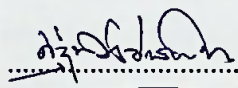


**DECLARATION**

**LIBRARY  
UNIVERSITY OF MORATUWA, SRI LANKA  
MORATUWA**

"I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books)

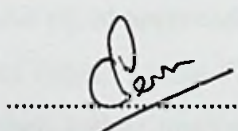
  
.....

13/03/2013

Signature

Date

The above candidate has carried out research for the master Dissertation under my supervision.

  
.....

Date 07/06/2013

Signature of the supervisor

University of Moratuwa  
  
106867

65 "12"  
62:65(043)

106867

## ACKNOWLEDGEMENTS

I would like to express my profound gratitude to my Co Supervisors Prof. Sarath Dasanayaka and Prof Chandana Perera for their sincere help, encouragement and moral support that extended to me to complete this research project successfully. I remind with appreciation of their involvement, time they spared from their busy schedules, which helped me to complete this research on time. A special appreciation goes to Mr. Dinesh Samarasinghe who helped me to develop questionnaire and help on resolving issues in statistical calculations.

I would like to extend my earnest gratitude to Department of Management of Technology of University of Moratuwa for giving me the opportunity to follow the Master of Business Administration in Management of Technology Degree program. I extend my sincere thanks to all my lecturers and resource personnel who imparted their knowledge and experience and encouragement me towards obtaining a MBA.

A special appreciation should go to the Mr. R.M.J.B. Rathnayake Head –Milco factory Narahenpita, and Mr. N.M. Gamini, NLDB farm Weerawila, who shared their experience on dairy processing plants. Special thanks goes to Mr. Chanaka Sudesh at Tissamaharamaya , Mr. Sameera Indunil at Ambalanthota and Dr. Daminda Senannayake who assisted me in collecting data from small scale dairy processors and arranged interviews with them in Hambanthota area. An equal appreciation goes to Mr.Upali Weerasinghe and Production Group 2 Management staff of Nestle Lanka PLC for giving their thoughts on certain issues relating to my study and giving their fullest support to carry out my study work during past two years.

I would like convey my gratitude to MBA colleague Boniface Fernando and his family for the support he has given all these 2 years and other colleagues Sunil Premathilaka, Vijitha Muthugala and Darshana Karunarathna for making MBA more pleasurable. I extend my special thanks to my husband Praveen, without him I may not have succeed in my MBA program. Finally I would like to extend my gratitude to my family for their encouragement and patience throughout the two years of my study program.

## **ABSTRACT**

The main purpose of this study is to identify factors affecting to technological issues in dairy processing industry and to give recommendations for those factors. Dairy sector is one of the important sectors contributing to rural economy of country. In dairy sector, self sufficiency of milk is not achieved yet and government of Sri Lanka is targeting to achieve 50% of self sufficiency by year 2015. Not only dairy farming industry but dairy processing industry should also simultaneously develop to achieve this target. This study is targeted at both small and large scale dairy processing plants. This study covers only small scale dairy processors of Hambanthota District and four large scale dairy processors. This study is carried out through a situational analysis based on interviews with industry people and followed by a questionnaire survey to gather data. The situational analysis of small scale dairy processors shows that usage of modern technology is very limited and in large scale technology status was good though there is capacity for further improvement. Since this is a quantitative analysis data gathered and analyzed using statistical software in order to identify the factors affecting to technological issues. In small scale factor identification is not significant since social background of the people has affected to the data gathered. In large scale two major factors are significant and those are lack of financial capital of the organization and R&D capability of the organization. Recommendations are given to these two factors focusing on both organizational and government factors of the country.

**Key Words: Dairy, Technology, Processing**

## TABLE OF CONTENTS

DECLARATION .....	i
ACKNOELDEGEMENTS .....	ii
ABSTRACT.....	iii
TABLE OF CONTENTS.....	iv
LIST OF FIGURES .....	vii
LIST OF TABLES .....	vii
LIST OF ABBREVIATIONS.....	x
1.0 INTRODUCTION .....	1
1.1 Dairy Industry .....	1
1.2 Dairy technology .....	2
1.3 History of dairy technology in Sri Lanka.....	2
1.4 Dairy processing industry in Sri Lanka.....	4
1.5 Government institutes & private bodies in dairy processing industry .....	6
1.6 Identification of research situation .....	8
1.7 Significance of the research study.....	11
1.8 Research objectives .....	12
1.9 Methodology.....	12
1.10 Limitations.....	14
1.11 Chapter framework.....	14
2.0 LITERATURE REVIEW .....	16
2.1 Dairy Technology.....	16
2.2 Technological issues in dairy industry .....	19
2.3 Critical factor analysis.....	21
2.4 Factors affecting to technological issues in dairy processing industry .....	22
2.5 Summary of the chapter .....	27
3.0 METHODOLOGY AND CONCEPTUAL FRAME WORK .....	28
3.1 Conceptual Frame Work .....	29
3.2 Hypothesis development .....	30

3.3	Operationalization of variables .....	35
3.4	Sampling method.....	37
3.5	Data collection.....	38
3.6	Data analysis .....	38
3.7	Summary of the chapter .....	39
4.0	SITUATIONAL ANALYSIS .....	40
4.1	General Background of milk Industry.....	40
4.2	Milk production.....	43
4.3	Milk collection .....	45
4.4	Milk processing.....	47
4.4.1	Micro and small scale dairy industry technological status .....	48
4.4.2	Large scale dairy industry technological status.....	54
4.5	Contribution from institutes to dairy processing industry.....	57
4.6	SWOT analysis on dairy processing industry .....	59
4.7	Summary of the chapter .....	60
5.0	DATA ANALYSIS.....	61
5.1	Reliability and validity check of data.....	61
5.1.1	Reliability checking of data.....	61
5.1.2	Factor analysis of data .....	67
5.2	Descriptive statistics.....	69
5.2.1	Behaviour of government related factors in dairy industry .....	69
5.2.2	Behaviour of organizational factors in dairy industry .....	71
5.2.3	Behaviour of industry related factors in dairy industry .....	72
5.3	Inferential statistics .....	73
5.3.1	Correlation analysis .....	73
5.3.2	Regression analysis.....	76
5.4	Summary of the chapter .....	85
6.0	FINDINGS AND RECOMMENDATIONS .....	86
6.1	Findings.....	86
6.2	Conclusion.....	91

6.3 Recommendations .....	92
6.4 Agenda for futher reseach .....	94
APPENDIX 1 .....	95
References.....	100



## LIST OF FIGURES

	Page
Figure 1.1 Dairy channels in Sri Lanka	5
Figure 3.1 Conceptual model	30
Figure 4.1 Milk production and collection from 2005 to 2010	41
Figure 4.2 Full cream milk powder imported quantity and value	42
Figure 4.3 Stoves in curd manufacturing plant	49
Figure 4.4 Food safety measures in minor scale manufacture	51
Figure 4.5 Curd cooling room in medium scale manufacture	52
Figure 4.6 Utensils used in curd manufacturing industry	53
Figure 5.1 Descriptive statistics on government factors	70
Figure 5.2 Descriptive statistics on organizational factors	71
Figure 5.3 Descriptive statistics on industry factors	72

## LIST OF TABLES

	Page
Table 1.1 Milk powder imports	8
Table 1.2 Milk production and collection	9
Table 3.1 Operationalization table	35
Table 4.1 Dairy sector statistics	44
Table 4.2 Major issues in dairy farming sector	45
Table 4.3 Large scale dairy processors	55
Table 5.1 Cronbach's Alpha values got for the questions	62
Table 5.2 Recalculation of Cronbach alpha for questions in small scale	63
Table 5.3 Cronbach values got for factors	64
Table 5.4 Recalculation of Cronbach alpha for factors in small scale	65
Table 5.5 Recalculation of Cronbach alpha for factors in large scale	65
Table 5.6 Cronbach alpha for variables in small scale	66
Table 5.7 Cronbach alpha for variables in large scale	67
Table 5.8 Factor analysis on variables in small scale	67
Table 5.9 Factor analysis on variables in large scale	68
Table 5.10 Correlations among hypothesis in small scale industry	74
Table 5.11 Correlations among hypothesis in large scale industry	75
Table 5.12 Summary of Regression analysis for hypothesis 1	76
Table 5.13 Summary of Regression analysis for hypothesis 2	77
Table 5.14 Summary of Regression analysis for hypothesis 3	77
Table 5.15 Summary of Regression analysis for hypothesis 4	78
Table 5.16 Summary of Regression analysis for hypothesis 5	78
Table 5.17 Summary of Regression analysis for hypothesis 6	79



Table 5.18 Summary of Regression analysis for hypothesis 7	80
Table 5.19 Summary of Regression analysis for hypothesis 8	80
Table 5.20 Summary of Regression analysis for hypothesis 9	81
Table 5.21 Summary of Regression analysis for hypothesis 10	81
Table 5.22 Summary of Regression analysis in small scale industry	82
Table 5.23 Regression analysis in small scale industry	83
Table 5.24 Summary of Regression analysis in large scale industry	83
Table 5.25 Regression analysis in large scale industry	84

## LIST OF ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
BOD	Biological oxygen demand
CIP	Cleaning in place
FSMS	Food Safety Management System
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis Critical Control Point
IDPL	International Dairy Product Limited
ISO	International Standards Organization
Ltd	Limited
MN	Million
MT	Metric ton
NDDDB	National Dairy Development Board
NLDB	National Livestock Development Board
PLC	Public Liability Company
PRP	Pre requisite program
Pvt	Private
R&D	Research and Development
SLS	Sri Lankan Standards
SME	Small & medium entrepreneurs
SNF	Solid Non Fat
SPSS	Statistical Package for Social Science
SWOT	Strengths Weakness Opportunities Threats
UHT	Ultra high temperature

