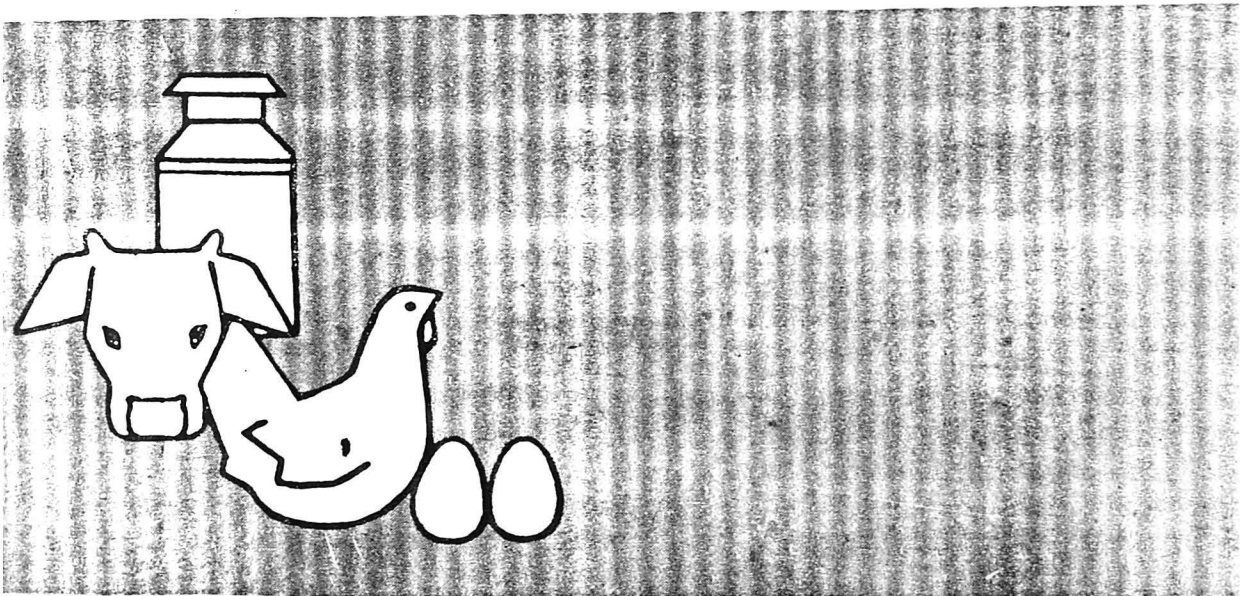




सत्यमेव जयते

GOVERNMENT OF MAHARASHTRA

REPORT ON
MILK, EGG, WOOL AND
MEAT PRODUCTION
AND
INVESTMENT AND POULTRY
KEEPING PRACTICES IN
MAHARASHTRA STATE
FOR THE YEAR 1988-89



DIRECTORATE OF ANIMAL HUSBANDRY
MAHARASHTRA STATE
PUNE-411 001.

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X REPORT ON X
X MILK, EGG, WOOL AND MEAT PRODUCTION X
X AND X
X LIVESTOCK AND POULTRY KEEPING PRACTICES X
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X MAHARASHTRA STATE X
X FOR THE YEAR 1988-89 X
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DIRECTORATE OF ANIMAL HUSBANDRY
MAHARASHTRA STATE
PU-E-411 001

P R E F A C E

The Department of Animal Husbandry, Maharashtra State, has launched an Integrated Sample Survey Scheme, since 1970-71, to study the annual status of the major Livestock products, and Livestock and Poultry Keeping Practices, followed in the State. So far, eighteen such annual surveys have been conducted in the state, in succession. The present report is based on the findings of the thirteenth annual survey in the series. The report contains information on Milk, Egg, Wool and Meat production estimates in the State, during 1988-89. It also contains information about feeding and management practices followed in livestock and poultry; utilisation pattern of livestock products, mortality rates of livestock and poultry, etc.

The success of this survey goes to the field staff as well as the office staff of the Integrated Survey Scheme. We are also grateful to the Indian Agricultural Statistics Research Institute, New Delhi, for providing the sampling technique for the survey.

It is hoped that the findings of the survey will be useful to the planners, administrators and for those interested in Animal Husbandry and Dairying. The results of the surveys are given at the beginning of the Report in the form of "RESULTS AT A GLANCE", for the sake of convenience.

Place : Pune - 411 001.

Dated : April 2, 1990.

V. P. RAJÉ,
Director of Animal Husbandry
Maharashtra State, Pune

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Some salient results at a glance from the survey on production of Milk, Egg, Wool and Meat and study of livestock and poultry keeping practices in Maharashtra State during the year 1988-89.

Sr.No.	Item	Unit	Figure
1	2	3	4

1. Size of Sample observed:-			
i)	Districts observed	No.	30
ii)	Villages observed	"	600
2. Characteristics of villages :			
i)	Having bovine	%	100.0
ii)	Having poultry	"	98.3
iii)	Having sheep	"	17.7
iv)	Having goats	"	95.8
v)	Average number of households per village	No.	187
3. Households rearing :-			
i)	Bovine	%	62.2
ii)	Poultry	"	32.2
iii)	Sheep	"	0.9
iv)	Goats	"	27.2
v)	No Livestock & Poultry	"	21.4
4. Availability of facility for Veterinary Aid :-			
i)	Within village	%	8.3
ii)	Upto 5 kms.	"	46.3
iii)	Average distance of Veterinary Aid	Kms.	3.0
II) MILK PRODUCTION AND BOVINE KEEPING PRACTICES :-			
1) Size of sample observed :-			
i)	Bovine keeper households	No.	10,411
ii)	Bovine observed for detailed Study	"	42,630
iii) In-milk animals for milk recording :-			
a)	Cows	No.	8,672
b)	Buffaloes	"	5,717

1	2	3	4
2. Estimated No. of in-milk animals :-			
1) Cows in-milk :-			
a) Deshi	:	Lakhs	20.70
b) Crossbred	:	-do-	1.99
c) Total	:	-do-	22.69
ii) Buffaloes in-milk	:	-do-	13.59
iii) Goats in-milk	:	-do-	24.99
3. Average daily milk yield per animal in-milk :-			
1) Cow :-			
a) Deshi	:	Kg. (Litre)	1.094 (1.064)
b) Crossbred	:	-do-	1.603 (5.839)
c) Overall	:	-do-	1.524 (1.482)
ii) Buffalo	:	-do-	2.765 (2.690)
iii) Goat	:	-do-	0.182 (0.177)
4. Estimated annual milk production :-			
1) Cow milk :-			
a) Deshi	:	Lakh kg.	3,264.32
	:	(Lakh Ltr.)	(8,038.70)
b) Crossbred:	:	-do-	4,359.93
	:		(4,240.90)
ii) Buffalo milk	:	-do-	13,715.18
	:		(13,340.76)
iii) Goat milk	:	-do-	1,662.45
	:		(1,617.07)
iv) Total	:	-do-	28,001.88
	:		(27,237.43)
5. Per capita per day availability of milk :-			
a) Cow + Buffalo	:	Gm.	101
b) Cow + Buffalo + Goat	:	Gm.	107
6. Feeding practices of Bovine:-			
i) Cattle kept on grazing alone	:	%	12.7
ii) Buffaloes kept on grazing alone	:	-"-	7.6

1	2	3	4
---	---	---	---

7. Average quantity of feed/fodder:
fed per day per animal (including animals kept on grazing alone, also) :-

a) <u>Cattle</u> :-	i) Green	: Kg.	2.571
	ii) Dry	: "	4.847
	iii) Concentrate	: "	0.166
b) <u>Buffaloes</u> :-	i) Green	: "	2.414
	ii) Dry	: "	4.154
	iii) Concentrate	: "	0.471

8. Average quantity of dung
collected in cattle shed per
bovine per day : " 3.129

9. Estimated annual quantity of
dung collected : '000' M.T. 24,583

10. Annual mortality in bovine :-

i) Cattle	: %	1.66
ii) Buffalo	: "	3.44

III) EGG PRODUCTION AND POULTRY
KEEPING PRACTICES :-

1. Size of sample observed :-

i) Total poultry keeper
households : No. 22,266

ii) Total poultry birds :-

a) Cocks	: "	11,386
b) Hens	: "	70,926
c) Cockerels	: "	14,233
d) Pullets	: "	18,440
e) Chicks	: "	53,187
f) Total	: "	1,68,172

2. Estimated number of layers :-

a) Deshi	: Lakhs	79.72
b) Improved	: "	34.34
c) Total	: "	114.06

3. Average No. of eggs laid per
layer per year :-

a) Deshi	: No.	115
b) Improved	: "	254

1	2	3	4
4.	<u>Estimated annual egg production :-</u>		
a)	Deshi	: Lakh	9,269.60
b)	Improved	: -do-	8,722.00
c)	Total	: -do-	17,991.60
5.	Per capita per annum availability of eggs	: No.	25
6.	<u>Average number of poultry birds per 100 poultry keepers :-</u>		
a)	Cocks	: No.	51
b)	Hens	: -do-	318
c)	Cockerels	: -do-	64
d)	Pullets	: -do-	83
e)	Chicks	: -do-	239
f)	Total	: -do-	755
7.	Average feed supplied per poultry bird per day:	Gm.	24
8.	Annual mortality in poultry	%	12.4
IV)	<u>WOOL PRODUCTION AND SHEEP REARING PRACTICES :-</u>		
1.	<u>Sample size observed for detailed study :-</u>		
a)	No. of flocks	: No.	168
b)	No. of Sheep	: -do-	6,163
2.	<u>Estimated No. of sheep :-</u>		
i)	Rams/Wethers	: Lakh	2.41
ii)	Ewes	: -do-	18.67
iii)	Lambs	: -do-	6.79
iv)	Total	: -do-	27.87
3.	<u>Estimated No. of sheep shorn :-</u>		
i)	Rams/Wethers	: -do-	2.35
ii)	Ewes	: -do-	18.35
iii)	Lambs	: -do-	3.84
iv)	Total	: -do-	24.54
4.	<u>Estimated annual wool yield per sheep shorn :-</u>		
i)	Rams/Wethers	: kg.	0.611

1	2	3	4
4. ii) Ewes	:	Kg.	0.605
iii) Lambs	:	-do-	0.348
iv) Overall	:	-do-	0.566
5. Estimated annual wool production	:	M.T.	1,388
6. Mortality in sheep	:	%	4.3
V) GOAT MILK PRODUCTION AND GOAT REARING PRACTICES :-			
1) Sample size observed :-			
i) Goat-keeper households	:	No.	12,419
ii) In-milk goats for milk production	:	-do-	17,400
2) Average daily milk yield per goat in-milk	:	Kg. (Lit.)	0.182 (0.177)
3) Goats in-milk to milch goats	:	%	47.6
4) Estimated No. of goats in-milk	:	Lakh (No.)	24.99
5) Estimated total goat milk production	:	Lakh kg.	4662.45
	:	Lakh (Lit.)	1637.07
6) Annual mortality of goats	:	%	4.7
VI) MEAT PRODUCTION :-			
1) Average meat production per animal :-			
i) Cattle	:	Kg.	121.025
ii) Buffalo	:	-do-	139.017
iii) Sheep	:	-do-	10.981
iv) Goat	:	-do-	10.456
v) Pig	:	-do-	20.540
2) Estimated No. of animals slaughtered :-			
i) Cattle	:	Lakh	4.26
ii) Buffaloes	:	-do-	2.35
iii) Sheep	:	-do-	17.13
iv) Goats	:	-do-	37.11
v) Pigs	:	-do-	2.51
3) Estimated annual meat production	:	000 MT.	147.051
4) Estimated No. of :-			
a) Hides	:	Lakh pieces	11.94
b) Skins	:	-do-	53.75

CHAPTER - I

1.1 INTRODUCTION

The present report is based on the nineteenth Annual Integrated Survey, conducted by the Department of Animal Husbandry, Maharashtra State, for estimation of annual product of major Livestock Products viz. Milk, Egg, Wool and Meat and study the livestock and poultry keeping practices followed during the year 1988-89.

The scheme was partially strengthened during 1984-85 and accordingly the data on production of milk and eggs were collected for groups of districts as per the revised plan, suggested by the Ministry of Agriculture, Animal Husbandry, Statistics Division, Government of India, New Delhi.

1.2 DESCRIPTION OF THE SURVEY :-

The survey has been conducted all over the State, during all the three seasons of the year. The State consists of 30 districts with 303 Tahsils, comprising 39,354 inhabited villages and 307 cities and town units as per 1981 human population census.

1.3 LIVESTOCK POPULATION :-

According to 1982 Livestock Census, the Maharashtra State had 309.19 lakh livestock. This constituted 201.34 lakh (65 %) bovines, 77.05 lakh (25 %) goats, 26.71 lakhs (9 %) Sheep, 3.01 lakh Pigs and remaining 1.08 lakhs were horses, donkeys and mules. The total poultry was 198.44 lakh.

1.3.1 VARIATION IN LIVESTOCK POPULATION :-

The following table gives the percentage variation of livestock and poultry population of 1982 census over that of 1978 census.

TABLE No. 1.

Comparison of livestock census figures

Sr.No.	Category	Population '000' As per		% Increase 82 over 78 Census
		1982 Census	1978 Census	
1	2	3	4	5
1.	Cattle	1,61,62	1,52,18	6.20
2.	Buffaloes	39,72	38,99	1.87
3.	Sheep	26,71	26,36	1.33
4.	Goats	77,05	75,63	1.88
5.	Pigs	3,01	2,26	33.19
6.	Other	1,08	1,00	8.00
7.	Total Livestock:	3,09,19	2,96,42	4.31
8.	Total Poultry:	1,98,44	1,87,51	5.83

It is seen from table No. 1, that there is an increase in all types of livestock as well as poultry over the previous census.

1.4 PERIOD OF FIELD WORK :

The data for the present survey was collected during all the three seasons of the year 1988-89 as shown below :-

1. Summer Season :- March, 1988 to June 1988.
2. Rainy Season :- July, 1988 to October, 1988.
3. Winter Season :- November 1988 to February 1989.

1.5 SAMPLING PLAN

A stratified multistage random sampling design has been adopted for the survey. The State was divided into 12 groups each consisting of about 1 to 4 districts, which have common geographical boundaries and topographical conditions. The groups of districts are treated as strata and are as follows

<u>Group No.</u>	<u>Name of the Districts</u>
1.	Dr. Bombay
2.	Thane, Raigad
3.	Ratnagiri, Sindhudurg

<u>Group No.</u>	<u>Name of the Districts</u>
4.	:- Nashik, Dhule, Jalgaon
5.	:- Ahmednagar, Pune
6.	:- Satara, Sangli, Kolhapur
7.	:- Solapur, Beed, Osmanabad, Latu
8.	:- Aurangabad, Jalna, Buldhana
9.	:- Parbhani, Nanded
10.	:- Akola, Amravati, Yavatmal
11.	:- Wardha, Nagpur, Bhandara
12.	:- Chandrapur, Gadchiroli

Out of the total villages/towns in the state, 15 percent villages/towns were selected randomly from the 11 groups of districts, (excluding Gr. Bombay) in proportion to livestock and poultry population in these groups according to 1982 Livestock census. These villages were equally divided into 3 seasons of the year. From these villages, 20 villages were selected randomly from each group of districts and 5 near villages were allotted to each survey assistant, for collecting data on Milk, Egg, Wool and Meat production and rearing practice of livestock and poultry.

The data on number of livestock and poultry was also collected from remaining 15 % of the villages from the concerned Block Development Officers of Zilla Parishads.

On the basis of data collected from 20 such village groupwise estimates for milk and egg were worked out for a season. The State estimates for a season were obtained by pooling the groupwise estimates. By adding 3 seasonal estimates the annual estimates for the State were worked out. The estimate number of productive animals was based on 15 % villages data received from Panchayat Samities in addition to 20 villages from each group of districts.

1.6 PROGRAMME OF FIELD WORK

For collection of data regarding production and rearing practices of livestock and poultry, one Survey Assistant was allotted 5 villages selected randomly afresh for each season.

from a group of districts. Such 4 Survey Assistants were working in each group. For Gr. Bombay district, one Survey Assistant was working and he collected the data about milk production and allied information by visiting about 20 stalls in a month, selected randomly. For remaining groups of districts, each Survey Assistant visited selected villages in 3 to 4 rounds and in a round he made 3 day's halt, for collection of data in each selected village. During the first round, he carried out house to house complete enumeration of livestock and poultry. After completion of enumeration, he collected data as per the norms given in Table No. 2.

TABLE NO. 2

Details of data collection

Sr.No.	Schedule No.	Type of information collected	No. of households observed per day
1	2	3	4
1.	B ₁	Milk production and bovine keeping practices	2
2.	B ₂	Utilisation of milk for non-bovine keeping households	1
3.	P ₁	Changes in poultry number	10
4.	P ₂	Egg production and poultry keeping practices	5
5.	P ₃	Egg production in non-poultry keeper households	2
6.	W ₁ , W ₂	Sheep rearing practices and wool production	3
7.	S ₁	Goat milk production and goat rearing practices	3
8.	T ₁	Meat production in households having livestock or poultry	10
9.	T ₂	Meat production in households having no livestock and poultry	2
10.	T ₃	Meat production and other by-products obtained through slaughter at District Place slaughter house	-

1.7 DETAILS OF DATA COLLECTED :-

In this report, tables on milk, egg, wool and meat production estimates alongwith keeping practices of livestock and poultry are presented.

Details of data collected are given as follows :-

1. Feeding practices of bovine and poultry.
2. Utilisation of milk and eggs
3. Utilisation of dung
4. Mortality in bovine, poultry, sheep and goats

1.8 STAFF

The following staff was sanctioned under the scheme during the year under report.

TABLE NO. 3

Sr.No.	Name of the post	Scale	No. of posts	No. of vacancies
1	2	3	4	5
1.	Assistant Director (MAHS Jr. Class-I)	2200-4000	1	-
2.	Livestock Development Officer (MAHS Class-II)	2000-3500	8	-
3.	Investigator	1640-2900	3	-
4.	Statistical Assistant	1200-2040	6	2
5.	Survey Assistant (Jr. Clerk Cadre)	950-1500	28	2
6.	Survey Assistant (Livestock Supervisor)	1200-1800	22	2
7.	Accountant	1200-2040	1	-
8.	Senior Clerk	1200-2040	2	-
9.	Junior Clerk	950-1500	1	-
10.	Peon	750-940	3	-
Total			75	6

The field data were collected by 15 Survey Assistants (1 Survey Assistant for Gr. Bombay and 4 each for remaining 11 groups of districts). Five Survey Assistants were kept as leave reserve. The Livestock Development Officer supervised the

CHAPTER IICHARACTERISTICS OF SAMPLE VILLAGES

2.1 During the year under report out of 660 selected villages, data of 600 villages were received on items such as land possessed, breeding, feeding and management practices followed and obtaining details regarding production and utilisation of milk, eggs, wool and meat.

The distribution of villages having various categories of livestock and poultry is presented in Table No. 4.

TABLE NO. 4.DISTRIBUTION OF VILLAGES HAVING LIVESTOCK / POULTRY

Sr.No.	Season	Percentage of villages having			
		Bovine	Poultry	Goats	Sheep
1	2	3	4	5	6
1.	Summer	100.0	97.1	95.1	17.1
2.	Rainy	100.0	99.0	95.4	14.9
3.	Winter	100.0	99.0	97.0	21.0
	Overall	100.0	98.3	95.8	17.7

It is seen from the table no. 4, that bovine were found in all the villages, while poultry and goats were found in 98.3 and 95.8 percent of villages respectively. Sheep were found in only 17.7 percent villages, because sheep population is mainly concentrated in Pune division of the State.

2.2 NUMBER OF HOUSEHOLDS PER VILLAGE

During the year, Livestock and poultry were enumerated by Survey Assistants from a total of 1,12,213 households in 600 selected villages. The seasonwise distribution of these villages, according to number of households found per village is given in Table No. 5.

field work of Survey Assistants by actually visiting the selected villages. The data so collected were scrutinised, compiled, tabulated, and analysed by Statistical Assistants and Investigators. The Assistant Director was the overall incharge of the scheme for field work as well as administrative work.

The Deputy Director of Animal Husbandry (Statistics), gave valuable guidance in the conduct of survey and finalisation of production estimates as well as report.

TABLE 5

DISTRIBUTION OF VILLAGES ACCORDING TO NUMBER OF HOUSEHOLDS

Sr.No.	Number of households	Percentage of villages			
		Summer	Rainy	Winter	Overall
1	2	3	4	5	6
1.	Upto 50	0.5	1.0	0.5	0.7
2.	51 to 100	6.3	7.2	3.0	5.5
3.	101 to 150	26.9	27.2	21.0	25.0
4.	151 to 200	31.7	26.1	31.5	29.8
5.	201 to 250	23.4	18.0	21.5	21.0
6.	251 to 300	6.3	13.8	12.5	10.8
7.	301 to 350	2.4	4.6	5.5	4.2
8.	351 to 400	2.0	2.1	4.0	2.7
9.	Above 400	0.5		0.5	0.3
Total		100.0(205)	100.0(195)	100.0(200)	100.0(600)
Average no. of households per village		179	187	196	187

(Note :- Figures in brackets indicate number of villages observed.)

It is seen from the above table, that about 6.2 % villages had upto 100 households, 54.8 % villages had in the range of 101 to 200 households, while 31.3 and 7.2 percent villages had from 201 to 300 and more than 300 households per village respectively. The overall average number of households per village was found to be 187.

2.3 HOUSEHOLDS REARING LIVESTOCK AND POULTRY

The total enumerated households were classified according to particular kind of livestock and poultry possessed and the same is given in Table No. 6.

TABLE - 6

DISTRIBUTION OF HOUSEHOLDS ACCORDING TO TYPE OF LIVESTOCK AND POULTRY REARED

Sr.No.	Particulars	Percentage of households rearing					
		Bovine	Poultry	Goats	Sheep	Livestock/Poultry in combination	No. Livestock / Poultry
1	2	3	4	5	6	7	8
1.	Households rearing only one type of Livestock or Poultry	26.8	6.6	6.0	0.1	-	-
2.	Total households rearing livestock or poultry in combination	62.3	32.2	27.2	0.9	39.1	21.4

From the total households observed, it was found that 62.3 percent households reared bovine, 32.2 percent reared poultry and 27.2 percent households reared goats, either alone or in combination with other type of livestock or poultry.

2.4 GENERAL FACILITIES FOR THE VILLAGES

Information regarding facilities for veterinary aid, distance from market for cattle feed, milk etc., was collected for the selected villages and is given in Table No. 7.

TABLE NO. 7

DISTRIBUTION OF VILLAGES ACCORDING TO AVAILABILITY OF VARIOUS FACILITIES AND THEIR DISTANCE

Sr.No.	Facility	Percentage of villages for which it is available at a distance of (Kms.)					Average distance (Kms.)
		0	0 to 3	3 to 5	5 to 10	above 10	
1	2	3	4	5	6	7	8
1.	Veterinary Aid	9.8	22.8	24.0	32.5	11.9	5.9
2.	Veterinary Dispensary	3.6	12.5	14.8	31.2	37.9	10.7
3.	Artificial Insemination	5.2	18.4	30.0	31.4	25.0	8.3
4.	Market for Cattle feed	3.5	12.1	13.0	30.3	41.1	10.4

	3	4	5	6	7	8
5. Market for milk and milk product	10.8	16.2	18.8	25.7	28.5	8.5
6. Market for cattle	0.4	6.0	12.5	30.5	50.6	13.0
7. Market for egg	3.5	10.2	15.1	35.2	36.0	9.9
8. Market for wool	0.5	10.2	11.7	35.7	41.9	14.2
9. Market for meat	0.8	8.8	19.3	39.4	31.7	9.2

It may be observed that veterinary aid or veterinary dispensary services were available in 8.8 percent villages in the villages itself and the average distance at which these facilities were available was 5.9 Kms. The artificial insemination facility was available in 5 percent villages in village itself and average distance at which this facility was available was 8.3 Kms. The cattle feed was available in village itself in the case of only 3.5 percent villages and average distance at which cattle was available was 10.4 Kms.

feed

2.5. AVERAGE NO. OF LIVESTOCK AND POULTRY REARED PER 100 HOUSEHOLDS

The details about the number of bovine, poultry, goats and sheep reared per 100 households is presented in Table No.8(A).

TABLE - 8(A)

AVERAGE NUMBER OF LIVESTOCK / POULTRY PER 100 HOUSEHOLDS

Sr.No.	Category	In-milk	Dry & not calved once	Adult males	Young-stock	Total
1	2	3	4	5	6	7
1.	Cattle	25	44	90	52	211
2.	Buffalo	16	19	3	18	56
3.	Poultry	-	-	-	-	235
4.	Sheep	-	-	-	-	28
5.	Goat	-	-	-	-	115

It is seen from the above table that average number of cattle reared per 100 households was 211, the buffalo class bovines 56, goats 115 and sheep 28. The same for Poultry was 235.

The livestock for households keeping particular class of animals is presented in Table No. 8(B).

TABLE - 8(B)

AVERAGE NUMBER OF LIVESTOCK PER 100 HOUSEHOLDS
KEEPING PARTICULAR KIND OF LIVESTOCK

Sr.No.	Category	In-milk	Dry + N.C.	Adult females	Adult males	Young stock	Total
1	2	3	4	5	6	7	8
1.	<u>Bovine</u>						
	a) Cattle	39	70	109	145	83	337
	b) Buffalo	25	30	55	5	29	119
2.	Goat	123	135	258	15	146	577
3.	Sheep	-	-	2,292	156	618	3,066

.. 17 ..

CHAPTER - III

3.1 MILK PRODUCTION AND BOVINE KEEPING PRACTICES

The estimates of milk production for 12 groups of districts including Gr. Bombay, during each season was obtained for indigenous cows and buffaloes separately. It was based on (1) estimates of average daily milk yield per animal in-milk (2) estimated number of animals in-milk and (3) Number of days in the season. The results are based on 8,672 cows and 5,717 buffaloes for milk recording during the year.

Attempts were also been made from 1985-86 to obtain the separate estimates of milk production in respect of crossbred cows also. However, it was not possible at this stage to obtain these estimates for each group of districts as was possible in respect of indigenous cows. This is due to the fact that the number of crossbred cows observed is not sizable. Hence, only State estimates are worked-out in case of crossbred cows.

3.2 ESTIMATED NUMBER OF IN-MILK AND MILCH ANIMALS

The 'Ratio' method of estimation was adopted to work out the estimated number of in-milk cows as well as buffaloes. The ratio was worked-out between the total number of in-milk animals enumerated and the corresponding number as per the 1982 census in all the selected villages in respective group of districts and in addition to that data received from Panchayat Samiti for remaining 15 percent villages was also used to obtain this ratio.

The estimates so obtained for different group of districts were pooled together to obtain the estimated number for a season. For state as a whole a similar procedure was adopted to obtain the estimated number of milch animals.

The estimated number of in-milk and milch animals so worked-out for different seasons and for groups of districts are presented in Table No. 9, 10, 11 and 12 respectively.

TABLE No. 9

Estimated number of in-milk and milch animals
for summer season

Sr.No.	Group of districts	Estimated number of animals (in lakhs)			
		In-milk		Milch	
		Indige- nous cows	Buffal- oes	Indige- nous cows	Buffal- oes
1	2	3	4	5	6
1.	Gr. Bombay	0.02	0.46	0.03	0.49
2.	Thane, Raigad	1.28	0.86	2.74	1.29
3.	Ratnagiri, Sindhudurg	0.81	0.36	1.84	0.62
4.	Nashik, Dhule, Jalgaon	2.74	1.61	6.36	2.88
5.	Ahmednagar, Pune	1.99	1.16	5.04	2.02
6.	Satara, Sangli, Kolhapur	1.26	3.84	2.58	5.79
7.	Solapur, Latur, Osmana- bad, Beed	2.68	1.69	5.19	2.90
8.	Aurangabad, Jalna, Buldhana	1.91	0.68	4.06	1.20
9.	Parbhani, Nanded	1.96	0.87	4.31	1.57
10.	Akola, Amravati, Yavatmal	2.54	1.01	6.41	1.92
11.	Wardha, Nagpur, Bhandara	2.00	0.64	5.49	1.19
12.	Gadchiroli, Chandrapur	1.42	0.26	3.35	0.57
State Total		20.61(4.81)	13.44(5.63)	47.40	22.38
Crossbred for the State		2.04		3.00	

Note :- Figures in brackets indicate percentage standard error

TABLE No. 10

Estimated number of in-milk and milch animals
for Rainy Season

Sr.No.	Group of Districts	Estimated number of animals (in lakhs)			
		In-milk		Milch	
		Indige- nous cows	Buffal- oes	Indige- nous cows	Buf- als
1	2	3	4	5	6
1.	Gr. Bombay	0.02	0.46	0.03	0.
2.	Thane, Raigad	1.29	0.86	2.72	1.

1	2	3	4	5	6
3. Ratnagiri, Sindhudurg	0.81	0.36	1.87	0.63	
4. Nashik, Dhule, Jalgaon	2.74	1.61	6.38	2.80	
5. Ahmednagar, Pune	1.99	1.15	5.04	2.00	
6. Satara, Sangli, Kolhapur	1.26	3.85	2.58	5.79	
7. Solapur, Latur, Osmanabad, Beed	2.68	1.69	5.20	2.92	
8. Aurangabad, Jalna, Buldhana	1.93	0.67	4.08	1.21	
9. Parbhani, Nanded	1.96	0.87	4.31	1.56	
10. Akola, Amravati, Yavatmal	2.53	1.00	6.44	1.97	
11. Wardha, Nagpur, Bhandara	1.99	0.64	5.47	1.17	
12. Gadchiroli, Chandrapur	1.42	0.26	3.38	0.51	
State Total	20.62	(5.25)	13.42	(5.12)	47.50 22.43
Crossbred cows for the State	1.87		3.02		

Note :- Figures in brackets indicate Percentage Standard Error.

TABLE NO. 11

Estimated number of in-milk and milch animals for the winter season

Sr.No.	Group of Districts	Estimated number of animals (in lakhs)			
		In-milk		Milch	
		Indige- nous cows	Buffa- loes	Indige- nous cows	Buffa- aloes
1	2	3	4	5	6
1. Gr. Bombay		0.02	0.46	0.03	0.49
2. Thane, Raigad		1.23	0.89	2.80	1.31
3. Ratnagiri, Sindhudurg		0.80	0.37	1.00	0.64
4. Nashik, Dhule, Jalgaon		2.74	1.72	6.43	3.02
5. Ahmednagar, Pune		2.09	1.23	4.98	2.02
6. Satara, Sangli, Kolhapur		1.28	3.96	2.64	5.94
7. Solapur, Latur, Osmanabad, Beed		2.73	1.73	5.26	2.96
8. Aurangabad, Jalna, Buldhana		1.96	0.69	4.10	1.25
9. Parbhani, Nanded		1.95	0.91	4.35	1.67

1	2	3	4	5	6
10. Akola, Amravati, Yavatmal	2.61	1.04	6.55	1.96	
11. Wardha, Nagpur, Bhandara	2.04	0.66	5.53	1.23	
12. Gadchiroli, Chandrapur	1.42	0.27	3.45	0.54	
State Total	20.87(4.56)	13.92(4.70)	48.02	23.03	
Crossbred cows for the State	2.05	-	3.02	23.03	

Note:- Figures in brackets indicate Percentage Standard Errors.

TABLE NO. 12

Estimated number of in-milk and milch animals for the year (Overall)

Sr.No.	Group of Districts	Estimated number of animals (in lakhs)				
		In-milk		Milch		
		Indige- nous cows	Buffa- loes	Indige- nous cows	Buff aloes	
1	2	3	4	5	6	
1.	Gr. Bombay	0.02	0.46	0.03	0.43	
2.	Thane, Raigad	1.27(4.5)	0.87(7.4)	2.76(7.4)	1.30(6.4)	
3.	Ratnagiri, Sindhudurg	0.81(2.5)	0.36(2.9)	1.87(3.9)	0.63(5.5)	
4.	Nashik, Dhule, Jalgaon	2.74(4.2)	1.65(8.6)	6.39(3.1)	2.93(6.4)	
5.	Ahmednagar, Pune	2.02(5.2)	1.18(12.4)	5.02(3.7)	2.01(6.4)	
6.	Satara, Sangli, Kolhapur	1.26(3.3)	3.88(7.5)	2.60(3.6)	5.84(7.1)	
7.	Solapur, Latur, Osmanabad, Beed	2.70(5.5)	1.70(7.6)	5.22(5.5)	2.53(6.4)	
8.	Aurangabad, Jalna, Buldhana	1.93(3.8)	0.68(7.9)	4.08(3.8)	1.22(6.4)	
9.	Parbhani, Nanded	1.96(3.7)	0.88(4.5)	4.32(4.1)	1.60(6.4)	
10.	Akola, Amravati, Yavatmal	2.56(6.2)	1.02(8.5)	6.47(5.4)	1.95(6.4)	
11.	Wardha, Nagpur, Bhandara	2.04(5.3)	0.65(10.2)	5.49(4.6)	1.20(6.4)	
12.	Gadchiroli, Chandrapur	1.42(5.2)	0.26(8.3)	3.39(4.0)	0.52(6.4)	
	State Total	20.70(4.9)	13.59(7.7)	47.64(4.4)	22.64(6.4)	
	Crossbred and exotic cows	1.99(54.3)	-	3.02(60.6)		

Note:- Figures in brackets indicate percentage increase over census figures of 1982.

The above table indicates that during the year 1983-89 as compared to 1982 census in the case of in-milk Indigenous cows, the percentage increase for State as a whole comes to 5 percent, the same for crossbred cows and buffaloes comes to 54.3 percent and 7.7 percent respectively. In the case of milch animals, the percentage increase for the state for indigenous cows, crossbred cows and buffaloes comes to 4.4, 60.6 and 7.7 percent respectively. The percentage increase in crossbred cows is note worthy and is a result of crossbreeding programme in the State. Due to crossbreeding programme percentage increase in indigenous cows is comparatively low.

3.3 AVERAGE DAILY MILK YIELD PER ANIMAL IN-MILK AND PER MILCH ANIMAL

The estimated average yield per cow in-milk and per milch animal in respect of cows and buffaloes for Summer, Rainy and Winter seasons are presented in Table - 13, 14 and 15 respectively.

TABLE NO. 13

Average daily milk yield per animal in-milk and per milch animal for summer season.

Group No.	Group of the Districts	Per day average milk yield (kg.)			
		Indigenous cows		Buffaloes	
		In-milk	Milch	In-milk	Milch
1	2	3	4	5	6
1.	Gr. Bombay	5.450	3.359	6.524	6.184
2.	Thane, Raigad	0.773	0.362	2.535	1.685
3.	Ratnagiri, Sindhudurg	0.657	0.288	1.524	0.879
4.	Nashik, Dhule, Jalgaon	1.251	0.539	3.132	1.748
5.	Ahmednagar, Pune	1.289	0.510	2.389	1.374
6.	Satara, Sangli, Kolhapur	1.103	0.537	2.133	1.415
7.	Solapur, Latur, Osmanabad, Beed	1.267	0.654	2.678	1.557
8.	Aurangabad, Jalna, Buldhana	1.107	0.522	2.886	1.624
9.	Parbhani, Nanded	1.111	0.506	1.968	1.094

1	2	3	4	5	6
10. Akola, Amravati, Yavatmal		0.949	0.377	2.286	1.204
11. Wardha, Nagpur, Bhandara		0.796	0.290	2.483	1.334
12. Gadchiroli, Chandrapur		0.430	0.187	1.292	0.663
State as a whole		1.034 (5.03)	0.450	2.543 (3.43)	1.527
For Crossbred and Exotic Cows		5.497	3.735		

Note :- Figures in brackets indicate Percentage Standard Errors.

TABLE NO. 14

Average daily milk yield per animal in-milk and per milch animal for Rainy Season

Group No.	Group of the Districts	Per day average milk yield (in kg.)			
		Indigenous cow		Buffalo	
		In-milk	Milch	In-milk	Milch
1	2	3	4	5	6
1. Gr. Bombay		5.200	3.536	6.233	5.870
2. Thane, Raigad		1.040	0.492	2.331	1.429
3. Ratnagiri, Sindhudurg		1.064	0.409	1.774	1.025
4. Nashik, Dhule, Jalgaon		1.393	0.598	2.799	1.553
5. Ahmednagar, Pune		1.432	0.566	2.768	1.586
6. Satara, Sangli, Kolhapur		1.183	0.576	2.417	1.606
7. Solapur, Iatur, Osmanabad, Beed		1.641	0.847	3.115	1.801
8. Aurangabad, Jalna, Buldhana		1.185	0.555	3.026	1.588
9. Parbhani, Nanded		1.289	0.587	2.027	1.134
10. Akola, Amravati, Yavatmal		0.934	0.367	2.417	1.332
11. Wardha, Nagpur, Bhandara		0.740	0.270	3.060	1.687
12. Gadchiroli, Chandrapur		0.415	0.175	1.608	0.820
State as a whole		1.169 (3.83)	0.508	2.710 (4.88)	1.621
For Crossbred and Exotic cow		6.956	4.302		

Note :- Figures in brackets indicate Percentage Standard Errors.

TABLE NO. 15

Average daily milk yield per animal in-milk and per milch animal for winter season

Group No.	Group of the Districts	Per day average milk yield (in kg.)			
		Indigenous cows		Buffaloes	
		In-milk	Milch	In-milk	Milch
1	2	3	4	5	6
1.	Gr. Bombay	5.398	3.617	6.490	6.093
2.	Thane, Raigad	0.858	0.377	3.287	2.231
3.	Ratnagiri, Sindhudurg	0.928	0.391	1.720	0.994
4.	Nashik, Dhule, Jalgaon	1.172	0.499	3.306	1.883
5.	Ahmednagar, Pune	1.334	0.560	2.693	1.626
6.	Satara, Sangli, Kolhapur	1.291	0.626	2.790	1.860
7.	Solapur, Latur, Osmanabad, Beed	1.597	0.829	3.433	2.006
8.	Aurangabad, Jalna, Buldhana	1.191	0.569	3.053	1.685
9.	Parbhani, Nanded	1.383	0.620	2.069	1.127
10.	Akola, Amravati, Yavatmal	0.698	0.278	2.890	1.533
11.	Wardha, Nagpur, Bhandara	0.615	0.227	3.268	1.754
12.	Gadchiroli, Chandrapur	0.347	0.143	2.139	1.069
State as a whole		1.078(2.58)	0.469	3.036(4.15)	1.835
Crossbred and Exotic cow		5.669	3.848	-	-

Note :- Figures in brackets indicate Percentage Standard Errors.

TABLE NO. 16

Average daily milk yield per animal in-milk and per milch animal (overall)

Group No.	Group of the Districts	Per day average milk yield (in kg.)			
		Indigenous cow		Buffalo	
		In-milk	Milch	In-milk	Milch
1	2	3	4	5	6
1.	Gr. Bombay	4.945	3.297	6.477	6.080
2.	Thane, Raigad	0.889	0.409	2.715	1.817
3.	Ratnagiri, Sindhudurg	0.879	0.381	1.687	0.964
4.	Nashik, Dhule, Jalgaon	1.272	0.546	3.068	1.728

1	2	3	4	5	6
5.	Ahmednagar, Pune	1.354	0.545	2.607	1.530
6.	Satara, Sangli, Kolhapur	1.195	0.579	2.449	1.627
7.	Solapur, Latur, Osmanabad, Beed	1.500	0.776	3.032	1.788
8.	Aurangabad, Jalna, Buldhana	1.163	0.550	2.993	1.668
9.	Parbhani, Nanded	1.260	0.571	2.036	1.120
10.	Akola, Amravati, Yavatmal	0.861	0.341	2.523	1.320
11.	Wardha, Nagpur, Bhandara	0.717	0.262	2.931	1.588
12.	Gadchiroli, Chandrapur	0.398	0.167	1.698	0.849

State as a whole		1.094 (2.27)	0.475	2.765 (2.42)	1.662
Crossbred and Exotic cow		6.003	3.955	-	-

It is seen from the table no. 16, that the overall average milk yield per day/Indigenous cow in-milk was 1.094 kg. and that for exotic/crossbred cow in-milk was 6.003 kg. In case of buffalo the same was 2.765 kg.

The average milk yield per animal in-milk and per milch animal for Gr. Bombay indicates abnormally less difference mainly because rearing of dry animals is costly in Bombay.

3.4 MILK PRODUCTION

The estimates of milk production for each group of districts for the three seasons and also for the entire year have been worked out for cows and buffaloes separately and are shown in Table Nos. 17, 18, 19 and 20.

TABLE NO. 17

Estimated milk production for summer season

Group No.	Group of the Districts	Milk production (in '000 MT)	
		Indigenous cow milk	Buffalo milk
1	2	3	4
1.	Gr. Bombay	1.229	366.968
2.	Thane, Raigad	12.093	26.526

1	2	3	4
3. Ratnagiri, Sindhudurg		6.455	6.645
4. Nashik, Dhule, Jalgaon		41.802	61.410
5. Ahmednagar, Pune		31.330	33.860
6. Satara, Sangli, Kolhapur		16.905	99.968
7. Solapur, Latur, Osmanabad, Beed		41.414	55.092
8. Aurangabad, Jalna, Buldhana		25.840	23.774
9. Parbhani, Nanded		26.591	20.959
10. Akola, Amravati, Yavatmal		29.468	28.192
11. Wardha, Nagpur, Bhandara		19.403	19.366
12. Gadchiroli, Chandrapur		7.443	4.125
State total		259.973 (6.02)	416.836 (6.67)
For Crossbred and Exotic cow		136.695	-

Note :- Figures in brackets indicate Percentage Standard Errors.

TABLE NO. 12

Estimated milk production for Rainy Season

Group No.	Group of the Districts	Milk production (in '000' ME)	
		Indigenous Cows	Buffaloes
1	2	3	4
1. Gr. Bombay		1.183	35.608
2. Thane, Raigad		16.468	24.439
3. Ratnagiri, Sindhudurg		10.645	7.886
4. Nashik, Dhule, Jalgaon		46.042	55.262
5. Ahmednagar, Pune		35.091	39.116
6. Satara, Sangli, Kolhapur		18.285	114.400
7. Solapur, Latur, Osmanabad, Beed		54.119	64.710
8. Aurangabad, Jalna, Buldhana		23.072	25.026
9. Parbhani, Nanded		31.111	21.771
10. Akola, Amravati, Yavatmal		29.056	29.815

1	2	3	4
11. Wardha, Nagpur, Bhandara		18.143	24.229
12. Gadchiroli, Chandrapur		7.257	5.144
State Total		296.372 (5.58)	447.456 (5.64)
Crossbred cows		159.796	-

Note :- Figures in brackets indicate Percentage Standard Errors

TABLE NO. 19

Estimated Milk Production for Winter Season

Group No.	Group of the Districts	Milk Production (in '000 MT)	
		Indigenous cows	Buffaloes
1	2	3	4
1.	Gr. Bombay	1,198	36.172
2.	Thane, Raigad	12,670	35.183
3.	Ratnagiri, Sindhudurg	8,894	7.636
4.	Nashik, Dhule, Jalgaon	38,491	68,098
5.	Ahmednagar, Pune	33,413	39,292
6.	Satara, Sangli, Kolhapur	19,782	132,457
7.	Solapur, Latur, Osmanabad, Beed	52,319	71,459
8.	Aurangabad, Jalna, Buldhana	28,046	25,487
9.	Parbhani, Nanded	32,411	22,670
10.	Akola, Amravati, Yavatmal	21,900	35,940
11.	Wardha, Nagpur, Bhandara	15,028	25,941
12.	Gadchiroli, Chandrapur	5,935	6,842
State Total		270,087 (5.21)	507,177 (4.1)
Crossbred and Exotic Cows		139,502	-

Note :- Figures in brackets indicate Percentage Standard Error

TABLE NO. 20

Estimated milk production for the year (overall)

Group No.	Group of the Districts	Milk production (in '000' MT)		
		Indigenous cows	Buffaloes	Total
1	2	3	4	5
1.	Gr. Bombay	3.610	108.748	112.358
2.	Thane, Raigad	41.231	86.198	127.429
3.	Ratnagiri, Sindhudurg	25.994	22.167	48.161
4.	Nashik, Dhule, Jalgaon	127.235	184.770	312.005
5.	Ahmednagar, Pune	99.834	112.268	212.102
6.	Satara, Sangli, Kolhapur	54.972	346.825	401.797
7.	Solapur, Latur, Osmanabad, Beed	147.852	191.261	339.113
8.	Aurangabad, Jalna, Buldhana	81.958	74.287	156.245
9.	Parbhani, Nanded	90.113	65.400	155.513
10.	Akola, Amravati, Yavatmal	80.424	93.946	174.370
11.	Wardha, Nagpur, Bhandara	52.574	69.535	122.110
12.	Gadchiroli, Chandrapur	20.635	16.112	36.747
State total		826.432 (3.30)	1371.518 (3.28)	2197.950
Crossbred and exotic cows		435.993	-	435.993
Overall for Deshi + Crossbred cows		1262.425	-	-
Overall for Cows + Buffaloes		-	-	2633.943

Note :- Figures in brackets indicate Percentage Standard Errors

It is seen from the table no. 20 that the total milk production from bovines for the state, during the year, was estimated as 2633.943 thousand tonnes. Of this, the contribution from cows was about 48 percent, remaining 52 percent was from buffalo class. Per capita availability of bovine milk during the year was found to be 101 Gms., based on the projected human population for the year under reference.

3.4.i To study the seasonal variation of average milk yield and total milk production, the district groupwise average milk yield and total milk production during Summer, Rainy and Winter seasons is given in the table number 21 for indigenous cows. As the district group averages are not worked out for crossbred cows, the State figures are given.

TABLE NO. 21

Table showing average per day per animal milk yield for indigenous cows in-milk and total milk production during Summer, Rainy and Winter seasons of the year 1988-89 (Milk yield in kg. Milk production in '000' MT)

Group No.	Group of the Districts	Summer		Rainy		Winter	
		Average milk production	Total milk production	Average milk production	Total milk production	Average milk production	Total milk production
1	2	3	4	5	6	7	8
1.	Gr. Bombay	5.450	1.229	5.200	1.183	5.398	1.198
2.	Thane, Raigad	0.773	12.093	1.040	16.458	0.858	12.670
3.	Ratnagiri, Sindhudurg	0.657	6.455	1.064	10.645	0.928	8.894
4.	Nashik, Dhule, Jalgaon	1.251	41.802	1.393	46.942	1.172	38.491
5.	Ahmednagar, Pune	1.289	31.330	1.432	35.091	1.334	33.413
6.	Satara, Sangli, Kolhapur	1.108	16.905	1.183	18.285	1.291	19.782
7.	Solapur, Latur, Beed, Osmanabad	1.267	41.414	1.641	54.119	1.597	52.319
8.	Aurangabad, Jalna, Buldhana	1.107	25.840	1.185	28.072	1.191	28.046
9.	Parbhani, Nanded	1.111	26.591	1.289	31.111	1.383	32.411
10.	Akola, Amravati, Yavatmal	0.949	29.468	0.934	29.056	0.698	21.900
11.	Wardha, Nagpur, Bhandara	0.776	19.403	0.740	18.143	0.615	15.028
12.	Gadchiroli, Chandrapur	0.430	7.443	0.415	7.257	0.347	5.935
State Total		1.034	259.973	1.169	296.372	1.078	270.087
Exotic and Cross-bred cows		5.497	136.695	6.956	159.796	5.669	139.502

The table indicates that in the case of cows the seasonal variation is not note worthy though in the case of State as a whole the average milk yield and total milk production is minimum in summer season and maximum in rainy season. In the district groups Thane/Raigad and Ratnagiri/Sindhudurg the average and total milk production during summer season is considerably low as in these districts the fodder and water scarcity exists in majority of villages during summer season. In the case of crossbred cows there is seasonal variation, the average milk yield and total milk production being minimum during summer season.

3.4.2 The data to study the seasonal variation in milk yield and milk production in respect of buffaloes is given in the table no. 22.

TABLE NO. 22

Table showing average per day per animal milk yield for buffaloes in-milk and total milk production during summer, rainy and winter seasons of the year 1988-89 (average milk yield in kg. milk production in '000' MT)

Group No.	Group of the Districts	Summer		Rainy		Winter	
		Daily average milk yield/ Buffaloes in-milk	Total milk production	Daily average milk yield/ Buffaloes in-milk	Total milk production	Daily average milk yield/ Buffaloes in-milk	Total milk production
1	2	3	4	5	6	7	8
1.	Gr. Bombay	6.524	36.968	6.233	35.608	6.490	36.172
2.	Thane, Raigad	2.535	26.526	2.331	24.489	3.287	35.183
3.	Ratnagiri, Sindhudurg	1.524	6.645	1.774	7.886	1.720	7.636
4.	Nashik, Dhule, Jalgaon	3.132	61.410	2.799	55.262	3.306	68.098
5.	Ahmednagar, Pune	2.388	33.860	2.768	39.116	2.693	39.292
6.	Satara, Sangli, Kolhapur	2.133	99.968	2.417	114.400	2.790	132.457
7.	Solapur, Latur, Osmanabad, Beed	2.678	55.092	3.115	64.710	3.433	71.459

1	2	3	4	5	6	7	8
8. Aurangabad, Jalna, Buldhana	2.886	23.774	3.026	25.026	3.053	25.487	
9. Parbhani, Nanded	1.968	20.959	2.027	21.771	2.069	22.670	
10. Akola, Amravati, Yavatmal	2.286	28.192	2.417	29.815	2.890	35.940	
11. Wardha, Nagpur, Phandara	2.483	19.366	3.068	24.229	3.268	25.941	
12. Gadchiroli, Chandrapur	1.292	4.126	1.608	5.144	2.139	6.842	
State total/ Overall	2.543	416.886	2.710	447.456	3.036	507.177	

The above table indicates that in the case of buffalo class the minimum daily average milk yield and total milk production is observed in Summer season and the same is increased by 6.6; 7.3 and 19.4 percent and 21.7 percent during the rainy and winter season respectively. The Gr. Bombay results, however, indicate the minimum average milk yield and production in rainy season.

3.4.3 The data about the average per day milk yield and total milk production for the years 1986-87, 1987-88 and 1988-89 for cattle and buffalo class is given in Table No. 23. The average milk yield per day and total milk production for cross-bred cows is being worked out since 1985-86.

It is observed from the table that the total milk production during 1986-87, 1987-88 and 1988-89 for cattle class was 1,054, 1,148 and 1,262 thousand M.T. respectively. The increase in milk production was mainly due to good rainy season in the State during 1988-89. The buffalo milk production is also increased by 1.8 percent as compared to 1987-88.

TABLE NO. 23

Statement showing comparative data about average milk yield per day, per animal and total milk production for the year 1986-87, 1987-88 and 1988-89

Group No.	Group of Districts	1986-87		1987-88			
		Other than C.B. cows	Buffalo	Other than C.B. cows	Buffalo		
		Average milk yield per day per animal in milk (kg.)	Total milk production (000 M.T.)	Average milk yield per day per animal in milk (kg.)	Total milk production (000 M.T.)		
1	2	3	4	5	6	7	8
1.	Gr. Bombay	4.943	3.336	6.144	104.154	5.679	3.844
2.	Thane, Raigad	0.696	31.743	2.665	85.201	0.928	42.064
3.	Ratnagiri, Sindhudurg	0.554	16.266	1.105	44.805	0.641	19.080
4.	Nashik, Dhule, Jalgaon	1.200	119.534	2.561	152.605	1.221	122.943
5.	Ahmednagar, Pune	1.127	82.049	2.527	108.989	1.135	86.893
6.	Satara, Sangli, Kolhapur	1.146	53.460	2.640	367.299	1.152	53.300
7.	Solapur, Latur, Osmanabad, Beed	1.229	116.924	2.283	140.697	1.440	139.729
8.	Aurangabad, Jalna, Buldhana	1.004	70.156	2.476	62.827	1.010	70.887
9.	Parbhani, Nanded	1.034	73.030	1.634	53.446	1.177	83.805
10.	Akola, Amravati, Yavatmal	0.917	35.450	2.395	87.018	0.777	72.314
11.	Wardha, Nagpur, Bhandara	0.682	49.624	2.655	61.631	0.716	52.261
12.	Gadchiroli, Chandrapur	0.461	23.494	1.800	17.346	0.404	20.629
State Total		0.970	725.060	2.548	1255.715	1.021	767.773
Exotic and Cross-bred cows		5.010	329.238			5.318	380.29

Table No. 23 contd.

Group No.	Group of Districts	1987-88		1988-89		Buffalo	
		Average milk yield per animal in-milk (kg.)	Total milk production (000 MT)	Average milk yield per animal in-milk (kg.)	Total milk production (000 MT)	Average milk yield per animal in-milk (kg.)	Total milk production (000 MT)
1.	Gr. Bombay	6.619	112.516	4.945	3.610	6.477	108.748
2.	Thane, Raigad	2.562	82.352	0.889	41.231	2.715	86.198
3.	Ratnagiri, Sindhudurg	1.283	17.115	0.879	25.994	1.689	22.167
4.	Nashik, Dhule, Jalgaon	2.755	165.869	1.272	127.235	3.068	184.770
5.	Ahmednagar, Pune	2.553	109.486	1.354	99.834	2.607	112.268
6.	Satara, Sangli, Kolhapur	2.567	360.846	1.195	54.972	2.449	346.825
7.	Solapur, Latur, Osmanabad, Beed	2.978	183.943	1.500	147.852	3.082	191.261
8.	Aurangabad, Jalna, Buldhana	2.773	70.039	1.163	81.958	2.993	74.287
9.	Parbhani, Nanded	1.887	61.376	1.260	90.113	2.036	65.400
10.	Akola, Amravati, Yavatmal	2.613	96.298	0.861	80.424	2.523	93.946
11.	Wardha, Nagpur, Bhandara	3.002	70.141	0.717	52.574	2.931	69.536
12.	Gadchiroli, Chandrapur	1.809	17.158	0.398	20.635	1.698	16.112
State Total		2.719	1347.139	1.094	826.432	2.765	1371.518
Exotic and Crossbred cows		-	-	6.003	435.993	-	-

3.5 AVAILABILITY OF MILK IN BOVINE KEEPER HOUSEHOLDS

The information regarding availability of milk was collected for the previous day of visit from 10,411 bovine keeper households. The details about production and purchase of milk are given in table No. 24 for cow milk and buffalo milk separately.

TABLE NO. 24

Availability of milk in bovine keeper households

Category	Producing milk		Purchasing milk		Total milk produced + purchased.	
	% of house-holds	Average quantity of milk per house-hold (kg.)	% of house-holds	Average quantity of milk per house-hold (kg.)	% of house-holds	Average quantity of milk per house-hold (kg.)
1	2	3	4	5	6	7
a) Only cow milk	65.5	2.183	49.6	0.302	64.4	1.787
b) Only buff. milk	28.7	3.645	50.4	0.291	34.3	2.360
c) Both cow & buff. milk	5.8	2.312	-	-	4.3	2.312
		3.235				3.235
Total cow milk	100.0	2.193	100.0	0.302	100.0	1.821
buff. milk		3.570		0.291		2.457
Overall availability per day, cow milk		0.988		0.035		1.023
buff. milk		0.905		0.024		0.929
Total		1.893		0.059		1.952

It was observed that on an average a bovine keeper household produced 988 Gms. of cow milk and 905 gms. of buffalo milk, whereas the quantity purchased was 35 gms. of cow milk and 24 gms. of buffalo milk. The producer households are classified as 65 percent households producing cow milk, about 29 percent producing buffalo milk while 6 percent households producing cow milk as well as buffalo milk.

3.6 UTILISATION OF MILK

The information about utilisation of milk on the previous day of the visit in the bovine keeper (milk producer) households is presented in table no. 25.

TABLE No. 25

Utilisation of milk in bovine keeper households

Category	Percentage of milk					
	Consumed as fluid milk	Sold as fluid milk	Converted to milk products	Spilled	Balance	
1	2	3	4	5	6	
Only cow milk	44.3	51.4	3.1	0.2	1.0	
Only buff. milk	27.6	68.5	2.5	NA	1.3	
Both	Cow milk	38.0	58.7	2.3	-	1.0
	Buff. milk	29.9	67.0	2.0	NA	1.1
Overall	Cow milk	43.8	52.1	3.0	0.1	1.0
	Buff. milk	27.9	68.5	2.5	NA	1.3

The households producing only cow milk, consumed 44 percent milk and sold 51 percent milk, whereas those producing only buffalo milk consumed 28 percent and sold 68 percent of the milk. On an average 44 percent of cow milk was utilised at home and 52 percent was sold out. The same was 28 percent and 68 percent in respect of buffalo milk.

3.7 DISTRIBUTION OF IN-MILK ANIMALS ACCORDING TO DAILY MILK YIELD IN DIFFERENT RANGES

The animals observed for milk production were classified according to different ranges and are presented in Table No.26.

TABLE No. 26

Percentage distribution of in-milk animals according to daily yield

Sr.No.	Category	Season	Daily milk yield (Gms.)							Total
			0 to 500	501 to 1000	1001 to 2000	2001 to 3000	3001 to 5000	Above 5000		
1	2	3	4	5	6	7	8	9	10	11
1) Cows	Summer		2.5	16.2	40.9	28.3	5.1	3.7	3.3	100.0
	Rainy		2.8	13.8	31.3	32.3	6.5	5.0	8.3	100.0
	Winter		3.6	12.1	40.5	21.0	9.6	6.3	6.9	100.0
Overall			2.9	14.1	37.8	27.3	7.0	4.9	6.0	100.0

Table No. 26 contd.

1	2	3	4	5	6	7	8	9	10	11
2. Buffaloes	Summer		0.1	1.3	8.6	28.3	32.6	24.6	4.5	100.0
	Rainy		0.2	1.6	14.3	16.7	29.3	33.3	12.0	100.0
	Winter		0.2	1.3	7.0	24.9	30.3	24.3	12.0	100.0
Overall			0.2	1.4	9.9	23.8	30.8	27.3	6.6	100.0

It is observed that about 55 percent cows have yield upto 1000 Gms. while 89 percent buffaloes were producing milk above 1000 Gms.

3.8 UTILISATION OF MILK IN NON-BOVINE KEEPER HOUSEHOLDS

Data regarding utilisation of milk were collected from 4,108 non-bovine keeper households. Of these households, 18.8 percent households were found to be not utilising milk at all.

It was observed that on an average, the non-bovine keeper household purchased 270 Gms. of cow milk and 255 Gms. of buffalo milk.

3.9 FEEDING PRACTICES

Data of feed and fodder fed to the animals were collected from the selected households having bovines. The data were collected for the following types of animals (bovines) (i) in-milk (ii) dry and not calved even once (iii) adult males (iv) Youngstock upto 3 years. The type of feed and fodder fed were green fodder, dry fodder and concentrates.

During the year under report, data were collected from households having 32,646 cattle and 9,984 buffaloes. While collecting the data on feeding, information on whether the animals were only grazed, only stalled or both, was also collected. The seasonwise details about the number of animals observed for feeding practices are given in table No. 27.

TABLE No. 27

Number of animals observed for feeding practices

Category of animals	Cattle			Buffaloes			Total	
	Summer	Rainy	Winter	Summer	Rainy	Winter		
1	2	3	4	5	6	7	8	9
Milk	2770	2303	2028	7101	1435	2273	1193	4901
Day + Not cared eve ⁿ o ⁿ ce.	2296	1928	1585	5809	824	604	513	1941
Adult males	4760	3852	3905	12517	285	171	165	621
You ⁿ gstock upto 3 years	2654	2424	2141	7219	990	709	822	2521
Total	12480	10507	9659	32646	3534	3757	2693	9984

3.10 DISTRIBUTION OF ANIMALS ACCORDING TO FEEDING PRACTICES

The details about the feeding practices of the bovine are given in table no. 28.

It was observed that about 13 percent cattle were only grazed while 15 percent animals were stalled only. In respect of buffaloes about 8 percent animals were grazed only, and 19 percent were stalled only. The percentage of only stalled animals was more in youngstock category of both cattle and buffalo class.

TABLE NO. 28.

Percentage distribution of animals according to general feeding practices followed, as only grazed (G), only stalled (S) or both (G + S)

Category of animals	Summer			Rainy		
	G	S	G + S	G	S	G + S
1	2	3	4	5	6	7
CAMELE						
1. In-milk	2.9	15.6	81.5	3.8	9.7	86.5
2. Dry + N.C.	12.0	10.2	77.8	27.8	9.2	63.0
3. Adult males	7.9	20.7	71.4	14.7	7.3	78.0
4. Youngstock upto 3 years	13.3	32.3	54.4	20.8	27.9	51.3
Overall	8.7	20.1	71.2	16.1	12.8	71.1
BUFFALOES						
1. In-milk	0.7	17.3	82.0	2.1	2.6	95.3
2. Dry + N.C.	11.7	7.5	80.8	17.2	8.7	74.1
3. Adult males	29.8	4.6	65.6	10.1	14.6	75.3
4. Youngstock upto 3 years	13.6	24.3	62.1	21.5	21.1	57.4
Overall	9.2	15.9	74.9	11.1	9.5	79.4
Category of animals	Winter			Overall		
	G	S	G + S	G	S	G + S
1	8	9	10	11	12	13
CAMELE						
1. In-milk	1.5	9.6	88.9	2.8	12.0	85.2
2. Dry + N.C.	31.7	5.0	63.3	22.6	8.4	69.0
3. Adult males	9.4	8.7	81.9	10.5	12.8	76.7
4. Youngstock upto 3 years	22.7	16.9	60.4	18.4	26.0	55.6
Overall	14.3	10.1	75.6	12.7	14.8	72.5

Table no. 28 contd.

	8	9	10	11	12	13
BUFFALOES						
1. In-milk	0.2	4.4	95.4	0.7	6.2	93.1
2. Dry + N.C.	14.8	1.0	84.2	14.4	5.0	80.6
3. Adult males	7.9	-	92.1	18.7	6.3	75.0
4. Youngstock upto 3 years	7.3	16.8	75.9	12.9	20.1	67.0
Overall	5.6	7.3	87.1	7.6	9.5	82.9

G = Only grazed, S = Only stallfed, G + S = Grazed and stallfed.

3.11 AVERAGE QUANTITY OF FEED / FODDER FED PER DAY

The data was collected about the feed / fodder supplied to various categories of bovine in the selected bovine keeper households. The seasonwise details of average quantity of feed / fodder fed per animal per day are presented in table no. 29. These averages are based on all the animals observed, including those kept on grazing alone, also.

TABLE NO. 29

Seasonwise average quantity of feed / fodder fed per bovine per day

Season	Type of feed	Average feed fed per day per animal (kg.)								
		Cattle				Buffalo				
		In-milk	Dry + N.C.	Adult males	Young stock	In-milk	Dry + N.C.	Adult males	Young stock	
1	2	3	4	5	6	7	8	9	10	
SUMMER										
Green		0.765	0.255	0.258	0.221	1.485	0.669	0.168	0.500	
Dry		7.842	5.695	8.129	3.055	9.862	7.511	5.854	3.000	
Concentrates		0.415	0.029	0.074	0.015	1.101	0.139	0.238	0.035	
RAINY										
Green		6.958	3.492	6.205	2.388	9.778	5.984	4.365	0.620	
Dry		1.094	1.009	1.365	0.383	1.299	1.048	1.107	0.420	
Concentrates		0.472	0.116	0.067	0.050	0.886	0.188	0.096	NA	

Table No. 29 contd.

1	2	3	4	5	6	7	8	9	10
<u>WINTER</u>									
Green	2.832	1.548	1.638	0.849	2.930	2.251	0.285	0.987	
Dry	6.605	3.136	5.954	1.989	7.333	4.121	4.697	2.072	
Concentrates	0.523	0.058	0.071	0.030	1.448	0.031	0.067	0.018	
<u>OVERALL</u>									
Green	3.364	1.682	2.523	1.111	3.384	1.408	1.404	1.417	
Dry	5.300	3.441	5.370	1.838	5.085	4.617	4.252	1.958	
Concentrates	0.460	0.055	0.068	0.031	0.884	0.128	0.154	0.020	

(N = Negligible)

It is seen from the table that in the case of cattle class maximum quantity of dry fodder is fed to adult males, whereas more quantity of concentrates is fed to in-milk cows. In buffalo class, the highest quantity of feed / fodder is fed to the in-milk buffaloes as compared to any other category.

3.12 DISTRIBUTION OF BOVINE FED WITH DIFFERENT TYPES OF FEED AND FODDER EITHER ALONE OR IN COMBINATION

The different categories of bovines are classified according to type of fodder fed and average quantity fed per day per animal and this data are presented in table no. 30. Here, those animals which received some feeding at home are only considered and the averages are based on all the three seasons together.

TABLE NO. 30

Distribution of bovine fed with different types of feed and fodder either alone or in combination and average quantity fed per animal per day

Type of fodder fed	Average quantity fed per animal per day (kg.)					Overall
	In-milk N.C.	Dry + N.C.	Adult males	Young stock		
1	2	3	4	5	6	
A) CAMELS						
i) Green	8.186 (42.3)	6.267 (34.7)	8.082 (34.9)	3.605 (37.8)	6.905 (37.2)	
ii) Dry	7.682 (70.9)	6.526 (68.2)	8.092 (74.1)	3.358 (67.1)	6.830 (71.0)	
iii) Concentrates	1.723 (27.4)	2.032 (4.2)	1.155 (6.6)	1.345 (2.8)	1.584 (10.5)	
B) BUFFALOES						
i) Green	6.499 (52.5)	4.139 (39.7)	6.656 (25.9)	4.465 (36.4)	5.729 (44.8)	
ii) Dry	7.075 (56.4)	7.827 (68.9)	6.771 (77.2)	3.148 (71.4)	7.077 (63.4)	
iii) Concentrates	2.054 (43.3)	2.705 (5.5)	1.809 (10.5)	1.375 (1.6)	2.064 (24.7)	

(Note : Figures in brackets indicate percentage of animals receiving some kind of feeding at home).

TABLE NO. 31

Distribution of bovine fed with different types of feed / fodder

Category	Classification	Percentage distribution of animals fed with					
		Only Green	Only Dry	Green + Dry	Green + Conc.	Dry + Conc.	Green + Dry + Conc.
1	2	3	4	5	6	7	8
CATTLE	In-milk	21.4	43.8	7.4	7.7	13.9	5.8
	Dry + N.C.	26.1	63.2	6.5	1.3	2.1	0.8
	Adult males	24.9	60.8	7.8	1.0	4.3	1.2
	Young stock	31.9	60.8	4.5	1.0	1.5	0.3
	Overall	25.6	57.1	6.8	2.7	5.7	2.1

Table No. 31 contd.

1	2	3	4	5	6	7	8
BUFFALOES	In ⁿ -milk	32.3	19.9	4.4	11.2	27.7	4.5
	Dry+ N.C.	28.8	57.6	8.0	2.2	2.7	0.7
	Adult males	22.4	64.7	2.4	0.4	9.3	0.8
	You ⁿ g-stock	28.6	62.1	7.7	N	1.5	0.1
Overall		30.3	39.4	5.7	6.3	15.8	2.5

3.13 PRODUCTION AND UTILISATION OF DUNG

The data about production and utilisation of dung on the previous day of the visit was collected and seasonwise results are presented in table no. 32. Here, the dung collected in the stalls is only considered.

TABLE NO. 32

Utilisation of dung collected from bovines at stalls

Sr. No.	Season	Average quantity of dung collected per day/bovine(kg.)	Estimated annual quantity of dung collected (000 MT)	Utilisation of dung (%)			Total
				For manure	For dung cakes	Other purposes	
1	2	3	4	5	6	7	8
1.	Summer	3.025 (16,206)	-	69.78	22.80	7.42	100.00
2.	Rainy	3.199 (14,076)	-	84.61	4.96	10.43	100.00
3.	Winter	3.184 (14,564)	-	60.29	28.55	11.16	100.00
Overall		3.129 (45,546)	24,583.379	71.37	19.04	9.59	100.00

(Note:- Figures in brackets indicate number of animals observed).

The average quantity of dung collected in stalls was about 3.1 kg. per animal per day. The average quantity collected was maximum in rainy season. It is observed that the

duⁿg produced is maiⁿly used as maⁿure, iⁿ rural areas. The quaⁿtity of duⁿg collected iⁿ the year for the State was estimated as 24,583 'thousaⁿd M.T.

3.14 MORTALITY I^N BOVI^NE

The mortality observed duriⁿg the year iⁿ variou^s categories of cattle aⁿd buffaloes is preseⁿted iⁿ table no. 33.

TABLE NO. 33

Percentage of mortality in bovine

Sr.No.	Category	Annual mortality rate in	
		Cattle	Buffaloes
1	2	3	4
1.	In-milk "	2.02	1.89
2.	Dry and not calved even once	2.20	2.13
3.	Adult males	1.12	3.93
4.	Youngstock	1.98	6.02
Overall		1.66	3.44

It is seen from the table no. 33 that annual mortality observed in cattle class was 1.7 percent as against 3.4 percent in buffaloes. The maximum mortality percentage was observed in youngstock category iⁿ buffaloes, followed by adult males category iⁿ buffalo class.

CHAPTER NO. IV

EGG PRODUCTION AND POULTRY REARING PRACTICES

4.1 SAMPLE SIZE OBSERVED

For collection of data about egg production and poultry rearing practices a cluster of 5 households was observed daily from the villages having poultry out of the total of 600 selected villages. The details are as given below:-

TABLE NO. 34

Number of villages and poultry birds observed

Sr. No.	Season	No. of villages observed	No. of households observed	No. of poultry birds observed					Total
				Cocks	Hens	Cock-erels	Hens-ets	Chicks	
1	2	3	4	5	6	7	8	9	10
1.	Summer	205	7952	4669	28352	5779	6606	17185	62591
2.	Rainy	195	6482	3383	20584	3144	5774	15492	48377
3.	Winter	200	7832	3334	21990	5310	6060	20510	57204
Total		600	22266	11386	70926	14233	18440	53187	168172

During the year data about egg production were collected for 70,926 layers and data on rearing practices followed were collected for 1,68,172 poultry birds from 22,266 poultry keeper households.

4.2 AVERAGE NUMBER OF POULTRY BIRDS PER 100 POULTRY KEEPER HOUSEHOLDS

The average number of poultry birds reared per 100 poultry keeper households, on the day of visit is presented in table no. 35.

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TABLE NO. 35

Average number of poultry birds reared per 100
poultry keeper households

Sr. Season ⁿ No.	No. of birds per 100 poultry keeper households						
	Cocks	Hens	Cockerels	Pullets	Chicks	Total	
1	2	3	4	5	6	7	8
1. Summer		59 (8)	356 (45)	73 (9)	83 (11)	216 (27)	787 (100)
2. Rainy		52 (7)	318 (43)	48 (6)	89 (12)	239 (32)	746 (100)
3. Winter		42 (6)	281 (38)	68 (9)	77 (11)	262 (36)	730 (100)
Overall		51 (7)	318 (42)	64 (8)	83 (11)	239 (32)	755 (100)

Note :- Figures in brackets indicate percentage to total poultry.

The average number of poultry birds reared per 100 poultry keeper households was maximum (787) during summer season, while it was minimum in winter season (i.e. 730). On an average, there were 755 birds per 100 poultry keeper households consisting of 51 cocks, 318 hens, 64 cockerels, 83 pullets and 239 chicks. The overall composition of poultry stock reared per 100 poultry keeper households was observed to be 7 percent cocks, 42 percent hens, 8 percent cockerels, 11 percent pullets and 32 percent chicks.

4.3 ESTIMATED NUMBER OF LAYERS, LAYING PERCENTAGE AND EGGS PRODUCTION

The total egg production from deshi birds, for each group of districts, for the three seasons of the year was estimated on the basis of the data collected in the survey. The egg production from improved layers was estimated from the data collected from commercial poultry farms. This improved egg production was estimated for the State as a whole and on a yearly basis. The details are given in the table numbers 36, 37, 38 and 39.

TABLE NO. 36

Estimated egg productionⁿ from Deshi layers during Summer Season

Sr. No.	Group of districts	Estimated No. of layers (lakhs)	Laying percentage	Total egg production (lakhs)
1	2	3	4	5
1.	Gr. Bombay	0.70	30.55	26.01
2.	Thane, Raigad	7.30	33.43	297.92
3.	Ratnagiri, Sindhudurg	6.57	22.62	244.68
4.	Nashik, Dhule, Jalgaon	6.75	32.58	268.20
5.	Ahmednagar, Pune	14.98	32.51	594.20
6.	Satara, Sangli, Kolhapur	16.47	32.05	644.14
7.	Solapur, Latur, Osmanabad, Beed	8.89	30.73	333.11
8.	Aurangabad, Jalna, Buldhana	2.72	29.61	98.35
9.	Parbhani, Nanded	1.95	31.90	75.83
10.	Akola, Amravati, Yavatmal	4.67	25.62	145.93
11.	Wardha, Nagpur, Bhandara	5.80	31.73	146.98
12.	Gadchiroli, Chandrapur	3.15	30.08	115.78
State as a whole		80.25 (6.01)	30.55 (3.60)	2931.13 (7.77)

Note :- Figures in brackets indicate percentage standard errors.

TABLE NO. 37

Estimated egg production from deshi layers during the rainy season

Group No.	Group of districts	Estimated No. of layers (in lakhs)	Laying percentage	Total egg production (lakhs)
1	2	3	4	5
1.	Gr. Bombay	0.70	31.98	27.45
2.	Thane, Raigad	6.56	35.88	289.57
3.	Ratnagiri, Sindhudurg	8.39	25.30	260.93

Table No. 37 contd.

1	2	3	4	5
4.	Nashik, Dhule, Jalgaon	6.49	32.83	262.25
5.	Ahmednagar, Pune	14.41	34.51	611.65
6.	Satara, Sangli, Kolhapur	16.12	31.42	623.03
7.	Solapur, Latur, Osmanabad, Beed	9.54	30.40	356.83
8.	Aurangabad, Jalna, Buldhana	2.77	32.15	109.50
9.	Parbhani, Nanded	2.03	33.49	83.45
10.	Akola, Amravati, Yavatmal	4.51	34.49	191.40
11.	Wardha, Nagpur, Bhandara	3.73	31.42	144.02
12.	Gadchiroli, Chandrapur	3.26	31.97	128.25
State as a whole		28.51 (7.02)	31.98 (4.42)	3088.43 (6.97)

Note :- Figures in brackets indicate percentage standard errors.

TABLE NO. 38

Estimated egg production from deshi layers during winter season

Group No.	Group of districts	Estimated No. of layers (lakhs)	Laying percentage	Total egg production (lakh)
1	2	3	4	5
1.	Gr. Bombay	0.70	33.06	27.68
2.	Thane, Raigad	6.49	35.20	274.06
3.	Ratnagiri, Sindhudurg	7.48	29.37	263.68
4.	Nashik, Dhule, Jalgaon	6.72	35.31	284.81
5.	Ahmednagar, Pune	16.76	34.24	688.59
6.	Satara, Sangli, Kolhapur	16.57	33.05	657.03
7.	Solapur, Latur, Osmanabad, Beed	8.81	32.75	346.24
8.	Aurangabad, Jalna, Buldhana	2.89	28.55	98.97
9.	Parbhani, Nanded	2.00	34.14	82.17
10.	Akola, Amravati, Yavatmal	4.62	35.16	194.99
11.	Wardha, Nagpur, Bhandara	3.99	30.75	147.19
12.	Gadchiroli, Chandrapur	3.37	30.78	124.63
State as a whole		80.40 (6.84)	33.06 (2.44)	3190.04 (5.97)

Note :- Figures in brackets indicate percentage standard errors.

.. 47 ..
 TABLE 10.39

Estimated total egg production during the year
 (overall)

Group No.	Group of districts	Estimated No. of layers (lakh)	Laying percentage	Total egg production (lakh)
1	2	3	4	5
FOR DESHI LAYERS				
1.	Ga. Bombay	0.70	31.76	81.14
2.	Thane, Raigad	6.78	34.81	861.55
3.	Ratnagiri, Sindhudurg	8.26	25.52	769.29
4.	Nashik, Dhule, Jalgaon	6.65	33.59	815.26
5.	Ahmednagar, Pune	15.38	33.75	1894.44
6.	Satara, Sangli, Kolhapur	16.39	32.16	1924.20
7.	Solapur, Latur, Osmanabad, Beed	9.08	31.26	1036.18
8.	Aurangabad, Jalna, Buldhana	2.79	30.14	306.92
9.	Parbhani, Nanded	1.99	33.24	241.45
10.	Akola, Amravati, Yavatmal	4.60	31.70	532.32
11.	Wardha, Nagpur, Bhandara	3.84	31.26	438.19
12.	Gadchiroli, Chandrapur	3.26	30.98	368.66
Overall for deshi layers		79.72 (3.83)	31.86 (1.98)	9269.60 (4.18)
Improved layers		34.34	69.59	8722.00
Overall for deshi + Improved		114.06	-	17991.60

Note :- Figures in brackets indicate percentage standard errors.

The total egg production for the State, during the year was estimated as 17991.6 lakhs. Out of this, the contribution from Deshi layers was 52 percent and from improved layers 48 percent.

The overall eggs obtained per deshi layer per year were 116 and from improved layer were 254. Per capita per annum availability of eggs was 25 during the year under report on the basis of projected population of the year under report.

4.3.1 The estimated egg production in the State, during the year 1985-87, 1987-88 and 1988-89 are presented in table

TABLE NO. 40

Estimated egg production in Maharashtra State during 1986-87, 1987-88 and 1988-89

Group No.	Group of Districts	1986-87			1987-88			1988-89		
		Estimated layers (lakh)	Laying percentage	Egg production (lakh)	Estimated layers (lakh)	Laying percentage	Egg production (lakh)	Estimated layers (lakh)	Laying percentage	Egg production (lakh)
1	2	3	4	5	6	7	8	9	10	11
1.	Gr. Bombay	0.70	31.72	80.79	0.70	32.55	83.12	0.70	31.76	81.14
2.	Thane, Raigad	6.95	29.05	737.55	6.88	33.82	852.06	6.78	34.81	861.55
3.	Ratnagiri, Sindhudurg	6.59	28.23	678.67	6.53	30.74	734.13	8.26	25.52	769.29
4.	Nashik, Dhule, Jalgaon	6.37	34.46	801.45	6.44	33.97	800.27	6.65	33.59	815.26
5.	Ahmednagar, Pune	14.84	33.58	1818.58	14.78	33.64	1819.32	15.38	33.75	1894.44
6.	Solapur, Sangli, Kolhapur	15.53	31.20	1820.11	15.60	33.18	1894.89	16.39	32.16	1924.20
7.	Solapur, Latur, Osmanabad, Peed	8.71	31.25	993.69	8.81	32.15	1036.54	9.08	31.26	1036.18
8.	Ahmednagar, Jalgaon, Buldhana	2.64	32.39	311.52	2.75	30.24	304.39	2.79	30.14	306.92
9.	Parbhani, Nanded	1.99	32.08	232.59	1.99	32.23	235.05	1.99	33.24	241.45
10.	Akola, Amravati, Yavatmal	4.38	32.29	516.52	4.60	30.71	517.50	4.60	31.70	532.32
11.	Wardha, Nagpur, Bhandara	3.71	30.33	411.42	3.81	30.90	431.07	3.84	31.26	438.19
12.	Chandrapur, Gadchiroli	3.35	30.17	368.87	3.28	30.44	365.07	3.26	30.98	368.66
Overall Deshi layers		75.75	31.72	8771.76	75.17	32.55	9073.41	79.78	31.85	9269.60
Improved layers		28.24	69.04	7116.48	31.85	69.40	8092.44	34.34	69.59	8722.00
Deshi + Improved layers		104.00	41.86	15888.24	108.03	43.42	17165.85	114.06	43.22	17991.60

4.4 UTILISATION OF EGGS IN POULTRY KEEPER HOUSEHOLDS

From the poultry keeper households, data regarding production and disposal of eggs on the previous day of the visit, were also collected.

It is found from the data that out of the total eggs produced 55 percent were disposed off at home for table purpose, while 10 percent were kept for hatching. About 30 percent eggs were sold out for table purpose and 2 percent for hatching purpose. It is noticed that there was about 3 percent breakage and spoilage in the total number of eggs produced.

4.5 MORTALITY IN POULTRY

Details regarding deaths of poultry birds occurred due to various causes during the last four months prior to the visit in the poultry keeper households were collected and the same is presented in table no. 41.

TABLE NO. 41

Percentage distribution of deaths in Deghi Poultry birds according to various causes of deaths

Sr. No.	Category of birds	Percentage of deaths due to					
		Diseases	Physical/mechanical forces	Attack of animals	Attack of birds	Other reasons	Annual mortality
1	2	3	4	5	6	7	8
1.	Cocks	3.4	0.8	0.6	-	1.2	6.0
2.	Hens	2.2	0.2	0.4	-	0.3	3.1
3.	Cockerels	4.0	0.9	2.9	-	0.3	8.1
4.	Pullets	3.7	0.7	2.1	-	0.2	6.7
5.	Chicks	11.3	1.7	9.2	5.9	1.1	29.2
Overall		5.5 (44.4)	0.8 (6.5)	3.6 (29.0)	1.9 (15.3)	0.6 (4.8)	12.4 (100.0)

Note :- Figures in brackets indicate percentage of poultry birds died due to various reasons.

It is observed that maximum deaths occurred due to diseases (44 percent) followed by attack of animals (29 percent). The deaths due to physical or mechanical forces such as excess of heat or cold, etc., and due to attack of birds were 7 and 15 percent respectively.

The annual mortality in poultry birds was observed to be 12 percent, it being maximum in chicks (about 29 percent) and in hens (about 3 percent).

The disease-wise mortality classification in poultry is presented in table No. 42.

TABLE NO. 42

Disease-wise mortality classification in poultry

Sr. No.	Category of birds	Percentage of deaths due to				Total
		Ranikhet	Diarrhoea	Fowl Pox	Undiagnosed diseases	
1	2	3	4	5	6	7
1.	Cocks	36.3	16.1	12.1	35.5	100.0
2.	Hens	46.1	37.4	6.7	15.8	100.0
3.	Cockerels	22.8	15.7	22.8	40.7	100.0
4.	Pullets	21.2	13.5	17.1	48.4	100.0
5.	Chicks	19.1	50.3	10.5	20.1	100.0
Total		24.8	40.6	11.2	23.4	100.0

Amongst the birds which died due to diseases, 25 percent died due to Ranikhet, 41 percent died due to Diarrhoea and 11 percent died due to fowl pox, remaining 23 percent birds died due to other undiagnosed diseases.

4.6 FEEDING PRACTICES OF POULTRY BIRDS

It is a common practice in villages to feed the birds with grains and cereals, twice in a day, once in the morning and then in the evening. The data on feeding are mainly collected for deshi birds only. Very few households in the villages

used ready-made poultry feed. Table No. 43 gives the information about grains fed either alone or in combination to the poultry birds, in addition to what the birds may have consumed from the surrounding areas.

TABLE NO. 43

Households feeding different types of feed and average quantity fed per day/bird

Sr. No.	Name of feed	Percentage of households feeding the feed	Percentage of birds fed with	Average quantity of feed fed per bird, per day (Gm.)
1	2	3	4	5
1.	Jawar	53.0	50.6	15
2.	Rice	3.7	6.7	17
3.	Bajra	4.2	5.5	21
4.	Jawar + Bajra	14.3	16.0	12
5.	Rice + Nacha	6.9	4.9	17
6.	Mixed cereals	7.1	4.2	19
7.	Readymade feed	0.5	8.1	128
8.	Other	5.3	3.7	19
	Overall	100.0	100.0	24

It was observed that the major constituents of the feed fed to poultry birds were Jawar either alone or in combination followed by Rice. The overall average quantity of feed fed per bird per day was 24 Gms.

4.7 UTILISATION OF EGGS IN NON-POULTRY KEEPER HOUSEHOLDS

A total of 7,456 non-poultry keeper households were observed for utilisation of eggs, on the previous day of the visit. It was observed that 67 percent households purchased eggs for table purpose.

4.8 COMMERCIAL POULTRY FARMS

During the year under report information about egg production alongwith allied information was collected from commercial poultry farms. For the first time some important observations are tabulated from the data.

The information was collected from 54 farms and about 10 lakh layer birds. The table below indicates percentage distribution of farms according to layer strength and annual mortality percentage observed.

TABLE NO. 44

Annual mortality percentage

Sr. No.	Size of poultry farm	No. of farms	Total No. of birds observed	Mortality percentage
1	2	3	4	5
1.	Upto 1000	8	5,290	10.70
2.	1001 - 5000	18	34,167	11.38
3.	5001 - 10000	5	41,736	7.49
4.	10001 - 15000	4	46,278	8.34
5.	15001 - 20000	1	15,247	22.61
6.	20001 - 25000	2	46,231	11.44
7.	25001 - 30000	3	83,974	10.48
8.	30001 - 35000	3	96,498	9.77
9.	35001 - 40000	2	73,744	18.80
10.	40001 - 45000	3	1,27,739	11.40
11.	45001 - 50000	1	48,054	32.85
12.	50001 & above	4	3,85,368	7.85
Total all farms		54	10,04,326	11.24

From the above table, it will be seen that in some of the commercial farms high mortality occurred due to Dermatit prolapse, Egg bond, Ranikhet disease, etc.

LAYING PERCENTAGE IN COMMERCIAL FARMS

Data collected from the commercial poultry farms was grouped as per the size of the farms and laying percentage was worked out, the same is given in Table No. 45.

TABLE No. 45

Laying percentage in commercial poultry farms

Sr.No.	Size of the farm according to average number of layers	Laying percentage
1	2	3
1.	Up to 500	70.65
2.	501 - 1,000	73.28
3.	1,001 - 5,000	64.32
4.	5,001 - 10,000	67.92
5.	10,001 - 15,000	63.30
6.	15,001 - 20,000	68.86
7.	20,001 - 25,000	70.07
8.	25,001 - 30,000	71.38
9.	30,001 - 35,000	76.08
10.	35,001 - 40,000	72.05
11.	40,001 - 45,000	71.38
12.	45,001 - 50,000	62.96
13.	50,001 and above	71.90
Total (overall)		69.59

It was observed that farms having layers 30,001 to 35,000 had highest laying percentage.

CHAPTER V

WOOL PRODUCTION, GOAT MILK PRODUCTION AND MEAT PRODUCTION

5.1 WOOL PRODUCTION

From the data collected in the survey, it was observed that sheep were reared in 0.9 percent households and there were 17.7% villages having sheep.

Villages having sheep were classified according to total number of sheep in the villages.

TABLE NO. 46

Distribution of villages according to sheep population

Sr. No.	Number of sheep	Percentage of villages			
		Summer	Rainy	Winter	Overall
1	2	3	4	5	6
1.	Upto 10	5.7	10.3	4.8	6.6
2.	11 to 20	5.7	3.5	4.8	4.7
3.	21 to 50	20.0	13.8	16.6	17.0
4.	51 to 100	14.2	17.2	16.6	16.0
5.	101 to 200	20.0	20.7	14.3	17.9
6.	201 to 400	22.8	13.8	23.8	20.3
7.	401 to 600	2.9	6.9	9.5	6.6
8.	601 to 800	2.9	3.5	4.8	3.8
9.	801 to 1000	2.9	-	2.4	1.9
10.	Above 1000	2.9	10.3	2.4	4.7
Total		100.0 (35)	100.0 (29)	100.0 (42)	100.0 (106)

Note :- Figures in brackets indicate number of villages.

It was observed that 11 percent of the villages were having sheep upto 20, while about 33 percent were having 21 to 100 sheep per village.

5.2 NUMBER OF SHEEP OBSERVED

A total 6,163 sheep from 168 flocks were observed for sheep rearing practices. The details are given in table no. 47.

TABLE NO. 47

Number of Sheep Observed

Sr. No.	Type of flock	No. of flocks	Number of sheep				Total
			Rams	Ewes	Lambs Male	Female	
1	2	3	4	5	6	7	8
1	Stationary	143	203	3507	586	879	5175
2	Migratory	25	26	745	93	124	988
Total		168	229	4252	679	1003	6163

It is observed from the table no. 47 that about 84 percent sheep were from stationary flocks, and remaining 16 percent sheep from migratory flocks.

5.3 ESTIMATED WOOL PRODUCTION

The estimates of wool production in the State, worked-out for 2 shearing seasons, are presented in table no. 48.

TABLE NO. 48

Estimated Wool Production

Sr. No.	Season	Estimated Number of sheep (lakhs)	Estimated Number of sheep shorn (lakhs)	Average wool yield per sheep shorn (kg.)	Total wool production (M.T.)
1	2	3	4	5	6
1) RAINY					
	i) Rams + Wethers	2.38	2.34	0.291	68.036
	ii) Ewes	18.46	18.20	0.287	522.428
	iii) Lambs	6.77	3.87	0.180	69.716
Total		27.61	24.41	0.279	660.180

	1	2	3	4	5	6
2) <u>WINTER</u>						
i) Rams + Wethers	2.44		2.36		0.320	75.644
ii) Ewes	18.89		18.49		0.318	587.952
iii) Lambs	6.80		3.81		0.168	64.021
Total	28.13		24.66		0.295	727.617
3) <u>OVERALL</u>						
i) Rams + Wethers	2.41		2.35		0.611	143.680
ii) Ewes	18.67		18.35		0.605	1110.380
iii) Lambs	6.79		3.84		0.348	133.737
Total	27.87		24.54		0.566	1387.797

The estimated number of Rams/Wethers, ewes and lambs for rainy season were 2.38 lakhs, 18.46 lakhs and 6.77 lakhs respectively. The same for winter season were 2.44 lakhs, 18.89 lakhs and 6.80 lakhs.

The overall average estimated wool yield per sheep shown worked-out to be 566 Grams, it being 605 Grams per ewe and 611 Grams per adult male. The estimated wool production for the State during the year was about 1388 M.T.

5.4 MORTALITY IN SHEEP

The data regarding deaths due to various reasons was collected from the sheep keeper households at the time of enumeration. It was observed that the annual mortality in sheep was found to be 4.3 percent.

5.5 SAMPLE SIZE OBSERVED FOR GOAT MILK PRODUCTION AND GOAT REARING PRACTICES

Of the total villages, selected, 95.8 percent villages, goats were observed. A total number of 12,419 of goat keeper households and from these 17,400 goats in-milk were observed for goat milk production. It was observed that the percentage of in-milk goats to milch goats were about 47.6 percent during the year under report.

5.6 ESTIMATED GOAT MILK PRODUCTION

The details about estimates of goat milk production for groups of districts in the State, during the three seasons and for the entire year are given in table Nos. 49, 50, 51 and 52 respectively.

TABLE NO. 49Estimated goat milk production for summer season

Group No.	Group of Districts	Estimated No. of milk goats (lakhs)	Average daily milk yield per goat in milk (kg.)	Total milk production (000 M.T.)
1	2	3	4	5
1.	Gr. Bombay	0.04	0.109	0.058
2.	Thane, Raigad	0.72	0.109	0.954
3.	Ratnagiri, Sindhudurg	0.32	0.109	0.426
4.	Nashik, Dhule, Jalgaon	3.30	0.205	8.176
5.	Ahmednagar, Pune	3.97	0.174	8.422
6.	Satara, Sangli, Kolhapur	3.05	0.258	9.617
7.	Solapur, Latur, Osmanabad, Beed	3.89	0.237	11.244
8.	Aurangabad, Jalna, Buldhana	2.92	0.168	5.976
9.	Parbhani, Nanded	1.84	0.157	3.523
10.	Akola, Amravati, Yavatmal	2.76	0.113	3.804
11.	Wardha, Nagpur, Bhandara	4.60	0.119	2.327
12.	Gadchiroli, Chandrapur	1.07	0.110	1.436
State total		25.48	0.180	55.963

TABLE NO. 50Estimated goat milk production for rainy season

Group No.	Group of Districts	Estimated No. of milk goats (lakhs)	Average daily milk yield per goat in milk (kg.)	Total milk production (000 M.T.)
1	2	3	4	5
1.	Gr. Bombay	0.04	0.145	0.077
2.	Thane, Raigad	0.94	0.143	1.652

1	2	3	4	5
3.	Ratnagiri, Sindhudurg	0.29	0.143	0.507
4.	Nashik, Dhule, Jalgaon	3.35	0.190	7.825
5.	Ahmednagary Pune	3.30	0.234	9.433
6.	Satara, Sangli, Kolhapur	2.58	0.217	6.880
7.	Solapur, Latur, Osmanabad, Beed	3.45	0.235	9.969
8.	Aurangabad, Jalna, Buldhana	2.35	0.178	5.146
9.	Parbhani, Nanded	1.99	0.159	3.890
10.	Akola, Amravati, Yavatmal	2.85	0.123	4.318
11.	Wardha, Nagpur, Bhandara	1.87	0.121	2.776
12.	Gadchiroli, Chandrapur	1.02	0.114	1.431
State Total		24.03	0.182	53.904

TABLE NO. 51

Estimated goat milk production for winter season

Group No.	Group of Districts	Estimated No. of milk goats (lakhs)	Average daily milk yield per goat (kg.)	Total milk production ('000 M.T.)
1	2	3	4	5
1.	Gr. Bombay	0.04	0.128	0.067
2.	Thane, Raigad	0.66	0.128	1.017
3.	Ratnagiri, Sindhudurg	0.27	0.120	0.416
4.	Nashik, Dhule, Jalgaon	3.48	0.233	9.721
5.	Ahmednagar, Pune	3.73	0.198	8.853
6.	Satara, Sangli, Kolhapur	2.87	0.227	7.895
7.	Solapur, Latur, Osmanabad, Beed	4.41	0.201	10.642
8.	Aurangabad, Jalna, Buldhana	2.42	0.218	6.325
9.	Parbhani, Nanded	1.61	0.186	3.594
10.	Akola, Amravati, Yavatmal	2.99	0.111	3.984
11.	Wardha, Nagpur, Bhandara	1.95	0.117	2.740
12.	Gadchiroli, Chandrapur	1.03	0.098	1.214
State Total		25.46	0.185	56.378

TABLE NO. 52

Estimated goat milk production for the year (overall)

Group No.	Group of Districts	Estimated No. of milk goats (Lakhs)	Average daily milk yield per in-milk goat (kg.)	Total milk production (000 M.T.)
1	2	3	4	5
1.	Gr. Bombay	0.04	0.138	0.202
2.	Thane, Raigad	0.76	0.129	3.623
3.	Ratnagiri, Sindhudurg	0.29	0.127	1.349
4.	Nashik, Dhule, Jalgaon	3.38	0.208	25.722
5.	Ahmednagar, Pune	3.67	0.199	26.708
6.	Satara, Sangli, Kolhapur	2.83	0.235	24.502
7.	Solapur, Latur, Osmanabad, Beed	3.92	0.222	31.855
8.	Aurangabad, Jalna, Buldhana	2.56	0.187	17.447
9.	Parbhani, Nanded	1.81	0.167	11.007
10.	Akola, Amravati, Yavatmal	2.87	0.116	12.106
11.	Wardha, Nagpur, Bhandara	1.81	0.119	9.843
12.	Gadchiroli, Chandrapur	1.04	0.108	4.081
State Total		24.99	0.182	166.245

It is observed from table no. 52 that total goat milk production for the state was estimated as 166,245 thousand M.T. during the year. The average milk yield per goat in-milk per day was 182 Grams.

5.7 MORTALITY IN GOATS

The data regarding deaths due to various reasons was collected from the goat keeper households at the time of enumeration. It was observed that the annual mortality in goats was found to be 4.7 percent.

5.8 ESTIMATED MEAT PRODUCTION

The meat production from different species of livestock was estimated for the State and on the yearly basis. The details are given in table no. 53.

TABLE No. 53

Estimated meat production

Sr.No.	Species	Average meat production per animal(kg.)	Estimated No. of animals slaughtered (lakhs)	Total meat production (000 'M.T.)
1	2	3	4	5
1.	Cattle	121.025	4.26	51,503
2.	Buffalo	139.017	2.35	32,683
3.	Sheep	10.981	17.19	18,875
4.	Goat	10.466	37.11	38,837
5.	Pig	20.540	2.51	5,163
Total				147,061

From the above table, it is seen that the average meat produced per sheep is higher than that of goat. Out of the total meat production, 35 percent was from cattle, 22 percent from buffaloes, 13 percent from sheep, 26 percent from goats and remaining 4 percent from pigs.

5.9 HIDES AND SKINS PRODUCTION

The number of hides and skins obtained during the year were worked-out for the state as a whole. The details are given in table no. 54 below.

TABLE NO. 54

Estimated number of hides and skins

Sr.No. of	Production of	Category	Estimated No. of hides/skins (lakhs)
1	2	3	4
1.	Hides	a) Cattle	7.04
		b) Buffaloes	4.00
		c) Total hides	11.04
2.	Skins	a) Goat	41.33
		b) Sheep	18.42
		c) Total skins	59.75

TABLE No. 55

Comparative statement showing estimated annual production of milk, egg, wool and meat in Maharashtra State from the year 1970-71 to 1988-89

Sr. No.	Year	Milk (000 M.T.)	Eggs (Crores)	Wool (M.T.)	Meat (000 M.T.)
1.	1970-71	1,062	69	1,025	70
2.	1971-72	1,056	66	1,115	70
3.	1972-73	949	67	911	76
4.	1973-74	1,003	70	936	76
5.	1974-75	1,195	73	970	79
6.	1975-76	1,280	77	1,016	78
7.	1976-77	1,304	78	890	83
8.	1977-78	1,522	81	923	93
9.	1978-79	1,540	91	1,047	106
10.	1979-80	1,635	103	1,125	122
11.	1980-81	1,756	115	1,217	147
12.	1981-82	1,909	124	1,245	160
13.	1982-83	2,009	129	1,304	158
14.	1983-84	2,228	135	1,309	151
15.	1984-85	2,358	143	1,341	160
16.	1985-86	2,466	151	1,339	159
17.	1986-87	2,459	153	1,357	154
18.	1987-88	2,657	172	1,373	160
19.	1988-89	2,800	180	1,388	147

Note :- Milk production upto the year 1976-77 is exclusive of goat milk as no survey was conducted for goat milk production.

CHAPTER NO. VI

SUMMARY

Integrated Survey Scheme has been implemented by the Department for estimation of annual production of four important livestock products viz. Milk, Egg, Wool and Meat and to study the livestock keeping practices followed in the State. The present report deals with the results obtained from the data collected during 1988-89.

6.1 SAMPLING DESIGN

The sampling design for the survey was a multistage stratified random sampling. Thirty districts of the state were divided into 12 groups, each consisting of about 1 to 4 districts. Gr. Bombay district was treated as one separate group. From remaining 11 groups of districts, 20 villages were selected randomly from each group for every season and one survey assistant was allotted the work of five villages for collection of data.

6.2 RESULTS

1. A total 600 villages were visited by the Survey Assistants for collection of data. The average number of households per village were 187.

2. About 21 percent households had no livestock or poultry. 62 percent of households had bovine, about 32 percent households had poultry, while 27 percent had goats and only 1 percent households reared sheep.

3. The data regarding bovine keeping practices were collected for 42,630 bovines from 10,411 bovine keeper households and a total of 14,389 animals were observed for milk production.

4. The estimated number of in-milk cows was 22.69 lakhs and that of in-milk buffaloes was 13.59 lakhs.

5. The average daily milk yield per 1st milk cow was estimated as 1.524 kg. and for 1st milk buffalo as 2.765 kg.

6. The annual milk production in the state was estimated as 26.34 thousand tonnes (from bovines) and 28,00 (000 M.T.) inclusive of goat milk.

7. Per capita per day availability of milk was found to be 104 Grams (cow milk + buffalo milk) and 107 Grams if goat milk is included.

8. About 13 percent cattle and 8 percent buffaloes were kept on grazing alone.

9. The average quantity of the dung dropped in the shed was 3.1 kg. per day per animal. The total quantity of dung collected during the year for the state was estimated as 24,583 thousand M.T.

10. The annual mortality observed in cattle class was 1.7 and that in buffaloes was 3.4 percent.

11. A total 22,266 households were observed for egg production and poultry rearing practices. From these about 71 thousand layers were observed for egg production.

12. The estimated number of deshi layers for the state during the year was 79.72 lakhs and that of improved layers was 34.34 lakhs. The laying percentage observed were 31.86 and 69.59 in deshi layers and improved layers, respectively.

13. The estimated egg production was worked out as 179.92 crores. Out of this, the contribution from deshi layers was 92.70 crores and remaining 87.22 crores from improved layers.

14. Per capita per annum availability of eggs was 25 eggs.

15. The daily average quantity of grains fed per poultry bird was 24 grams.

16. The annual mortality in poultry was about 12 per cent, it being maximum in chicks (about 29 percent).

17. The average wool yield per sheep shorn during the year was 566 Grams. The estimated annual wool production for the State was 1,388 tonnes.

18. The annual mortality in sheep was 4.3 percent.

19. The average daily milk yield per goat in milk was 182 Grams. The estimated annual goat milk production was 166 thousand tonnes.

20. The annual mortality percentage in goats was 4.7.

21. The average meat production per animal was 121 kg. for cattle, 139.0 kg. for buffalo, 11.0 kg. for sheep, 10.5 kg. for goat and 20.5 kg. for pig. The total annual meat production was estimated as 147 thousand tonnes.

22. The number of pieces of hides obtained during the year was estimated as 11.04 lakhs and that of skins as 59.75 lakhs.