

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
ENGLISH ABSTRACT	iv
THAI ABSTRACT	vi
TABLE OF CONTENTS	ix
LIST OF TABLES	xii
LIST OF FIGURES	xiii
ABBREVIATIONS	xiv
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE REVIEW	7
2.1 Background information about Vietnam	7
2.2 Beef cattle production in the north of Vietnam	10
2.3 Beef cattle breeds and breeding programmes in Vietnam	11
2.4 Cattle farms, type and management	12
2.5 Feed resources for cattle and potential of crop by-products	13
2.6 Methods to improve quality and preservation period of crop by-products	16
2.6.1 <i>Rice straw treatment methods</i>	16
2.6.2 <i>Urea molasses multinutrient block</i>	17
2.7 Marketing	19
2.8 Genotype and environment interactions	20
CHAPTER 3 MATERIALS AND METHODS	22
3.1. Study area	22
3.2. Villages	26
3.3. Secondary data collection	27
3.4. Farmer interviews	27
3.5. Feeding trial	28

TABLE OF CONTENTS (Continued)

	Page
3.6. Treatment of crop by-products	31
3.6.1. Urea-treated rice straw (UTRS)	31
3.6.2. Urea-molasses-multi-nutrient block (UMMB)	32
3.7. Data analysis	32
CHAPTER 4 RESULTS	34
4.1. Cattle production in northern Vietnam	34
4.1.1. Description of the study area	34
4.1.2. General household information	35
4.1.2.1. Households size and information of household leaders in the investigated villages	35
4.1.2.2. Land ownership	37
4.1.3. Crop production	39
4.1.3.1. Area and output of crops	39
4.1.3.2. Methods to improve quality and preservation period of crop by-products	41
4.1.4. Cattle production	42
4.1.4.1. Reasons for keeping cattle	42
4.1.4.2. Cattle breed	43
4.1.4.3. Cattle herd composition	44
4.1.4.4. Cattle herd disposal	45
4.1.4.5. Feeding practices	48
4.1.4.6. Alternative feed sources	49
4.1.4.7. Constraints of cattle production	50
4.2. Feeding trial	52
4.2.1. Two frame size groups of Yellow cattle in the study region	52
4.2.2. Feeding trials with different husbandry and feeding managements for two different frame sizes of cattle	54
4.2.3. Economic feasibility of the feeding experiment	59

TABLE OF CONTENTS (Continued)

	Page
CHAPTER 5 DISCUSSION	62
5.1. Cattle production in northern Vietnam	62
5.1.1. <i>Socio economic characteristics of study regions</i>	62
5.1.2. <i>Crop production</i>	64
5.2. Cattle production in the study region	65
5.2.1. <i>Reasons for keeping cattle</i>	65
5.2.2. <i>Feeding practices</i>	66
5.2.3. <i>Some potential crop by-product resources used as alternative feed in the study region</i>	67
5.3. Feeding trials	69
5.3.1. <i>Two frame size groups in the study regions</i>	69
5.3.2. <i>Effects of husbandry and feeding management on two frame size groups</i>	70
5.3.3. <i>Economics of supplementation of the two frame size cattle fed UTRS, UMMB and fixed ration</i>	72
5.3.4. <i>Farmers' Perceptions</i>	73
CHAPTER 6 CONCLUSIONS	74
REFERENCES	75
APPENDICES	92
Annex 1 : Questionnaire for Survey	92
Appendix I. General information and main socio-economic data	93
Appendix II. Crop production	94
Appendix III. Cattle production	96
CURRICULUM VITAE	102

LIST OF TABLES

Table	Page
1: Livestock population in Yen Chau and Mai Son in 2009	25
2: Experimental design	29
3: General information of investigated villages	35
4: General information of respondents	36
5: Land tenure in investigated household	37
6: Planted crops and plot size per crop in the investigated households	39
7: Yield of main crops in the investigated households, harvested during the last 12 months	40
8: Crop by-products treatment known by farmers	42
9: Reasons for keeping cattle	43
10: Cattle herd composition in investigated household	45
11: Kinds of cattle herd disposal by villages experienced during last year	47
12: Cattle feedstuffs in investigated households in dry season	49
13: Constraints of keeping cattle in investigated households	51
14: Initial weight of experiment cattle by frame size	52
15: Initial weight of experimental cattle by village	53
16: ADG of control treatments in two frame size groups	54
17: Initial weight of experimental cattle	55
18: Percentage effect from frame size and treatment factors to the change of ADG	56
19: Average daily gain of SFS cattle with different treatments	57
20: Average daily gain of LFS cattle with different treatment	58
21: Net benefit accumulating during the experiment by treatment and size group of Yellow cattle	60
22: The overall change in net benefit for the treatment group over the control group	61

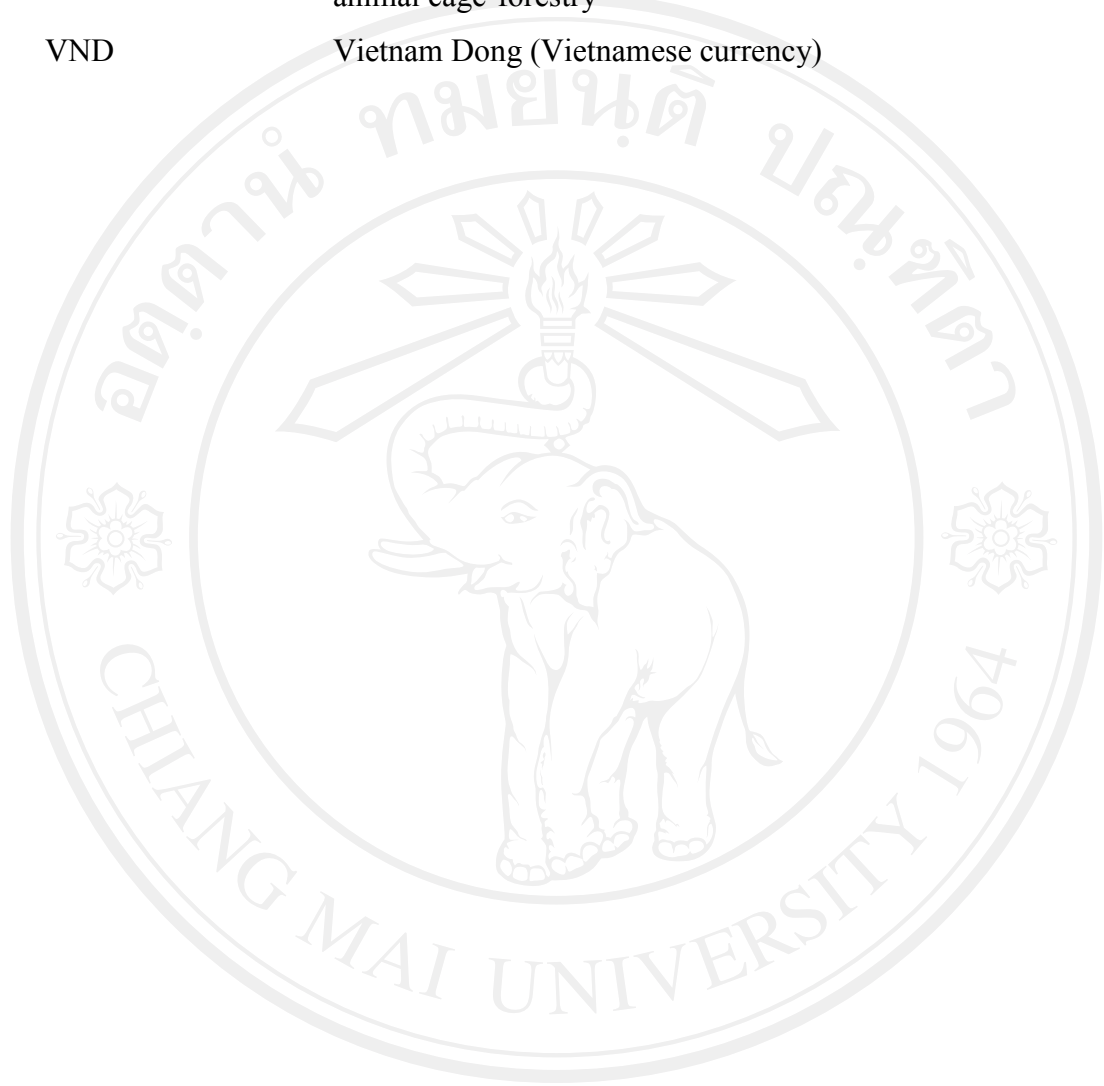
LIST OF FIGURES

Figure	Page
1: Map of Son La province	22
2: Planted area of rice	24
3: Production of rice	24
4: Planted area of maize	24
5: Production of maize	24
6: Planted area of cassava	24
7: Production of cassava	24
8: Planted area of sugar cane	24
9: Production of sugar cane	24

ABBREVIATIONS

°F	<i>Degrees Fahrenheit</i>
°C	<i>Degree Celsius</i>
ACIAR	Australian Centre for International Agricultural Research
ADG	average daily gain
ADG1	average daily gain in the first month
ADG2	average daily gain in the second month
ADG3	average daily gain over the whole experimental period
a.s.l.	above sea level
CRBD	Complete Randomized Block Design
DARD	Department of Agriculture and Rural Development
DFG	German Research Foundation (Deutsche Forschungsgemeinschaft)
e.g.	for example
FMD	Foot-and-mouth disease
IFPRI	International Food Policy Research Institute
GAIN	Global Agriculture Information Network
GxE	Genotype and environment
HF	Holstein Friesian
hh	household
Laos PDR	Laos People's Democratic Republic
LFS	Large frame size (cattle)
LWG	live weight gain
NB	net benefit
NDF	Neutral Detergent Fibre
PRA	Participatory Rural Appraisal
QD-TTg	Decision of Prime Minister (Vietnamese)
SD	Standard deviation
SFS	Small frame size (cattle)
UMMB	Urea-molasses-multinutrient block
UTRS	Urea-treated rice straw

V.A.C.	Vuon-Ao-Chuong (Vietnamese)/ Garden-fish pond-animal cage
V.A.C.R.	Vuon-Ao-Chuong-Rung (Vietnamese)/Garden-fish pond-animal cage-forestry
VND	Vietnam Dong (Vietnamese currency)



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved