

Final Report

Breakeven Analysis in Dairy Farm Enterprises and Strategies for its Sustainable Growth under National Dairy Plan-I in Selected States of India



Funded by PMU NDDB



Agro-Economic Research Centre
(Ministry of Agriculture & Farmers Welfare, GOI)
H. M. Patel Institute of Rural Development
Sardar Patel University,
Vallabh Vidyanagar 388120, Dist. Anand, Gujarat.
Ph. +91-2692-230106/230799; Fax- +91-2692-233106

© NDDDB, Anand.

AERC Report No. 191

Prepared by: Agro-Economic Research Centre, **Sardar Patel University, Vallabh Vidyanagar**

Dr. S. S. Kalamkar, *Director and Professor, AERC, SPU, VVN*

Dr. Kinjal Ahir, *Deputy Director (Hon), AERC, SPU, VVN*

Dr. S. R. Bhaiya, *Field Officer, CCS, SPU, VVN*

Dr. H. Sharma, *Research Officer/ Assistant Professor, AERC, SPU, VVN*

Dr. D. P. Raykundaliya, *Assistant Professor, Deptt. of Statistics, SPU, VVN*

State Partners

Karnataka	Centre for Ecological Economics and Natural Resources(CEENR) , Institute for Social and Economic Change, Nagarbhavi, Bangalore, India.
Bihar	Director, Agro-Economic Research Centre, T M Bhagalpur University, Bhagalpur – 812 007, Bihar.
Gujarat	Director & Professor, AERC, Sardar Patel University, Vallabh Vidyanagar, Anand.
Punjab	Principal Scientist and Head, Division of Dairy Economics, Statistics & Management, National Dairy Research Institute, Karnal (Haryana), & Indraprastha Softech Private Limited, New Delhi.

Published by

The Director

Agro-Economic Research Centre

(Ministry of Agriculture & Farmers Welfare, Govt. of India)

Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat.

Ph. No. +91-2692-230106, 230799, 292865 (direct)

Fax- +91-2692-233106

Email: director.aerc@gmail.com; directoraercgujarat@gmail.com

Printing and Circulation In-charge:

Shri Deep K. Patel, Res. and Ref. Assistant

Report submitted on November, 2019

Citation: Kalamkar, S. S.; Ahir Kinjal; Bhaiya S. R.; Sharma H. ; and Raykundaliya D. P. (2019). “**Breakeven Analysis in Dairy Farm Enterprises and Strategies for its Sustainable Growth under National Dairy Plan-I in Selected States of India**”, AERC Report No. 191, Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat.

Foreword

Dairying has become an important secondary source of income for millions of poor and rural households and has assumed an important role in providing employment and income generating opportunities particularly for marginal and women farmers. This sector has created a significant impact on providing equity in terms of employment and poverty alleviation as well. It cannot be merely a coincidence that the level of rural poverty is significantly higher in states where livestock sector is underdeveloped. This is the sector where the poor contribute to growth directly instead of deriving benefits from growth generated in other sectors of the economy. Besides milk has always played a critical role in addressing hunger and malnutrition.

Cost plays an important role in portraying economic viability of a dairy enterprise. It is a critical economic indicator for milk producers, consumers and policy makers in order to provide an effective linkage between the milk producers and consumers for fixing the price of milk rationally. Generally, a milk producer can increase his dairy income in two ways either by increasing the milk production or by reducing cost of milk production. Cost of milk production often becomes a policy issue, when milk producers complain that the price of milk they are getting does not cover cost of milk production. One of the main problems identified is that many dairy producers, especially small operators, are unaware of their costs of production and financial breakeven point. During these tough times, it is important for producers to see how they can reduce costs without reducing milk production. Therefore, there is a need to know the break-even point to estimate the minimum quantity of milk to be produced to cover the total cost on all the size groups of household for both the cow and buffaloes. Breakeven point is a point where no profit no loss status is achieved. The costs that have to be covered by the milk price determine the break-even point, or price. Keeping the above background in mind, it was felt necessary to study the comparative analysis of per liter cost of milk production as well as break even analysis for two groups - members and non-members of dairy cooperative society for two categories of dairy farmers (small and medium) in case of milch Cow and buffalo. In view of above, as desired by the NDDDB, Anand, the present study was undertaken in selected milk unions of four states to know the break-even point to estimate the minimum quantity of milk to be produced to cover the total cost of milk production for both the cows and buffaloes. The study came out with important and relevant policy implications which would help to adopt strategic interventions to enhance net income of the milk producers.

I am thankful to authors and the research team for putting in a lot of efforts to complete this excellent piece of work. I also thank the National Dairy Development Board, Anand for giving us an opportunity to undertake this study. I hope this report will be useful for policy makers and researchers.

Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture and Farmers Welfare, GOI)
Sardar Patel University,
Vallabh Vidyanagar 388120

(Dr. S.S. Kalamkar)
Director & Professor

Acknowledgements

The study on “**Breakeven Analysis in Dairy Farm Enterprises and Strategies for its Sustainable Growth under National Dairy Plan-I**” has been carried out at the Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, Anand, Gujarat, as supported by National Dairy Development Board, Anand, Gujarat.

We have benefited immensely from various scholars and officials from different government departments while carrying out this study. At the outset, we would like to thank **Prof. Shirish Kulkarni, Vice Chancellor of our University** and Chairman, AERC Advisory Body for his constant encouragement and support for undertaking such research activity at the Centre.

We are deeply grateful to our former Honorary Advisor Prof. **Mahesh Pathak** for his constant support and guidance in undertaking and completion of this project work.

We are grateful to **Dr. Dilip Rath**, Chairman, National Dairy Development Board (NDDB), Anand for giving us an opportunity to undertake this study. We also thank the officers of NDDB, Shri Meenesh C Shah (Executive Director-I), Shri O. P. Sachan (General Manager, Purchase), Shri S. Regupathai (General Manager, Accounts), Dr. G. Chokkalingam (General Manager, Sectoral Analysis & Studies), Shri V. Sridhar (General Manager, Animal Nutrition), Shri Subir Mitra (Deputy General Manager, Sectoral Analysis & Studies), Dr. Jignesh Shah (Sr. Manager, Sectoral Analysis & Studies), Shri A. K. Srivastava, Team Leader (Animal Nutrition), Shri S. Y. Krishna (Sr. Manager, Purchase), Shri Arvind Kumar (Sr. Manager, Coordination and Monitoring Cell), Dr. Nihar Ghosh (Sr. Manager, Animal Nutrition), Shri Mayank Tandon (Manager, Animal Nutrition), and Shri Himanshu Ratnottar (Manager, Purchase) for their support and help during the study.

We are specifically thankful to Shri V. Sridhar (GM, AN) and Shri A. K. Srivastava (Team Leader, Animal Nutrition), Dr. Nihar Ghosh (Sr. Manager, Animal Nutrition), Shri Mayank Tandon (Manager, Animal Nutrition), NDDB, Anand for their constant support during the execution of field survey data as well as data analysis and presentation.

We thank all the corresponding officers of NDDB in selected four States for providing the necessary support in primary data collection. We are grateful to all the Chairman and Managing Director of selected District Co-operative Milk Producers' Union Ltd as well as Primary Dairy Cooperative Societies of selected villages from all the States covered under study for providing the necessary data and support in primary data collection.

We are also thankful to all our state partners, viz. Centre for Ecological Economics and Natural Resources (CEENR), Institute for Social and Economic Change, Bangalore, India; Director, Agro-Economic Research Centre, T M Bhagalpur University, Bhagalpur, Bihar; Principal Scientist and Head, Division of Dairy Economics, Statistics &

Management, National Dairy Research Institute, Karnal (Haryana) for their support in primary data collection in respective state.

The study would not have reached to this stage without the active co-operation of the respondent dairy households from selected villages who provided all the required data for the study without any hesitation and expectation. We thank each one of them for their invaluable support.

We have also received support and encouragement from our colleagues in the Centre while carrying out the study. We are thankful to our fieldsmen (for collecting data from the field and government/dairy union offices), accounts and supporting staff for necessary support.

Thanks to Shri Deep Patel (Research and Reference Assistant-Lib) for preparing the cover page of report and making necessary arrangements for printing of the report.

Lastly but not least, we thank the all other AERC and CCS staff for their direct and indirect support.

Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
(Ministry of Agriculture, Govt. of India)
Sardar Patel University,
Vallabh Vidyanagar 388120, Anand,
Gujarat.

S. S. Kalamkar
Kinjal Ahir
S. R. Bhaiya
Hemant Sharma
D. P. Raykundaliya

Contents

<i>Foreword</i>	<i>iii</i>
<i>Acknowledgements</i>	<i>v</i>
<i>List of Tables</i>	<i>ix</i>
<i>List of Figures</i>	<i>xii</i>
<i>List of Maps</i>	<i>xii</i>
<i>List of Boxes</i>	<i>xii</i>
<i>List of Annexures</i>	<i>xii</i>
<i>List of Abbreviations</i>	<i>xiii</i>
<i>Highlights of Report</i>	

Chapter I	Introduction	01
------------------	---------------------	-----------

1.1	Introduction	
1.2	Need of the Study	
1.3	Objectives of the study	
1.4	Data Sources	
1.5	Survey Design	
1.5.1	Sampling Framework	
1.5.2	Development of Survey schedule	
1.6	Data Analysis	
1.6.1	Operational Expenses/ Variable/Paid out /Direct Cost	
1.6.2	Fixed Cost	
1.6.3	Estimation of Opportunity Cost:	
1.6.4	Estimation of Association between income received from Dairy and Gross Income	
1.6.5	Estimation of Weighted Average	
1.6.6	Standard Error of the Mean	
1.6.7	Estimation of Break Even Point	
1.6.8	Sensitivity Analysis	
1.6.9	Constraints Analysis	
1.7	Organization of Report	

Chapter II	Profile of Selected Households	15
-------------------	---------------------------------------	-----------

2.1	Introduction	
2.2	Profile of Selected DCS and NDCS Households	
2.3	Herd Strength	
2.4	Source-wise Farmers' Income	
2.5	Fodder Crop Production by Dairy Farmers	
2.6	Chapter Summary	

Chapter III	Cost of Milk Production & Sensitivity Analysis	29
	3.1 Introduction	
	3.2 Details of Milch Animals	
	3.3 Cost of Feed and Fodder	
	3.4 Labour Use and Other Expenditure	
	3.5 Sale of Milk and Other Income	
	3.6 Cost of Milk Production	
	3.7 Sensitivity Analysis	
	3.8 Chapter Summary	
Chapter IV	Breakeven Analysis	47
	4.1 Introduction	
	4.2 Breakeven Levels	
	4.3 Sensitivity Analysis	
	4.3 Chapter Summary	
Chapter V	Constraints in Milk Production and Feeding Management	63
	5.1 Introduction	
	5.2 Constraints in Milk Production	
	5.3 Constraints in Feeding Management	
	5.4 Service Delivery System	
	5.5 Chapter Summary	
Chapter VI	Summary and Conclusions	73
	6.1 Introduction	
	6.2 Major Findings	
	6.3 Policy Implications	
	References	85
	Glimpses of Field Visits	95
	Annexures (I-IX)	87

List of Tables

Table No.	Title	Page
1.1	Selected States and Milk Unions for the Study	4
1.2	Details on Selected Milk Producers' Cooperative Unions in Selected States of India	5
1.3	Sampling Framework of the Study	7
2.1	Family Profile of Selected Households	16
2.2	Socio-Economic Characteristics of Selected Households	17
2.3	Details on Occupation and Land Holdings Size of Selected Households	18
2.4	Herd Strength of Selected Households (Animals/hh)	20
2.5	Details on Cattle Shed of Selected dairy Households	21
2.6	Fodder Storage with Selected dairy Households	21
2.7	Holding of Productive Assets by Selected dairy Households	22
2.8	Purchase of Animal during 2018-19 by selected Households	23
2.9	Source-wise Farmer's Households Gross Income (2018-19)	24
2.10	Correlation of Dairy Income and Total Income	24
2.11	Details on Fodder Crops Grown by the Selected DCS & NDCS Households	25
2.12	Season-wise Milk Yield and Milk rate realised by Selected Households	26
2.13	Standard Error (%) estimated for Seasonwise Milk Yield (Lit/day) and Milk rate	26
3.1	Details of Milch Animals (Dry + In Milk) on Survey Date	31
3.2	Details of Total Cost of Feed and Fodder- DCS- Summer season	33
3.3	Details of Total Cost of Feed and Fodder- NDCS- Summer season	33
3.4	Fodder Consumption as per Rainy Seasons (kg / day) - DCS Households-Rainy	34
3.5	Fodder Consumption as per Rainy Seasons (kg / day) - NDCS Households-Rainy	34
3.6	Fodder Consumption as per Winter Seasons (kg / day) - DCS Households-Rainy	35
3.7	Fodder Consumption as per Winter Seasons (kg / day) - NDCS Households-Rainy	35
3.8	Labour use for dairy activities by Selected Households	36

3.9	Other Expenditures incurred by Selected Households	37
3.10	Details on Sale of Milk by selected households	38
3.11	Details of Other Income in Dairy (Annual) by selected Households	39
3.12	Cost of Milk Production (per day per animal) in DCS households	40
3.13	Cost of Milk Production (per day per animal) in NDCS households	41
3.14	Sensitivity Analysis for Changes in Fodder Cost (reduction by 5%) and Milk Yield (increase by 5%) in DCS hh	41
3.15	Sensitivity Analysis for Changes in Fodder Cost (reduction by 15% in Bihar and Punjab & 13% in Gujarat and Karnataka) and Milk Yield (increase by 5%) in DCS hh	42
3.16	Sensitivity Analysis for Changes in Milk Yield (increase by 15%) in DCS hh	42
3.17	Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 5%) and Milk Yield (increase by 20%) in DCS hh	43
3.18	Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh	43
3.19	Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh with increase in milk days	44
3.20	Sensitivity Analysis Fixed Milk Rate across the States	44
4.1	BEP of Milk Production of in milk animal/lactation of DCS households	50
4.2	BEP of Milk Production of in milk animal/lactation of NDCS households	50
4.3	BEP of Milk Production of in milk animal/lactation of DCS households- paid out cost	51
4.4	BEP of Milk Production of in milk animal/lactation of NDCS households- paid out cost	51
4.5	BEP of Milk Production of Milch animal/Cycle of DCS households	52
4.6	BEP of Milk Production of Milch animal/Cycle of NDCS households	52
4.7	BEP of Milk Production of Milch animal/Cycle of DCS households- Paid out Cost	53
4.8	BEP of Milk Production of Milch animal/Cycle of NDCS households-Paid out Cost	53
4.9	BEP of Milk Production of milch animal/Lactation of DCS households-without Family labour	54
4.10	BEP of Milk Production of milch animal/Cycle of DCS households- without Family labour	54

4.11	BEP-Sensitivity Analysis for Changes in Fodder Cost (reduction by 5%) and Milk Yield (increase by 5%) in DCS hh (Lactation)	55
4.12	BEP-Sensitivity Analysis for Changes in Fodder Cost (reduction by 5%) and Milk Yield (increase by 5%) in DCS hh (Cycle)	55
4.13	BEP-Sensitivity Analysis for Changes in Fodder Cost (reduction by 15% in Bihar and Punjab & 13% in Gujarat and Karnataka) and Milk Yield (increase by 5%) in DCS hh (Lactation)	56
4.14	BEP-Sensitivity Analysis for Changes in Fodder Cost (reduction by 15% in Bihar and Punjab & 13% in Gujarat and Karnataka) and Milk Yield (increase by 5%) in DCS hh (Cycle)	56
4.15	BEP-Sensitivity Analysis for Changes in Milk Yield (increase by 15%) in DCS hh (lactation)	57
4.16	BEP-Sensitivity Analysis for Changes in Milk Yield (increase by 15%) in DCS hh (Cycle)	57
4.17	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 5%) and Milk Yield (increase by 20%) in DCS hh (Lactation)	58
4.18	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 5%) and Milk Yield (increase by 20%) in DCS hh (Cycle)	58
4.19	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh (Lactation)	59
4.20	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh (Cycle)	59
4.21	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh with increase in milk days (lactation)	60
4.22	BEP-Sensitivity Analysis for Changes in Fodder Cost (Increase in fodder cost by 15%) and Milk Yield (increase by 25%) in DCS hh with increase in milk days (cycle)	60
5.1	Constraints Faced in Milk Production - DCS Households	65
5.2	Constraints Faced in Milk Production - NDCS Households	66
5.3	Constraints Faced in Feeding Management - DCS Households	67
5.4	Constraints Faced in Feeding Management - NDCS Households	68
5.5	Details of Input Service Delivery experienced by selected households	69
5.6	Details of Output Service Delivery experienced by selected households	70

List of Figure

Figure No.	Figure	Page
1.1	Sampling Framework	7

List of Map

Map No.	Maps	Page
1.1	Location Map of Selected States for the Study	4

List of Boxes

Map No.	Maps	Page
1.1	Depreciation rate for Dairy Animals	10
1.2	Deprecation rate for Buildings and Dairy Equipments	10
1.3	Constraint in milk production and feeding management	14

List of Annexures

Annexure No.	Annexure	Page
A1	Details on Selected Milk Unions in Selected States of India & ACZs	87
A2	Details on Selected Villages	89
A3	Wages rates: MGNREGA and Prevailing Wages in Selected Study area	90
A4	Sensitivity analysis/ Feed Strategies	90
A5	Details on Animals with Selected Households	91
A6	Village Census Schedule	101
A7	Focus Group Discussion Format	102
A8	Schedule for DCS Members	104
A9	Schedule for Non-Members (NDCS)	108

List of Abbreviations

ACZ	- Agro Climatic Zone
A.I	- Artificial Insemination
ADP	- Annual Development Plan
AN	- Animal Nutrition
ASMM	- Area Specific Mineral Mixture
Av.	- Average
CB	- Cross Breed
DCS	- Dairy Cooperative Society households
DM	- Dry Matter
EIA	- End Implementing Agency
FGD	- Focus Group Discussion
GOI	- Government of India
ha	- Hectare
HH/hh	- Household
LTPD	- Litres per day
MAAHI	- Maahi Milk Producer Company Limited, Rajkot
M.T./mt	- Metric Tone
MCLR	Marginal Cost of Funds Based Lending Rate
MGNREGA	- Mahatma Gandhi National Rural Employment Guarantee Act
mha	- Million hectares
MU	- Milk Union (district level)
NA	- Not Available/ Not Applicable
NDCS	- Non-Dairy Cooperative Society households
NDDB	- National Dairy Development Board
NDP	- National Dairy Plan
NITI Ayog	- National Institution for Transforming India
No./Nos	- Number
PDCS	- Primary Dairy Cooperative Society (village level)
PMC	- Project Management Cell
PMU	- Project Management Unit

Prodvty.	- Productivity
Rs.	- Rupees
SAUs	- State Agricultural University
SC	- Scheduled Caste
SF/MF/AL	- Small Farmer, Marginal Farmer, Agricultural Laborer
ST	- Scheduled Tribe
ST	- Scheduled Tribe
TC	- Total Cost
TR	- Total Revenue
Y	- Yield
