

**STUDY ON VALUE ADDITION OF MILK FOR RURAL
ENTREPRENEURIAL DEVELOPMENT**

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**STUDY ON VALUE ADDITION OF MILK FOR RURAL
ENTREPRENEURIAL DEVELOPMENT**

by

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*Dedicated to my beloved
Late Father
and
Father-in-Law*

Certificate

This is to certify that the thesis entitled “STUDY ON VALUE ADDITION OF MILK FOR RURAL ENTREPRENEURIAL DEVELOPMENT” being submitted by Mr. Kishor Harish Gedam to the Indian Institute of Technology, Delhi for the award of Doctor of Philosophy is a record of bona fide research work carried out by him under our guidance and supervisions in conformity with the rules and regulations of Indian Institute of Technology, Delhi.

The research report and results presented in this thesis have not been submitted, in part or in full, to any other university or institute for the award of any degree or diploma.

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Milk production is a livestock enterprise in which small-scale farmers can successfully engage in order to improve their livelihoods. Regular milk sales also allow them to move from subsistence to a market based income. The main purpose of this study was to gain insight into the household and farm economics of small-scale dairy farmers in India, the country with the highest number of small-scale dairy farmers by far, and to obtain estimates of their costs of milk production so as to gauge their vulnerability to international competition. In order to ascertain possible developments in the dairy sector and to broadly identify areas of interventions that favour small-scale dairy producers, the study examines impacts of changes in prices, farm management and other market factors that affect small-scale milk production systems, the whole farm and related household income. A case study approach is used, the aim being qualitative insight rather than quantitative extrapolation.

India has made lot of progress in agriculture & food sectors since independence in terms of growth in output and yields. Today, India is the largest producer of milk, fruits, cashew nuts, coconuts and tea in the world. Now the time is to provide better food processing & its marketing infrastructure for Indian small scale industries to serve good quality & safest processed food like ready to eat food. It is opening a new window in world scenario as far as taste and acceptance is concerned. Therefore, Indian Government is providing more infrastructures for this sector. Excise duty is now zero per cent on RTE and 100 per cent tax deduction for the first 10 years for new units. This allows manufactures to bring down their prices & spreads its flavours to the world.

The retort processed foods do not require rehydration or cooking and can be consumed straight from the pouch with or without pre-warming, depending upon the requirement of the users and the weather conditions. These foods meet the specific needs of convenience, nutritional adequacy, shelf stability, storage, distribution to the centers and have become very popular now days. Some of the mouth-watering dishes in retort pouches include *kheer* and *sevian* etc. The pioneer introduction of retorting technology has made the sale of 'Ready-to-Eat' food products commercially viable with great taste.

The need to develop inexpensive and effective methods of food processing is well recognised now. While every effort is being made to increase food production, adequate attention needs to be focused on the methods of conserving the produce by appropriate processing technologies. In the present study, an attempt has been made to carry the fruits of modern technology to our rural sector by introducing an inexpensive and easy-to-adopt technology for processing of milk and milk products, in particular traditional milk products by rural households.

To ascertain the availability of manpower, surplus milk, space etc., and preliminary field visit were conducted in Haryana and Maharashtra state. The major finding of the visit to the villages indicated that agriculture and rearing milch cattle were the common occupations found in these rural villages. It was also found that there was ample milk production in the rural areas. The surplus milk was normally sold to middleman who made a substantial profit by selling it in the urban areas. It was evident that there was a great need for processing such foods in rural areas i.e., in the places where they were produced. It was, therefore, considered that if these conditions were reversed and the villagers could process these traditional dairy products and preserve them for selling at a later date, it would bring more income to them. This would also help the rural population with self-employment throughout the year and prevent them from migrating to urban areas in search of employment. As we have seen from last few years, that the suicides rates of the farmers, especially in Vidarbha region, mainly due to low productivity of land, unfavourable climatic conditions and shortage of adequate water supply. In such scenario small scale entrepreneurship in a form of integrated dairy farming can be a boon to the farmers and to minimise suicides rates in these areas.

In the present study, milk was chosen for detailed study, because it was found to be produced by a large number of families. A simple method of sterilization for increasing the shelf-life of milk, involving little investment was chosen for adoption to suit the rural sector where cold storage and transportation facilities are generally not available. The equipment selected and used in carrying out the processes were of low cost and easy-to-operate. For carrying out the process, suitable and optimum time-temperature combinations were worked out. In the methods, fresh cow and buffalo milk was used to prepare flavoured milk, *kheer* and *sevan*. These products were sterilized at different time-temperature combinations and sealed in glass bottles and retort pouches were processed in autoclave. The milk and milk products were found to possess a shelf life of more than 32 weeks at room temperature.

To ascertain the keeping quality of the processed milk and milk products, these were subjected to a number of tests such as rapid tests, pH value, fat, protein, total solids, total ash, acidity, turbidity test, number of microbial colonies and sensory evaluation. The results of these quality tests have shown that the processed milk and milk products in glass bottles and retort pouches, favourably with fresh milk in all its qualities. Encouraged by these results and also to find out the efficacy of the method, the processing technology was extended to a few milk preparations like flavoured milk, *kheer* and *sevian*. It was found that these products could be stored for over a period of 32 weeks. Thus, the study indicated that the milk and milk products which are otherwise being wasted or sold at less remunerative prices could profitably be processed and preserved by the producer himself for sale later.

The economics of the study was also worked out. These have indicated that the technology was economically viable and the rural families can earn good income. The standard of living of the rural families will also improve with the rise in their income, in turn; contribute to the growth of nation's economy and people's welfare.

	Page No.
Certificate	i
Acknowledgement	ii-iii
Abstract	iv-vi
Table of Contents	vii-xi
List of Figures	xii-xiv
List of Tables	xv
List of Plates	xvi
Nomenclature	xvii-xviii
Chapter I	
INTRODUCTION	1-10
1. Background	1
1.1 Milk production in India	2
1.1.1 Indian dairy industry	3
1.2 Sterilization and its importance	4
1.3 Indian dairy products	4
1.4 Value addition in dairy products	5
1.5. Self-employment and entrepreneurship development	6
1.6 Future challenges	7
1.7 Role of science and technology	7
1.8 Scope of the work	8
1.9 Justification of the Research Problem	9
Chapter II	
RIVIEW OF LITERATURE	11-45
2.1 Milk	11
2.1.1 Milk, India's white hope	12
2.2 Indian dairy in the Global context	13
2.3 Dairying in India	15
2.3.1 Dairy farming	15
2.3.2 Women's role in dairying	18
2.4 Why heat milk	19
2.5 Types of milk processing technologies	19
2.5.1 Thermisation	19
2.5.2 LTLT pasteurization of milk	20
2.5.3 HTST pasteurization of milk	20
2.5.4 Sterilization of milk	21
2.5.4.1 History of sterilization of milk	22
2.5.4.2 Definition of sterilized milk	22
2.5.5 Types of sterilization processes	23
2.5.5.1 In-container sterilization	23
2.5.5.1.1 Preheating	23
2.5.5.1.2 Hot filling	24
2.5.5.2 Ultra -High-Temperature method	24
2.6 Effect of heat processing	24
2.6.1 The effects heat processing on organoleptic properties	26

2.6.2 The effects on microbiological Properties	27
2.7 Milk and milk products packaging	28
2.7.1 Roles of food packaging	29
2.7.2 Packaging materials	29
2.7.2.1 Glass bottles	30
2.7.2.2 Retort pouches	31
2.7.2.2.1 Pouch material characteristics and specifications	32
2.7.2.2.2 Impulse sealing	34
2.7.2.2.3 Advantages of retort pouch	34
2.7.3 Container Integrity	34
2.8 Optimization of the process	35
2.9 Milk and Milk products	36
2.9.1 Sterilized Milk	36
2.9.2 Flavoured Milk	37
2.9.3 <i>Kheer</i>	37
2.9.4 <i>Sevian</i>	38
2.10 <i>Stevia</i>	39
2.11 Value addition	39
2.12 Entrepreneurship development	40
2.13 Socio-Economic aspect (Dairying and national economy)	41
2.14 Shelf Life	42
2.14.1 Shelf life prediction studies	42
2.15 Problem Identifications	43
2.16 Knowledge gaps	44
2.17 Objectives of the study	44

Chapter III

MATERIALS AND METHODS

46-81

3.1 Field survey	46
3.1.1 Mewat district (Haryana state)	46
3.1.2 Vidarbha region (Maharashtra state)	47
3.2 Why study of traditional products	48
3.3 Selection and adaptation of appropriate processing technology	48
3.3.1 Why need of processing	49
3.4 Selection of milk products to be processed	49
3.4.1 Technology development	50
3.5 Packaging	50
3.5.1 Containers	51
3.5.1.1 Glass bottles	51
3.5.1.2 Retort pouches	53
3.5.1.2.1 Pouch filling	54
3.5.1.2.2 Exhausting the filled pouch	54
3.5.1.2.3 Specifications of retort pouches	54
3.5.1.2.4 Sealing test	55
3.5.1.2.5 Container Examination and Tests	56
3.5.1.2.5.1 Visual Examination of retort pouches	56
3.6 Optimizing the conditions for sterilization	57
3.7 Development of technology identified and adopted	58
3.7.1 Experiments planned	58
3.7.2 Test procedures followed for judging the keeping quality of milk and milk Products	58

3.7.3 Experiments procedure	60
3.7.3.1 Product formulations	61
3.8 Sterilized milk	62
3.9 Sterilized flavoured milk	63
3.10 Traditional milk products	64
3.10.1 Processing of milk products	65
3.10.1.1 <i>Kheer</i>	67
3.10.1.1.1 Selection of rice	68
3.10.1.2 <i>Sevian</i>	70
3.10.1.2.1 Selection of Vermicelli	70
3.11 Analysis of milk and milk products	72
3.11.1 Milk quality assessment	72
3.11.1.1 Rapid testing	73
3.11.1.1.1 Detection of starch	73
3.11.1.1.2 Detection of cane sugar	73
3.11.1.1.3 Detection Urea	73
3.11.1.1.4 Rosalie acid test for carbonates	73
3.11.2 Physical testing	74
3.11.2.1 COB	74
3.11.2.2 pH	74
3.11.3 Chemical testing	74
3.11.3.1 Alcohol test	74
3.11.3.2 Turbidity test	74
3.11.3.3 Fat	74
3.11.3.4 Protein	75
3.11.3.5 Acidity	75
3.11.3.6 SNF	75
3.11.3.7 Total solids	75
3.11.3.8 Total ash	75
3.11.4 Microbiological tests	76
3.11.4.1 TPC	76
3.11.5 Organoleptic properties	76
3.11.5.1 Tests for acceptability and sensory evaluation through taste panel	76
3.12 Tests for shelf life	77
3.13 Statistical analysis	79
3.14 Economics of the milk and milk products	80
3.14.1 Net present worth	80
3.14.2 Benefit Cost Ratio	80
3.14.3 Payback period	81

Chapter IV

RESULTS AND DISCUSSION

82-155

4.1 Preparation of milk sample	83
4.2 Physical properties of raw milk	83
4.2.1 Rapid tests	83
4.2.2 Clot-on-boiling (C.O.B.) test	84
4.2.3 pH test	84
4.3 Chemical properties of raw milk	84
4.4 Microbiological Properties of Raw Milk	85
4.5 Sensory evaluation	86

4.6	Effect of heat treatment on milk and milk properties	86
4.6.1	Effect of heat treatment on physical properties during storage of sterilized milk	88
4.6.1.1	Clot on boiling test	88
4.6.1.2	pH	88
4.7	Effect of heat treatment and storage on chemical properties of sterilized milk	92
4.7.1	Turbidity test	92
4.7.2	Acidity	92
4.7.3	Fat	95
4.7.4	Protein	97
4.7.5	Total solid	98
4.7.6	Total ash	98
4.7.7	SNF	98
4.8	Effect of heat treatment and storage on microbiological properties of sterilized milk	100
4.8.1	Total plate count	100
4.9	Effect of heat treatment and storage on sensory properties of sterilized milk	103
4.10	Flavoured milk	105
4.11	Microbiological properties of the chocolate flavoured milk	112
4.12	Mango flavoured milk	116
4.13	Microbiological properties of the mango flavoured milk	122
4.14	Organoleptic Properties of the Mango Flavoured Milk	124
4.15	Pineapple flavoured milk	125
4.16	Traditional dairy products	135
4.16.1	Effect of heat treatment on physiochemical properties of <i>Kheer</i> and <i>Sevian</i>	136
4.16.2	Effect of heat treatment on microbiological properties of <i>Kheer</i> and <i>Sevian</i>	147
4.16.3	Sensory properties	151
4.17	Economic viability of the technology	153
4.18	Impact of the technology on the rural households	154

CHAPTER V

SUMMARY, CONCLUSIONS AND SUGGESTIONS

156-166

5.1	Major results obtained from the study	
5.1.1	Rapid tests	158
5.1.2	Clot-on-Boiling (C.O.B.) Test	159
5.1.3	pH	159
5.1.4	Alcohol test	159
5.1.5	Turbidity test	160
5.1.6	Fat	160
5.1.7	Protein	160
5.1.8	Acidity	160
5.1.9	SNF	161
5.1.10	Total solids	161
5.1.11	Total ash	161
5.1.12	Total Plate Count	161
5.1.13	Organoleptic properties	162
5.1.14	Shelf life	162
5.1.15	Economic viability of the technology	162
5.2	Conclusions	163

5.3	Limitations of the study	164
5.4	Suggestions	164
5.5	Benefits of the technology	165

REFERENCES	167-184
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APPENDICES	185-271
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BRIEF BIODATA
