TABLE OF CONTENTS

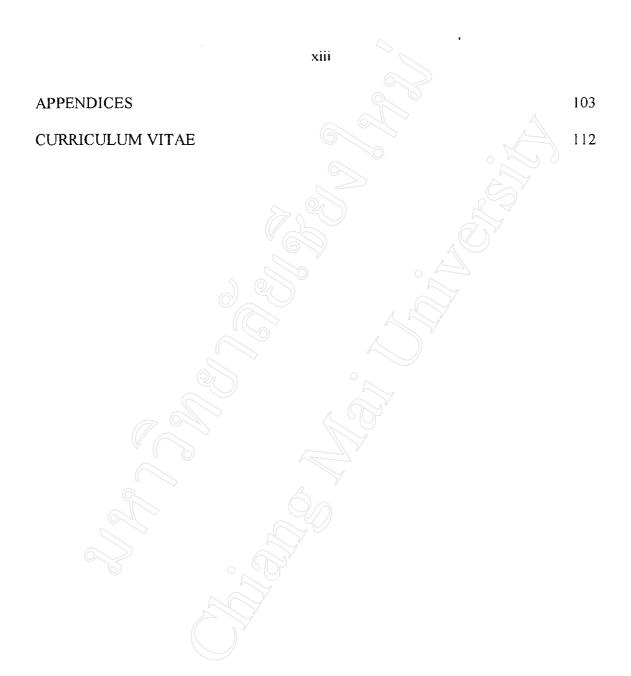
	Page
ACKNOWLEDGMENT	i
ABSTRACT	ii
THAI ABSTRACT	vi
TABLE OF CONTENTS	ix
LIST OF TABLES	xiv
LIST OF FIGURES	xvii
CHAPTER I INTRODUCTION	1
1.1 Background	1
1.2 Rationale	3
1.3 Objectives of the Study	4
1.4 Usefulness of the Study	4
1.5 Review of Literature	5
1.5.1 Debt and Loan Repayment	5
1.5.2 Factors Related to Credit	6
1.5.3 Previous Study Related to Dairy Farming	6
1.5.4 Concept of Production Function and Application	
to Dairy Farming	8
1.5.4.1 Concept of Production Function	8
1.5.4.2 Application of Production Function on Dairy Farming	9
CHAPTER II RESEARCH METHODS	10
2.1 Scope of the Study	10
2.2 Theoretical Framework	11

.

\mathbf{x}	
2.3 Data Collection	14
2.3.1 Primary Data	14
2.3.1.1 Bio-physical Variables	15
2.3.1.2 Socio-economic Variables	15
2.3.2 Secondary Data	16
2.4 Data Analysis	16
2.4.1 Variables Defined	18
2.4.1.1 Output Variable	18
2.4.1.2 Input Variables	18
CHAPTER III THE STUDY AREA AND DAIRY FARMING	
3.1 General Description of the Study Area	21
3.1.1 Bio-Physical Information of the Study Area	21
3.1.1.1 Location and Topography	21
3.1.1.2 Climate, Soil and Water Resources	21
3.1.2 Socio-Economic Information of the Study Area	23
3.1.2.1 Population	23
3.1.2.2 Occupation	23
3.1.2.3 Dairy Farming	23
3.1.2.4 Bank for Agriculture and Agricultural Cooperatives	
(BAAC)	24
3.2 Socio-Economic Background and Dairy Farming of	
the Sampled households	24
3.2.1 Demographic Characteristics	24
3.2.2 Farm Activities and Resources	25
3.2.3 Cropping Patterns	30
3.2.4 Labor Use	30
3.2.5 Land Ownership/Holding	31
3.2.6 Farm Management	35
, -	

3.2.6.1 Raising Systems	35
3.2.6.2 Water Resource in Dairy Farming	35
3.2.6.3 Feeding Management	36
3.2.6.4 Mineral Supplement	36
3.2.6.5 Cow Culling Management	36
3.2.6.6 Manure Handling	37
3.2.6.7 Disease Incidence and Fertility	37
3.2.7 Milk Production	37
3.2.8 Milk Consumption	39
3.2.9 Milk Market Channels	40
3.2.10 Price of Raw Milk in the Market	42
3.2.11 Government Agencies for Dairy Farming	43
3.2.12 Attitudes toward Dairy Farming and Government Service	44
3.2.12.1 Attitude towards Government Service and	
Veterinary Volunteer Service	44
3.2.12.2 Attitude towards Dairy Farming	45
3.2.13 Future Plan on Dairy Farming	45
3.2.14 Problems on Dairy Farming	46
3.2.14.1 Problems Related to Production	47
3.2.14.2 Problems Related to Marketing	48
3.2.14.3 Problems Related to Policy and Organization	49
CHAPTER IV LOAN AND LOAN REPAYMENT	50
4.1 Agricultural Credit Sources	50
4.1.1 Institutional Source of Credit	50
4.1.2 Non-Institutional Source of Credit	52
4.2 Loan Collateral	53
4.3 Pay Back Period	55
4.3.1 Short-Term Pay Back Period	55

4.3.2 Medium-Term Pay Back Period	55
4.3.3 Long-Term Pay Back Period	55
4.4 Interest Rate	56
4.5 Indebtedness and Reasons for Obtaining Loan	57
4.6 Loan by Farmers' Experience	59
4.7 Loan by Farm Size	60
4.8 Loan Repayment	61
4.8.1 Loan Repayment in Different Sites in the Study Area	61
4.8.2 Loan Repayment by Experience of Dairy Farmers	63
4.8.3 Loan Repayment by Farm Size	64
CHAPTER V OPTIMUM LEVEL OF CAPITAL NEED IN DAIRY FARMING	66
5.1 Economic Analysis of Milk Production Function	66
5.1.1 Specifications of the Model	66
5.2 Descriptive Statistics of the Variables	69
5.3 Estimation of Milk Production Function	70
5.3.1 Testing for Multicollinearity and Heteroskedasticity	
in the Final Model	71
5.3.2 Result of the Production Function Estimation	
in the Final Model	73
5.4 Optimum Level of Capital Need in Dairy Farming	77
5.4.1 Input Use Efficiency	80
5.4.2 Optimum Level of Input Used and Capital Need	82
CHAPTER VI CONCLUSION, DISCUSSION AND RECOMMENDATIONS	93
6.1 Conclusion and Discussions	93
6.2 Recommendation	97
6.3 Further Research	98
REFERENCES	99



LIST OF TABLES

Table		Page
1.1	Production and demand of raw milk production in Thailand.	2
1.2	Quantity and value of milk production imported into Thailand.	3
2.1	The number of interviewed farmers in the study area.	15
3.1	The distribution of dairy farmers in Chiang Mai province.	24
3.2	The percentage of household of education level of interviewed farmers	
	and spouses.	25
3.3	The percentage of household in different experience by different farm size	
	and average number of dairy cows in the study area.	26
3.4	Average number of dairy cows by different farm size in the study area.	26
3.5	Distribution of HF crossbred in the herd.	27
3.6	Farm activities by farm size in the study area.	29
3.7	Average annual gross margin from each activity in dairy farming.	29
3.8	Land ownership in the study area.	31
3.9	Area per household and the percentage of household of land use.	32
3.10	Area per household and the percentage of household of land types.	33
3.11	Area per household and the percentage of household of land types by	
	different farm size.	33
3.12	An average pasture land with herd size.	34
3.13	Annual milk production in the study area.	38
3.14	Annual milk production by different farm size in the study area.	39
3.15	Milk consumption in the study area.	40
3.16	Purchasing and processing of raw milk in the study area.	42
3,17	Price of raw milk in 1997.	43

	. xv	
3.18	Attitude towards government service and veterinary volunteer service.	44
3.19	The percent of household of attitude towards dairy farming.	45
3.20	The percent of household of future plan on dairy farming in this study area	46
4.1	The twelve Dairy Farming Promotion Special Project of BAAC.	53
4.2	Amount of initial investment in the study area.	57
4.3	Amount of subsequent investment and operating costs.	58
4.4	Reasons for obtaining loans from BAAC.	59
4.5	Loan by different farmers' experience in the study area.	60
4.6	Loan by farm size of dairy farmers in the study area.	61
4.7	Outstanding loan per household of dairy farmers in the study area.	62
4.8	Loan repayment rate by different sites in the study area.	63
4.9	Loan repayment rate with different farmers' experience in the study area.	64
4.10	Loan repayment rate by farm size in the study area.	65
5.1	Descriptive statistic of variables.	70
5.2	GLS estimates of the production function of milk in the model.	73
5.3	Milk production of different loan repayment performance.	76
5.4	Milk production of different loan repayment performance by	
	different farm size	76
5.5	Amount of loan and interest rate of BAAC.	78
5.6	Price of building and equipment by different interest rates.	78
5.7	Price of operational costs by different interest rates.	79
5.8	The ratio of MVP to unit price of input variables in different loan	
	repayment performance at mean level.	82
5.9	The optimum level of capital need of three different repayment	
	performance groups by different farm size.	84
5.10	The optimum level of capital need of three different repayment performance	
	groups by different farm size when use 50 % of operational costs.	89

5.11	Total capital requirement by including value of cows for new dairy	
	farmers by different farm size.	90
5.12	The optimum level of capital need of three different repayment	
	performance groups by different farm size when milk price increased 10%.	92

LIST OF FIGURES

Figu	are San	Page
2.1	Components on performance of dairy farming systems in the scope	
	of the study.	11
2.2	Capital need in the use of a variable input.	13
3.1	Map of the study area.	22
3.2	Cropping patterns in the study area.	. 30
3.3	Milk market channels in the study area.	41