

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
ABSTRACT IN ENGLISH	v
ABSTRACT IN THAI.....	vi
LIST OF TABLES.....	ix
LIST OF ILLUSTRATIONS	x
ABBREVIATIONS AND SYMBOLS	xi
1. INTRODUCTION	
1.1 Introduction and objectives.....	1
1.2 Significance and impact of the study.....	2
2. LITERATURE REVIEW	
2.1 Biological and biochemical aspects of <i>Salmonella</i>	3
2.2 Morphological base for serotyping.....	6
2.3 Serological aspects of <i>Salmonella</i>	9
2.4 Distribution of <i>Salmonella</i> serotypes in Thailand.....	11
2.5 Laboratory identification and serotyping.....	15
2.6 <i>Salmonella</i> and salmonellosis in pigs.....	20
2.7 Distribution of <i>Salmonella</i> in pigs and pork	21
2.8 Slaughtering process and <i>Salmonella</i> contamination.....	22
3. MATERIAL AND METHODS	
3.1 Study design	25
3.2 Sample size determination	26
3.3 The slaughtering process	26
3.4 Collection of samples	27
3.5 Laboratory procedures	
3.5.1 Conventional culture: ISO 6579 (2002)	29
3.5.2 Serological testing: SALMOTYPE® Pig LPS ELISA	34
3.6 Data management and statistical analysis.....	36

4. RESULTS	
4.1 Sample prevalence of <i>Salmonella</i>	37
4.2 <i>Salmonella</i> serotypes	38
4.3 Distribution of <i>Salmonella</i> serotypes	44
4.4 Serological results	49
5. DISCUSSIONS AND CONCLUSIONS	
5.1 Prevalence of <i>Salmonella</i> in the slaughter pigs.....	52
5.2 Sample prevalence of the pig carcasses.....	55
5.3 Pre-slaughter pig factors effecting <i>Salmonella</i> prevalence.....	56
5.4 <i>Salmonella</i> serotype distribution in the slaughter pigs and carcasses	57
5.5 Conclusions.....	58
REFERENCES	60
APPENDICES	66
CURRICULUM VITAE	70
DECLARATION	72

â€¢
 â€¢
 Copyright © by Chiang Mai University
 All rights reserved

LIST OF TABLES

TABLE	PAGE
1. <i>Salmonella</i> species and subspecies	3
2. Biochemical characteristics of <i>Salmonella</i>	5
3. Common serotypes of <i>Salmonella</i> isolates from humans in 1993 to 2002, Thailand	12
4. Distribution of the 10 most common serotypes from different sources in Thailand	14
5. Principles and media for conventional culturing of <i>Salmonella</i>	15
6. Biochemical tests for <i>Salmonella</i>	18
7. Hygienic aspects and preventive actions	24
8. Sample prevalence of <i>Salmonella</i> and 95% confidence intervals.....	37
9. Distribution of <i>Salmonella</i> somatic serogroups	38
10. <i>Salmonella</i> somatic serogroups found in lymph nodes by farms.....	39
11. Fecal proportions of <i>Salmonella</i> somatic serogroups distributed by farms....	40
12. Distribution of swab-1 prevalence of <i>Salmonella</i> somatic serogroups before use of chlorinated-water spray by farms	41
13. Distribution of <i>Salmonella</i> serogroups isolated from carcasses after overnight chilling classified by farms	42
14. <i>Salmonella</i> serotypes isolated from the slaughter pigs and carcasses.....	44
15. Distribution of <i>Salmonella</i> serotypes identified from various types of samples	46
16. <i>Salmonella</i> serotypes classified by farms of origin.....	48
17. Summary of serological results of all 181 meat juice samples	49
18. Comparison of lymph node culture results and the ELISA result of <i>Salmonella</i> at the individual pig level	50
19. Comparison of fecal culture and the ELISA results of <i>Salmonella</i> at the individual pig level.....	51

LIST OF ILLUSTRATIONS

FIGURE	PAGE
1. The micrographic structure of <i>Salmonella</i>	6
2. General structure of flagella.....	7
3. Structural arrangement of the outer layer of <i>Salmonella</i>	7
4. The lipopolysaccharide components	8
5. Slide movement.....	19
6. Slide agglutination: positive and negative reaction.....	19
7. Swab sampling sites on the carcass	28
8. <i>Salmonella</i> Serotyping flow chat (Slide agglutination test)	32
9. Overall summary of sample handling and <i>Salmonella</i> identification procedure	33
10. Flow chart of SALMOTYPE® Pig LPS ELISA.....	35
11. <i>Salmonella</i> serogroup proportions found in all 21 farms	43

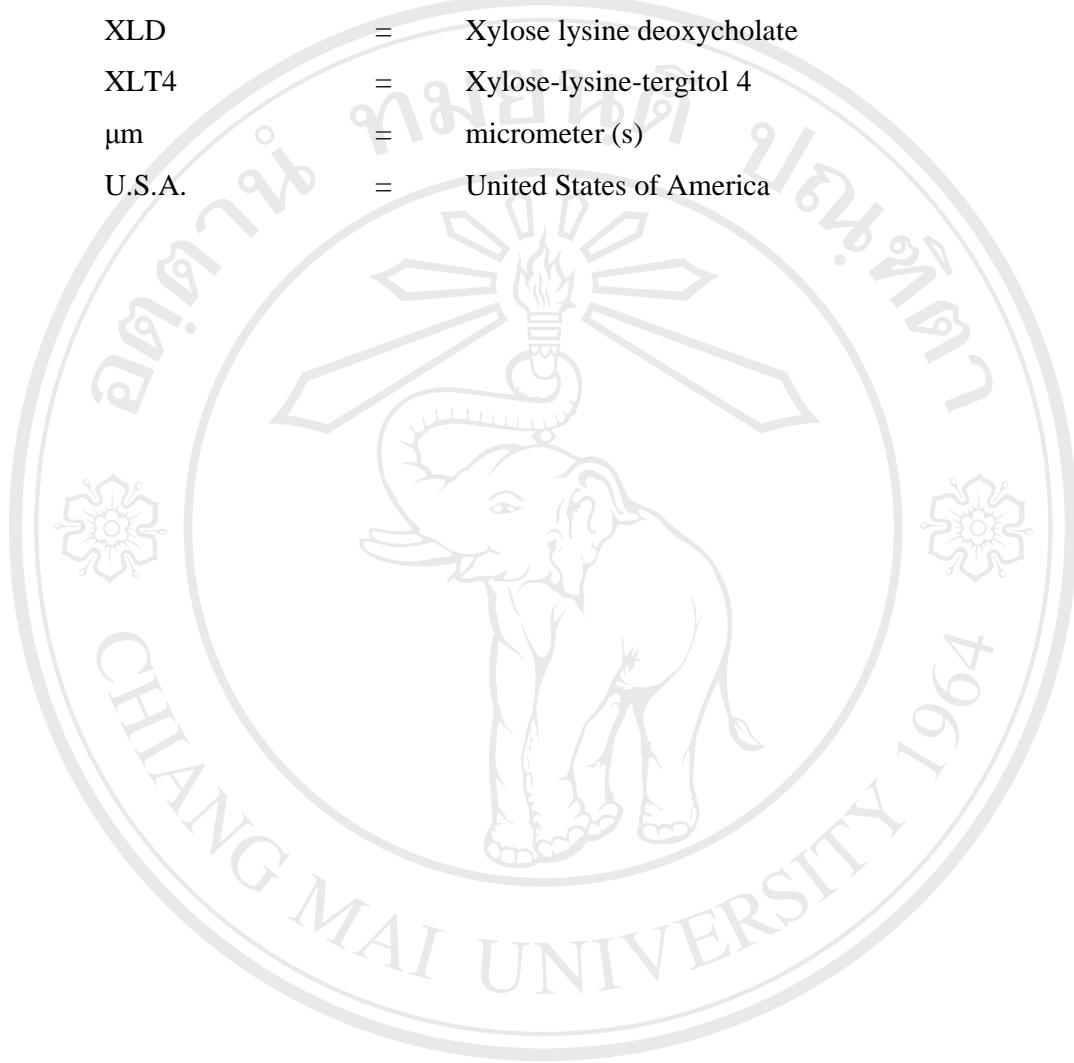
â€¢ ขอสงวนสิทธิ์ มหาวิทยาลัยเชียงใหม่
Copyright © by Chiang Mai University
All rights reserved

ABBREVIATIONS AND SYMBOLS

+	=	positive
-	=	negative
%	=	percent
&	=	and
°C	=	degree Celsius
®	=	Trademark
BGA	=	Brilliant Green agar
BPLS	=	Brilliant Green Phenol Red Lactose Sucrose agar
BPW	=	Buffered Peptone Water
CCP	=	Critical Control Point
CI	=	Confidence Intervals
CM	=	Chiang Mai (province)
cm ²	=	Square Centimeter
CMU	=	Chiang Mai University (Thailand)
CP	=	Control Point
DCA	=	Desoxy Cholate Citrate agar
Demin. water	=	Demineralized water
<i>E. coli</i>	=	<i>Escherichia coli</i>
e.g.	=	<i>exempli gratia</i> (Latin), for example
ELISA	=	Enzyme Immunoabsorbent Essay
et al.	=	<i>et alii</i> (Latin), and others
FU Berlin	=	Freie Universität Berlin (Germany)
G, g	=	gram(s)
HACCP	=	Hazard Analysis and Critical Control Point
H antigen	=	<i>Hauch</i> (German--meaning Breath) antigen
H ₂ S	=	Hydrogen Sulfide
Hrs	=	Hours
i.e.	=	<i>id est</i> (Latin), that is; in other words

ISO	=	International Standard Organization
Lab.	=	Laboratory
LDC	=	Lysine decarboxylase
Lmt.	=	Limited
LP	=	Lamphun (province)
LPS	=	Lipopolysaccharides
MCLB	=	MacConkey Lactose Bile-salt agar
MIL	=	Motile-Indole-Lysine
Min.	=	Minute (s)
ml	=	milliliter (s)
MSc VPH	=	Master of Science in Veterinary Public Health
MSRV	=	Modified Semi-solid Rappaport Vasiliadis
NA	=	Nutrient agar
NaCl (NSS)	=	Sodium Chloride (Normal Saline)
No.	=	Number (s)
O antigen	=	<i>Oberfläche</i> (German--meaning Surface) antigen
O.D.	=	Optical Density
ONPG	=	Orthonitrophenyl-β-D-galactopyranoside
ppm.	=	Part per million
RV	=	Rappaport Vasiliadis broth
RVS	=	Rappaport Vasiliadis Soya broth
Spp.	=	species
ssp.	=	sub species
SW1	=	Carcass swabs before chlorinated-water spray
SW2	=	Carcass swabs after overnight chilling
TSI	=	Triple Sugar Iron agar
TT	=	Tetrathionate broth
Vi antigen	=	Virulence (Capsular) antigen
VP	=	Voges-Proskaur
WHO	=	World Health Organization

XLD	=	Xylose lysine deoxycholate
XLT4	=	Xylose-lysine-tergitol 4
µm	=	micrometer (s)
U.S.A.	=	United States of America



â€¢ ขล€ส€น มหาวิทยาลัยเชียงใหม่
Copyright © by Chiang Mai University
All rights reserved