

636.513

Sa3

2008

ANTIBIOTIC SENSITIVITY PROFILE OF Salmonella spp.
ISOLATES IN THE LIVER OF CHICKEN
(Gallus gallus domesticus, Linn.) FROM
A DRESSING PLANT IN TRECE
MARTIRES CITY, CAVITE

THESIS

CHESTER JOSHUA VASQUEZ SALDANA

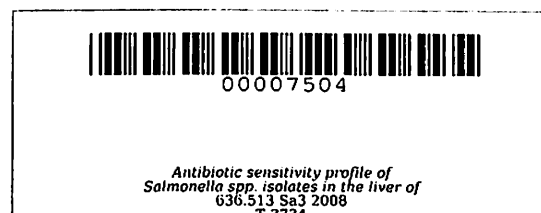
College of Veterinary Medicine and Biomedical Sciences
CAVITE STATE UNIVERSITY
Indang, Cavite

April 2008

**ANTIBIOTIC SENSITIVITY PROFILE OF *Salmonella* spp. ISOLATES IN THE
LIVER OF CHICKEN (*Gallus gallus domesticus*, Linn.) FROM A
DRESSING PLANT IN TRECE MARTIRES CITY,
CAVITE**

Undergraduate Thesis
Submitted to the Faculty of the
College of Veterinary Medicine and Biomedical Sciences
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree of
Doctor of Veterinary Medicine



CHESTER JOSHUA VASQUEZ SALDAÑA

April 2008

ABSTRACT

SALDAÑA, CHESTER JOSHUA V. April 2008. Antibiotic Sensitivity Profile of *Salmonella* spp. Isolates in the Liver of Chicken (*Gallus gallus domesticus*, Linn.) from a Dressing Plant in Trece Martires City, Cavite. Doctor of Veterinary Medicine, Cavite State University, Indang, Cavite. Adviser: Ma. Cynthia N. Rundina- dela Cruz, DVM, MS.

The study was conducted to determine the antibiotic sensitivity profile of *Salmonella* spp. isolates from the liver of 150 broiler chickens in a dressing plant in Trece Martires City, Cavite and to determine the prevalence rate of *Salmonella* spp among the broilers examined. Two hundred-seventy colonies were isolated from the Xylose Lysine Desoxycholate (Difco®). Morphological characterization revealed that 232 of the 270 isolates were gram negative, rod-shaped organisms. The isolates were further characterized biochemically and were found to possess the following *Salmonella* spp. reactions: Oxidase negative, Alkaline slant/ Acid butt with gas and Hydrogen Sulfide production on Triple Sugar Iron, indole negative with hydrogen sulfide production and motile on Sulfide Indole Motility Medium, Methyl red positive and Voges-Proskauer test negative, citrate utilization positive, nitrate, urease and gelatinase negative. The isolates also fermented glucose, lactose and yield negative result in maltose. The isolates were further characterized serologically using polyvalent O (A-I) and Vi antiserum and result showed that 5 isolates agglutinated the antiserum. On the other hand, these 5 isolates did not agglutinate the Vi antiserum.

All isolates were found to be susceptible to fosfomycin, gentamicin, trimethoprim-sulfamethoxazole and nitrofurantoin but were resistant to lincomycin,

erythromycin, ampicillin and tetracycline. Intermediate results were obtained with norfloxacin and ciprofloxacin.

The prevalence rate of *Salmonella* spp. in the liver of dressed chickens in a dressing plant in Trece Martires City, Cavite was found to be 3.3%. It is therefore recommended that proper handling practices be emphasized repeatedly from the farm to the household by application of Hazard Analysis Critical Control Point (HACCP) to prevent the organism from entering the human food chain and that indiscriminate use of antibiotics be avoided in food animals.

TABLE OF CONTENTS

	Page
TITLE PAGE.....	i
APPROVAL SHEET.....	ii
BIOGRAPHICAL SKETCH.....	iii
ACKNOWLEDGMENT.....	iv
TABLE OF CONTENTS	vi
LIST OF TABLES.....	vii
LIST OF APPENDIX TABLES	viii
LIST OF APPENDIX FIGURES.....	ix
LIST OF APPENDICES.....	xi
ABSTRACT.....	xiii
INTRODUCTION.....	1
Significance of the Study.....	2
Objectives of the Study.....	3
Scope and Limitations of the Study.....	3
Time and Place of the Study.....	4
REVIEW OF RELATED LITERATURE.....	5
METHODOLOGY.....	34
Animal.....	34
Sample Collection.....	34
<i>Salmonella</i> Reference Strain and <i>Salmonella</i> Polyvalent O (A-I) and Vi and Vi Antiserum	
Reference Strain.....	34
<i>Salmonella</i> Polyvalent O(A-I) and Vi and Vi Antisera	34
Microbiological Methods.....	35
Primary Enrichment.....	35
Direct Culture.....	35
Delayed Secondary Enrichment.....	35

Morphological and Biochemical Testing of Presumptive <i>Salmonella</i> spp. Isolates	
Gram Staining.....	36
Biochemical Testing.....	36
Serological Characterization	
Detection of O Antigen.....	37
Detection of Vi Antigen.....	37
Antibiotic Sensitivity Testing.....	38
Prevalence Rate Determination.....	39
RESULTS AND DISCUSSION.....	40
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	50
LITERATURE CITED.....	52
APPENDIX TABLES.....	57
APPENDIX FIGURES.....	80
APPENDICES.....	91

LIST OF TABLES

Table	Title	Page
1	Results of antibiotic sensitivity testing of <i>Salmonella</i> spp. using the disk diffusion method.	43

LIST OF APPENDIX FIGURES

Figure	Title	Page
1	Schematic diagram of the procedure for isolation and identification <i>Salmonella</i> spp.	80
2	A Dressing plant in Trece Martires City	81
3	The researcher collecting liver sample	81
4	Xylose Lysine Desoxycholate (XLD) used in the study	82
5	Presumptive <i>Salmonella</i> spp. isolates on XLD appearing as red colonies with black centers	82
6	Gram-stain reaction of the presumptive <i>Salmonella</i> spp showing gram-negative and rod-shaped bacteria	83
7	Result of Triple Sugar Iron Test: Alkaline slant/Acid but with gas and hydrogen sulfide production	83
8	Result of IMViC reactions: Indole negative, Methyl red positive (+), Vogues Proskauer negative (-) and Citrate utilization negative (+).	84
9	Result of Urease Test: A. Uninoculated urease broth, B. Urease showing negative result(-), C. Positive result on urease broth as indicated by a color change	84
10	Result of Nitrate Test A. Uninoculated nitrate broth, B. Isolate C56c inoculated onto nitrate showing a positive result as indicated by a color change	85

11	Result of Gelatinase Test: A. Uninoculated gelatinase medium, B. Isolate A1b inoculated on gelatin medium remained solid after refrigeration at 4-10°C for 15-30 minutes, hence negative for gelatinase activity	85
12	Result on inoculation on sugars glucose and sucrose, results of which were positive as indicated by yellow color, a maltose result of which is negative as indicated by red color.	86
13	Detection of O Antigen: Isolate no D61c showing positive agglutination of O antigen using polyvalent O (A-I) antiserum.	86
14	Detection of Vi Antigen: Isolate no F105a showing negative agglutination of Vi antigen using Vi antiserum.	87
15	Antibiotic Sensitivity Test of Isolate A13b	87
16	Antibiotic Sensitivity Test of Isolate C42e	88
17	Antibiotic Sensitivity Test of Isolate C56e	88
18	Antibiotic Sensitivity Test of Isolate D61c	89
19	Antibiotic Sensitivity Test of Isolate F105a	89

LIST OF APPENDIX TABLES

Appendix Table	Title	Page
1	Field Collection Data Sheet	57
2	Data on the Laboratory Test	65
3	Classification of Diameters of Zone of Inhibition of Selected Antimicrobial Drugs	78

LIST OF APPENDICES

Appendix	Title	Page
A	Schematic Diagram of the Standard Operating Procedure in the Dressing Plant	91
B	Procedure for Use of Rappaport-Vassiliadis (RV) Broth	92
C	Procedure for the use of Xylose Lysine Desoxycholate (XLD) Agar	93
D	Preparation of McFarland Nephelometer Standard	94
E	Preparation of Phosphate Buffer Saline	96

**ANTIBIOTIC SENSITIVITY PROFILE OF *Salmonella* spp. ISOLATES IN THE
LIVER OF CHICKEN (*Gallus gallus domesticus*, Linn.) FROM A
DRESSING PLANT IN TRECE MARTIRES CITY
CAVITE¹**

CHESTER JOSHUA VASQUEZ SALDAÑA

^{1/} An undergraduate thesis manuscript submitted to the faculty of the College of Veterinary Medicine and Biomedical Sciences of Cavite State University in partial fulfillment of the requirements for the degree Doctor of Veterinary Medicine with Contribution no. CVMBBS 2007 - 08 - 005. Prepared under the supervision of Dr. Ma. Cynthia Rundina-dela Cruz

INTRODUCTION

Salmonella is one of the most important pathogens responsible for human food poisoning in the developed world (Cerro et al., 2002) and chicken products are widely acknowledged to be a significant reservoir for *Salmonella*. They have frequently been incriminated as a source of *Salmonellae* contamination and consequently thought to be major sources of the pathogen in humans (Uyttendaele et al., 1998; Baeumler et al., 2000). Furthermore, one of the commonest causes of *Salmonella* infection reported in humans has been through the handling of raw poultry carcasses and products, together with the consumption of undercooked poultry meat (Panisello et al., 2000). In the study