows and the remaining had three or more.

**Table 9.1: Composition of Sample Irrigated Dairy Farmers and Other Dairy Farmers According to Number of Cross-bred Cows in Their Holding of Milch Animals**

No. of cross-bred cows in their holding of milch animals	No. of Dairy Farmers			Total
	Irrigated Dairy Farmers	Dry Land Dairy Farmers	Land-less	
No cross-bred cows but cross-bred calves and other milch animals	6	13	2	21
One cross-bred cow with or without cross-bred calves but no other milch animals	45	55	17	117
One cross-bred cow and other milch animals	39	21	3	63
Two cross-bred cows with or without cross-bred calves but no other milch animals	19	18	3	40
Two cross-bred cows and other milch animals	4	2	-	6
Three cross-bred cows with or without cross-bred calves but no other milch animals	2	2	-	4
Three cross-bred cows and other milch animals	1	-	-	1
Four cross-bred cows and cross-bred calves	1	-	-	1
<b>Total</b>	<b>117</b>	<b>111</b>	<b>25</b>	<b>253</b>

Of the 228 dairy farmers, the remaining 25 being landless, 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 land and the remaining about 7 per cent had more than 5 ha. of cultivated holding. Of these, 117 dairy farmers who had irrigated land, 50 per cent had upto one ha. of irrigated land, 32 per cent had between one and two ha. of irrigated land and the remaining had more than 2 ha. of irrigated land. The dairy enterprise of sample dairy farmers during the reference year including other milch animals showed that 92 per cent of them had excess of income over expenditure. The remaining 8 per cent who showed deficit, had either only cross-bred calves or their milch animals were not in milk for most of the period during the reference year.

As for cross-breeding, 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. Normally as reported by the A.H. Department, 3 to 4 A.I. are required per conception. Most of the dairy farmers had their cross-bred 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 seven dairy farmers had cross-bred bullocks used as draught cattle. Most of the others considered that cross-bred 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 cross-bred cows until their first calving after about 30 months came to £. 3,000 per calf. Of this, about 40 per cent was in cash.

As regards veterinary and other care of the cross-bred 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 cross-bred cows.

Of the total of 291 cross-bred cows, the dairy farmers had in November 1984, 209 cows were purchased. The average purchase price for Holstein and Jersey cross-bred cows at first calving was £. 4,265 and £. 3,300 respectively. About one-fourth each of the cows purchased were in their first to fourth calving. Of the total expenditure on purchases of cross-bred cows, one-third was met from own resources, 55 per cent from loans from the banks and the remaining from sales proceeds of cattle or short term borrowings. 35 cross-bred cows and 19 cross-bred calves were sold in 1984 at an average price of £.3,563 and £.1,826 respectively.

As regards the inter-calving period of Holstein cross-bred cows, it declined from the first to the third calving, from 13.3 months to 11.8 months in the case of irrigated dairy farmers and from 11.9 months to 11.2 months in the case of others. The decline was not as marked in the case of Jersey cross-bred cows perhaps because the number of such cows in our sample was small to come to any firm conclusion.

The average lactation length was between 9 to 10 months and the dry period about 2 to 3 months. The average lactation yield varied between 2,050 lts. to 2,350 lts. in the case of Holstein and between 1,475 lts. to 2,050 lts. in the case of Jersey cross-bred cows. The irrigated dairy farmers reported larger milk yield from cross-bred cows as compared to that reported by other dairy farmers. The average milk yield per day on the day prior to the Field Investigator's visit varied between 6 lts. to 8 lts. in the case of Holstein and between 5.5 lts. to 8 lts. in the case of Jersey cross-bred cows. The cow milk was sold at B. 2.80 to B. 3.00 per litre.

The dairy farmers received on an average about nine cart loads of dung in a year from the milch animals. About three-fourths of dung was used as manure by those who had some land to cultivate. Only about 10 per cent of total dung manure was sold. About half the dairy farmers used dung, on an average four cart loads for fuel. Only 10 out of 253 dairy farmers had Gobar Gas Plant and 8 more stated that they proposed to install one soon.

Except the nine dairy farmers who had no milch animals but only cross-bred calves, 112 irrigated dairy farmers and 132 other dairy farmers had cross-bred cows together with/without other milch animals. During the reference year, the average milk production received by a dairy farmer was 2,638 lts. in the case of the former and 2,450 lts. in the case of the latter. 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. The average value of milk production in the case of those who had only one cross-bred cow but no other milch animals was B. 5,581. It varied from B. 3,080

in the case of dairy farmers from village Umadi situated in a draught prone area and Rs. 7,039 in the case of village Nandre, situated in the milk-shed of Sangli district.

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, and concentrates including 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 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 surplus of Rs.1,952 and other dairy farmers Rs.2,186. After excluding the imputed value of family labour from the total expenditure, the average surplus stood enhanced to Rs.3,386 in the case of the former and Rs.3,478 in the case of the latter. The average surplus when worked out in the case of dairy farmers who had no other milch animals but only cross-bred cows was also found to be 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 that reported by other dairy farmers. Though we had obtained data from the Milk Cooperatives in respect of milk sold by the dairy farmers during the reference year, we had no authentic record of sale of milk to others. It is likely that the irrigated dairy farmers

cross-bred Holstein cow at Rs.4,300/- Jersey cross-bred 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. The reason for restricting upto this period was that majority of the cross-bred cows in our sample were in their first to fourth lactation. Secondly, the dairy farmers would have a cross-bred cow at its first calving from second generation by the end of the fourth lactation of the parent animal. Hence the dairy farmer may sell the parent animal and retain the cow of the second generation. Thirdly, the doubt in the mind of the dairy farmers as to whether A.I. will result in successful conception after the cross-bred cows had four calvings.

In our exercise we included the receipts from and expenditure on the female calves of the second and third generation also. The male calf born at the first calving was assumed dead and the male calf born at the fourth calving was assumed to have been sold soon after birth.

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, dung of the female calf of the third generation and also sale of male calf born of the fourth calving. At the end of the fourth lactation, we included in the receipts side resale value of the parent cow, the cow of the second generation and the female calf of the third generation.

On the expenditure side, we estimated expenditure for the reference period on the parent animal and the female calves born in the second and third generation on feed, fodder and concentrates (including farm produced

fodder), other expenditure and imputed value of family labour. We did not include interest on loan, depreciation on cattle shed, etc. or salary of servant assuming that the dairy enterprise can be managed by family labour. We also included the capital expenditure on purchase of cow on the expenditure side.

We found out the discounted value (present worth) of the total receipts and total expenditure at an interest rate of 11 per cent as the bank loans for purchase of milch animals are given at this rate of interest. 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 Holstein and Jersey cross-bred cows in respect of the irrigated dairy farmers. It was 1.5 for Holstein and about 1.2 for Jersey cross-bred 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 cross-bred 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 cross-bred cows profitably. The major constraint is green fodder but they seem to have made up the deficiency by giving cattle feed and concentrates. As the dairy farmers now breed cross-bred cows locally with A.I., rather than purchasing from Bangalore or other places, such cross-bred cows seem to be suitable to local climatic conditions and also sturdier. Our survey data shows that dairying with cross-bred cows seems to have been accepted by the dairy

farmers and that it can become viable even in the case of dry land farmers as also the landless provided, of course, fodder is available in adequate quantities. The A.I. work being done by the A.H. Department of the State Government, the BAIF and other agencies shows that cross-breeding of cows is now accepted in Western Maharashtra. However, as stated earlier in this Chapter, it is necessary for the State Government to take a policy decision in the matter of intensification of the cross-breeding programme in the light of the availability of the fodder supply and problem of marketing of cow milk.