Center for Veterinary Medicine

Protecting Public and Animal Health

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

FDA

2009

Retail Meat Report

National Antimicrobial Resistance Monitoring System

NARMS

TABLE OF CONTENTS

ENTEROCOCCUS DATA

ESCHERICHIA COLI DATA

APPENDICES

ABBREVIATIONS USED IN THE REPORT, 2009

General Abbreviations

AR	Antimicrobial Resistance
BAP	Blood Agar Plate
CCA	Campy-Cefex Agar Plate
CDC	Centers for Disease Control and Prevention
CLSI	Clinical and Laboratory Standards Institute
CVM	Center for Veterinary Medicine
EAP	Enterococcosel Agar Plate
EIP	Emerging Infections Program
EMB	Eosin Methylene Blue
FDA	Food and Drug Administration
FoodNet	Foodborne Diseases Active Surveillance Network
MIC	Minimum Inhibitory Concentration
NARMS	National Antimicrobial Resistance Monitoring System
PCR	Polymerase Chain Reaction
PFGE	Pulsed Field Gel Electrophoresis
PulseNet	National Molecular Subtyping Network for Foodborne Disease Surveillance
QC	Quality Control
RVR10	Rappaport-Vassiliadis Medium
USDA	United States Department of Agriculture
XLD	Xylose Lysine Deoxycholate

Antimicrobial Abbreviations

AMC	Amoxicillin/Clavulanic Acid	GEN	Gentamicin
AMI	Amikacin	KAN	Kanamycin
AMP	Ampicillin	LIN	Lincomycin
AXO	Ceftriaxone	LZD	Linezolid
AZI	Azithromycin	NAL	Nalidixic Acid
CHL	Chloramphenicol	NIT	Nitrofurantoin
CIP	Ciprofloxacin	PEN	Penicillin
CLI	Clindamycin	QDA	Quinupristin/Dalfopristin
COT	Trimethoprim/Sulfamethoxazole	STR	Streptomycin
DAP	Daptomycin	TEL	Telithromycin
DOX	Doxycycline	TET	Tetracycline
ERY	Erythromycin	TGC	Tigecycline
FFN	Florfenicol	TYL	Tylosin
FIS	Sulfisoxazole	TIO	Ceftiofur
FOX	Cefoxitin	VAN	Vancomycin

Meat Types Abbreviations

CB	Chicken Breast	GT	Ground Turkey
GB	Ground Beef	PC	Pork Chop

State Abbreviations

CA	California	NM	New Mexico
CO	Colorado	NY	New York
CT	Connecticut	OR	Oregon
GA	Georgia	PA	Pennsylvania
MD	Maryland	TN	Tennessee
MN	Minnesota		

NARMS Retail Meat Working Group

U.S. Food and Drug Administration

Jason Abbott
Sherry Ayers
Sonya Bodeis-Jones
Kristin Cooley
Sharon Friedman
Stuart Gaines
David Heller
Claudia Lam
Patrick McDermott
Shawn McDermott
Sadaf Qaiyumi
Emily Tong
Niketta Womack
Shenia Young
Shaohua Zhao

Centers for Disease Control and Prevention

Fred Angulo
Ezra Barzilay
Olympia Anderson
Sharon Greene
Felicita Medalla

Many thanks to Denise Benton and Laura Alvey for providing outstanding web support to the NARMS program.

Participating State and Local Health Departments

California
- Richard Alexander
- Melody Hung-Fan
- Maribel Rickard

Colorado
- Joe Gossack
- Dee Jae Dutton
- Dave Heltzel
- Hugh Maguire

Connecticut
- Aristea Kinney
- Mona Mandour
- Ruthanne Marcus
- Michael A. Pascucilla
- Laurn Mank
- Diane Barden

Georgia
- James Benson
- Cherie Drenzek
- Tameka Hayes
- Lynett Poventud
- Elizabeth Franko
- Mary Hodel
- Mahin Park
- Melissa Tobin-D'angelo

Maryland
- David Blythe
- Beverly Jolbitado
- Jennifer Kiluk
- Kirsten Larson
- Amanda Palmer
- Patricia Ryan
- Chengru Zhu

Minnesota
- John Besser
- Craig Braymen
- Karen Everstine
- Gary Horvath
- Billie Juni
- Fe Leano
- Stephanie Meyer
- Kirk Smith
- Leeann Johnson

New Mexico
- Adreiena Armijo
- Lisa Butler
- Carlos Gonzales
- Cindy Nicholson
- Nicole Espinoza
- Erica Swanson
- Paul Torres
- Frederick Gentry
- Jennifer Hollander

New York
- Dale Morse
- Marsha Peck
- Timothy Root
- Shelley Zansky
- Ariel Endlich-Frazier
- Suzanne Solghan

Oregon
- Elizabeth Baldwin
- Emilio DeBess
- Helen Packett
- Robert Vega
- Veronica Williams
- Marianna Cavanaugh
- Dawn Daly
- Barbara Olson
- Vicki A. Hafits

Pennsylvania
- Michael Nageotte
- Stanley Reynolds
- Deepanker Tewari
- Anthony Russell
- Ann Rosenberg
- Carol Sandt
- Lisa Dettinger
- Susan Johnston
- Nkuchia M. M'ikanatha

Tennessee
- Parvin Arjmandi
- Samir Hanna
- Henrietta Hardin
- Tim Jones
- Ryan Mason
- Sheri Roberts
- John Dunn
- Stephanie Estes
- Kenneth Mitchell
- Robyn Atkinson
- Bobby Price
- Henry Davis
- Julie Montgomery

NARMS Retail Meat Annual Report 2009

Introduction

The primary purpose of the NARMS retail meat surveillance program is to monitor the prevalence of antimicrobial resistance among foodborne bacteria, specifically, *Salmonella, Campylobacter, Enterococcus* and *Escherichia coli.* The results generated by the NARMS retail meat program serve as a reference point for identifying and analyzing trends in antimicrobial resistance among these organisms.

NARMS retail meat surveillance is an ongoing collaboration between the U.S. Food and Drug Administration/Center for Veterinary Medicine (FDA/CVM), the Centers for Disease Control and Prevention (CDC), the 2009 FoodNet laboratories and an additional State Department of Public Health Laboratory: California, Colorado, Connecticut, Georgia, Maryland, Minnesota, New Mexico, New York, Oregon, Tennessee, and Pennsylvania. From January to December, each site purchased approximately 40 food samples per month, which are comprised of 10 samples each from chicken breast, ground turkey, ground beef, and pork chops. All sites culture the meat and poultry samples for *Salmonella* and only poultry samples are cultured for *Campylobacter*. In 2009, 3 of the 10 participating FoodNet laboratories (Georgia, Oregon, and Tennessee) also cultured meat and poultry samples for *E. coli* and *Enterococcus*. Bacterial isolates were sent to FDA/CVM for confirmation of species and serotypes, antimicrobial susceptibility testing, and genetic analysis.

As a public health monitoring system, the primary objectives of NARMS are to:

- Monitor trends in antimicrobial resistance among foodborne bacteria from humans, retail meats, and animals
- Disseminate timely information on antimicrobial resistance to promote interventions that reduce resistance among foodborne bacteria
- Conduct research to better understand the emergence, persistence, and spread of antimicrobial resistance
- Assist the FDA in making decisions related to the approval of safe and effective antimicrobial drugs for animals

What is New in the NARMS Retail Meat Report for 2009

A total of 5,280 meat samples were collected in 2009, compared with 5,236 in 2008. The Pennsylvania Department of Public Health Laboratory joined the NARMS retail meat surveillance program in 2008 but was only testing meat samples for *Salmonella*. As of 2009, Pennsylvania has increased their testing to include *Campylobacter* isolation from poultry samples.

In 2008, both CMV2AGPF and CMV3AGPF Sensititre™ plates were used for *Enterococcus* testing and the smaller range from either plate was used in the report. In 2009, all *Enterococcus* testing were performed using the CMV3AGPF Sensititre™ plate. Resistance data for flavomycin was excluded from this report as the new CMV3AGPF plate does not include this antimicrobial. Flavomycin resistance data can be found in prior NARMS Retail Meat Reports. The CMV3AGPF range of dilutions tested expanded for daptomycin, erythromycin, penicillin, quinupristin-dalfopristin and tetracycline, while ranges decreased for lincomycin and vancomycin.

Prior to 2009 NARMS reports used ceftiofur (an extended-spectrum cephalosporin used in food animals) to represent resistance to third-generation cephalosporins in the multidrug resistance patterns. In 2009 ceftriaxone replaced ceftiofur in the multidrug resistance patterns presented in this report, resulting from revised ceftriaxone breakpoints where ceftriaxone resistance (MIC ≥ 4 µg/ml) is nearly identical to ceftiofur resistance.

A new table (Table 6.) was added to the *Salmonella* multidrug resistance section of this report. This table highlights the number of resistant isolates by *Salmonella* serotype for each retail meat. This table is very useful for comparing the distribution of *Salmonella* serotype specific resistance among the different classes of antimicrobials. *Salmonella* antigenic formulas I 4,12:i:- and I 4,5,12:i:- were included with serotype I 4,[5],12:i:- to correspond with the NARMS Executive Report.

Highlights of the NARMS Retail 2009 Report

Salmonella[1]

Salmonella serotypes Typhimurium, Saintpaul, and Heidelberg account for 53% of retail meat isolates (Table 4). *S*. Typhimurium and *S*. Saintpaul increased markedly from an average of 11.4% and 8.9% from 2002–2008 to 25.6% and 16.4% in 2009, respectively. In 2009 *S*. Saintpaul became the most common serotype in ground turkey. Also never seen before was a higher prevalence of *S*. Heidelberg among chicken breast over ground turkey. *S.* Heidelberg prevalence among all retail meat continued to decrease from 22.8–11.5% from 2002–2009.

First-line antimicrobial agents recommended for treating salmonellosis are ciprofloxacin, ceftriaxone and trimethoprim-sulfamethoxazole.[2]

- Quinolones - Resistance to nalidixic acid corresponds to decreased fluoroquinolone susceptibility; however, fluoroquinolone resistance has never been detected in *Salmonella* recovered from any retail meat since the program began in 2002. Only 0.8% of *Salmonella* (4/489) were nalidixic acid resistant (Table 5). Nalidixic acid resistance was detected for the first time in ground beef and 2 of 3 ground beef isolates resistant to nalidixic acid were also ceftriaxone resistant.
- Cephalosporins – Third-generation cephalosporin resistance rose in all retail meats compared to 2008, with > 10% increases detected in chicken breast.
- There were highly significant increases in ampicillin resistance among chicken breast (16.7–45.8%) and ground turkey isolates (16.2–57.9%) from 2002 to 2009.
- Trimethoprim-Sulfamethoxazole - Resistance to this antimicrobial is extremely rare and 6 (of 489) isolates were resistant in 2009 compared to only 1 in 2008.
- Multidrug Resistance – 48.4% of chicken breast isolates were resistant to ≥ 3 antimicrobial classes in 2009 compared to 26.3% in ground turkey, which is an increase in chicken breast from previous years (ranging 20–38.2%). More than 30% of chicken breast isolates showed resistance to ≥ 5 classes in 2009 (Table 8), to which *S*. Typhimurium accounts for more than half of them (Table 6).
- *Salmonella* isolates susceptible to all antimicrobials (Table 8) decreased in chicken breast (45.7–29.2%), ground beef (79.2–57.1%), and pork chops (65.2–50%) from 2008 to 2009. Meanwhile, *Salmonella* pansusceptibility slightly increased among ground turkey (20.8–22.1%) isolates.

Campylobacter[3]

More than 90% of *Campylobacter* are recovered from chicken breast each year and of those isolates, the proportion of *C. jejuni* to *C. coli* is about 2:1 (Table 10).

Macrolides and fluoroquinolones are used in the treatment of *Campylobacter* infections. It is well known that *C. coli* tend to be more resistant than *C. jejuni* regardless of source, and this is reflected in the 2009 NARMS retail data with the exception of quinolones and tetracycline.

- Macrolide resistance in chicken breast isolates was seen in 4.5% of *C. coli* and 1% of *C. jejuni* in 2009, with no significant changes over time (Table 13).

---

[1] Nearly all salmonellae were recovered from poultry. Due to the low recovery from ground beef and pork chops (< 2%), statistical analysis of trends in resistance from these sources should be considered with caution.

[2] IDSA, Practice Guidelines for the Management of Infectious Diarrhea. *Clinical Infectious Diseases* 2001; 32:331–50.

[3] Ground beef and pork chop samples are no longer cultured for *Campylobacter*, due to their low recovery (<0.5%) from 2002–2007.

- Ciprofloxacin resistance in *C. coli* from chicken breast rose from 10% in 2002 to its highest peak of 29.1% in 2005. Since the fluoroquinolone ban in September 2005, ciprofloxacin resistance in *C. coli* has decreased to 18.4% in 2009 (Table 13), while *C. jejuni* significantly increased from 15.2–21.1% from 2002 to 2009 (p=0.0296).
- Tetracycline resistance decreased in both *C. jejuni* (49.8–46.2%) and *C. coli* (46.4–38%) compared to 2008.
- Gentamicin resistance in *C. coli* has increased with 5.6% in 2009, up from 1.7% in 2008 (p<0.0001).
- Multidrug resistance is rare in *Campylobacter*. There were only 9 (of 606) *Campylobacter* isolates resistant to ≥ 3 antimicrobial classes in 2009 (Table 14).

<u>*Enterococcus*</u>

E. faecalis (67.6% [884/1307]) was more prevalent than *E. faecium* (27% [353/1307]) in 2009 (Table 16). Chicken breast was the only meat type where *E. faecium* was more prevalent than *E. faecalis*.

Enterococcus is used as a sentinel for antibiotic selection pressures by compounds with gram-positive activity. This spectrum of activity is exhibited by many antimicrobials used in food animal production; and the same classes of antibiotics are also used to treat human infections.

- No isolates were resistant to vancomycin or linezolid. These classes of compounds are critically important in human medicine but are not used in food animal production (Table 17).
- Since 2002, streptogramin resistance has decreased in ground beef (46.2–13%) and pork chop (27.2–11.4%) but has remained above 50% in poultry isolates.
- *E. faecalis* from poultry showed markedly higher aminoglycoside and macrolide resistance than *E. faecium*, with exception of streptomycin. *E. faecium* had much higher resistance to nitrofurantoin, penicillin and ciprofloxacin from all sources compared to *E. faecalis* (Table 18a-b).
- Multidrug resistance from 2002–2009 was highest in *E. faecium* isolates from poultry which more than doubled the amount of multidrug resistant *E. faecalis* (Table 19a-b).

<u>*Escherichia coli*</u>

E. coli are common in all retail meat products tested in NARMS. Nearly 71% of the 1,440 retail meats tested in 2009 were culture positive for *E. coli*, with pork chops having the lowest prevalence (40.8%) and chicken breasts the highest (87.5%).

- Ceftriaxone resistance among *E. coli* isolates from chicken breast is consistently higher than any other retail meat tested. Chicken breast (7.8–12.4%), Ground turkey (1.3–6.9%), and pork chop (0.5–6.8%) had statistically significant trends in ceftriaxone resistance from 2002–2009 at the $p < 0.05$ level (Table 22).
- Ciprofloxacin resistance remained low (< 1.0%) among *E. coli* isolates (Table 22).
- From 2002–2005, nalidixic acid resistance in *E. coli* from chicken breast increased from 2.8–6.6% and increased in ground turkey from 4.3–10.4%. Since the fluoroquinolone ban in September 2005, resistance has decreased to 2.9% in chicken breast and 2.6% in ground turkey (Table 22). Nalidixic acid resistance in ground beef and pork chops remains < 2%.
- Gentamicin resistance is much higher in retail poultry isolates (> 20%) than ground beef and pork chop isolates (< 5%), with a statistically significant increase among chicken breast at the $p < 0.05$ level (Table 22).
- A highly statistically significant trend (p<0.0001) in ampicillin resistance was seen among ground turkey with 56.2% resistance in 2009, up from 31.3% in 2002.

Surveillance and Laboratory Testing Methods

Sample Collection and Isolate Submission

For 2009, retail meat samples were collected from 10 CDC FoodNet sites including California, Colorado, Connecticut, Georgia, Maryland, Minnesota, New Mexico, New York, Oregon, Tennessee plus the Pennsylvania Department of Health. Each site collected samples from a randomized list of area grocery stores derived from the Chain Store Guide (Tampa, FL). All 11 sites cultured the meat samples for non-typhoidal *Salmonella* and *Campylobacter*. In 2009, Tennessee, Georgia and Oregon cultured the same samples for *E. coli* and *Enterococcus*. A single isolate from each culture-positive meat sample was submitted by the 11 sites to the FDA/CVM for serotype or species confirmation and antimicrobial susceptibility testing.

Microbiological Analysis and Testing Methods at the FoodNet Site

Retail meat samples were stored at 4°C and processed within 96 hours of purchase. Meat packages were kept intact until they were aseptically opened in the laboratory. A sample is defined as a single chicken breast or pork chop, or a 25 gram (g) aliquot of ground product (beef and turkey). Samples were placed in separate sterile plastic bags with 250 mL of buffered peptone water, and the bags were vigorously shaken. Fifty milliliters of the rinsate from each sample were transferred to individual sterile containers for bacterial isolation as outlined below.

Salmonella Isolation

Fifty milliliters of double strength lactose broth were added to the flasks containing 50 mL of rinsate. The contents were mixed thoroughly and incubated at 35°C for 24 hours. From each flask, 0.1 mL was transferred to 9.9 mL of RVR10 medium and incubated at 42°C for 16-20 hours. One milliliter of this enrichment was transferred to pre-warmed (35-37°C) 10 mL tubes of M Broth and incubated 35-37°C for 6-8 hours. From each M Broth culture, 1 mL was heated at 100°C for 15 minutes, and the remaining portion was refrigerated. The heated portion from each culture was screened using the TECRA *Salmonella* Visual Immunoassay kit (International BioProducts, Bothell, WA) or the VIDAS® *Salmonella* Immunoassay kit (bioMerieux, Hazelwood, MO) according to the manufacturers' instructions. If the TECRA or VIDAS assay was negative, the sample was considered negative for *Salmonella*. If the TECRA or VIDAS assay was positive, a loopful of the corresponding unheated M Broth culture was streaked for isolation onto a Xylose Lysine Deoxycholate (XLD) agar plate and incubated at 35°C for 24 hours. Each XLD agar plate was examined for typical *Salmonella* colonies (pink colonies with or without black centers). If no *Salmonella*-like growth was observed on XLD agar, the sample was considered negative. A typical *Salmonella* colony was streaked for purity onto a trypticase soy agar plate supplemented with 5% defibrinated sheep blood (BAP). The BAP(s) were incubated at 35°C for 18-24 hours before sub-culturing an isolated colony for further biochemical identification and serotyping using the FoodNet

laboratory's standard procedures. *Salmonella* isolates were subsequently frozen at -70 to -80°C in Brucella broth with 20% glycerol and shipped on dry ice to FDA/CVM. Upon arrival at FDA/CVM, each isolate was streaked for purity on a BAP before being confirmed as *Salmonella* using the Vitek 2 Compact microbial identification system (bioMérieux, Hazelwood, MO). These isolates were further serotyped for O and H antigens using either commercially available (Difco-Becton Dickinson, Sparks, MD) antisera or antisera (Miravista Diagnostics, Indianapolis, IN) from the CDC.

***Campylobacter* Isolation**

Fifty milliliters of double-strength Bolton broth was added to the flasks containing 50 mL of rinsate, mixed gently to avoid aeration, and incubated at 42°C for 24 hours in a reduced oxygen atmosphere containing 85% nitrogen, 10% carbon dioxide, and 5% oxygen. The Bolton broth enrichment was inoculated onto Campy Cefex Agar (CCA) to obtain isolated colonies, and incubated at 42°C in the above atmosphere for 24 to 48 hours. If no *Campylobacter*-like growth was observed on a CCA plate, the sample was considered negative. When *Campylobacter*-like growth was observed, one typical well-isolated colony from each CCA plate was sub-cultured to a BAP and incubated as described above. Following incubation, the purified culture was gram stained and tested for its reaction to catalase, oxidase, hippurate and/or motility. All isolates presumptively identified as *Campylobacter* were frozen at -70 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA/CVM. Upon arrival at FDA/CVM, isolates were streaked for purity on a BAP before being identified to the species level using PCR assays previously described (2, 6).

***Escherichia coli* Isolation (only Georgia, Oregon and Tennessee in 2009)**

Fifty milliliters of double strength MacConkey broth was added to flasks containing 50 mL of rinsate, mixed thoroughly and incubated at 35°C for 16-20 hours. One loopful from each flask was streaked onto an Eosin Methylene Blue (EMB) agar plate and incubated at 35°C for 16-20 hours. If no typical *E. coli* colonies were observed on an EMB agar plate, the sample was considered. When *E. coli*-like growth was present, one typical, well-isolated colony was subcultured onto a BAP. Indole positive and oxidase negative isolates were presumptively identified as *E. coli*. These isolates were frozen at -70 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA/CVM. Upon arrival at FDA/CVM, every isolate was streaked for purity on a BAP before being confirmed as *E. coli* using the Vitek 2 Compact microbial identification system (bioMérieux, Hazelwood, MO).

***Enterococcus* Isolation (only Georgia, Oregon and Tennessee in 2009)**

Fifty milliliters of double-strength Enterococcosel broth was added 50 mL of rinsate, mixed thoroughly and incubated at 45°C for 18-24 hours. If no typical growth or blackening was observed in the flask, the sample was considered negative. If blackening of the broth was observed, a loopful was streaked for isolation onto an Enterococcosel Agar plate (EAP) and incubated at 35°C for 18-24 hours. If no typical

growth was observed on the EA plate, the sample was considered negative. If *Enterococcus*-like growth was present, one well-isolated colony was streaked for isolation onto a BAP, and incubated at 35°C for 18-24 hours in ambient air. Presumptive *Enterococcus* isolates were subsequently frozen at -70 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA/CVM. Upon arrival at FDA/CVM, every isolate was streaked for purity on a BAP before being confirmed as *Enterococcus* using the Vitek 2 Compact microbial identification system (bioMérieux, Hazelwood, MO).

Antimicrobial Susceptibility Testing

Antimicrobial minimal inhibitory concentrations (MICs) were determined by broth microdilution according to the Clinical and Laboratory Standards Institute (CLSI) standards (3, 4, 5) using a 96-well microtiter plate (Sensititre, Trek Diagnostic Systems, Westlake, OH). *Salmonella* and *E. coli* isolates were tested using a custom plate developed for Gram-negative bacteria (catalog # CMV1AGNF); *Enterococcus* isolates were tested using a custom plate developed for Gram-positive bacteria (catalog # CMV2AGPF); and *Campylobacter* isolates were tested using a custom plate developed for *Campylobacter* testing (catalog # CAMPY) (Table 1). The quality control organisms included *Escherichia coli* ATCC 25922, *Enterococcus faecalis* ATCC 29212, *Enterococcus faecalis* ATCC 51299 *Staphylococcus aureus* ATCC 29213, *Pseudomonas aeruginosa* ATCC 27853, and *Campylobacter jejuni* ATCC 33560 (3, 4, 5). CLSI approved interpretive criteria were used when available; otherwise provisional NARMS breakpoints were used (Table 1).

Pulsed-Field Gel Electrophoresis (PFGE)

Pulsed-field gel electrophoresis (PFGE) was used to assess genetic relatedness among all *Salmonella* and select *Campylobacter* isolates using protocols developed by CDC (1). All *Campylobacter* isolated from 2002 to 2005 were tested by PFGE. Since 2006, only those resistant to ciprofloxacin or erythromycin have been examined by PFGE. Agarose-embedded DNA was digested with *Xba*I and *Bln*I for *Salmonella* isolates and *Sma*I and *Kpn*I for *Campylobacter* isolates. DNA restriction fragments were separated by pulsed electrophoresis using the CHEF Mapper system (Bio-Rad, Hercules, CA). Genomic-DNA profiles were analyzed using BioNumerics software (Applied-Maths, Kortrijk, Belgium), and banding patterns were compared using Dice coefficients with a 1.5% band position tolerance.

References

1. Centers for Disease Control and Prevention. 2002. Standardized molecular subtyping of foodborne bacterial pathogens by pulsed-field gel electrophoresis. Centers for Disease Control and Prevention. Atlanta, GA.

2. Linton, D., A. J. Lawson, R. J. Owen, and J. Stanley. 1997. PCR detection, identification to species level, and fingerprinting of *Campylobacter jejuni* and *Campylobacter coli* direct from diarrheic samples. J. Clin. Microbiol. 35:2568-2572

3. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Disk and Dilution Susceptibility Tests for Bacteria Isolated from Animals; Approved Standard – Second Edition (M31-A2). 2002. CLSI, Wayne, Pa.

4. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Disk and Dilution Susceptibility Tests for Bacteria Isolated from Animals; Informational Supplement (M31-S1). 2004. CLSI, Wayne, Pa.

5. Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Seventeenth Informational Supplement (M100-S17). 2007. CLSI, Wayne, Pa.

6. Zhao, C., B. Ge, J. De Villena, R. Sudler, E. Yeh, S. Zhao, D. G. White, D. Wagner, and J. Meng. 2001. Prevalence of *Campylobacter* spp., *Escherichia coli*, and *Salmonella* serovars in retail chicken, turkey, pork, and beef from the Greater Washington, D.C., area. Appl.Environ.Microbiol. 67:5431-5436

Table 1. Interpretive Criteria used for Antimicrobial Susceptibility Testing: NARMS Retail Meat, 2009[1]

Breakpoints Used for Susceptibility Testing of *Salmonella* and *E. coli*

Antimicrobial Class	Antimicrobial Agent	Breakpoints (µg/ml)		
		Susceptible	Intermediate	Resistant
Aminoglycosides	Amikacin	≤ 16	32	≥ 64
	Gentamicin	≤ 4	8	≥ 16
	Kanamycin	≤ 16	32	≥ 64
	Streptomycin*	≤ 32	N/A	≥ 64
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin–Clavulanic Acid	≤ 8 / 4	16 / 8	≥ 32 / 16
Cephems	Cefoxitin	≤ 8	16	≥ 32
	Ceftiofur	≤ 2	4	≥ 8
	Ceftriaxone[2]	≤ 1	2	≥ 4
Folate Pathway Inhibitors	Sulfamethoxazole/Sulfisoxazole[3]	≤ 256	N/A	≥ 512
	Trimethoprim–Sulfamethoxazole	≤ 2 / 38	N/A	≥ 4 / 76
Penicillins	Ampicillin	≤ 8	16	≥ 32
Phenicols	Chloramphenicol	≤ 8	16	≥ 32
Quinolones	Ciprofloxacin	≤ 1	2	≥ 4
	Nalidixic acid	≤ 16	N/A	≥ 32
Tetracyclines	Tetracycline	≤ 4	8	≥ 16

Breakpoints Used for Susceptibility Testing of *Campylobacter*

Antimicrobial Class	Antimicrobial Agent	Breakpoints (µg/ml)		
		Susceptible	Intermediate	Resistant
Aminoglycosides	Gentamicin*	≤ 2	4	≥ 8
Ketolides	Telithromycin*	≤ 4	8	≥ 16
Lincosamides	Clindamycin*	≤ 2	4	≥ 8
Macrolides	Azithromycin*	≤ 2	4	≥ 8
	Erythromycin	≤ 8	16	≥ 32
Phenicols	Chloramphenicol	≤ 8	16	≥ 32
	Florfenicol*[4]	≤ 4	N/A	N/A
Quinolones	Ciprofloxacin	≤ 1	2	≥ 4
	Nalidixic acid*	≤ 16	32	≥ 64
Tetracyclines	Doxycycline	≤ 2	4	≥ 8
	Tetracycline	≤ 4	8	≥ 16

*No CLSI interpretative criteria for this bacterium/antimicrobial combination currently available

[1] Breakpoints were adopted from CLSI (Clinical and Laboratory Standards Institute)

[2] Revised ceftriaxone breakpoints from the CLSI M100-S20 document, published in January 2010, were used for this report.

[3] Sulfamethoxazole was replaced by sulfisoxazole in 2004.

[4] Only a susceptible breakpoint (≤ 4 µg/ml) has been established. Isolates with an MIC ≥ 8 µg/ml are reported as nonsusceptible.

Table 1. Interpretive Criteria used for Antimicrobial Susceptibility Testing: NARMS Retail Meat, 2009[1]

Breakpoints Used for Susceptibility Testing of *Enterococcus*

Antimicrobial Class	Antimicrobial Agent	Breakpoints (µg/ml)		
		Susceptible	Intermediate	Resistant
Aminoglycosides	Gentamycin	≤ 500		> 500
	Kanamycin*	≤ 512		≥ 1024
	Streptomycin	≤ 512		≥ 1024
Glycopeptides	Vancomycin	≤ 4	8, 16	≥ 32
Glycylcycline	Tigecycline*[2]	≤ 0.25		
Lincosamides	Lincomycin*	≤ 2	4	≥ 8
Lipopeptides	Daptomycin*[3]	≤ 4		
Macrolides	Erythromycin	≤ 0.5	1,2,4	≥ 8
	Tylosin*	≤ 8	16	≥ 32
Nitrofurans	Nitrofurantoin	≤ 32	64	≥ 128
Oxazolidinones	Linezolid	≤ 2	4	≥ 8
Penicillins	Penicillin	≤ 8		≥ 16
Phenicols	Chloramphenicol	≤ 8	16	≥ 32
Phosphoglcolipids	Flavomycin*	≤ 8	16	≥ 32
Quinolones	Ciprofloxacin	≤ 1	2	≥ 4
Streptogramins	Quinupristin/Dalfopristin	≤ 1	2	≥ 4
Tetracyclines	Tetracycline	≤ 4	8	≥ 16

*No CLSI interpretative criteria for this bacterium/antimicrobial combination currently available

[1] Breakpoints were adopted from CLSI (Clinical and Laboratory Standards Institute).

[2] Only a susceptible breakpoint (≤ 0.25 µg/ml) has been established. Isolates with an MIC ≥ 0.5 µg/ml are reported as nonsusceptible.

[3] Only a susceptible breakpoint (≤ 4 µg/ml) has been established. Isolates with an MIC ≥ 8 µg/ml are reported as nonsusceptible.

Table 2a. Percent Positive Samples for Chicken Breast by Bacterium and Site, 2002-2009

		Campylobacter			*Salmonella*			*Enterococcus*			*Escherichia coli*		
Site[1]	Year	N[2]	# Isolates	% Positive[3]	N	# Isolates	% Positive	N	# Isolates	Positive	N	# Isolates	% Positive
CA	2003	120	64	53.3%	120	4	3.3%						
	2004	120	96	80.0%	120	17	14.2%						
	2005	118	83	70.3%	118	21	17.8%						
	2006	118	96	81.4%	118	16	13.6%						
	2007	119	97	81.5%	120	12	10.0%						
	2008	120	78	65.0%	120	19	15.8%						
	2009	120	90	75.0%	120	34	28.3%						
	Total	**835**	**604**	**72.3%**	**836**	**123**	**14.7%**						
CO	2004	97	21	21.6%	97	1	1.0%						
	2005	116	38	32.8%	116	12	10.3%						
	2006	120	74	61.7%	120	7	5.8%						
	2007	120	62	51.7%	120	2	1.7%						
	2008	120	63	52.5%	120	4	3.3%						
	2009	120	57	47.5%	120	10	8.3%						
	Total	**693**	**315**	**45.5%**	**693**	**36**	**5.2%**						
CT	2002	120	74	61.7%	120	17	14.2%						
	2003	60	50	83.3%	60	9	15.0%						
	2004	120	86	71.7%	120	30	25.0%						
	2005	120	85	70.8%	120	19	15.8%						
	2006	120	79	65.8%	120	20	16.7%						
	2007	119	66	55.5%	120	15	12.5%						
	2008	120	41	34.2%	120	7	5.8%						
	2009	120	47	39.2%	120	21	17.5%						
	Total	**899**	**528**	**58.7%**	**900**	**138**	**15.3%**						
GA	2002	120	84	70.0%	120	14	11.7%	120	120	100.0%	120	104	86.7%
	2003	120	76	63.3%	120	8	6.7%	120	119	99.2%	120	120	100.0%
	2004	120	61	50.8%	120	6	5.0%	120	120	100.0%	120	115	95.8%
	2005	120	62	51.7%	120	10	8.3%	120	120	100.0%	120	119	99.2%
	2006	120	63	52.5%	120	15	12.5%	120	120	100.0%	120	117	97.5%
	2007	120	57	47.5%	120	8	6.7%	120	118	98.3%	120	114	95.0%
	2008	120	66	55.0%	120	11	9.2%	120	119	99.2%	120	115	95.8%
	2009	120	49	40.8%	120	12	10.0%	120	119	99.2%	120	115	95.8%
	Total	**960**	**518**	**54.0%**	**960**	**84**	**8.8%**	**960**	**955**	**99.5%**	**960**	**919**	**95.7%**
MD	2002	120	30	25.0%	120	8	6.7%	120	117	97.5%	120	107	89.2%
	2003	120	38	31.7%	120	18	15.0%	120	113	94.2%	120	113	94.2%
	2004	120	76	63.3%	120	24	20.0%	120	114	95.0%	120	110	91.7%
	2005	120	85	70.8%	120	22	18.3%	120	110	91.7%	120	100	83.3%
	2006	120	68	56.7%	120	18	15.0%	120	115	95.8%	120	102	85.0%
	2008	110	34	30.9%	110	43	39.1%						
	2009	120	50	41.7%	120	37	30.8%						
	Total	**830**	**3960**	**477.1%**	**830**	**170**	**20.5%**	**600**	**569**	**94.8%**	**600**	**532**	**88.7%**
MN	2002	106	33	31.1%	106	4	3.8%						
	2003	120	62	51.7%	120	13	10.8%						
	2004	120	73	60.8%	120	20	16.7%						
	2005	120	24	20.0%	120	24	20.0%						
	2006	120	43	35.8%	120	16	13.3%						
	2007	120	28	23.3%	120	11	9.2%						
	2008	120	24	20.0%	120	6	5.0%						
	2009	120	25	20.8%	120	12	10.0%						
	Total	**946**	**312**	**33.0%**	**946**	**106**	**11.2%**						
NM	2004	119	53	44.5%	119	3	2.5%						
	2005	120	31	25.8%	120	5	4.2%						
	2006	119	15	12.6%	120	18	15.0%						
	2007	120	52	43.3%	120	30	25.0%						
	2008	120	61	50.8%	120	36	30.0%						
	2009	120	49	40.8%	120	29	24.2%						
	Total	**718**	**261**	**36.4%**	**719**	**121**	**16.8%**						
NY	2003	120	75	62.5%	120	11	9.2%						
	2004	120	96	80.0%	120	16	13.3%						
	2005	116	50	43.1%	120	17	14.2%						
	2006	119	48	40.3%	120	15	12.5%						
	2007	120	33	27.5%	120	12	10.0%						
	2008	120	53	44.2%	120	30	25.0%						
	2009	120	50	41.7%	120	68	56.7%						
	Total	**835**	**405**	**48.5%**	**840**	**169**	**20.1%**						
OR	2002	40	1	2.5%	40	4	10.0%	40	40	100.0%	40	9	22.5%
	2003	120	45	37.5%	120	17	14.2%	120	119	99.2%	120	78	65.0%
	2004	120	73	60.8%	120	25	20.8%	120	118	98.3%	120	73	60.8%
	2005	120	37	30.8%	120	16	13.3%	110	109	99.1%	120	76	63.3%
	2006	119	50	42.0%	120	7	5.8%	120	119	99.2%	118	94	79.7%
	2007	120	52	43.3%	120	2	1.7%	120	119	99.2%	120	98	81.7%
	2008	120	39	32.5%	120	1	0.8%	120	118	98.3%	120	92	76.7%
	2009	120	45	37.5%	120	9	7.5%	120	115	95.8%	120	98	81.7%
	Total	**879**	**342**	**38.9%**	**880**	**81**	**9.2%**	**870**	**857**	**98.5%**	**878**	**618**	**70.4%**
PA	2008				120	25	20.8%						
	2009	120	80	66.7%	120	41	20.8%						
	Total	**120**	**80**	**66.7%**	**240**	**66**	**27.5%**						
TN	2002	110	66	60.0%	110	13	11.8%	110	104	94.5%	110	62	56.4%
	2003	117	59	50.4%	117	3	2.6%	117	115	98.3%	117	85	72.6%
	2004	116	71	61.2%	116	15	12.9%	116	114	98.3%	116	102	87.9%
	2005	120	59	49.2%	120	7	5.8%	120	118	98.3%	108	98	90.7%
	2006	118	36	30.5%	118	20	16.9%	118	115	97.5%	117	105	89.7%
	2007	112	28	25.0%	112	7	6.3%	111	105	94.6%	102	87	85.3%
	2008	120	51	42.5%	120	17	14.2%	120	109	90.8%	120	99	82.5%
	2009	120	40	33.3%	120	4	3.3%	120	115	95.8%	120	102	85.0%
	Total	**933**	**410**	**43.9%**	**933**	**86**	**9.2%**	**932**	**895**	**96.0%**	**910**	**740**	**81.3%**
Grand Total		**8648**	**7735**	**89.4%**	**8777**	**1180**	**13.4%**	**2430**	**2381**	**98.0%**	**3348**	**2809**	**83.9%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008. MD did not collect samples for NARMS reta meat testing in 2007.

[2] N= # of meat samples collected

[3] Where % Positive = the # of isolates (n) / the # of meat samples (N)

Table 2b. Percent Positive Samples for Ground Turkey by Bacterium and Site, 2002-2009

		Campylobacter			*Salmonella*			*Enterococcus*			*Escherichia coli*		
Site[1]	Year	N[2]	# Isolates	% Positive[3]	N	# Isolates	% Positive	N	# Isolates	Positive	N	# Isolates	% Positive
CA	2003	120	0	0.0%	120	6	5.0%						
	2004	120	0	0.0%	120	9	7.5%						
	2005	119	1	0.8%	119	15	12.6%						
	2006	120	0	0.0%	120	5	4.2%						
	2007	120	1	0.8%	120	8	6.7%						
	2008	119	0	0.0%	119	12	10.1%						
	2009	120	1	0.8%	120	12	10.0%						
	Total	**838**	**3**	**0.4%**	**838**	**67**	**8.0%**						
CO	2004	101	0	0.0%	101	8	7.9%						
	2005	116	0	0.0%	116	17	14.7%						
	2006	120	10	8.3%	120	17	14.2%						
	2007	120	10	8.3%	120	20	16.7%						
	2008	120	14	11.7%	120	30	25.0%						
	2009	120	3	2.5%	120	19	15.8%						
	Total	**697**	**37**	**5.3%**	**697**	**111**	**15.9%**						
CT	2002	120	2	1.7%	120	21	17.5%						
	2003	60	0	0.0%	60	8	13.3%						
	2004	120	2	1.7%	120	26	21.7%						
	2005	120	3	2.5%	120	12	10.0%						
	2006	120	2	1.7%	120	8	6.7%						
	2007	120	1	0.8%	120	14	11.7%						
	2008	120	1	0.8%	120	9	7.5%						
	2009	120	2	1.7%	120	13	10.8%						
	Total	**900**	**13**	**1.4%**	**900**	**111**	**12.3%**						
GA	2002	120	0	0.0%	120	19	15.8%	120	120	100.0%	120	103	85.8%
	2003	120	2	1.7%	120	27	22.5%	120	120	100.0%	120	117	97.5%
	2004	120	1	0.8%	120	38	31.7%	120	120	100.0%	120	119	99.2%
	2005	120	5	4.2%	120	32	26.7%	120	120	100.0%	120	117	97.5%
	2006	120	6	5.0%	120	28	23.3%	120	117	97.5%	120	116	96.7%
	2007	120	7	5.8%	120	48	40.0%	120	120	100.0%	120	120	100.0%
	2008	120	3	2.5%	120	47	39.2%	120	120	100.0%	120	120	100.0%
	2009	120	3	2.5%	120	43	35.8%	120	120	100.0%	120	119	99.2%
	Total	**960**	**27**	**2.8%**	**960**	**282**	**29.4%**	**960**	**957**	**99.7%**	**960**	**931**	**97.0%**
MD	2002	120	0	0.0%	120	9	7.5%	120	113	94.2%	120	110	91.7%
	2003	120	0	0.0%	120	25	20.8%	120	103	85.8%	120	103	85.8%
	2004	120	2	1.7%	120	13	10.8%	120	106	88.3%	120	109	90.8%
	2005	120	3	2.5%	120	12	10.0%	120	111	92.5%	120	105	87.5%
	2006	120	0	0.0%	120	12	10.0%	120	99	82.5%	120	95	79.2%
	2008	110	1	0.9%	110	30	27.3%						
	2009	120	2	1.7%	120	13	10.8%						
	Total	**830**	**8**	**1.0%**	**830**	**114**	**13.7%**	**600**	**532**	**88.7%**	**600**	**522**	**87.0%**
MN	2002	127	1	0.8%	127	7	5.5%						
	2003	110	3	2.7%	110	11	10.0%						
	2004	120	6	5.0%	120	14	11.7%						
	2005	120	4	3.3%	120	28	23.3%						
	2006	120	4	3.3%	120	25	20.8%						
	2007	119	6	5.0%	120	27	22.5%						
	2008	120	3	2.5%	120	16	13.3%						
	2009	120	4	3.3%	120	18	15.0%						
	Total	**956**	**31**	**3.2%**	**957**	**146**	**15.3%**						
NM	2004	118	0	0.0%	118	9	7.6%						
	2005	120	2	1.7%	120	20	16.7%						
	2006	120	0	0.0%	120	19	15.8%						
	2007	118	5	4.2%	118	42	35.6%						
	2008	120	4	3.3%	120	53	44.2%						
	2009	120	2	1.7%	120	30	25.0%						
	Total	**716**	**13**	**1.8%**	**716**	**173**	**24.2%**						
NY	2003	120	0	0.0%	120	20	16.7%						
	2004	120	0	0.0%	120	11	9.2%						
	2005	120	1	0.8%	120	12	10.0%						
	2006	119	2	1.7%	119	15	12.6%						
	2007	120	2	1.7%	120	10	8.3%						
	2008	120	0	0.0%	120	18	15.0%						
	2009	120	0	0.0%	120	12	10.0%						
	Total	**839**	**5**	**0.6%**	**839**	**98**	**11.7%**						
OR	2002	40	0	0.0%	40	2	5.0%	40	40	100.0%	40	17	42.5%
	2003	120	0	0.0%	120	5	4.2%	120	108	90.0%	120	49	40.8%
	2004	120	0	0.0%	120	6	5.0%	120	105	87.5%	120	53	44.2%
	2005	120	0	0.0%	120	16	13.3%	110	103	93.6%	120	72	60.0%
	2006	120	0	0.0%	120	8	6.7%	120	115	95.8%	120	76	63.3%
	2007	120	0	0.0%	120	2	1.7%	120	113	94.2%	120	104	86.7%
	2008	120	1	0.8%	120	4	3.3%	120	115	95.8%	120	89	74.2%
	2009	120	2	1.7%	120	10	8.3%	120	103	85.8%	120	84	70.0%
	Total	**880**	**3**	**0.3%**	**880**	**53**	**6.0%**	**870**	**802**	**92.2%**	**880**	**544**	**61.8%**
PA	2008				120	11	9.2%						
	2009	120	4	3.3%	120	8	6.7%						
	Total	**120**	**4**	**3.3%**	**240**	**19**	**7.9%**						
TN	2002	115	1	0.9%	115	16	13.9%	115	114	99.1%	115	74	64.3%
	2003	87	0	0.0%	87	12	13.8%	87	87	100.0%	87	64	73.6%
	2004	106	1	0.9%	106	8	7.5%	106	106	100.0%	106	95	89.6%
	2005	120	1	0.8%	120	19	15.8%	120	118	98.3%	110	102	92.7%
	2006	106	0	0.0%	106	22	20.8%	105	104	99.0%	106	101	95.3%
	2007	108	2	1.9%	108	19	17.6%	108	108	100.0%	98	91	92.9%
	2008	120	4	3.3%	120	15	12.5%	120	110	91.7%	120	91	75.8%
	2009	120	1	0.8%	120	12	10.0%	120	105	87.5%	120	103	85.8%
	Total	**882**	**10**	**1.1%**	**882**	**123**	**13.9%**	**881**	**852**	**96.7%**	**862**	**721**	**83.6%**
Grand Total		**8618**	**154**	**1.8%**	**8739**	**1297**	**14.8%**	**2430**	**2291**	**94.3%**	**3302**	**2718**	**82.3%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008. MD did not collect samples for NARMS reta meat testing in 2007.

[2] N= # of meat samples collected

[3] Where % Positive = the # of isolates (n) / the # of meat samples (N)

Table 2c. Percent Positive Samples for Ground Beef by Bacterium and Site, 2002-2009

Site[1]	Year	*Campylobacter*			*Salmonella*			*Enterococcus*			*Escherichia coli*		
		N[2]	# Isolates	% Positive[3]	N	# Isolates	% Positive	N	# Isolates	Positive	N	# Isolates	% Positive
CA	2003	120	0	0.0%	120	1	0.8%						
	2004	120	0	0.0%	120	1	0.8%						
	2005	120	0	0.0%	120	1	0.8%						
	2006	120	0	0.0%	120	1	0.8%						
	2007	119	0	0.0%	119	2	1.7%						
	2008				120	2	1.7%						
	2009				120	0	0.0%						
	Total	**599**	**0**	**0.0%**	**839**	**8**	**1.0%**						
CO	2004	106	0	0.0%	106	0	0.0%						
	2005	116	0	0.0%	116	0	0.0%						
	2006	120	0	0.0%	120	2	1.7%						
	2007	120	0	0.0%	120	1	0.8%						
	2008				120	0	0.0%						
	2009				120	0	0.0%						
	Total	**462**	**0**	**0.0%**	**702**	**3**	**0.4%**						
CT	2002	120	0	0.0%	120	5	4.2%						
	2003	60	0	0.0%	60	0	0.0%						
	2004	120	0	0.0%	120	5	4.2%						
	2005	120	0	0.0%	120	3	2.5%						
	2006	116	0	0.0%	116	2	1.7%						
	2007	120	0	0.0%	120	0	0.0%						
	2008				120	0	0.0%						
	2009				120	2	1.7%						
	Total	**656**	**0**	**0.0%**	**896**	**17**	**1.9%**						
GA	2002	120	0	0.0%	120	2	1.7%	120	118	98.3%	120	93	77.5%
	2003	120	0	0.0%	120	2	1.7%	120	119	99.2%	120	90	75.0%
	2004	120	0	0.0%	120	1	0.8%	120	117	97.5%	120	91	75.8%
	2005	120	0	0.0%	120	0	0.0%	120	118	98.3%	120	102	85.0%
	2006	120	0	0.0%	120	4	3.3%	120	118	98.3%	119	94	79.0%
	2007	120	0	0.0%	120	0	0.0%	120	120	100.0%	120	100	83.3%
	2008				120	0	0.0%	120	117	97.5%	120	100	83.3%
	2009				120	1	0.8%	120	119	99.2%	120	101	84.2%
	Total	**720**	**0**	**0.0%**	**960**	**10**	**1.0%**	**960**	**946**	**98.5%**	**959**	**771**	**80.4%**
MD	2002	120	0	0.0%	120	2	1.7%	120	107	89.2%	120	105	87.5%
	2003	120	1	0.8%	120	3	2.5%	120	92	76.7%	120	87	72.5%
	2004	120	0	0.0%	120	1	0.8%	120	100	83.3%	120	83	69.2%
	2005	120	0	0.0%	120	0	0.0%	120	113	94.2%	120	78	65.0%
	2006	120	0	0.0%	120	0	0.0%	120	100	83.3%	120	47	39.2%
	2008				110	3	2.7%						
	2009				120	0	0.0%						
	Total	**600**	**1**	**0.2%**	**830**	**9**	**1.1%**	**600**	**512**	**85.3%**	**600**	**400**	**66.7%**
MN	2002	123	0	0.0%	123	0	0.0%						
	2003	110	0	0.0%	110	1	0.9%						
	2004	120	0	0.0%	120	0	0.0%						
	2005	120	0	0.0%	120	1	0.8%						
	2006	120	0	0.0%	120	1	0.8%						
	2007	120	0	0.0%	120	3	2.5%						
	2008				120	0	0.0%						
	2009				120	1	0.8%						
	Total	**713**	**0**	**0.0%**	**953**	**7**	**0.7%**						
NM	2004	120	0	0.0%	120	0	0.0%						
	2005	120	0	0.0%	120	1	0.8%						
	2006	120	0	0.0%	120	2	1.7%						
	2007	120	0	0.0%	120	3	2.5%						
	2008				120	4	3.3%						
	2009				120	5	4.2%						
	Total	**480**	**0**	**0.0%**	**720**	**15**	**2.1%**						
NY	2003	120	0	0.0%	120	0	0.0%						
	2004	120	0	0.0%	120	0	0.0%						
	2005	120	0	0.0%	120	0	0.0%						
	2006	120	0	0.0%	120	0	0.0%						
	2007	120	0	0.0%	120	0	0.0%						
	2008				120	0	0.0%						
	2009				120	0	0.0%						
	Total	**600**	**0**	**0.0%**	**840**	**0**	**0.0%**						
OR	2002	40	0	0.0%	40	0	0.0%	40	40	100.0%	40	22	55.0%
	2003	120	0	0.0%	120	2	1.7%	120	112	93.3%	120	57	47.5%
	2004	120	0	0.0%	120	6	5.0%	120	115	95.8%	120	99	82.5%
	2005	120	0	0.0%	120	1	0.8%	110	98	89.1%	120	61	50.8%
	2006	120	0	0.0%	120	2	1.7%	120	108	90.0%	119	69	58.0%
	2007	120	0	0.0%	120	1	0.8%	120	114	95.0%	120	82	68.3%
	2008				120	0	0.0%	120	106	88.3%	120	61	50.8%
	2009				120	0	0.0%	120	94	78.3%	120	60	50.0%
	Total	**640**	**0**	**0.0%**	**880**	**12**	**1.4%**	**870**	**787**	**90.5%**	**879**	**511**	**58.1%**
PA	2008				120	2	1.7%						
	2009				120	1	0.8%						
	Total				**240**	**3**	**1.3%**						
TN	2002	119	0	0.0%	119	0	0.0%	119	118	99.2%	119	75	63.0%
	2003	110	0	0.0%	110	1	0.9%	110	109	99.1%	110	77	70.0%
	2004	120	0	0.0%	120	0	0.0%	120	116	96.7%	120	65	54.2%
	2005	120	0	0.0%	120	1	0.8%	120	118	98.3%	108	75	69.4%
	2006	119	0	0.0%	120	5	4.2%	117	111	94.9%	112	84	75.0%
	2007	112	5	4.5%	112	3	2.7%	112	102	91.1%	103	74	71.8%
	2008				120	13	10.8%	120	113	94.2%	120	89	74.2%
	2009				120	4	3.3%	120	114	95.0%	120	86	71.7%
	Total	**700**	**5**	**0.7%**	**941**	**27**	**2.9%**	**938**	**901**	**96.1%**	**912**	**625**	**68.5%**
Grand Total		**6170**	**6**	**0.1%**	**8801**	**111**	**1.3%**	**3368**	**3146**	**93.4%**	**3350**	**2307**	**68.9%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008. MD did not collect samples for NARMS reta meat testing in 2007.

[2] N= # of meat samples collected

[3] Where % Positive = the # of isolates (n) / the # of meat samples (N)

Table 2d. Percent Positive Samples for Pork Chop by Bacterium and Site, 2002-2009

		Campylobacter			*Salmonella*			*Enterococcus*			*Escherichia coli*		
Site[1]	Year	N[2]	# Isolates	% Positive[3]	N	# Isolates	% Positive	N	# Isolates	Positive	N	# Isolates	% Positive
CA	2003	120	2	1.7%	120	1	0.8%						
	2004	120	1	0.8%	120	1	0.8%						
	2005	120	0	0.0%	120	2	1.7%						
	2006	120	0	0.0%	120	0	0.0%						
	2007	117	0	0.0%	117	1	0.9%						
	2008				117	0	0.0%						
	2009				120	3	2.5%						
	Total	**597**	**3**	**0.5%**	**834**	**8**	**1.0%**						
CO	2004	99	0	0.0%	99	0	0.0%						
	2005	116	0	0.0%	116	0	0.0%						
	2006	116	0	0.0%	116	0	0.0%						
	2007	120	2	1.7%	120	2	1.7%						
	2008				120	1	0.8%						
	2009				120	0	0.0%						
	Total	**451**	**2**	**0.4%**	**691**	**3**	**0.4%**						
CT	2002	120	1	0.8%	120	1	0.8%						
	2003	60	0	0.0%	60	0	0.0%						
	2004	120	1	0.8%	120	5	4.2%						
	2005	120	1	0.8%	120	1	0.8%						
	2006	120	0	0.0%	120	1	0.8%						
	2007	120	0	0.0%	120	0	0.0%						
	2008				120	0	0.0%						
	2009				120	2	1.7%						
	Total	**660**	**3**	**0.5%**	**900**	**10**	**1.1%**						
GA	2002	120	0	0.0%	120	2	1.7%	120	119	99.2%	120	55	45.8%
	2003	120	0	0.0%	120	0	0.0%	120	116	96.7%	120	68	56.7%
	2004	120	0	0.0%	120	0	0.0%	120	116	96.7%	120	64	53.3%
	2005	120	0	0.0%	120	2	1.7%	120	117	97.5%	120	71	59.2%
	2006	120	0	0.0%	120	0	0.0%	120	115	95.8%	120	65	54.2%
	2007	120	0	0.0%	120	3	2.5%	120	119	99.2%	120	71	59.2%
	2008				120	2	1.7%	120	114	95.0%	120	61	50.8%
	2009				120	2	1.7%	120	117	97.5%	120	69	57.5%
	Total	**720**	**0**	**0.0%**	**960**	**11**	**1.1%**	**960**	**933**	**97.2%**	**960**	**524**	**54.6%**
MD	2002	120	1	0.8%	120	6	5.0%	120	101	84.2%	120	66	55.0%
	2003	120	0	0.0%	120	1	0.8%	120	90	75.0%	120	71	59.2%
	2004	120	0	0.0%	120	0	0.0%	120	77	64.2%	120	62	51.7%
	2005	120	1	0.8%	120	3	2.5%	120	86	71.7%	120	58	48.3%
	2006	120	0	0.0%	120	0	0.0%	120	78	65.0%	120	36	30.0%
	2008				110	2	1.8%						
	2009				120	0	0.0%						
	Total	**600**	**2**	**0.3%**	**830**	**12**	**1.4%**	**600**	**432**	**72.0%**	**600**	**293**	**48.8%**
MN	2002	103	0	0.0%	103	0	0.0%						
	2003	120	1	0.8%	120	0	0.0%						
	2004	120	0	0.0%	120	0	0.0%						
	2005	120	0	0.0%	120	0	0.0%						
	2006	120	0	0.0%	120	0	0.0%						
	2007	119	0	0.0%	120	0	0.0%						
	2008				120	2	1.7%						
	2009				120	0	0.0%						
	Total	**702**	**1**	**0.1%**	**943**	**2**	**0.2%**						
NM	2004	119	1	0.8%	119	0	0.0%						
	2005	120	0	0.0%	120	0	0.0%						
	2006	120	1	0.8%	120	2	1.7%						
	2007	120	0	0.0%	120	6	5.0%						
	2008				120	3	2.5%						
	2009				120	0	0.0%						
	Total	**479**	**2**	**0.4%**	**719**	**11**	**1.5%**						
NY	2003	120	0	0.0%	120	2	1.7%						
	2004	120	0	0.0%	120	3	2.5%						
	2005	120	0	0.0%	120	1	0.8%						
	2006	120	0	0.0%	120	1	0.8%						
	2007	120	1	0.8%	120	0	0.0%						
	2008				120	0	0.0%						
	2009				120	0	0.0%						
	Total	**600**	**1**	**0.2%**	**840**	**7**	**0.8%**						
OR	2002	40	0	0.0%	40	0	0.0%	40	39	97.5%	40	9	22.5%
	2003	120	1	0.8%	120	1	0.8%	120	103	85.8%	120	28	23.3%
	2004	120	0	0.0%	120	2	1.7%	120	108	90.0%	120	51	42.5%
	2005	120	0	0.0%	120	0	0.0%	110	95	86.4%	120	31	25.8%
	2006	120	2	1.7%	120	4	3.3%	120	93	77.5%	118	36	30.5%
	2007	120	1	0.8%	120	0	0.0%	120	101	84.2%	120	35	39.2%
	2008				120	3	2.5%	120	108	90.0%	120	48	40.0%
	2009				120	0	0.0%	120	89	74.2%	120	29	24.2%
	Total	**640**	**4**	**0.6%**	**880**	**10**	**1.1%**	**870**	**736**	**84.6%**	**878**	**267**	**30.4%**
PA	2008				120	0	0.0%						
	2009				120	1	0.8%						
	Total				**240**	**1**	**0.4%**						
TN	2002	110	3	2.7%	110	1	0.9%	110	110	100.0%	110	54	49.1%
	2003	119	0	0.0%	119	0	0.0%	119	117	98.3%	119	51	42.9%
	2004	118	0	0.0%	118	0	0.0%	118	103	87.3%	118	55	46.6%
	2005	120	0	0.0%	120	0	0.0%	120	111	92.5%	105	45	42.9%
	2006	116	0	0.0%	116	0	0.0%	112	103	92.0%	114	45	39.5%
	2007	116	0	0.0%	116	6	5.2%	116	93	80.2%	116	46	39.7%
	2008				120	10	8.3%	120	88	73.3%	120	37	30.8%
	2009				120	0	0.0%	120	97	80.8%	120	49	40.8%
	Total	**699**	**3**	**0.4%**	**939**	**17**	**1.8%**	**935**	**822**	**87.9%**	**922**	**382**	**41.4%**
Grand Total		**6148**	**21**	**0.3%**	**8776**	**92**	**1.0%**	**3365**	**2923**	**86.9%**	**3360**	**1466**	**43.6%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008. MD did not collect samples for NARMS retail meat testing in 2007.

[2] N= # of meat samples collected

[3] Where % Positive = the # of isolates (n) / the # of meat samples (N)

Table 3. Percent Positive Samples by Bacterium and Meat Type, 2002-2009

2002	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (2513)	616	288	(46.8)	642	4	(1.0)	642	-	-	613	5	(0.8)
Salmonella (2513)	616	60	(9.7)	642	74	(11.5)	642	9	(1.4)	613	10	(1.6)
Enterococcus (1574)	390	381	(97.7)	395	387	(98.0)	399	383	(96.0)	390	369	(94.6)
Escherichia coli (1574)	390	282	(72.3)	395	304	(77.0)	399	295	(73.9)	390	184	(47.2)

2003	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (3533)	897	469	(52.3)	857	5	(0.6)	880	1	(0.1)	899	4	(0.4)
Salmonella (3533)	897	83	(9.3)	857	114	(13.3)	880	10	(1.1)	899	5	(0.6)
Enterococcus (1873)	477	466	(97.7)	447	418	(93.5)	470	432	(91.9)	479	426	(88.9)
Escherichia coli (1873)	477	396	(83.0)	447	333	(74.5)	470	311	(66.2)	479	218	(45.5)

2004	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (4699)	1172	706	(60.2)	1165	12	(1.0)	1186	-	-	1176	3	(0.3)
Salmonella (4699)	1172	157	(13.4)	1165	142	(12.2)	1186	14	(1.2)	1176	11	(0.9)
Enterococcus (1900)	476	466	(97.9)	466	437	(93.8)	480	448	(93.3)	478	404	(84.5)
Escherichia coli (1900)	476	400	(84.0)	466	376	(80.7)	480	338	(70.4)	478	232	(48.5)

2005	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (4777)	1190	554	(46.6)	1195	20	(1.7)	1196	-	-	1196	2	(0.2)
Salmonella (4781)	1194	153	(12.8)	1195	183	(15.3)	1196	8	(0.7)	1196	9	(0.8)
Enterococcus (1880)	470	457	(97.2)	470	452	(96.2)	470	447	(95.1)	470	409	(87.0)
Escherichia coli (1871)	468	393	(84.0)	470	396	(84.3)	468	316	(67.5)	465	205	(44.1)

2006	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (4766)	1193	572	(47.9)	1185	24	(2.0)	1196	-	-	1192	3	(0.3)
Salmonella (4769)	1196	152	(12.7)	1185	159	(13.4)	1196	19	(1.6)	1192	8	(0.7)
Enterococcus (1893)	478	469	(98.1)	465	435	(93.5)	478	438	(91.6)	472	389	(82.4)
Escherichia coli (1884)	475	418	(88.0)	466	388	(83.3)	471	295	(62.6)	472	182	(38.6)

2007	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (4278)	1070	475	(44.4)	1065	34	(3.2)	1071	5	(0.5)	1072	4	(0.4)
Salmonella (4282)	1072	99	(9.2)	1066	190	(17.8)	1071	13	(1.2)	1073	18	(1.7)
Enterococcus (1407)	351	342	(97.4)	348	341	(98.0)	352	336	(95.5)	356	313	(87.9)
Escherichia coli (1379)	342	299	(87.4)	338	315	(93.2)	343	256	(74.6)	356	152	(42.7)

2008	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (2379)	1190	510	(42.9)	1189	31	(2.6)						
Salmonella (5236)	1310	199	(15.2)	1309	245	(18.7)	1310	24	(1.8)	1307	23	(1.8)
Enterococcus (1440)	360	346	(96.1)	360	345	(95.8)	360	336	(93.3)	360	310	(86.1)
Escherichia coli (1440)	360	306	(85.0)	360	300	(83.3)	360	250	(69.4)	360	146	(40.6)

2009	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
Bacterium (A)	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**	**N**	**n**	**(%)**
Campylobacter (2640)	1320	582	(44.1)	1320	24	(1.8)						
Salmonella (5280)	1320	277	(21.0)	1320	190	(14.4)	1320	14	(1.1)	1320	8	(0.6)
Enterococcus (1440)	360	349	(96.9)	360	328	(91.1)	360	327	(90.8)	360	303	(84.2)
Escherichia coli (1440)	360	315	(87.5)	360	306	(85.0)	360	247	(68.6)	360	147	(40.8)

A = Total number of meat sampled
N = Number of samples tested
n = Number of isolates
Where % = Number of isolates (n) / number of samples per meat type (N)
Dashes indicate no positive isolates.
Gray area indicates not tested.

Figure 1. Percent Positive Samples for *Salmonella* by Meat Type, All Sites, 2002-2009

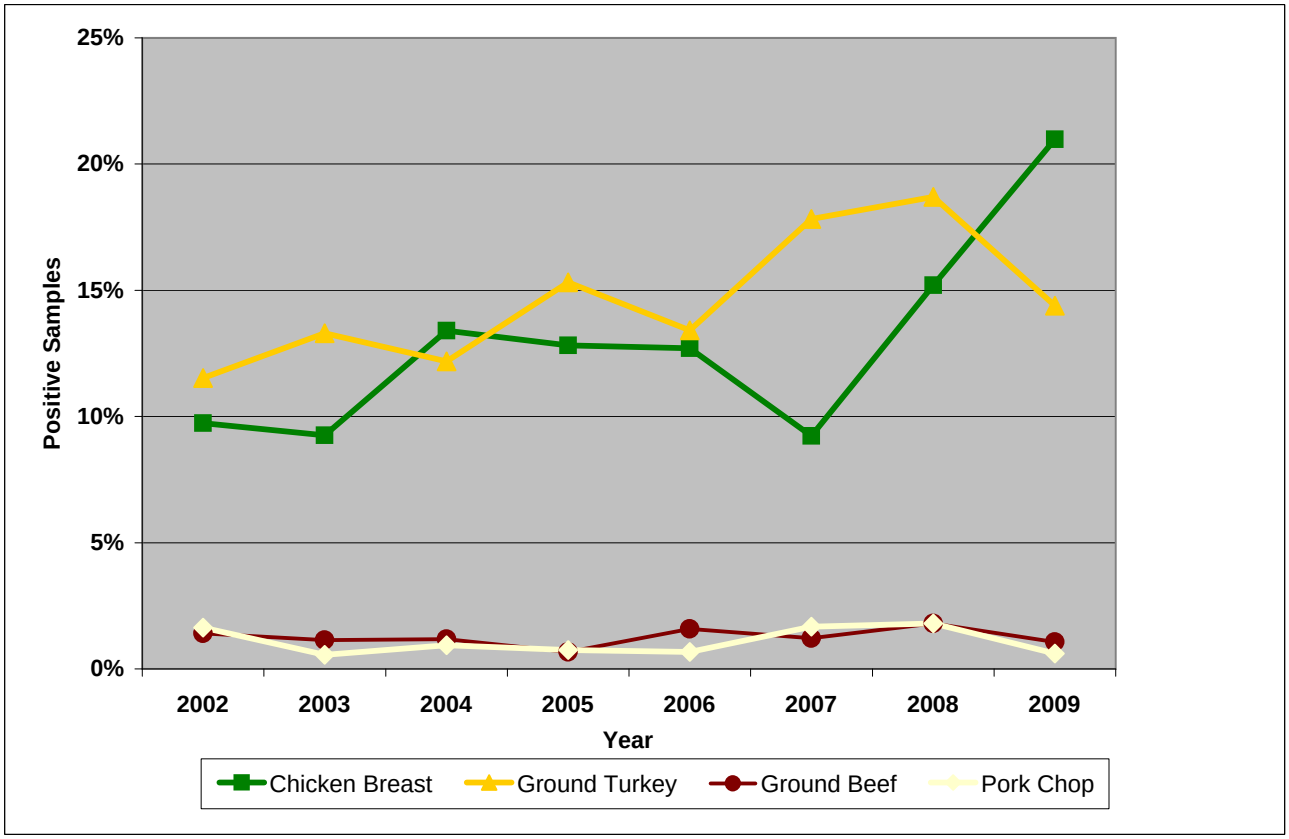
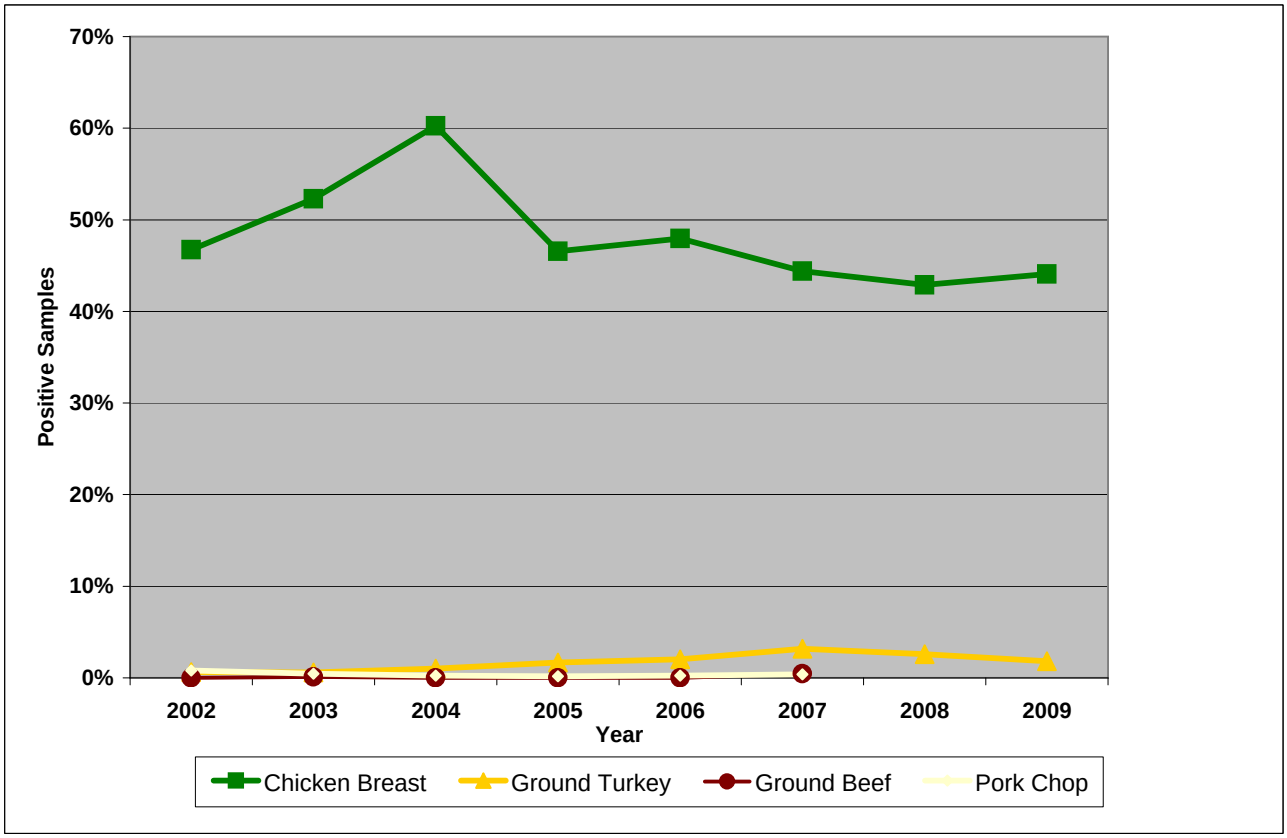


Figure 2. Percent Positive Samples for *Campylobacter* by Meat Type, All Sites, 2002-2009[1]



[1] Due to low recovery, Ground Beef and Pork Chop were not tested for *Campylobacter* after 2007.

Table 4. *Salmonella* Serotype Distribution among all Meat Types, 2009

Serotype (N)[1]	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
	n[2]	%[3]	n	%	n	%	n	%
1. Typhimurium (125)	123	98.4%	1	0.8%			1	0.8%
2. Saintpaul (80)	1	1.3%	76	95.0%	3	3.8%		
3. Heidelberg (56)	45	80.4%	10	17.9%			1	1.8%
4. Kentucky (46)	44	95.7%	2	4.4%				
5. Enteritidis (27)	27	100.0%						
6. Hadar (23)	3	13.0%	20	87.0%				
7. IIIa 18:z4,z23:- (19)	1	5.3%	18	94.7%				
8. Montevideo (12)	4	33.3%	4	33.3%	4	33.3%		
9. Senftenberg (12)	2	16.7%	10	83.3%				
10. I 4,12:d:- (9)			9	100.0%				
11. Schwarzengrund (9)			9	100.0%				
12. Derby (8)			5	62.5%			3	37.5%
13. Albany (6)			6	100.0%				
14. Infantis (6)	3	50.0%	1	16.7%			2	33.3%
15. Newport (6)	1	16.7%	3	50.0%	2	33.3%		
16. I 4,5,12:r:- (5)	1	20.0%	4	80.0%				
17. Agona (4)	1	25.0%	3	75.0%				
18. I 4,[5],12:i:- (8)	8	100.0%						
19. Mbandaka (4)	4	100.0%						
20. Berta (3)			3	100.0%				
21. Braenderup (3)	3	100.0%						
22. Dublin (3)					3	100.0%		
23. I 9,12:non-motile (3)	2	66.7%	1	33.3%				
24. I 4,12:non-motile (2)	1	50.0%	1	50.0%				
25. Alachua (1)			1	100.0%				
26. Anatum (1)			1	100.0%				
27. Cerro (1)	1	100.0%						
28. Give (1)					1	100.0%		
29. I 6,7:- 1,5 (1)	1	100.0%						
30. Muenster (1)					1	100.0%		
31. Norwich (1)			1	100.0%				
32. Ohio (1)							1	100.0%
33. Orion (1)			1	100.0%				
34. Tennessee (1)	1	100.0%						
Total (489)	**277**	**56.6%**	**190**	**38.9%**	**14**	**2.9%**	**8**	**1.6%**

[1] Where N = the total # of *Salmonella* isolates per serotype

[2] Where n = # of isolates with a given serotype per meat

[3] Where % = (n) # of isolates per serotype per meat / (N) total # of isolates per serotype

Table 5. Trends in Antimicrobial Resistance among *Salmonella* by Meat Type, 2002-2009[1]

Meat Type	Year (N)	Aminoglycosides				Penicillins	β-Lactamase Inhibitor Combinations	Cephems			Folate Pathway Inhibitors		Phenicols	Quinolones		Tetra-cyclines
		AMI (MIC ≥ 64)	GEN (MIC ≥ 16)	KAN (MIC ≥ 64)	STR (MIC ≥ 64)	AMP (MIC ≥ 32)	AMC (MIC ≥ 32)	TIO (MIC ≥ 32)	AXO (MIC ≥ 4)	FOX (MIC ≥ 32)	FIS[2] (MIC ≥ 512)	COT (MIC ≥ 4)	CHL (MIC ≥ 512)	CIP (MIC ≥ 4)	NAL (MIC ≥ 32)	TET (MIC ≥ 16)
Chicken Breast	2002 (60)	–	10.0%	6.7%	28.3%	16.7%	10.0%	10.0%	10.0%	10.0%	16.7%	–	–	–	–	33.3%
	2003 (83)	–	6.0%	4.8%	26.5%	33.7%	25.3%	25.3%	26.5%	25.3%	14.5%	–	2.4%	–	1.2%	27.7%
	2004 (157)	–	3.8%	11.5%	28.0%	30.6%	24.8%	24.8%	24.8%	24.8%	28.7%	–	1.9%	–	–	46.5%
	2005 (153)	–	3.3%	4.6%	30.1%	26.8%	21.6%	20.9%	21.6%	20.9%	17.0%	–	0.7%	–	0.7%	43.8%
	2006 (152)	–	9.2%	9.9%	36.2%	22.4%	19.1%	19.1%	19.1%	18.4%	23.0%	1.3%	2.6%	–	0.7%	46.7%
	2007 (99)	–	6.1%	5.1%	30.3%	18.2%	16.2%	16.2%	16.2%	15.2%	25.3%	–	1.0%	–	–	41.4%
	2008 (199)	–	7.0%	10.6%	23.6%	29.2%	22.6%	22.6%	22.6%	21.6%	39.2%	–	0.5%	–	–	46.7%
	2009 (277)	–	3.6%	15.2%	23.1%	45.8%	37.2%	36.8%	37.5%	32.5%	48.0%	0.4%	–	–	0.4%	59.9%
	Z Statistic	**N/A[4]**	**0.7344**	**-2.8960**	**1.6064**	**-3.9729**	**-3.8154**	**-3.7823**	**-5.2988**	**-2.7345**	**-7.7961**	**-0.5376**	**1.8103**	**N/A**	**0.5126**	**-4.9733**
	P Value[3]	**N/A**	**0.4627**	**0.0038**	**0.1082**	**<0.0001**	**0.0001**	**0.0002**	**<0.0001**	**0.0062**	**<0.0001**	**0.5909**	**0.0702**	**N/A**	**0.6082**	**<0.0001**
Ground Turkey	2002 (74)	–	14.9%	18.9%	37.8%	16.2%	12.2%	8.1%	8.1%	8.1%	20.3%	1.4%	1.4%	–	8.1%	55.4%
	2003 (114)	–	22.8%	27.2%	45.6%	28.9%	11.4%	2.6%	2.6%	2.6%	33.3%	–	0.9%	–	4.4%	39.5%
	2004 (142)	–	20.4%	18.3%	34.5%	20.4%	7.7%	4.9%	5.6%	4.9%	28.2%	–	2.8%	–	–	56.3%
	2005 (183)	–	26.8%	20.2%	44.3%	26.8%	8.7%	7.1%	7.1%	7.1%	34.4%	0.5%	0.5%	–	1.1%	39.9%
	2006 (159)	–	28.9%	15.1%	40.9%	25.8%	5.0%	5.0%	5.0%	5.0%	32.1%	–	0.6%	–	–	56.0%
	2007 (190)	–	24.7%	23.7%	45.8%	42.6%	5.3%	5.3%	5.8%	5.3%	34.7%	0.5%	1.6%	–	2.6%	67.4%
	2008 (245)	–	27.8%	18.0%	58.8%	50.6%	5.3%	4.5%	4.5%	4.5%	27.4%	0.4%	1.6%	–	0.4%	66.1%
	2009 (190)	–	18.4%	6.8%	27.9%	57.9%	5.8%	5.8%	5.8%	5.8%	20.0%	1.6%	1.6%	–	–	65.3%
	Z Statistic	**N/A**	**-0.7436**	**3.1403**	**-0.6484**	**-9.5415**	**2.7790**	**0.1584**	**0.2268**	**0.1584**	**1.3050**	**-1.1119**	**-0.2226**	**N/A**	**3.9396**	**-5.5360**
	P Value	**N/A**	**0.4571**	**0.0017**	**0.5167**	**<0.0001**	**0.0055**	**0.8741**	**0.8206**	**0.8741**	**0.1919**	**0.2662**	**0.8238**	**N/A**	**<0.0001**	**<0.0001**
Ground Beef	2002 (9)	–	–	–	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	–	22.2%	–	–	22.2%
	2003 (10)	–	–	–	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	–	40.0%	–	–	40.0%
	2004 (14)	–	–	–	14.3%	21.4%	14.3%	14.3%	14.3%	14.3%	14.3%	7.1%	14.3%	–	–	14.3%
	2005 (8)	–	25.0%	25.0%	25.0%	25.0%	–	–	–	–	25.0%	–	12.5%	–	–	12.5%
	2006 (19)	–	–	5.3%	10.5%	10.5%	–	–	–	–	10.5%	–	5.3%	–	–	21.1%
	2007 (13)	–	7.7%	–	–	–	–	–	–	–	7.7%	–	–	–	–	–
	2008 (24)	–	8.3%	8.3%	20.8%	12.5%	8.3%	8.3%	8.3%	8.3%	20.8%	–	12.5%	–	–	20.8%
	2009 (14)	–	14.3%	14.3%	28.6%	28.6%	14.3%	14.3%	14.3%	14.3%	35.7%	–	21.4%	–	14.3%	42.9%
	Z Statistic	**N/A**	**-1.5925**	**-1.4143**	**0.4633**	**1.1473**	**1.9680**	**1.9680**	**1.9680**	**1.9680**	**0.0221**	**0.9210**	**1.2510**	**N/A**	**-1.9480**	**-0.2929**
	P Value	**N/A**	**0.1113**	**0.1573**	**0.6431**	**0.2513**	**0.0491**	**0.0491**	**0.0491**	**0.0491**	**0.9823**	**0.3571**	**0.2109**	**N/A**	**0.0514**	**0.7696**
Pork Chop	2002 (10)	–	30.0%	10.0%	70.0%	40.0%	20.0%	20.0%	20.0%	20.0%	70.0%	20.0%	40.0%	–	–	70.0%
	2003 (5)	–	–	–	40.0%	40.0%	20.0%	20.0%	20.0%	20.0%	40.0%	–	40.0%	–	–	80.0%
	2004 (11)	–	–	9.1%	27.3%	9.1%	–	–	–	–	18.2%	–	18.2%	–	–	54.5%
	2005 (9)	–	–	–	33.3%	22.2%	–	–	–	–	33.3%	11.1%	22.2%	–	–	55.6%
	2006 (8)	–	50.0%	25.0%	25.0%	25.0%	–	–	–	–	75.0%	50.0%	–	–	–	25.0%
	2007 (18)	–	5.6%	5.6%	16.7%	5.6%	–	–	–	–	16.7%	5.6%	–	–	–	50.0%
	2008 (23)	–	13.0%	–	13.0%	13.0%	–	–	–	–	30.4%	–	–	–	–	34.8%
	2009 (8)	–	–	12.5%	37.5%	37.5%	25.0%	25.0%	25.0%	25.0%	37.5%	25.0%	12.5%	–	–	37.5%
	Z Statistic	**N/A**	**0.7698**	**0.4114**	**2.7069**	**1.2488**	**1.0744**	**1.0744**	**1.0744**	**1.0744**	**1.5624**	**0.3396**	**3.7087**	**N/A**	**N/A**	**2.2864**
	P Value	**N/A**	**0.4414**	**0.6808**	**0.0068**	**0.2117**	**0.2827**	**0.2827**	**0.2827**	**0.2827**	**0.1182**	**0.7341**	**0.0002**	**N/A**	**N/A**	**0.0222**

[1] Dashes indicate 0.0% resistance to antimicrobial. Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).

[2] Sulfisoxazole replaced Sulfamethoxazole on NARMS panel in 2004.

[3] P value for percent resistant trend was calculated using the Cochran-Armitage Trend Test method.

[4] N/A = No Z statistic or P value could be calculated.

Figure 3a. Antimicrobial Resistance among *Salmonella* from Chicken Breast, 2002-2009

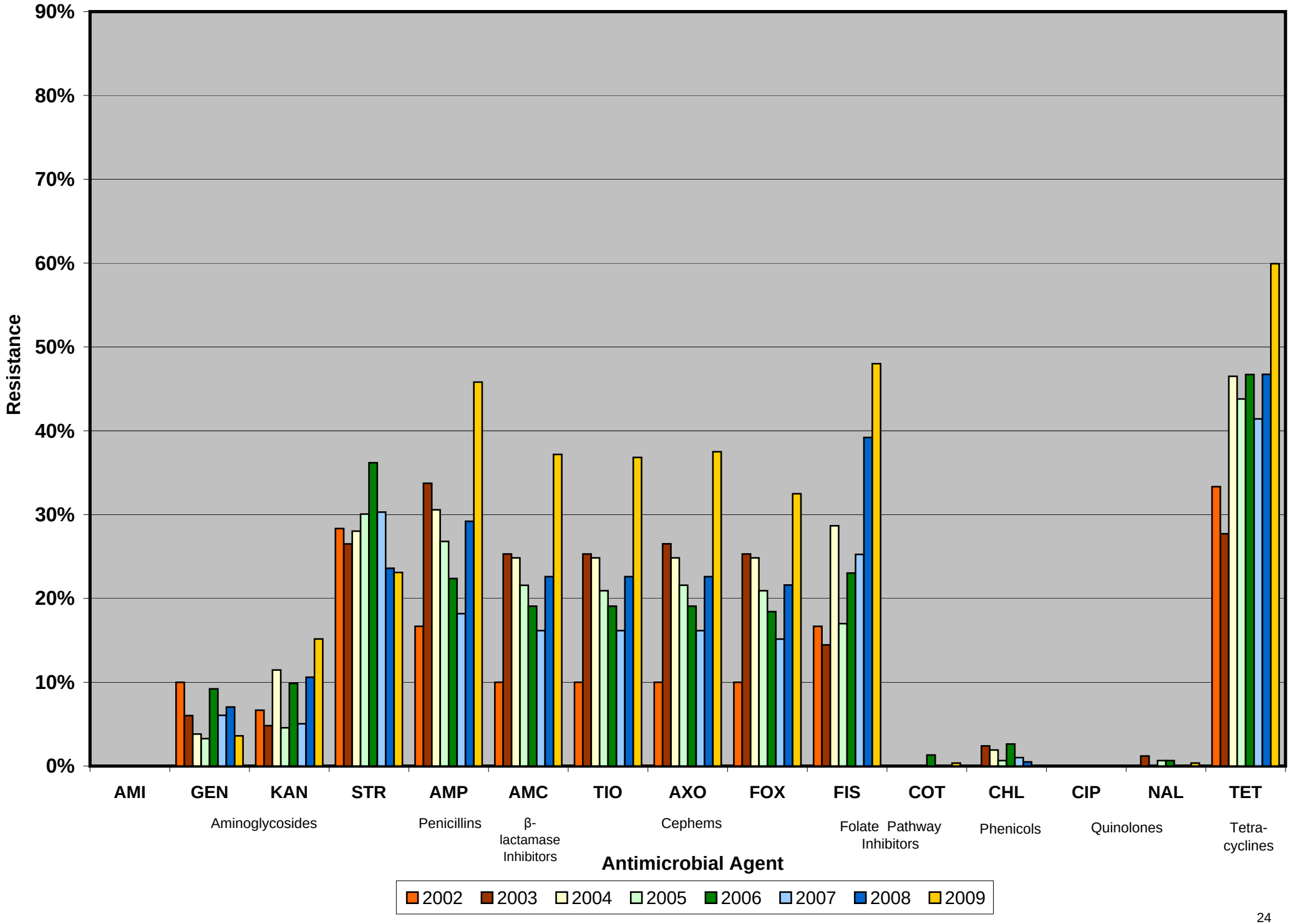


Figure 3b. Antimicrobial Resistance among *Salmonella* from Ground Turkey, 2002-2009

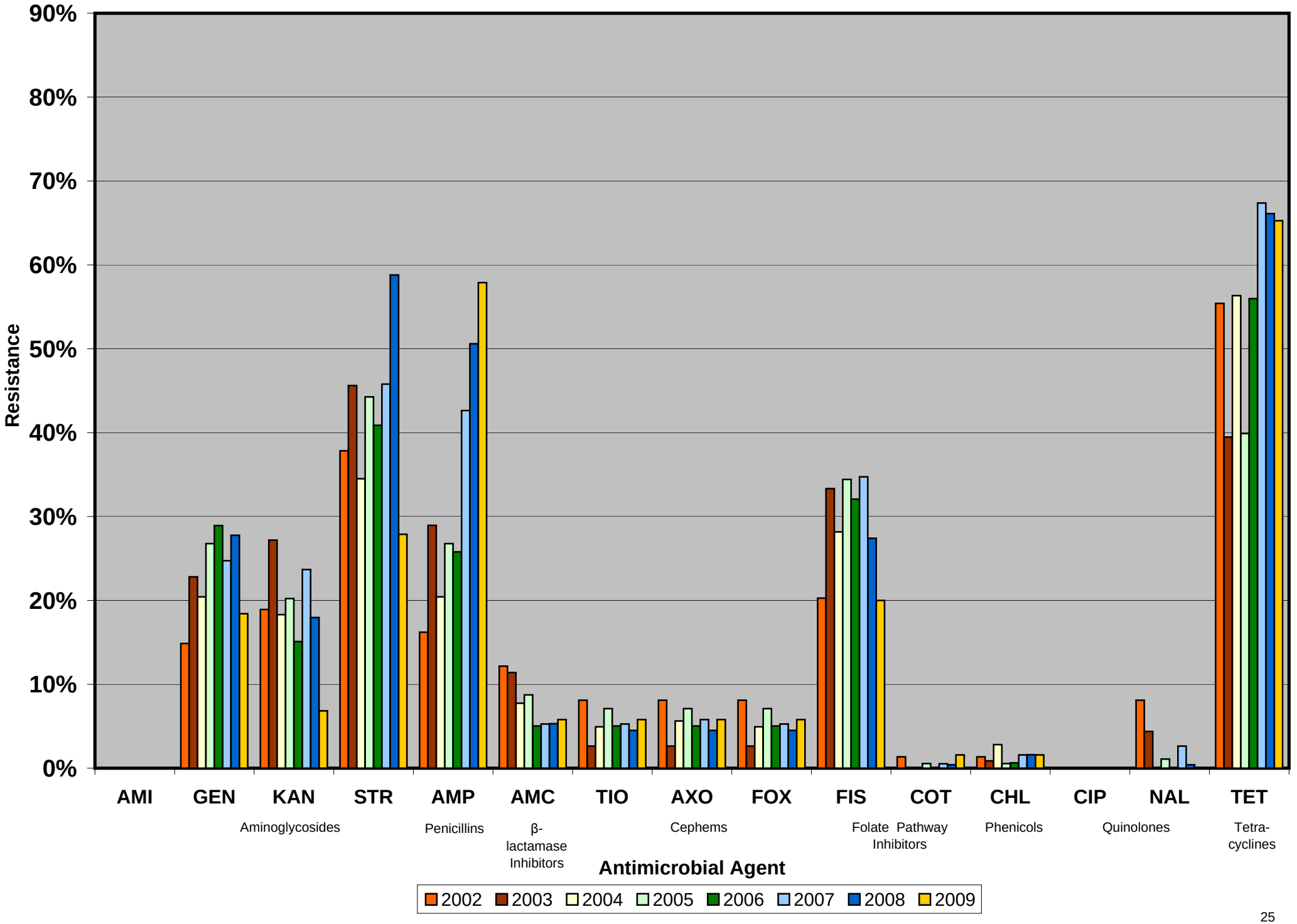


Figure 3c. Antimicrobial Resistance among *Salmonella* from Ground Beef, 2002-2009

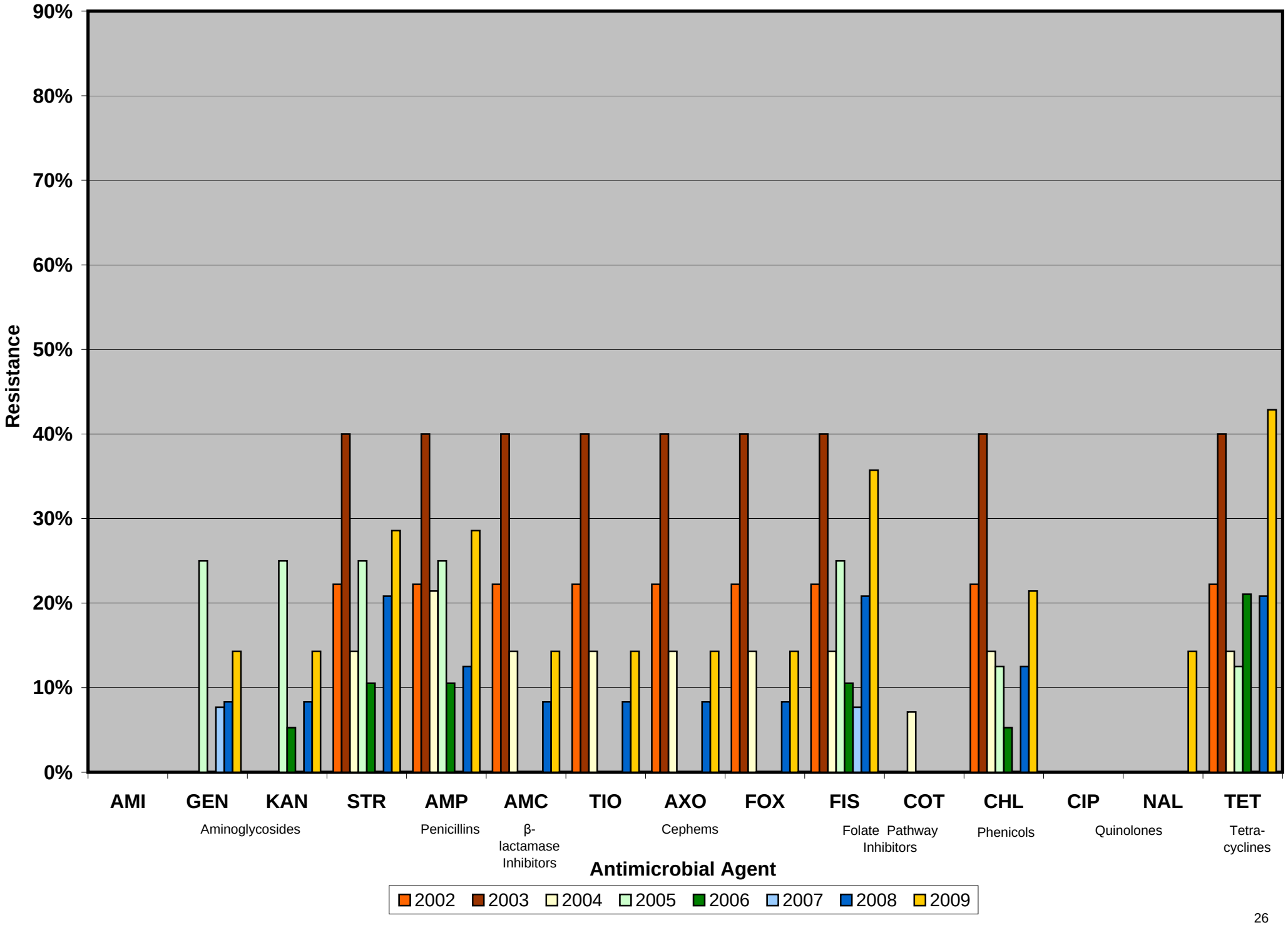


Figure 3d. Antimicrobial Resistance among *Salmonella* from Pork Chop, 2002-2009

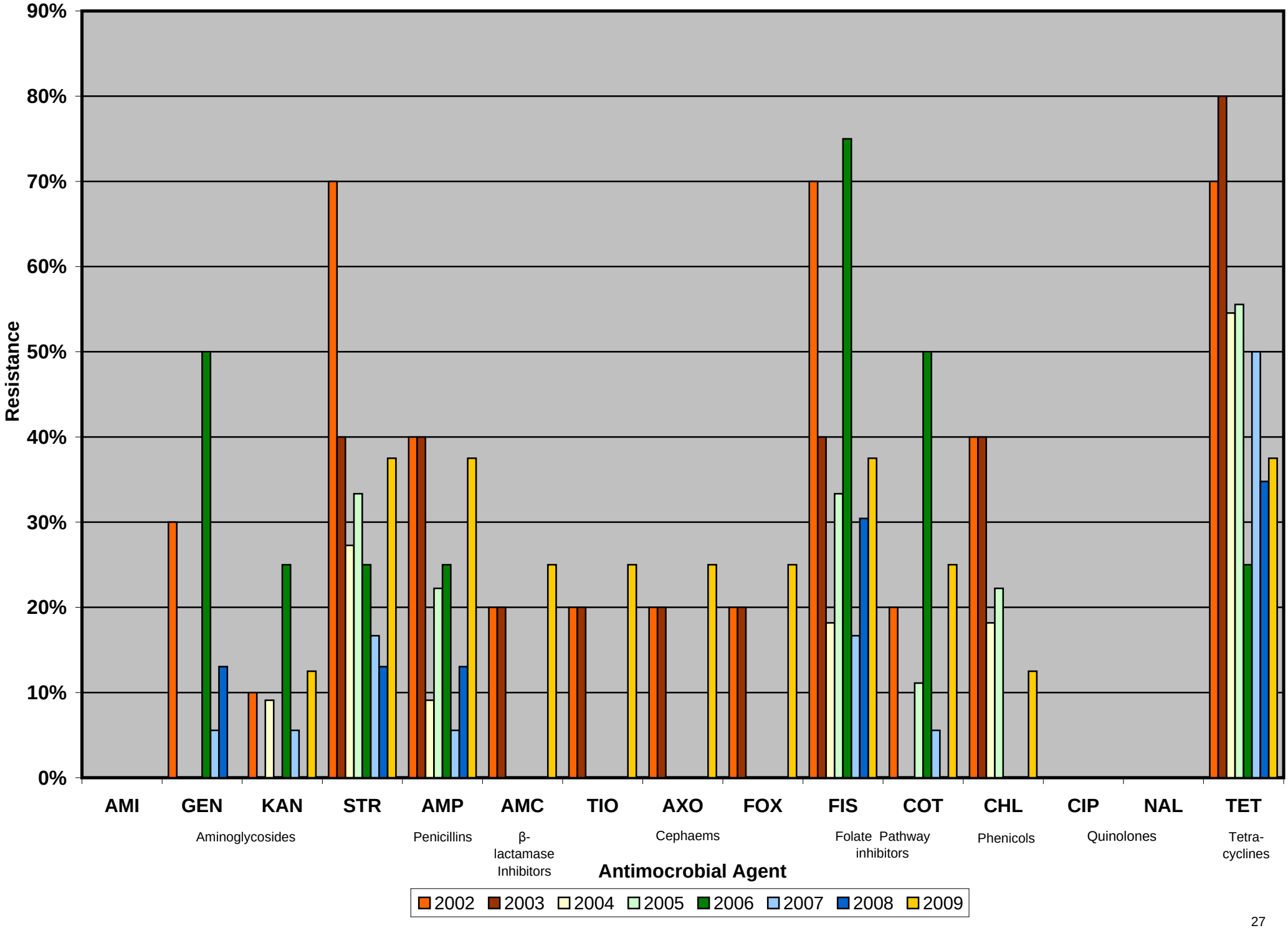


Table 6. Number of Resistant *Salmonella* Isolates by Meat Type and Serotype, 2009

Meat Type	Serotype	No. of Isolates	% of Isolates	Number of Antimicrobial Classes in Resistance Pattern						Number of Resistant Isolates by Antimicrobial Agent and Class														
										Aminoglocosides				β-Lactamase Inhibitors	Cephems			Folate Pathway Inhibitors		Penicillins	Phenicols	Quinolones		Tetracyclines
				0	1	2-3	4-5	6-7	8	AMI	GEN	KAN	STR	AMC	FOX	TIO	AXO	FIS	COT	AMP	CHL	CIP	NAL	TET
				Number of Isolates																				
Chicken Breast	Typhimurium	123	44.4%	3		45	44	31			3	34	19	71	58	70	71	119		84				118
	Heidelberg	45	16.2%	28		13	4				1	7	6	14	14	14	14	1		14				7
	Kentucky	44	15.9%	7	2	23	12				1		31	16	16	16	16	2		17				30
	Enteritidis	27	9.7%	20	6		1							1	1	1	1	1	1	5			1	1
	Montevideo	4	1.4%	1	1	1	1				1		1					3		1				1
	I 4,[5],12:i:-	8	2.9%	6		2					1		1					2						2
	Mbandaka	4	1.4%	2	1	1					1	1	1					1						2
	Braenderup	3	1.1%	3																				
	Hadar	3	1.1%		1	2							2							2				2
	Infantis	3	1.1%	3																				
	Senftenberg	2	0.7%	1		1					1		1							1				
	Other	11	4.0%	7	1		3				1		2	1	1	1	2	4		3				3
	Total	277	100.0%	81	12	88	65	31			10	42	64	103	90	102	104	133	1	127			1	166
Ground Turkey	Saintpaul	76	40.0%	7	5	58	6				3	1	8					6	3	65				67
	Hadar	20	10.5%		1	19					2	3	15					2		11				18
	IIIa 18:z4,z23:-	18	9.5%	18																				
	Heidelberg	10	5.3%	1		6	3				7	2	6	1	1	1	1	5		8				6
	Senftenberg	10	5.3%	3		4	1	2			3	3	3	3	3	3	3	4		6	2			1
	I 4,12:d:-	9	4.7%		6	3												2		2				9
	Schwarzengrund	9	4.7%	4	1	3	1				1	1	1	1	1	1	1	2		2				4
	Albany	6	3.2%	3		2		1			2		3	1	1	1	1	2		2				2
	Derby	5	2.6%			3	2				3		3	2	2	2	2	3		2				5
	I 4,5,12:r:-	4	2.1%				4				4		4					4		4				4
	Montevideo	4	2.1%		4						1	2	3											
	Other	19	10.0%	6	2	8	1	2			9	1	7	3	3	3	3	8		8	1			8
	Total	190	100.0%	42	19	106	18	5			35	13	53	11	11	11	11	38	3	110	3			124
Ground Beef	Montevideo	4	28.6%	4																				
	Saintpaul	3	21.4%		1		2				2		1					2		2				3
	Dublin	3	21.4%				1		2			2	3	2	2	2	2	3		2	3		2	3
	Newport	2	14.3%	2																				
	Give	1	7.1%	1																				
	Muenster	1	7.1%	1																				
	Total	14	100.0%	8	1		3		2		2	2	4	2	2	2	2	5		4	3		2	6
Pork Chop	Derby	3	37.5%	2		1							1					1						1
	Infantis	2	25.0%	1		1								1	1	1	1			1				
	Heidelberg	1	12.5%					1				1	1	1	1	1	1	1	1	1				1
	Ohio	1	12.5%	1																				
	Typhimurium	1	12.5%				1						1					1	1	1	1			1
	Total	8	100.0%	4		2	1	1				1	3	2	2	2	2	3	2	3	1			3

Table 7. Multidrug Resistance Patterns among *Salmonella* Isolates, 2002-2009[1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	60	83	157	153	152	99	199	277
	Ground Turkey	74	114	142	183	159	190	245	190
	Ground Beef	9	10	14	8	19	13	24	14
	Pork Chop	10	5	11	9	8	18	23	8
Resistance Pattern	**Isolate Source**								
1. At Least ACSSuT[2] Resistant	Chicken Breast	–	2.4% 2	1.9% 3	0.7% 1	2.6% 4	–	0.5% 1	–
	Ground Turkey	1.4% 1	0.9% 1	2.8% 4	0.5% 1	0.6% 1	1.6% 3	1.6% 4	0.5% 1
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3	14.3% 2
	Pork Chop	40.0% 4	40.0% 2	9.1% 1	22.2% 2	–	–	–	12.5% 1
2. At Least ACT/S[3] Resistant	Chicken Breast	–	–	–	–	–	–	–	–
	Ground Turkey	1.4% 1	–	–	–	–	–	–	–
	Ground Beef	–	–	7.1% 1	–	–	–	–	–
	Pork Chop	20.0% 2	–	–	11.1% 1	–	–	–	12.5% 1
3. At Least ACSSuTAuCx[4] Resistant	Chicken Breast	–	–	1.9% 3	–	2.6% 4	–	–	–
	Ground Turkey	1.4% 1	0.9% 1	2.1% 3	0.5% 1	–	1.1% 2	1.2% 3	0.5% 1
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	–	–	–	8.3% 2	14.3% 2
	Pork Chop	20.0% 2	20.0% 1	–	–	–	–	–	–
4. At Least Ceftriaxone and Nalidixic Acid Resistant	Chicken Breast	–	–	–	0.7% 1	–	–	–	–
	Ground Turkey	–	0.9% 1	–	–	–	0.5% 1	–	–
	Ground Beef	–	–	–	–	–	–	–	14.3% 2
	Pork Chop	–	–	–	–	–	–	–	–

[1] Dashes indicate 0.0% resistance.

[2] ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline.

[3] ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole.

[4] ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone.

Table 8. Multidrug Resistance among *Salmonella* Isolates by Antimicrobial Class, 2002-2009[1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	60	83	157	153	152	99	199	277
	Ground Turkey	74	114	142	183	159	190	245	190
	Ground Beef	9	10	14	8	19	13	24	14
	Pork Chop	10	5	11	9	8	18	23	8
Resistance Pattern[2]	**Isolate Source**								
1. No Resistance Detected	Chicken Breast	51.7% 31	45.8% 38	40.1% 63	46.4% 71	38.8% 59	47.5% 47	45.7% 91	29.4% 81
	Ground Turkey	37.8% 28	34.2% 39	28.9% 41	30.1% 55	17.6% 28	15.3% 29	20.8% 51	22.1% 42
	Ground Beef	77.8% 7	60.0% 6	78.6% 11	75.0% 6	73.7% 14	92.3% 12	79.2% 19	57.1% 8
	Pork Chop	20.0% 2	20.0% 1	45.5% 5	44.4% 4	25.0% 2	44.4% 8	65.2% 15	50.0% 4
2. Resistant to ≥ 3 Antimicrobial Classes	Chicken Breast	20.0% 12	30.1% 25	34.4% 54	25.5% 39	24.3% 37	25.3% 25	38.2% 76	48.4% 134
	Ground Turkey	20.3% 15	29.0% 33	26.1% 37	29.0% 53	24.5% 39	42.6% 81	51.0% 125	26.3% 50
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	25.0% 2	10.5% 2	–[2]	20.8% 5	35.7% 5
	Pork Chop	60.0% 6	40.0% 2	18.2% 2	22.2% 2	25.0% 2	5.6% 1	17.4% 4	50.0% 4
3. Resistant to ≥ 4 Antimicrobial Classes	Chicken Breast	5.0% 3	16.9% 14	24.2% 38	18.3% 28	15.1% 23	13.1% 13	23.1% 46	34.7% 96
	Ground Turkey	13.5% 10	24.6% 28	12.7% 18	7.7% 14	8.2% 13	14.7% 28	15.1% 37	12.1% 23
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3	35.7% 5
	Pork Chop	40.0% 4	40.0% 2	18.2% 2	22.2% 2	25.0% 2	5.6% 1	13.0% 3	25.0% 2
4. Resistant to ≥ 5 Antimicrobial Classes	Chicken Breast	3.3% 2	13.3% 11	22.3% 35	17.7% 27	14.5% 22	12.1% 12	19.1% 38	31.4% 87
	Ground Turkey	12.2% 9	14.0% 16	4.9% 7	2.7% 5	3.1% 5	3.2% 6	2.9% 7	3.7% 7
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3	14.3% 2
	Pork Chop	40.0% 4	40.0% 2	9.1% 1	22.2% 2	–	–	–	25.0% 2
5. Resistant to ≥ 6 Antimicrobial Classes	Chicken Breast	–	4.8% 4	5.7% 9	3.9% 6	5.9% 9	4.0% 4	4.0% 8	11.2% 31
	Ground Turkey	10.8% 8	3.5% 4	2.8% 4	2.2% 4	1.9% 3	2.1% 4	2.0% 5	2.6% 5
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	–	–	–	8.3% 2	14.3% 2
	Pork Chop	20.0% 2	40.0% 2	–	–	–	–	–	12.5% 1

[1] Dashes indicate 0.0% resistance.

[2] Cephem class includes Cephalothin for 2002 and 2003.

Table 9a. MIC Distribution among *Salmonella* from Chicken Breast, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (60)	0.0	**0.0**	[0.0 - 6.0]						6.7	58.3	30.0	5.0								
	2003 (83)	0.0	**0.0**	[0.0 - 4.3]						8.4	47.0	41.0	3.6								
	2004 (157)	0.0	**0.0**	[0.0 - 2.3]						7.6	46.5	40.1	5.7								
	2005 (153)	0.0	**0.0**	[0.0 - 2.4]						7.2	69.3	20.3	3.3								
	2006 (152)	0.0	**0.0**	[0.0 - 2.4]						1.3	44.1	44.1	10.5								
	2007 (99)	0.0	**0.0**	[0.0 - 3.7]						9.1	42.4	45.5	2.0	1.0							
	2008 (199)	0.0	**0.0**	[0.0 - 1.8]						0.5	41.2	52.3	5.5	0.5							
	2009 (277)	0.0	**0.0**	[0.0 - 1.3]						8.3	48.0	39.4	4.3								
Gentamicin	2002 (60)	0.0	**10.0**	[3.8 - 20.5]					36.7	48.3	5.0				**1.7**	**8.3**					
	2003 (83)	1.2	**6.0**	[2.0 - 13.5]					33.7	54.2	4.8			1.2	**2.4**	**3.6**					
	2004 (157)	0.6	**3.8**	[1.4 - 8.1]					46.5	45.2	3.8			0.6	**1.9**	**1.9**					
	2005 (153)	0.0	**3.3**	[1.1 - 7.5]					64.7	30.1	2.0				**0.7**	**2.6**					
	2006 (152)	1.3	**9.2**	[5.1 - 15.0]					42.1	46.1	1.3			1.3		**9.2**					
	2007 (99)	1.0	**6.1**	[2.3 - 12.7]					52.5	35.4	4.0	1.0		1.0	**2.0**	**4.0**					
	2008 (199)	0.0	**7.0**	[3.9 - 11.5]					28.6	56.3	8.0					**7.0**					
	2009 (277)	0.7	**3.6**	[1.7 - 6.5]					51.6	40.4	3.2		0.4	0.7	**1.4**	**2.2**					
Kanamycin	2002 (60)	0.0	**6.7**	[1.8 - 16.2]										91.7	1.7			**6.7**			
	2003 (83)	1.2	**4.8**	[1.3 - 11.9]										94.0		1.2		**4.8**			
	2004 (157)	0.6	**11.5**	[6.9 - 17.5]										84.7	3.2	0.6		**11.5**			
	2005 (153)	0.0	**4.6**	[1.9 - 9.2]										95.4				**4.6**			
	2006 (152)	0.0	**9.9**	[5.6 - 15.8]										88.8	1.3			**9.9**			
	2007 (99)	0.0	**5.1**	[1.7 - 11.4]										91.9	3.0			**5.1**			
	2008 (199)	0.5	**10.6**	[6.7 - 15.7]										86.9	2.0	0.5	**0.5**	**10.1**			
	2009 (277)	0.0	**15.2**	[11.2 - 19.9]										84.5	0.4			**15.2**			
Streptomycin	2002 (60)	N/A	**28.3**	[17.5 - 41.4]												71.7	**10.0**	**18.3**			
	2003 (83)	N/A	**26.5**	[17.4 - 37.3]												73.5	**14.5**	**12.0**			
	2004 (157)	N/A	**28.0**	[21.2 - 35.7]												72.0	**16.6**	**11.5**			
	2005 (153)	N/A	**30.1**	[22.9 - 38.0]												69.9	**21.6**	**8.5**			
	2006 (152)	N/A	**36.2**	[28.6 - 44.4]												63.8	**23.0**	**13.2**			
	2007 (99)	N/A	**30.3**	[21.5 - 40.4]												69.7	**21.2**	**9.1**			
	2008 (199)	N/A	**23.6**	[17.9 - 30.1]												76.4	**9.6**	**14.1**			
	2009 (277)	N/A	**23.1**	[18.3 - 28.5]												76.9	**15.9**	**7.2**			
Penicillins																					
Ampicillin	2002 (60)	0.0	**16.7**	[8.3 - 28.5]							53.3	30.0					**16.7**				
	2003 (83)	0.0	**33.7**	[23.7 - 44.9]							43.4	22.9					**33.7**				
	2004 (157)	0.0	**30.6**	[23.5 - 38.4]							60.5	8.9					**30.6**				
	2005 (153)	0.0	**26.8**	[20.0 - 34.5]							69.3	3.3	0.7				**26.8**				
	2006 (152)	0.0	**22.4**	[16.0 - 29.8]							74.3	2.6	0.7				**22.4**				
	2007 (99)	0.0	**18.2**	[11.1 - 27.2]							68.7	12.1	1.0				**18.2**				
	2008 (199)	0.0	**29.1**	[22.9 - 36.0]							60.8	9.6	0.5				**29.2**				
	2009 (277)	0.0	**45.8**	[39.9 - 51.9]							44.8	9.0	0.4				**45.9**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (60)	1.7	**10.0**	[3.8 - 20.5]							76.7	6.7		5.0	1.7		**10.0**				
	2003 (83)	6.0	**25.3**	[16.4 - 36.0]							65.1	1.2		2.4	6.0		**25.3**				
	2004 (157)	1.3	**24.8**	[18.3 - 32.4]							61.8	7.6		4.5	1.3		**24.8**				
	2005 (153)	3.9	**21.6**	[15.3 - 28.9]							70.6	2.0		2.0	3.9	**2.0**	**19.6**				
	2006 (152)	0.7	**19.1**	[13.2 - 26.2]							75.7	1.3	0.7	2.6	0.7	**0.7**	**18.4**				
	2007 (99)	1.0	**16.2**	[9.5 - 24.9]							77.8	3.0	1.0	1.0	1.0	**1.0**	**15.2**				
	2008 (199)	3.5	**22.6**	[17.0 - 29.1]							65.8	5.0		3.0	3.5	**1.5**	**21.1**				
	2009 (277)	4.3	**37.2**	[31.5 - 43.2]							50.2	3.6	0.4	4.3	4.3	**6.5**	**30.7**				
Cephems																					
Ceftiofur	2002 (60)	0.0	**10.0**	[3.8 - 20.5]					1.7	71.7	16.7	0.0			**10.0**						
	2003 (83)	0.0	**25.3**	[16.4 - 36.0]						51.8	21.7	1.2			**25.3**						
	2004 (157)	0.0	**24.8**	[18.3 - 32.4]					0.6	47.1	27.4				**24.8**						
	2005 (153)	0.0	**20.9**	[14.8 - 28.2]					2.6	61.4	15.0	0.0			**20.9**						
	2006 (152)	0.0	**19.1**	[13.2 - 26.2]						17.8	62.5	0.7		**0.7**	**18.4**						
	2007 (99)	0.0	**16.2**	[9.5 - 24.9]						22.2	58.6	3.0		**1.0**	**15.2**						
	2008 (199)	0.0	**22.6**	[17.0 - 29.1]						11.6	64.8	1.0		**1.5**	**21.1**						
	2009 (277)	0.4	**36.8**	[31.1 - 42.8]						14.1	46.9	1.8	0.4	**10.1**	**26.7**						
Ceftriaxone	2002 (60)	0.0	**10.0**	[3.8 - 20.5]					90.0					**5.0**	**3.3**	**1.7**					
	2003 (83)	0.0	**26.5**	[17.4 - 37.3]					73.5				**1.2**	**1.2**	**16.9**	**7.2**					
	2004 (157)	0.0	**24.8**	[18.3 - 32.4]					75.2					**1.9**	**18.5**	**4.5**					
	2005 (153)	0.0	**21.6**	[15.3 - 28.9]					77.8	0.7				**2.0**	**17.0**	**2.6**					
	2006 (152)	0.0	**19.1**	[13.2 - 26.2]					80.9				**0.7**	**0.7**	**13.8**	**3.3**	**0.7**				
	2007 (99)	0.0	**16.2**	[9.5 - 24.9]					83.8					**2.0**	**10.1**	**4.0**					
	2008 (199)	0.0	**22.6**	[17.0 - 29.1]					77.4					**3.0**	**15.1**	**4.5**					
	2009 (277)	0.0	**37.5**	[31.8 - 43.5]					62.5				**0.4**	**9.7**	**18.4**	**8.7**	**0.4**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9a. MIC Distribution among *Salmonella* from Chicken Breast, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (60)	0.0	**10.0**	[3.8 - 20.5]							1.7	61.7	20.0	6.7		**10.0**					
	2003 (83)	0.0	**25.3**	[16.4 - 36.0]								60.2	13.3	1.2		**25.3**					
	2004 (157)	0.0	**24.8**	[18.3 - 32.4]							2.5	56.7	14.6	1.3		**5.7**	**19.1**				
	2005 (153)	0.7	**20.9**	[14.8 - 28.2]							25.5	48.4	4.6	0.0	0.7	**11.1**	**9.8**				
	2006 (152)	0.7	**18.4**	[12.6 - 25.5]								58.6	21.1	1.3	0.7	**6.6**	**11.8**				
	2007 (99)	2.0	**15.2**	[8.7 - 23.8]							3.0	55.6	22.2	2.0	2.0	**3.0**	**12.1**				
	2008 (199)	1.0	**21.6**	[16.1 - 28.0]							2.5	52.8	21.6	0.5	1.0	**6.5**	**15.1**				
	2009 (277)	5.1	**32.5**	[27.0 - 38.4]							0.7	43.0	16.2	2.5	5.1	**16.2**	**16.2**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (60)	N/A	**16.7**	[8.3 - 28.5]											38.3	31.7	13.3				**16.7**
	2003 (83)	N/A	**14.5**	[7.7 - 23.9]											32.5	33.7	15.7	3.6			**14.5**
Sulfisoxazole	2004 (157)	N/A	**28.7**	[21.7 - 36.4]											12.1	14.6	43.3	1.3		**28.7**	
	2005 (153)	N/A	**17.0**	[11.4 - 23.9]											11.1	28.1	41.8	2.0		**17.0**	
	2006 (152)	N/A	**23.0**	[16.6 - 30.5]											5.3	16.4	53.9	1.3		**23.0**	
	2007 (99)	N/A	**25.3**	[17.1 - 35.0]											13.1	20.2	31.3	10.1		**25.3**	
	2008 (199)	N/A	**39.2**	[32.4 - 46.3]											3.0	18.6	37.7	1.0	0.5	**39.2**	
	2009 (277)	N/A	**48.0**	[42.0 - 54.1]											4.7	15.5	29.2	2.2	0.4	**48.0**	
Trimethoprim-	2002 (60)	N/A	**0.0**	[0.0 - 6.0]				98.3	1.7												
Sulfamethoxazole	2003 (83)	N/A	**0.0**	[0.0 - 4.3]				97.6	2.4												
	2004 (157)	N/A	**0.0**	[0.0 - 2.3]				96.8	3.2												
	2005 (153)	N/A	**0.0**	[0.0 - 2.4]				98.7	1.3												
	2006 (152)	N/A	**1.3**	[0.2 - 4.7]				94.7	3.3	0.7				**1.3**							
	2007 (99)	N/A	**0.0**	[0.0 - 3.7]				84.8	15.2												
	2008 (199)	N/A	**0.0**	[0.0 - 1.8]				90.5	7.0	2.5											
	2009 (277)	N/A	**0.4**	[0.0 - 2.0]				97.8	1.4	0.4			**0.4**								
Phenicols																					
Chloramphenicol	2002 (60)	0.0	**0.0**	[0.0 - 6.0]								1.7	68.3	30.0							
	2003 (83)	0.0	**2.4**	[0.3 - 8.4]									32.5	65.1			**2.4**				
	2004 (157)	0.6	**1.9**	[0.4 - 5.5]								2.5	14.6	80.3	0.6		**1.9**				
	2005 (153)	0.0	**0.7**	[0.0 - 3.6]								1.3	65.4	32.7			**0.7**				
	2006 (152)	0.7	**2.6**	[0.7 - 6.6]								0.7	32.9	63.2	0.7		**2.6**				
	2007 (99)	5.1	**1.0**	[0.0 - 5.5]									28.3	65.7	5.1	**1.0**					
	2008 (199)	0.0	**0.5**	[0.0 - 2.8]								1.0	27.1	71.4			**0.5**				
	2009 (277)	0.4	**0.0**	[0.0 - 1.3]									23.1	76.5	0.4						
Quinolones																					
Ciprofloxacin	2002 (60)	0.0	**0.0**	[0.0 - 6.0]	90.0	10.0															
	2003 (83)	0.0	**0.0**	[0.0 - 4.3]	83.1	14.5	1.2		1.2												
	2004 (157)	0.0	**0.0**	[0.0 - 2.3]	96.2	3.8															
	2005 (153)	0.0	**0.0**	[0.0 - 2.4]	88.2	11.1		0.7													
	2006 (152)	0.0	**0.0**	[0.0 - 2.4]	68.4	30.9			0.7												
	2007 (99)	0.0	**0.0**	[0.0 - 3.7]	85.9	14.1															
	2008 (199)	0.0	**0.0**	[0.0 - 1.8]	81.9	17.1	1.0														
	2009 (277)	0.0	**0.0**	[0.0 - 1.3]	78.0	20.6	1.1		0.4												
Nalidixic Acid	2002 (60)	N/A	**0.0**	[0.0 - 6.0]									68.3	31.7							
	2003 (83)	N/A	**1.2**	[0.0 - 6.5]							1.2	1.2	84.3	12.0			**1.2**				
	2004 (157)	N/A	**0.0**	[0.0 - 2.3]								12.1	82.8	5.1							
	2005 (153)	N/A	**0.7**	[0.0 - 3.6]							0.7	27.5	69.3	1.3	0.7	**0.7**					
	2006 (152)	N/A	**0.7**	[0.0 - 3.6]								25.0	71.1	3.3			**0.7**				
	2007 (99)	N/A	**0.0**	[0.0 - 3.7]								33.3	62.6	4.0							
	2008 (199)	N/A	**0.0**	[0.0 - 1.8]								26.1	70.4	3.5							
	2009 (277)	N/A	**0.4**	[0.0 - 2.0]							0.4	16.2	82.0	0.7	0.4		**0.4**				
Tetracyclines																					
Tetracycline	2002 (60)	1.7	**33.3**	[21.7 - 46.7]									65.0	1.7			**33.3**				
	2003 (83)	0.0	**27.7**	[18.4 - 38.6]									72.3			**1.2**	**26.5**				
	2004 (157)	0.6	**46.5**	[38.5 - 54.6]									52.9	0.6			**46.5**				
	2005 (153)	0.0	**43.8**	[35.8 - 52.0]									56.2			**0.7**	**43.1**				
	2006 (152)	0.0	**46.7**	[38.6 - 55.0]									53.3			**1.3**	**45.4**				
	2007 (99)	0.0	**41.4**	[31.6 - 51.8]									58.6				**41.4**				
	2008 (199)	0.5	**46.7**	[39.6 - 53.9]									52.8	0.5	**1.5**		**45.2**				
	2009 (277)	0.4	**59.9**	[53.9 - 65.7]									39.7	0.4	**0.4**		**59.6**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9b. MIC Distribution among *Salmonella* from Ground Turkey, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (74)	0.0	**0.0**	[0.0 - 4.9]						6.8	55.4	32.4	5.4								
	2003 (114)	0.0	**0.0**	[0.0 - 3.2]							52.6	44.7	2.6								
	2004 (142)	0.0	**0.0**	[0.0 - 2.6]						2.1	50.0	44.4	3.5								
	2005 (183)	0.0	**0.0**	[0.0 - 2.0]						0.0	62.3	35.5	1.6	0.5							
	2006 (159)	0.0	**0.0**	[0.0 - 2.3]							34.6	59.1	5.7	0.6							
	2007 (190)	0.0	**0.0**	[0.0 - 1.9]						1.1	46.8	42.6	8.9	0.5							
	2008 (245)	0.4	**0.0**	[0.0 - 1.5]							11.0	74.7	12.7	1.2		0.4					
	2009 (190)	0.0	**0.0**	[0.0 - 1.9]						0.5	36.8	55.3	7.4								
Gentamicin	2002 (74)	2.7	**14.9**	[7.7 - 25.0]					40.5	39.2	2.7			2.7	**5.4**	**9.5**					
	2003 (114)	5.3	**22.8**	[15.5 - 31.6]					25.4	37.7	5.3	3.5		5.3	**14.9**	**7.9**					
	2004 (142)	2.8	**20.4**	[14.1 - 28.0]					33.8	37.3	4.9	0.7		2.8	**9.2**	**11.3**					
	2005 (183)	5.5	**26.8**	[20.5 - 33.8]					36.6	29.0	1.1		1.1	5.5	**14.2**	**12.6**					
	2006 (159)	1.3	**28.9**	[22.0 - 36.6]					18.9	45.3	4.4	1.3		1.3	**6.9**	**22.0**					
	2007 (190)	2.1	**24.7**	[18.8 - 31.5]					27.9	41.1	3.7	0.5		2.1	**5.8**	**18.9**					
	2008 (245)	0.4	**27.8**	[22.2 - 33.8]					8.2	51.0	11.0	1.2	0.4	0.4	**4.9**	**22.9**					
	2009 (190)	1.6	**18.4**	[13.2 - 24.7]					25.8	46.3	6.8	0.5	0.5	1.6	**2.6**	**15.8**					
Kanamycin	2002 (74)	2.7	**18.9**	[10.7 - 29.7]										74.3	4.1	2.7	**2.7**	**16.2**			
	2003 (114)	2.6	**27.2**	[19.3 - 36.3]										70.2		2.6	**14.0**	**13.2**			
	2004 (142)	1.4	**18.3**	[12.3 - 25.7]										78.9	1.4	1.4	**7.0**	**11.3**			
	2005 (183)	0.0	**20.2**	[14.7 - 26.8]										77.6	2.2		**3.3**	**16.9**			
	2006 (159)	1.3	**15.1**	[9.9 - 21.6]										81.1	2.5	1.3	**3.1**	**11.9**			
	2007 (190)	1.6	**23.7**	[17.8 - 30.4]										69.5	5.3	1.6	**2.1**	**21.6**			
	2008 (245)	2.0	**18.0**	[13.4 - 23.3]										72.7	7.4	2.0	**0.4**	**17.6**			
	2009 (190)	0.0	**6.8**	[3.7 - 11.4]										91.6	1.6			**6.8**			
Streptomycin	2002 (74)	N/A	**37.8**	[26.8 - 49.9]												62.2	**8.1**	**29.7**			
	2003 (114)	N/A	**45.6**	[36.3 - 55.2]												54.4	**20.2**	**25.4**			
	2004 (142)	N/A	**34.5**	[26.7 - 42.9]												65.5	**21.1**	**13.4**			
	2005 (183)	N/A	**44.3**	[36.9 - 51.8]												55.7	**23.5**	**20.8**			
	2006 (159)	N/A	**40.9**	[33.2 - 48.9]												59.1	**20.1**	**20.8**			
	2007 (190)	N/A	**45.8**	[38.6 - 53.2]												54.2	**27.9**	**17.9**			
	2008 (245)	N/A	**58.8**	[52.3 - 65.0]												41.2	**25.7**	**33.1**			
	2009 (190)	N/A	**27.9**	[21.6 - 34.8]												72.1	**17.9**	**10.0**			
Penicillins																					
Ampicillin	2002 (74)	0.0	**16.2**	[8.7 - 26.6]							41.9	36.5	4.1	1.4			**16.2**				
	2003 (114)	0.0	**28.9**	[20.8 - 38.2]							36.8	31.6	1.8	0.9			**28.9**				
	2004 (142)	0.0	**20.4**	[14.1 - 28.0]							64.1	14.1	1.4				**20.4**				
	2005 (183)	0.0	**26.8**	[20.5 - 33.8]							63.9	8.7	0.5				**26.8**				
	2006 (159)	0.0	**25.8**	[19.2 - 33.3]							67.9	6.3					**25.8**				
	2007 (190)	0.0	**42.6**	[35.5 - 50.0]							49.5	7.9					**42.6**				
	2008 (245)	0.0	**50.6**	[44.2 - 57.0]							43.2	5.7	0.4			**0.4**	**50.2**				
	2009 (190)	0.0	**57.9**	[50.5 - 65.0]							34.7	6.8	0.5				**57.9**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (74)	1.4	**12.2**	[5.7 - 21.8]							73.0	9.5	2.7	1.4	1.4	**5.4**	**6.8**				
	2003 (114)	15.8	**11.4**	[6.2 - 18.7]							58.8	11.4	0.9	10.8	15.8	**8.8**	**2.6**				
	2004 (142)	8.5	**7.7**	[3.9 - 13.4]							71.8	8.5		3.5	8.5	**2.8**	**4.9**				
	2005 (183)	10.4	**8.7**	[5.1 - 13.8]							69.4	3.8		7.7	10.4	**2.7**	**6.0**				
	2006 (159)	11.3	**5.0**	[2.2 - 9.7]							71.7	2.5		9.4	11.3		**5.0**				
	2007 (190)	22.6	**5.3**	[2.6 - 9.5]							53.2	3.7	0.5	14.7	22.6	**1.1**	**4.2**				
	2008 (245)	26.9	**5.3**	[2.9 - 8.9]							43.7	5.7		18.4	26.9	**0.8**	**4.5**				
	2009 (190)	18.4	**5.8**	[2.9 - 10.1]							37.9	4.2		33.7	18.4	**2.1**	**3.7**				
Cephems																					
Ceftiofur	2002 (74)	0.0	**8.1**	[3.0 - 16.8]						51.4	35.1	5.4		**1.4**	**6.8**						
	2003 (114)	0.0	**2.6**	[0.5 - 7.5]						41.2	54.4	1.8			**2.6**						
	2004 (142)	0.0	**4.9**	[2.0 - 9.9]						43.0	47.9	4.2			**4.9**						
	2005 (183)	0.0	**7.1**	[3.8 - 11.8]						44.8	46.4	1.6			**7.1**						
	2006 (159)	0.0	**5.0**	[2.2 - 9.7]						4.4	87.4	3.1			**5.0**						
	2007 (190)	0.0	**5.3**	[2.6 - 9.5]						9.5	82.6	2.6			**5.3**						
	2008 (245)	0.0	**4.5**	[2.3 - 7.9]						7.4	82.5	5.7			**4.5**						
	2009 (190)	0.0	**5.8**	[2.9 - 10.1]					0.5	10.5	80.5	2.6		**1.1**	**4.7**						
Ceftriaxone	2002 (74)	0.0	**8.1**	[3.0 - 16.8]					91.9				**1.4**	**5.4**	**1.4**						
	2003 (114)	0.0	**2.6**	[0.5 - 7.5]					97.4					**0.9**		**1.8**					
	2004 (142)	0.0	**5.6**	[2.5 - 10.8]					94.4						**2.1**	**3.5**					
	2005 (183)	0.0	**7.1**	[3.8 - 11.8]					92.9						**3.3**	**1.1**	**1.6**	**1.1**			
	2006 (159)	0.0	**5.0**	[2.2 - 9.7]					95.0					**0.6**	**3.1**	**0.6**	**0.6**				
	2007 (190)	0.0	**5.8**	[2.9 - 10.1]					93.7	0.5					**1.1**	**2.6**	**1.6**	**0.5**			
	2008 (245)	0.0	**4.5**	[2.3 - 7.9]					95.5						**2.9**	**1.2**		**0.4**			
	2009 (190)	0.0	**5.8**	[2.9 - 10.1]					94.2					**0.5**	**2.6**	**2.1**	**0.5**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9b. MIC Distribution among *Salmonella* from Ground Turkey, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (74)	1.4	**8.1**	[3.0 - 16.8]							2.7	47.3	31.1	9.5	1.3	**8.1**					
	2003 (114)	1.8	**2.6**	[0.5 - 7.5]							1.8	55.3	31.6	7.0	1.8	**2.6**					
	2004 (142)	1.4	**4.9**	[2.0 - 9.9]							1.4	60.6	28.2	3.5	1.4	**0.7**	**4.2**				
	2005 (183)	0.0	**7.1**	[3.8 - 11.8]							23.5	46.4	20.8	2.2		**3.8**	**3.3**				
	2006 (159)	0.0	**5.0**	[2.2 - 9.7]								54.7	38.4	1.9		**3.1**	**1.9**				
	2007 (190)	0.5	**5.3**	[2.6 - 9.5]							2.6	65.3	24.7	1.6	0.5	**0.5**	**4.7**				
	2008 (245)	0.0	**4.5**	[2.3 - 7.9]							0.8	65.7	24.9	4.1		**0.4**	**4.1**				
	2009 (190)	0.0	**5.8**	[2.9 - 10.1]							1.6	63.7	26.3	2.6		**2.1**	**3.7**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (74)	N/A	**20.3**	[11.8 - 31.2]											20.3	51.4	6.8	1.4			**20.3**
	2003 (114)	N/A	**33.3**	[24.8 - 42.8]											18.4	33.3	13.2	1.8		**0.9**	**32.5**
Sulfisoxazole	2004 (142)	N/A	**28.2**	[20.9 - 36.3]											4.9	17.6	49.3			**28.2**	
	2005 (183)	N/A	**34.4**	[27.6 - 41.8]											3.3	23.0	39.3			**34.4**	
	2006 (159)	N/A	**32.1**	[24.9 - 39.9]											1.9	10.7	51.6	3.1	0.6	**32.1**	
	2007 (190)	N/A	**34.7**	[28.0 - 42.0]											4.2	23.7	27.9	7.9	1.6	**34.7**	
	2008 (245)	N/A	**27.3**	[21.9 - 33.4]											1.6	32.2	35.9	1.6	1.2	**27.4**	
	2009 (190)	N/A	**20.0**	[14.6 - 26.4]											4.7	13.2	60.0	2.1		**20.0**	
Trimethoprim-	2002 (74)	N/A	**1.4**	[0.0 - 7.3]				89.2	8.1	1.4				**1.4**							
Sulfamethoxazole	2003 (114)	N/A	**0.0**	[0.0 - 3.2]				86.0	13.2	0.9											
	2004 (142)	N/A	**0.0**	[0.0 - 2.6]				89.4	6.3	4.2											
	2005 (183)	N/A	**0.5**	[0.0 - 3.0]				96.2	2.7	0.5				**0.5**							
	2006 (159)	N/A	**0.0**	[0.0 - 2.3]				93.1	5.7	1.3											
	2007 (190)	N/A	**0.5**	[0.0 - 2.9]				78.4	20.5	0.5				**0.5**							
	2008 (245)	N/A	**0.4**	[0.0 - 2.3]				83.7	13.1	2.9				**0.4**							
	2009 (190)	N/A	**1.6**	[0.3 - 4.5]				96.8	1.6					**1.6**							
Phenicols																					
Chloramphenicol	2002 (74)	6.8	**1.4**	[0.0 - 7.3]									39.2	52.7	6.8		**1.4**				
	2003 (114)	2.6	**0.9**	[0.0 - 4.8]									13.2	83.3	2.6		**0.9**				
	2004 (142)	4.2	**2.8**	[0.8 - 7.1]									12.7	80.3	4.2		**2.8**				
	2005 (183)	2.7	**0.5**	[0.0 - 3.0]									41.0	55.7	2.7		**0.5**				
	2006 (159)	0.6	**0.6**	[0.0 - 3.5]									27.7	71.1	0.6		**0.6**				
	2007 (190)	1.6	**1.6**	[0.3 - 4.5]									32.1	64.7	1.6		**1.6**				
	2008 (245)	1.2	**1.6**	[0.4 - 4.1]									35.1	62.0	1.2		**1.6**				
	2009 (190)	1.1	**1.6**	[0.3 - 4.5]								1.1	22.6	73.7	1.1	**1.1**	**0.5**				
Quinolones																					
Ciprofloxacin	2002 (74)	0.0	**0.0**	[0.0 - 4.9]	71.6	17.6	2.7	1.4	1.4	2.7	2.7										
	2003 (114)	0.0	**0.0**	[0.0 - 3.2]	86.0	8.8	0.9		3.5	0.9											
	2004 (142)	0.0	**0.0**	[0.0 - 2.6]	93.7	4.9	1.4														
	2005 (183)	0.0	**0.0**	[0.0 - 2.0]	80.9	16.4	1.6	0.5	0.5												
	2006 (159)	0.0	**0.0**	[0.0 - 2.3]	74.8	24.5				0.6											
	2007 (190)	0.0	**0.0**	[0.0 - 1.9]	87.4	10.0			2.6												
	2008 (245)	0.0	**0.0**	[0.0 - 1.5]	78.4	20.4	0.8		0.4												
	2009 (190)	0.0	**0.0**	[0.0 - 1.9]	84.7	14.7	0.5														
Nalidixic Acid	2002 (74)	N/A	**8.1**	[3.0 - 16.8]							1.4		64.9	24.3	1.4		**8.1**				
	2003 (114)	N/A	**4.4**	[1.4 - 9.9]								0.9	82.5	11.4	0.9		**4.4**				
	2004 (142)	N/A	**0.0**	[0.0 - 2.6]								4.2	85.2	9.9	0.7						
	2005 (183)	N/A	**1.1**	[0.1 - 3.9]								14.2	80.9	3.8			**1.1**				
	2006 (159)	N/A	**0.0**	[0.0 - 2.3]								10.1	86.2	3.1	0.6						
	2007 (190)	N/A	**2.6**	[0.9 - 6.0]							1.1	28.4	67.4	0.5			**2.6**				
	2008 (245)	N/A	**0.4**	[0.0 - 2.3]								18.0	78.4	2.9	0.4		**0.4**				
	2009 (190)	N/A	**0.0**	[0.0 - 1.9]							0.5	15.8	81.1	2.6							
Tetracyclines																					
Tetracycline	2002 (74)	0.0	**55.4**	[43.4 - 67.0]									44.6		**1.4**	**2.7**	**51.4**				
	2003 (114)	2.6	**39.5**	[30.4 - 49.1]									57.9	2.6			**39.5**				
	2004 (142)	7.7	**56.3**	[47.8 - 64.6]									35.9	7.7	**4.2**	**0.7**	**51.4**				
	2005 (183)	0.0	**39.9**	[32.7 - 47.4]									60.1			**0.5**	**39.3**				
	2006 (159)	0.0	**56.0**	[47.9 - 63.8]									44.0			**0.6**	**55.3**				
	2007 (190)	0.5	**67.4**	[60.2 - 74.0]									32.1	0.5	**0.5**	**3.7**	**63.2**				
	2008 (245)	0.4	**66.1**	[59.8 - 72.0]									33.5	0.4		**4.1**	**62.0**				
	2009 (190)	1.1	**65.3**	[58.0 - 72.0]									33.7	1.1	**1.1**	**1.1**	**63.2**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9c. MIC Distribution among *Salmonella* from Ground Beef, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (9)	0.0	**0.0**	[0.0 - 4.9]						11.1	66.7	22.2									
	2003 (10)	0.0	**0.0**	[0.0 - 3.2]							60.0	40.0									
	2004 (14)	0.0	**0.0**	[0.0 - 2.6]							64.3	28.6	7.1								
	2005 (8)	0.0	**0.0**	[0.0 - 2.0]						12.5	75.0	12.5									
	2006 (19)	0.0	**0.0**	[0.0 - 2.3]							15.8	73.7	5.3	5.3							
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]							46.2	46.2	7.7								
	2008 (24)	0.0	**0.0**	[0.0 - 14.2]							8.3	79.2	12.5								
	2009 (14)	0.0	**0.0**	[0.0 - 23.2]							28.6	57.1	14.3								
Gentamicin	2002 (9)	0.0	**0.0**	[0.0 - 33.6]					55.6	44.4											
	2003 (10)	0.0	**0.0**	[0.0 - 30.8]					30.0	40.0	30.0										
	2004 (14)	0.0	**0.0**	[0.0 - 23.2]					57.1	42.9											
	2005 (8)	0.0	**25.0**	[3.2 - 65.1]					37.5	37.5					**25.0**						
	2006 (19)	0.0	**0.0**	[0.0 - 17.6]					15.8	68.5	15.8										
	2007 (13)	0.0	**7.7**	[0.2 - 36.0]					15.4	76.9					**7.7**						
	2008 (24)	0.0	**8.3**	[1.0 - 27.0]					4.2	75.0	8.3	4.2				**8.3**					
	2009 (14)	0.0	**14.3**	[1.8 - 42.8]					7.1	57.1	14.3	7.1			**7.1**	**7.1**					
Kanamycin	2002 (9)	0.0	**0.0**	[0.0 - 33.6]										100.0							
	2003 (10)	0.0	**0.0**	[0.0 - 30.8]										100.0							
	2004 (14)	0.0	**0.0**	[0.0 - 23.2]										100.0							
	2005 (8)	0.0	**25.0**	[3.2 - 65.1]										75.0				**25.0**			
	2006 (19)	0.0	**5.3**	[0.1 - 26.0]										94.7				**5.3**			
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]										100.0							
	2008 (24)	0.0	**8.3**	[1.0 - 27.0]										83.3	8.3			**8.3**			
	2009 (14)	0.0	**14.3**	[1.8 - 42.8]										85.7				**14.3**			
Streptomycin	2002 (9)	N/A	**22.2**	[2.8 - 60.0]												77.8		**22.2**			
	2003 (10)	N/A	**40.0**	[12.2 - 73.8]												60.0		**40.0**			
	2004 (14)	N/A	**14.3**	[1.8 - 42.8]												85.7		**14.3**			
	2005 (8)	N/A	**25.0**	[3.2 - 65.1]												75.0	**12.5**	**12.5**			
	2006 (19)	N/A	**10.5**	[1.3 - 33.1]												89.2	**5.3**	**5.3**			
	2007 (13)	N/A	**0.0**	[0.0 - 24.7]												100.0					
	2008 (24)	N/A	**20.8**	[7.1 - 42.2]												79.2		**20.8**			
	2009 (14)	N/A	**28.6**	[8.4 - 58.1]												71.4		**28.6**			
Penicillins																					
Ampicillin	2002 (9)	0.0	**22.2**	[2.8 - 60.0]							33.3	33.3	11.1				**22.2**				
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]							10.0	50.0						**40.0**			
	2004 (14)	0.0	**21.4**	[4.7 - 50.8]							78.6						**21.4**				
	2005 (8)	0.0	**25.0**	[3.2 - 65.1]							75.0						**25.0**				
	2006 (19)	0.0	**10.5**	[1.3 - 33.1]							84.2	5.3					**10.5**				
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]							76.9	23.1									
	2008 (24)	0.0	**12.5**	[2.7 - 32.4]							70.8	16.7					**12.5**				
	2009 (14)	0.0	**28.6**	[8.4 - 58.1]							42.9	28.6					**28.6**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (9)	0.0	**22.2**	[2.8 - 60.0]							55.6	22.2					**22.2**				
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]							50.0	10.0					**40.0**				
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]							71.4	7.1		7.1			**14.3**				
	2005 (8)	25.0	**0.0**	[0.0 - 36.9]							75.0				25.0						
	2006 (19)	5.3	**0.0**	[0.0 - 17.6]							84.2	5.3		5.3	5.3						
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]							92.3	7.7									
	2008 (24)	4.2	**8.3**	[1.0 - 27.0]							75.0	12.5			4.2		**8.3**				
	2009 (14)	14.3	**14.3**	[1.8 - 42.8]							50.0	21.4			14.3		**14.3**				
Cephems																					
Ceftiofur	2002 (9)	0.0	**22.2**	[2.8 - 60.0]						44.4	33.3				**22.2**						
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]				30.0	30.0						**40.0**						
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]						50.0	35.7				**14.3**						
	2005 (8)	0.0	**0.0**	[0.0 - 36.9]						37.5	62.5										
	2006 (19)	0.0	**0.0**	[0.0 - 17.6]						10.5	89.5										
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]						30.8	61.5	7.7									
	2008 (24)	0.0	**8.3**	[1.0 - 27.0]						8.3	70.8	12.5			**8.3**						
	2009 (14)	0.0	**14.3**	[1.8 - 42.8]						14.3	71.4				**14.3**						
Ceftriaxone	2002 (9)	0.0	**22.2**	[2.8 - 60.0]					77.8						**11.1**	**11.1**					
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]					60.0						**30.0**		**10.0**				
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]					85.7							**7.1**	**7.1**				
	2005 (8)	0.0	**0.0**	[0.0 - 36.9]					100.0												
	2006 (19)	0.0	**0.0**	[0.0 - 17.6]					100.0												
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]					100.0												
	2008 (24)	0.0	**8.3**	[1.0 - 27.0]					91.7					**4.2**		**4.2**					
	2009 (14)	0.0	**14.3**	[1.8 - 42.8]					85.7							**7.1**	**7.1**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9c. MIC Distribution among *Salmonella* from Ground Beef, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (9)	11.1	**22.2**	[2.8 - 60.0]								33.3	22.2	11.1	11.1	**22.2**					
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]								40.0	20.0			**40.0**					
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]								50.0	14.3	21.4			**14.3**				
	2005 (8)	0.0	**0.0**	[0.0 - 36.9]								50.0	37.5	12.5							
	2006 (19)	0.0	**0.0**	[0.0 - 17.6]								52.6	47.4								
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]								61.5	38.5								
	2008 (24)	0.0	**8.3**	[1.0 - 27.0]							4.2	41.7	45.8			**4.2**	**4.2**				
	2009 (14)	0.0	**14.3**	[1.8 - 42.8]								57.1	14.3	14.3			**14.3**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (9)	N/A	**22.2**	[2.8 - 60.0]											22.2	44.44	11.1				**22.2**
	2003 (10)	N/A	**40.0**	[12.2 - 73.8]											20.0	30.0	10.0				**40.0**
Sulfisoxazole	2004 (14)	N/A	**14.3**	[1.8 - 42.8]											7.1	7.1	71.4			**14.3**	
	2005 (8)	N/A	**25.0**	[3.2 - 65.1]											0.0	12.5	62.5			**25.0**	
	2006 (19)	N/A	**10.5**	[1.3 - 33.1]											5.3	21.1	57.9	5.3		**10.5**	
	2007 (13)	N/A	**7.7**	[0.2 - 36.0]												38.5	30.8	7.7	15.4	**7.7**	
	2008 (24)	N/A	**20.8**	[7.1 - 42.2]												20.8	54.2	4.2		**20.8**	
	2009 (14)	N/A	**35.7**	[12.8 - 64.9]												7.1	57.1			**35.7**	
Trimethoprim-	2002 (9)	N/A	**0.0**	[0.0 - 33.6]				100.0													
Sulfamethoxazole	2003 (10)	N/A	**0.0**	[0.0 - 30.8]				60.0	40.0												
	2004 (14)	N/A	**7.1**	[0.2 - 33.9]				92.9						**7.1**							
	2005 (8)	N/A	**0.0**	[0.0 - 36.9]				87.5	12.5												
	2006 (19)	N/A	**0.0**	[0.0 - 17.6]				94.7	5.3												
	2007 (13)	N/A	**0.0**	[0.0 - 24.7]				76.9	23.1												
	2008 (24)	N/A	**0.0**	[0.0 - 14.2]				91.7	4.2	4.2											
	2009 (14)	N/A	**0.0**	[0.0 - 23.2]				71.4	28.6												
Phenicols																					
Chloramphenicol	2002 (9)	0.0	**22.2**	[2.8 - 60.0]									11.1	66.7			**22.2**				
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]									10.0	50.0			**40.0**				
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]									7.1	78.6			**14.3**				
	2005 (8)	0.0	**12.5**	[0.3 - 52.7]									12.5	75.0			**12.5**				
	2006 (19)	5.3	**5.3**	[0.1 - 26.0]									10.5	78.9	5.3		**5.3**				
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]										100.0							
	2008 (24)	0.0	**12.5**	[2.7 - 32.4]									8.3	79.2			**12.5**				
	2009 (14)	0.0	**21.4**	[4.7 - 50.8]									7.1	71.4			**21.4**				
Quinolones																					
Ciprofloxacin	2002 (9)	0.0	**0.0**	[0.0 - 33.6]	66.7	22.2	11.1														
	2003 (10)	0.0	**0.0**	[0.0 - 30.8]	70.0	30.0															
	2004 (14)	0.0	**0.0**	[0.0 - 23.2]	100.0																
	2005 (8)	0.0	**0.0**	[0.0 - 36.9]	75.0	25.0															
	2006 (19)	0.0	**0.0**	[0.0 - 17.6]	68.4	31.6															
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]	76.9	23.1															
	2008 (24)	0.0	**0.0**	[0.0 - 14.2]	95.8	4.2															
	2009 (14)	0.0	**0.0**	[0.0 - 23.2]	71.4	14.3			14.3												
Nalidixic Acid	2002 (9)	N/A	**0.0**	[0.0 - 33.6]									66.7	22.2	11.1						
	2003 (10)	N/A	**0.0**	[0.0 - 30.8]								10.0	70.0	20.0							
	2004 (14)	N/A	**0.0**	[0.0 - 23.2]								7.1	92.9								
	2005 (8)	N/A	**0.0**	[0.0 - 36.9]									100.0								
	2006 (19)	N/A	**0.0**	[0.0 - 17.6]								10.5	89.5								
	2007 (13)	N/A	**0.0**	[0.0 - 24.7]								30.8	69.2								
	2008 (24)	N/A	**0.0**	[0.0 - 14.2]								37.5	62.5								
	2009 (14)	N/A	**14.3**	[1.8 - 42.8]								21.4	64.3				**14.3**				
Tetracyclines																					
Tetracycline	2002 (9)	0.0	**22.2**	[2.8 - 60.0]									77.8				**22.2**				
	2003 (10)	0.0	**40.0**	[12.2 - 73.8]									60.0				**40.0**				
	2004 (14)	0.0	**14.3**	[1.8 - 42.8]									85.7				**14.3**				
	2005 (8)	0.0	**12.5**	[0.3 - 52.7]									87.5				**12.5**				
	2006 (19)	0.0	**21.1**	[6.1 - 45.6]									78.9			**15.8**	**5.3**				
	2007 (13)	0.0	**0.0**	[0.0 - 24.7]									100.0								
	2008 (24)	0.0	**20.8**	[7.1 - 42.2]									79.2			**4.2**	**16.7**				
	2009 (14)	0.0	**42.9**	[17.7 - 71.1]									57.1				**42.9**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9d. MIC Distribution among *Salmonella* from Pork Chop, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (10)	0.0	**0.0**	[0.0 - 30.8]							80.0	20.0									
	2003 (5)	0.0	**0.0**	[0.0 - 52.2]							100.0										
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]							63.6	27.3	9.1								
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]							55.6	33.3	11.1								
	2006 (8)	0.0	**0.0**	[0.0 - 36.9]							12.5	87.5									
	2007 (18)	0.0	**0.0**	[0.0 - 18.5]							33.3	50.0	16.7								
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]							8.7	82.6	8.7								
	2009 (8)	0.0	**0.0**	[0.0 - 36.9]								75.0	25.0								
Gentamicin	2002 (10)	0.0	**30.0**	[6.7 - 65.2]					30.0	40.0						**30.0**					
	2003 (5)	20.0	**0.0**	[0.0 - 52.2]					40.0	40.0				20.0							
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]					63.6	36.4											
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]					55.6	33.3		11.1									
	2006 (8)	12.5	**50.0**	[15.7 - 84.3]					12.5	25.0				12.5	**25.0**	**25.0**					
	2007 (18)	0.0	**5.6**	[0.1 - 27.3]					27.8	50.0	16.7					**5.6**					
	2008 (23)	0.0	**13.0**	[2.8 - 33.6]					4.4	52.2	26.1	4.4			**8.7**	**4.4**					
	2009 (8)	0.0	**0.0**	[0.0 - 36.9]					12.5	75.0	12.5										
Kanamycin	2002 (10)	0.0	**10.0**	[0.3 - 44.5]										70.0	20.0		**10.0**				
	2003 (5)	20.0	**0.0**	[0.0 - 52.2]										80.0		20.0					
	2004 (11)	0.0	**9.1**	[0.2 - 41.3]										81.8	9.1		**9.1**				
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]										100.0							
	2006 (8)	0.0	**25.0**	[3.2 - 65.1]										75.0			**25.0**				
	2007 (18)	0.0	**5.6**	[0.1 - 27.3]										94.4			**5.6**				
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]										100.0							
	2009 (8)	0.0	**12.5**	[0.3 - 52.7]										87.5			**12.5**				
Streptomycin	2002 (10)	N/A	**70.0**	[34.8 - 93.3]												30.0	**10.0**	**60.0**			
	2003 (5)	N/A	**40.0**	[5.3 - 85.3]												60.0	**20.0**	**20.0**			
	2004 (11)	N/A	**27.3**	[6.0 - 61.0]												72.7		**27.3**			
	2005 (9)	N/A	**33.3**	[7.5 - 70.1]												66.7	**22.2**	**11.1**			
	2006 (8)	N/A	**25.0**	[3.2 - 65.1]												75.0		**25.0**			
	2007 (18)	N/A	**16.7**	[3.6 - 41.4]												83.3	**11.1**	**5.6**			
	2008 (23)	N/A	**13.0**	[2.8 - 33.6]												87.0	**8.7**	**4.4**			
	2009 (8)	N/A	**37.5**	[8.5 - 75.5]												62.5		**37.5**			
Penicillins																					
Ampicillin	2002 (10)	0.0	**40.0**	[12.2 - 73.8]							50.0	10.0					**40.0**				
	2003 (5)	0.0	**40.0**	[5.3 - 85.3]							40.0	20.0					**40.0**				
	2004 (11)	0.0	**9.1**	[0.2 - 41.3]							81.8		9.1				**9.1**				
	2005 (9)	0.0	**22.2**	[2.8 - 60.0]							66.7		11.1				**22.2**				
	2006 (8)	0.0	**25.0**	[3.2 - 65.1]							50.0		25.0				**25.0**				
	2007 (18)	0.0	**5.6**	[0.1 - 27.3]							44.4	22.2	27.8				**5.6**				
	2008 (23)	0.0	**13.0**	[2.8 - 33.6]							82.6	4.4					**13.0**				
	2009 (8)	0.0	**37.5**	[8.5 - 75.5]							62.5						**37.5**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-	2002 (10)	20.0	**20.0**	[2.5 - 55.6]							60.0				20.0		**20.0**				
Clavulanic Acid	2003 (5)	20.0	**20.0**	[0.5 - 71.6]							40.0	20.0			20.0		**20.0**				
	2004 (11)	18.2	**0.0**	[0.0 - 28.5]							72.7	9.1			18.2						
	2005 (9)	22.2	**0.0**	[0.0 - 33.6]							66.7	11.1			22.2						
	2006 (8)	25.0	**0.0**	[0.0 - 36.9]							50.0	25.0			25.0						
	2007 (18)	5.6	**0.0**	[0.0 - 18.5]							66.7	27.8			5.6						
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]							82.6	4.4		13.0							
	2009 (8)	12.5	**25.0**	[3.2 - 65.1]							62.5				12.5	**12.5**	**12.5**				
Cephems																					
Ceftiofur	2002 (10)	0.0	**20.0**	[2.5 - 55.6]						50.0	30.0				**20.0**						
	2003 (5)	0.0	**20.0**	[0.5 - 71.6]						60.0		20.0			**20.0**						
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]						72.7	27.3										
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]						22.2	66.7	11.0									
	2006 (8)	0.0	**0.0**	[0.0 - 36.9]							62.5	37.5									
	2007 (18)	0.0	**0.0**	[0.0 - 18.5]						5.6	66.7	27.8									
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]						13.0	87.0										
	2009 (8)	0.0	**25.0**	[3.2 - 65.1]							75.0				**25.0**						
Ceftriaxone	2002 (10)	0.0	**20.0**	[2.5 - 55.6]					80.0						**20.0**						
	2003 (5)	0.0	**20.0**	[0.5 - 71.6]					80.0							**20.0**					
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]					100.0												
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]					100.0												
	2006 (8)	0.0	**0.0**	[0.0 - 36.9]					100.0												
	2007 (18)	0.0	**0.0**	[0.0 - 18.5]					94.4	5.6											
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]					100.0												
	2009 (8)	0.0	**25.0**	[3.2 - 65.1]					75.0							**25.0**					

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 9d. MIC Distribution among *Salmonella* from Pork Chop, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (10)	0.0	**20.0**	[2.5 - 55.6]								40.0	40.0			**20.0**					
	2003 (5)	0.0	**20.0**	[0.5 - 71.6]								20.0	20.0	40.0		**20.0**					
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]								81.8	18.2								
	2005 (9)	11.1	**0.0**	[0.0 - 33.6]							11.1	22.2	55.6		11.1						
	2006 (8)	25.0	**0.0**	[0.0 - 36.9]								62.5	12.5		25.0						
	2007 (18)	27.8	**0.0**	[0.0 - 18.5]								22.2	50.0		27.8						
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]								39.1	60.9								
	2009 (8)	0.0	**25.0**	[3.2 - 65.1]								12.5	62.5			**12.5**	**12.5**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (10)	N/A	**70.0**	[34.8 - 93.3]											10.0		20.0				**70.0**
	2003 (5)	N/A	**40.0**	[5.3 - 85.3]											20.0	40.0					**40.0**
Sulfisoxazole	2004 (11)	N/A	**18.2**	[2.3 - 51.8]												9.1	72.7			**18.2**	
	2005 (9)	N/A	**33.3**	[7.5 - 70.1]											11.1	22.2	33.3			**33.3**	
	2006 (8)	N/A	**75.0**	[34.9 - 96.8]												12.5	12.5			**75.0**	
	2007 (18)	N/A	**16.7**	[3.6 - 41.4]												11.1	33.3	38.9		**16.7**	
	2008 (23)	N/A	**30.4**	[13.2 - 52.9]												8.7	60.9			**30.4**	
	2009 (8)	N/A	**37.5**	[8.5 - 75.5]												12.5	50.0			**37.5**	
Trimethoprim-Sulfamethoxazole	2002 (10)	N/A	**20.0**	[2.5 - 55.6]				70.0	10.0					**20.0**							
	2003 (5)	N/A	**0.0**	[0.0 - 52.2]				60.0	40.0												
	2004 (11)	N/A	**0.0**	[0.0 - 28.5]				100.0													
	2005 (9)	N/A	**11.1**	[0.3 - 48.2]				77.8	11.1					**11.1**							
	2006 (8)	N/A	**50.0**	[15.7 - 84.3]				37.5	12.5				**50.0**								
	2007 (18)	N/A	**5.6**	[0.1 - 27.3]				88.9	5.6					**5.6**							
	2008 (23)	N/A	**0.0**	[0.0 - 14.8]				91.3	4.4	4.4											
	2009 (8)	N/A	**25.0**	[3.2 - 65.1]				75.0						**25.0**							
Phenicols																					
Chloramphenicol	2002 (10)	0.0	**40.0**	[12.2 - 73.8]									30.0	30.0			**40.0**				
	2003 (5)	0.0	**40.0**	[5.3 - 85.3]										60.0			**40.0**				
	2004 (11)	0.0	**18.2**	[2.3 - 51.8]										81.8			**18.2**				
	2005 (9)	11.1	**22.2**	[2.8 - 60.0]								11.1	22.2	33.3	11.1		**22.2**				
	2006 (8)	37.5	**0.0**	[8.5 - 75.5]										62.5	37.5						
	2007 (18)	33.3	**0.0**	[0.0 - 18.5]									5.6	61.1	33.3						
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]										100.0							
	2009 (8)	12.5	**12.5**	[0.3 - 52.7]										75.0	12.5		**12.5**				
Quinolones																					
Ciprofloxacin	2002 (10)	0.0	**0.0**	[0.0 - 30.8]	80.0	20.0															
	2003 (5)	0.0	**0.0**	[0.0 - 52.2]	60.0	20.0	20.0														
	2004 (11)	0.0	**0.0**	[0.0 - 28.5]	100.0																
	2005 (9)	0.0	**0.0**	[0.0 - 33.6]	77.8	22.2															
	2006 (8)	0.0	**0.0**	[0.0 - 36.9]	62.5	12.5	25.0														
	2007 (18)	0.0	**0.0**	[0.0 - 18.5]	66.7	5.6	27.8														
	2008 (23)	0.0	**0.0**	[0.0 - 14.8]	82.6	13.0	4.4														
	2009 (8)	0.0	**0.0**	[0.0 - 36.9]	62.5	37.5															
Nalidixic Acid	2002 (10)	N/A	**0.0**	[0.0 - 30.8]									60.0	40.0							
	2003 (5)	N/A	**0.0**	[0.0 - 52.2]									80.0		20.0						
	2004 (11)	N/A	**0.0**	[0.0 - 28.5]									100.0								
	2005 (9)	N/A	**0.0**	[0.0 - 33.6]								11.1	77.8	11.1							
	2006 (8)	N/A	**0.0**	[0.0 - 36.9]									75.0	25.0							
	2007 (18)	N/A	**0.0**	[0.0 - 18.5]								22.2	44.4	27.8	5.6						
	2008 (23)	N/A	**0.0**	[0.0 - 14.8]								21.7	73.9	4.4							
	2009 (8)	N/A	**0.0**	[0.0 - 36.9]									87.5	12.5							
Tetracyclines																					
Tetracycline	2002 (10)	0.0	**70.0**	[34.8 - 93.3]									30.0			**10.0**	**60.0**				
	2003 (5)	0.0	**80.0**	[28.4 - 99.5]									20.0				**80.0**				
	2004 (11)	0.0	**54.5**	[23.4 - 83.3]									45.5			**18.2**	**36.4**				
	2005 (9)	0.0	**55.6**	[21.2 - 86.3]									44.4			**11.1**	**44.4**				
	2006 (8)	0.0	**25.0**	[3.2 - 65.1]									75.0				**25.0**				
	2007 (18)	0.0	**50.0**	[26.0 - 74.0]									50.0			**5.6**	**44.4**				
	2008 (23)	0.0	**34.8**	[16.4 - 57.3]									65.2				**34.8**				
	2009 (8)	0.0	**37.5**	[8.5 - 75.5]									62.5			**12.5**	**25.0**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double red vertical bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 10. *Campylobacter* Species by Meat Type, 2002-2009[1]

	Species	2002	2003	2004	2005	2006	2007	2008	2009
Total Species (a) Per Year	***C. jejuni***	**202**	**330**	**517**	**414**	**439**	**356**	**339**	**412**
	C. coli	**95**	**147**	**204**	**160**	**157**	**162**	**200**	**194**
	C. lari	**0**	**2**	**0**	**2**	**3**	**0**	**2**	**0**
Total (A)		**297**	**479**	**721**	**576**	**599**	**518**	**541**	**606**
Meat Type[2]	**Species[3]**								
Chicken Breast	***C. jejuni***	98.0% 198	98.5% 325	98.6% 510	97.3% 403	97.0% 426	93.3% 332	97.1% 329	97.8% 403
	C. coli	94.7% 90	96.6% 142	96.1% 196	94.4% 151	92.4% 145	88.3% 143	90.5% 181	92.3% 179
	C. lari		100.0% 2			33.3% 1			
	Total (N)[4]	**97.0% 288**	**97.9% 469**	**97.9% 706**	**96.2% 554**	**95.5% 572**	**91.7% 475**	**94.3% 510**	**96.0% 582**
Ground Turkey	***C. jejuni***	1.0% 2	1.2% 4	1.4% 7	2.4% 10	2.7% 12	5.6% 20	3.0% 10	2.2% 9
	C. coli	2.1% 2	0.7% 1	2.5% 5	5.6% 9	6.4% 10	8.6% 14	9.5% 19	7.7% 15
	C. lari				50.0% 1	66.7% 2		100.0% 2	
	Total (N)	**1.3% 4**	**1.0% 5**	**1.7% 12**	**3.5% 20**	**4.0% 24**	**6.6% 34**	**5.7% 31**	**4.0% 24**

[1] Grey areas indicate no isolates were identified for this species per meat type.

[2] Ground beef and pork chop are no longer tested for *Campylobacter* due to low recovery from 2002-2007.

[3] Where % = Number of isolates per species per meat type (n) / total # of isolates per species (a).

[4] Where % in Total (N) = total # of isolates in meat type for any given year (N) / total # of isolates in that year (A).

Table 11a. *Campylobacter jejuni* Isolates from Chicken Breast by Month for All Sites, 2002-2009

Month	2002 n (%[1])	2003 n (%)	2004 n (%)	2005 n (%)	2006 n (%)	2007 n (%)	2008 n (%)	2009 n (%)
January	13 (6.6)	26 (8.0)	42 (8.2)	30 (7.4)	32 (7.5)	29 (8.7)	24 (7.3)	39 (9.7)
February	25 (12.6)	26 (8.0)	40 (7.8)	44 (10.9)	42 (9.9)	24 (7.2)	31 (9.4)	30 (7.4)
March	23 (11.6)	21 (6.5)	32 (6.3)	37 (9.2)	49 (11.5)	32 (9.6)	21 (6.4)	29 (7.2)
April	16 (8.1)	15 (4.6)	27 (5.3)	31 (7.7)	20 (4.7)	25 (7.5)	39 (11.9)	28 (6.9)
May	15 (7.6)	29 (8.9)	41 (8.0)	37 (9.2)	30 (7.0)	18 (5.4)	16 (4.9)	23 (5.7)
June	7 (3.5)	30 (9.2)	49 (9.6)	28 (6.9)	45 (10.6)	26 (7.8)	22 (6.7)	43 (10.7)
July	17 (8.6)	29 (8.9)	51 (10.0)	36 (8.9)	36 (8.5)	32 (9.6)	37 (11.3)	32 (7.9)
August	24 (12.1)	24 (7.4)	45 (8.8)	41 (10.2)	35 (8.2)	33 (9.9)	26 (7.9)	36 (8.9)
September	19 (9.6)	30 (9.2)	52 (10.2)	28 (6.9)	44 (10.3)	17 (5.1)	21 (6.4)	29 (7.2)
October	11 (5.6)	39 (12.0)	55 (10.8)	28 (6.9)	32 (7.5)	35 (10.5)	32 (9.7)	32 (7.9)
November	19 (9.6)	22 (6.8)	33 (6.5)	31 (7.7)	29 (6.8)	35 (10.5)	34 (10.3)	38 (9.4)
December	9 (4.5)	34 (10.5)	43 (8.4)	32 (7.9)	32 (7.5)	26 (7.8)	26 (7.9)	44 (10.9)
Total N (%)[2]	**198 (100)**	**325 (100)**	**510 (100)**	**403 (100)**	**426 (100)**	**332 (100)**	**329 (100)**	**403 (100)**

Table 11b. *Campylobacter coli* Isolates from Chicken Breast by Month for All Sites, 2002-2009

Month	2002 n (%)	2003 n (%)	2004 n (%)	2005 n (%)	2006 n (%)	2007 n (%)	2008 n (%)	2009 n (%)
January	5 (5.6)	4 (2.8)	18 (9.2)	15 (9.9)	7 (4.8)	5 (3.5)	14 (7.7)	11 (6.1)
February	4 (4.4)	5 (3.5)	19 (9.7)	16 (10.6)	8 (5.5)	10 (7.0)	12 (6.6)	13 (7.3)
March	6 (6.7)	6 (4.2)	15 (7.7)	9 (6.0)	10 (6.9)	10 (7.0)	29 (16.0)	20 (11.2)
April	6 (6.7)	15 (10.6)	8 (4.1)	11 (7.3)	11 (7.6)	12 (8.4)	11 (6.1)	17 (9.5)
May	11 (12.2)	11 (7.7)	10 (5.1)	10 (6.6)	12 (8.3)	14 (9.8)	9 (5.0)	19 (10.6)
June	17 (18.9)	11 (7.7)	10 (5.1)	17 (11.3)	12 (8.3)	10 (7.0)	13 (7.2)	12 (6.7)
July[3]		24 (16.9)	16 (8.2)	15 (9.9)	16 (11.0)	14 (9.8)	14 (7.7)	18 (10.1)
August	7 (7.8)	5 (3.5)	17 (8.7)	6 (4.0)	7 (4.8)	11 (7.7)	16 (8.8)	19 (10.6)
September	8 (8.9)	20 (14.1)	20 (10.2)	7 (4.6)	14 (9.7)	10 (7.0)	16 (8.8)	16 (8.9)
October	10 (11.1)	19 (13.4)	18 (9.2)	19 (12.6)	14 (9.7)	16 (11.2)	18 (9.9)	12 (6.7)
November	2 (2.2)	4 (2.8)	25 (12.8)	11 (7.3)	23 (15.9)	14 (9.8)	10 (5.5)	11 (6.1)
December	14 (15.6)	18 (12.7)	20 (10.2)	15 (9.9)	11 (7.6)	17 (11.9)	19 (10.5)	11 (6.1)
Total N (%)	**90 (100)**	**142 (100)**	**196 (100)**	**151 (100)**	**145 (100)**	**143 (100)**	**181 (100)**	**179 (100)**

[1] Where % = # of isolates that month (n) / total # of isolates that year (N).

[2] Where % in Total N = the total % of isolates from January to December.

[3] Grey area indicates that no isolates were identified in that month.

Table 12. Antimicrobial Resistance among *Campylobacter* Species by Meat Type, 2002-2009[1]

Meat Type[2]	Species	Year (N)	Aminoglycosides GEN	Ketolides TEL	Lincosamides CLI	Macrolides AZI	Macrolides ERY	Phenicols FFN	Quinolones CIP	Quinolones NAL	Tetracyclines TET[3]
Chicken Breast	*C. jejuni*	2002 (198)	-				-		15.2%		38.4%
		2003 (325)	0.3%				-		14.5%		40.6%
		2004 (510)	-	0.4%	0.4%	0.8%	0.8%	-	15.1%	15.1%	50.2%
		2005 (403)	-	0.5%	0.5%	0.5%	0.5%	-	15.1%	14.9%	46.4%
		2006 (426)	-	0.7%	0.7%	0.9%	0.9%	-	16.7%	16.7%	47.2%
		2007 (332)	-	0.6%	0.6%	0.6%	0.6%	-	17.2%	17.2%	48.5%
		2008 (329)	-	0.3%	0.9%	1.2%	1.2%	-	14.6%	14.6%	49.9%
		2009 (403)	-	0.2%	0.5%	1.0%	1.0%	-	21.1%	21.1%	46.2%
		Total (2926)	< 0.1%	0.5%	0.6%	0.8%	0.7%	-	16.3%	16.6%	46.6%
	C. coli	2002 (90)	-				7.8%		10.0%		44.4%
		2003 (142)	-				7.0%		13.4%		50.7%
		2004 (196)	-	8.2%	7.1%	9.2%	9.2%	-	16.3%	16.3%	46.4%
		2005 (151)	-	7.9%	8.6%	9.9%	9.9%	-	29.1%	29.1%	42.4%
		2006 (145)	-	4.8%	4.8%	5.5%	5.5%	-	22.1%	20.7%	46.9%
		2007 (143)	0.7%	7.0%	4.9%	6.3%	6.3%	-	25.9%	25.9%	39.9%
		2008 (181)	1.7%	7.7%	5.0%	9.9%	9.9%	-	20.4%	20.4%	46.4%
		2009 (179)	5.6%	4.5%	3.4%	4.5%	4.5%	-	18.4%	18.4%	38.0%
		Total (1227)	1.1%	6.7%	5.6%	7.6%	7.6%	-	19.8%	21.4%	44.3%
	C. lari	2003 (2)	-				-		-		-
		2006 (1)	-	-	-	-	-	-	100.0%	100.0%	-
		Total (3)	-	-	-	-	-	-	33.3%	100.0%	-
	Total (N=4156)		0.4%	2.3%	2.1%	2.8%	2.7%	-	17.3%	18.0%	45.9%
Ground Turkey	*C. jejuni*	2002 (2)	-				-		50.0%		100.0%
		2003 (4)	-				-		-		75.0%
		2004 (7)	-	-	-	-	-	-	28.6%	28.6%	42.9%
		2005 (10)	-	-	-	-	-	-	10.0%	10.0%	70.0%
		2006 (12)	-	-	-	-	-	-	50.0%	50.0%	75.0%
		2007 (20)	-	5.0%	5.0%	5.0%	5.0%	-	30.0%	30.0%	90.0%
		2008 (10)	-	10.0%	10.0%	10.0%	10.0%	-	60.0%	60.0%	100.0%
		2009 (9)	-	-	-	-	-	-	44.4%	44.4%	100.0%
		Total (74)	-	2.9%	2.9%	2.9%	2.7%	-	35.1%	36.8%	82.4%
	C. coli	2002 (2)	-				-		50.0%		50.0%
		2003 (1)	-				-		100.0%		100.0%
		2004 (5)	-	-	-	-	-	-	-	-	-
		2005 (9)	-	22.2%	-	22.2%	22.2%	-	55.6%	55.6%	88.9%
		2006 (10)	-	-	-	-	-	-	30.0%	30.0%	80.0%
		2007 (14)	-	-	-	-	-	-	50.0%	50.0%	64.3%
		2008 (19)	-	5.3%	-	5.3%	5.3%	-	47.4%	47.4%	94.7%
		2009 (15)	-	-	-	-	-	-	46.7%	46.7%	73.3%
		Total (75)	-	4.2%	-	4.2%	4.0%	-	44.0%	43.1%	74.7%
	C. lari	2005 (1)	-	-	-	-	-	-	100.0%	100.0%	-
		2006 (2)	-	-	-	-	-	-	100.0%	100.0%	-
		2008 (2)	-	-	-	-	-	-	100.0%	100.0%	-
		Total (5)	-	-	-	-	-	-	100.0%	100.0%	-
	Total (N=154)		-	3.4%	1.4%	3.4%	3.2%	-	41.6%	42.1%	76.0%
Grand Total (N=4310)			0.3%	2.3%	2.0%	2.8%	2.7%	-	18.2%	19.0%	47.0%

[1] Gray areas indicate antimicrobial not included in testing that year. Totals for these antimicrobials exclude years when they were not tested. Dashes indicate 0.0% resistance.

[2] Ground beef and pork chop are no longer tested for *Campylobacter* due to low recovery from 2002-2007.

[3] Results for 2002 and 2003 are for Doxycycline.

Table 13. Trends in Antimicrobial Resistance among *Campylobacter* Species from Chicken Breast, 2002-2009[1]

Species	Year (N)		Aminoglycosides	Ketolides	Lincosamides	Macrolides		Phenicols	Quinolones		Tetracyclines[2]
			GEN (MIC ≥ 8)	TEL (MIC ≥ 16)	CLI (MIC ≥ 8)	AZI (MIC ≥ 8)	ERY (MIC ≥ 32)	FFN[3] (MIC > 4)	CIP (MIC ≥ 4)	NAL (MIC ≥ 64)	TET (MIC ≥ 16)
C. jejuni	2002 (198)	n (%R[4])	–	Not Tested	Not Tested	Not Tested	–	Not Tested	30 (15.2)	Not Tested	76 (38.4)
	2003 (325)		1 (0.3)	Not Tested	Not Tested	Not Tested	–	Not Tested	47 (14.5)	Not Tested	132 (40.6)
	2004 (510)		–	2 (0.4)	2 (0.4)	4 (0.8)	4 (0.8)	–	77 (15.1)	77 (15.1)	256 (50.2)
	2005 (403)		–	2 (0.5)	2 (0.5)	2 (0.5)	2 (0.5)	–	61 (15.1)	60 (14.9)	187 (46.4)
	2006 (426)		–	3 (0.7)	3 (0.7)	4 (0.9)	4 (0.9)	–	71 (16.7)	71 (16.7)	201 (47.2)
	2007 (332)		–	2 (0.6)	2 (0.6)	2 (0.6)	2 (0.6)	–	57 (17.2)	57 (17.2)	161 (48.5)
	2008 (329)		–	1 (0.3)	3 (0.9)	4 (1.2)	4 (1.2)	–	48 (14.6)	48 (14.6)	164 (49.8)
	2009 (403)		–	1 (0.2)	2 (0.5)	4 (1.0)	4 (1.0)	–	85 (21.1)	85 (21.1)	186 (46.2)
	Z Statistic		**1.2403**	**0.4375***	**-0.5290***	**-0.7058***	**-1.9629**	**N/A[6]**	**-2.1757**	**-2.0382***	**-1.8933**
	P Value[5]		**0.2149**	**0.6617**	**0.5968**	**0.4803**	**0.0497**	**N/A**	**0.0296**	**0.0415**	**0.0583**
C. coli	2002 (90)	n (%R)	–	Not Tested	Not Tested	Not Tested	7 (7.8)	Not Tested	9 (10.0)	Not Tested	40 (44.4)
	2003 (142)		–	Not Tested	Not Tested	Not Tested	10 (7.0)	Not Tested	19 (13.4)	Not Tested	72 (50.7)
	2004 (196)		–	16 (18.2)	14 (7.1)	18 (9.2)	18 (9.2)	–	32 (16.3)	32 (16.3)	91 (46.4)
	2005 (151)		–	12 (7.9)	13 (8.6)	15 (9.9)	15 (9.9)	–	44 (29.1)	44 (29.1)	64 (42.4)
	2006 (145)		–	7 (4.8)	7 (4.8)	8 (5.5)	8 (5.5)	–	32 (22.1)	30 (20.7)	68 (46.9)
	2007 (143)		1 (0.7)	10 (7.0)	7 (4.9)	9 (6.3)	9 (6.3)	–	37 (25.9)	37 (25.9)	57 (39.9)
	2008 (181)		3 (1.7)	14 (7.7)	9 (5.0)	18 (9.9)	18 (9.9)	–	37 (20.4)	37 (20.4)	84 (46.4)
	2009 (179)		10 (5.6)	8 (4.5)	6 (3.4)	8 (4.5)	8 (4.5)	–	33 (18.4)	33 (18.4)	68 (38.0)
	Z Statistic		**-4.8698**	**1.1070***	**2.0125***	**1.3466***	**0.8853**	**N/A**	**-2.1215**	**0.2090**	**1.6998**
	P Value		**<0.0001**	**0.2683**	**0.0442**	**0.1781**	**0.3760**	**N/A**	**0.0339**	**0.8344**	**0.0892**

[1] Dashes indicate 0.0% resistance.

[2] Results for 2002 and 2003 are for Doxycycline.

[3] Percent non susceptible is reported rather than percent resistant as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.

[4] % R = the number of resistant isolates (n) / the number of positive isolates (N).

[5] P value for percent resistant for trend was calculated using Cochran-Armitage trend test method.

[6] N/A = Z Statistic and P value could not be calculated due to insufficient data or no resistance observed.

* Z statistic and P value calculated based on 6 years data.

Figure 4a. Antimicrobial Resistance among *Campylobacter jejuni* from Chicken Breast, 2002-2009

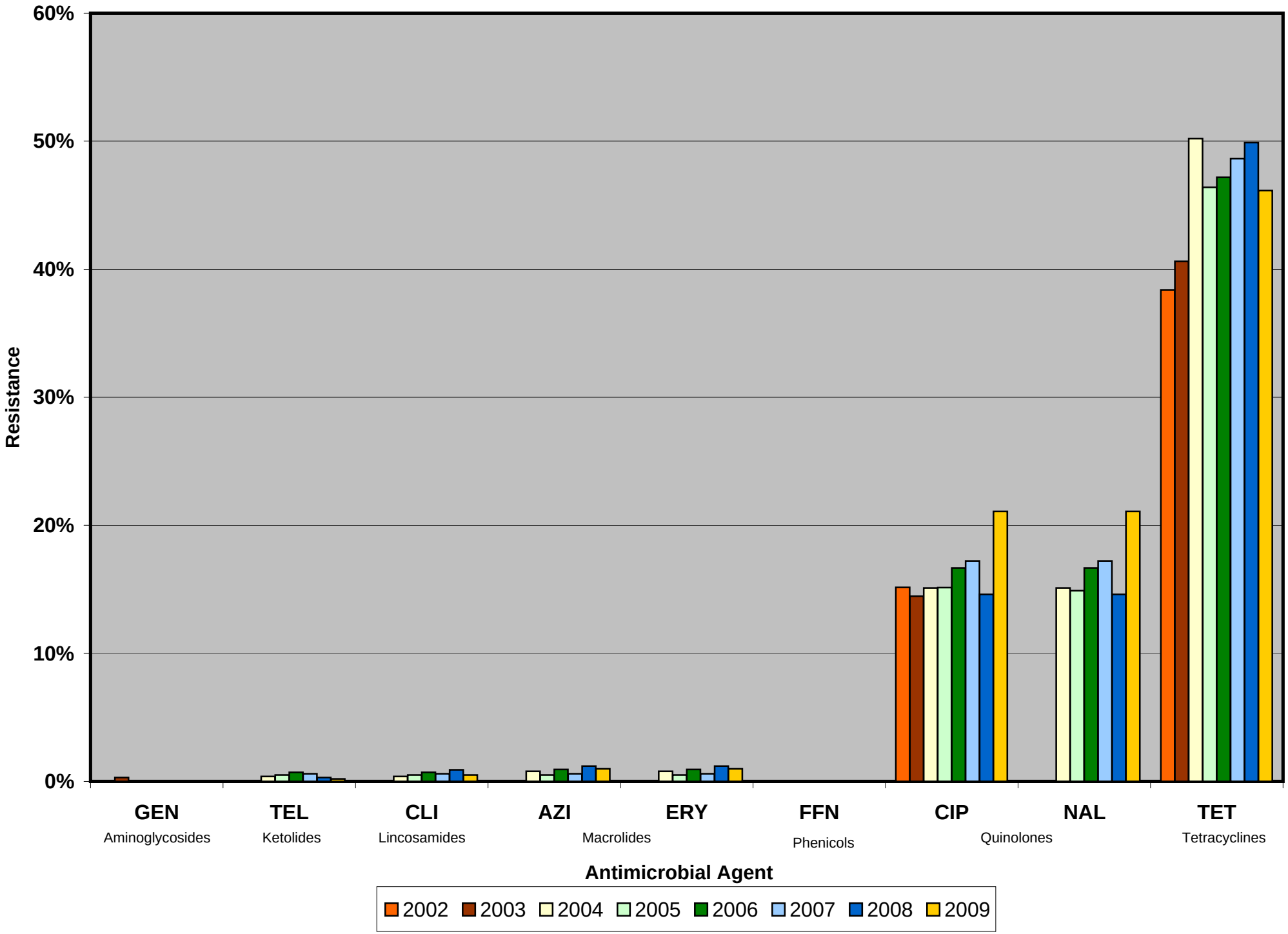


Figure 4b. Antimicrobial Resistance among *Campylobacter coli* from Chicken Breast, 2002-2009

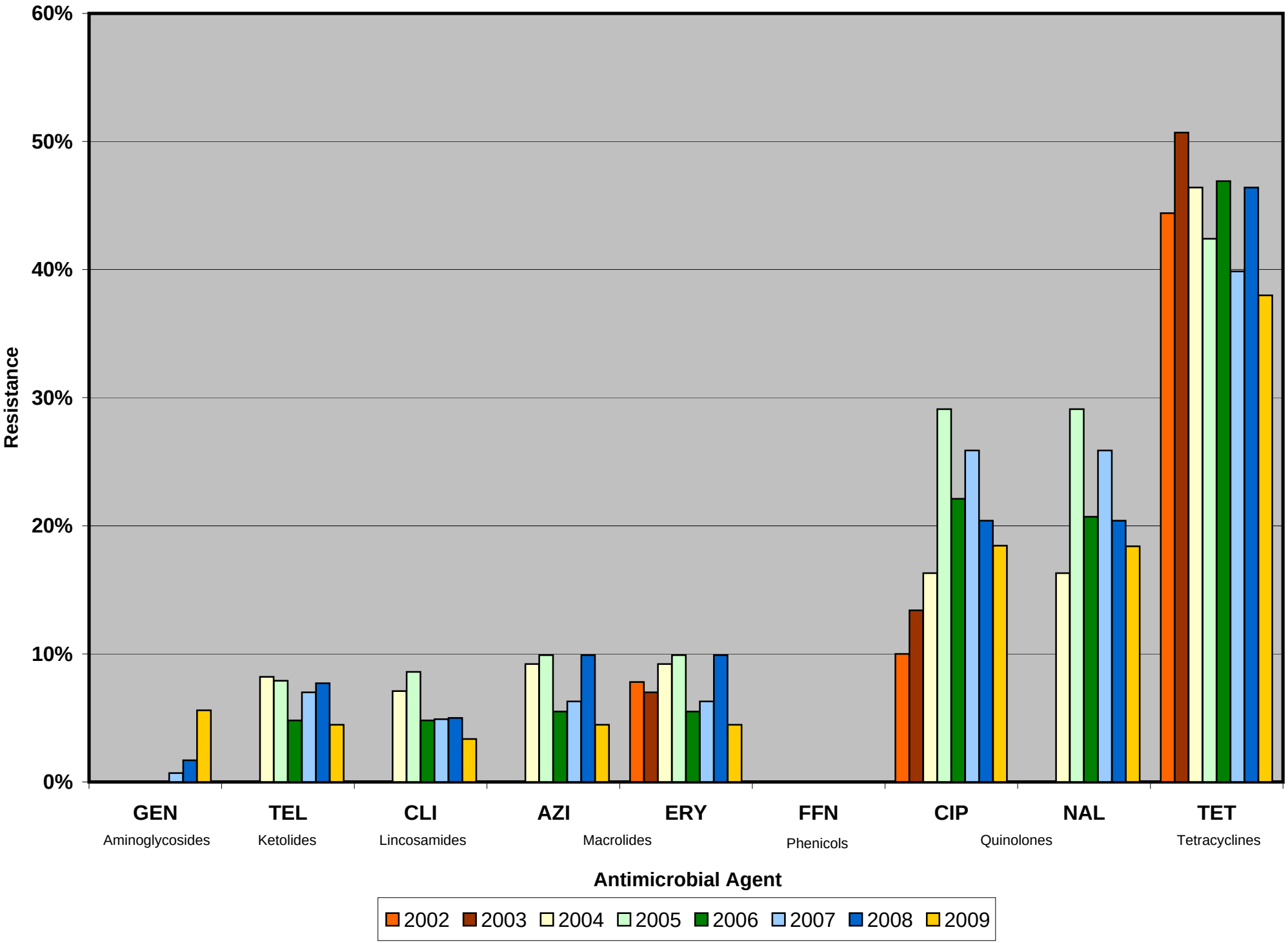


Table 14. Multidrug Resistance among *Campylobacter* Isolates by Species, 2002-2009[1]

Year			2002	2003	2004	2005	2006	2007	2008	2009
No. of Isolates Tested by Species and Source	*C. jejuni*	Chicken Breast	198	325	510	403	426	332	329	403
		Ground Turkey	2	4	7	10	12	20	10	9
	C. coli	Chicken Breast	90	142	196	151	145	143	181	179
		Ground Turkey	2	1	5	9	10	14	19	15
Resistance Pattern	**Species**	**Isolate Source[2]**								
1. No Resistance Detected	*C. jejuni*	Chicken Breast	54.6% 108	51.7% 168	41.0% 209	43.4% 175	43.9% 187	40.4% 134	40.4% 133	41.9% 169
		Ground Turkey	–	25.0% 1	42.9% 3	30.0% 3	16.7% 2	10.0% 2	–	–
	C. coli	Chicken Breast	51.1% 46	43.0% 61	38.3% 75	36.4% 55	38.6% 56	45.5% 65	41.4% 75	48.6% 87
		Ground Turkey	50.0% 1	–	100.0% 5	11.1% 1	20.0% 2	28.6% 4	5.3% 1	20.0% 3
2. Resistance to ≥ 2 Antimicrobial Classes	*C. jejuni*	Chicken Breast	8.1% 16	7.1% 23	7.1% 36	6.0% 24	8.7% 37	7.2% 24	7.0% 23	10.7% 43
		Ground Turkey	50.0% 1	–	14.3% 1	10.0% 1	41.7% 5	30.0% 6	70.0% 7	44.4% 4
	C. coli	Chicken Breast	12.2% 11	10.6% 15	15.3% 30	19.9% 30	15.2% 22	19.6% 28	24.3% 44	15.6% 28
		Ground Turkey	50.0% 1	100.0% 1	–	55.6% 5	30.0% 3	42.9% 6	52.6% 10	40.0% 6
3. Resistance to ≥ 3 Antimicrobial Classes	*C. jejuni*	Chicken Breast	–	–	0.4% 2	0.5% 2	0.7% 3	0.6% 2	0.3% 1	0.2% 1
		Ground Turkey	–	–	–	–	–	5.0% 1	10.0% 1	–
	C. coli	Chicken Breast	1.1% 1	3.5% 5	8.2% 16	9.3% 14	5.5% 8	7.0% 10	6.1% 11	4.5% 8
		Ground Turkey	–	–	–	22.2% 2	–	–	5.3% 1	–
4. Resistance to ≥ 4 Antimicrobial Classes	*C. jejuni*	Chicken Breast	–	–	0.4% 2	0.3% 1	0.7% 3	–	–	–
		Ground Turkey	–	–	–	–	–	5.0% 1	10.0% 1	–
	C. coli	Chicken Breast	–	–	1.5% 3	4.6% 7	2.1% 3	2.8% 4	2.2% 4	1.7% 3
		Ground Turkey	–	–	–	22.2% 2	–	–	–	–
5. Resistance to ≥ 5 Antimicrobial Classes	*C. jejuni*	Chicken Breast	–	–	–	–	–	–	–	–
		Ground Turkey	–	–	–	–	–	5.0% 1	–	–
	C. coli	Chicken Breast	–	–	0.5% 1	0.7% 1	–	0.7% 1	–	1.1% 2
		Ground Turkey	–	–	–	–	–	–	–	–

[1] Dashes indicate 0.0% resistance.

[2] Ground beef and pork chop are no longer tested for Campylobacter due to low recovery from 2002-2007.

Table 15a. MIC Distribution among *Campylobacter jejuni* from Chicken Breast, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.008	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128
Aminoglycosides																			
Gentamicin	2002 (198)	0.0	**0.0**	[0.0 - 1.8]				1.0	3.5	24.7	65.7	5.1							
	2003 (325)	0.0	**0.3**	[0.0 - 1.7]					0.9	15.4	67.7	15.7					**0.3**		
	2004 (510)	0.0	**0.0**	[0.0 - 0.7]					1.8	5.1	85.1	8.0							
	2005 (403)	0.0	**0.0**	[0.0 - 0.9]						5.5	89.1	5.5							
	2006 (426)	0.0	**0.0**	[0.0 - 0.9]					0.2	12.9	82.9	3.8	0.2						
	2007 (332)	0.0	**0.0**	[0.0 - 1.1]					0.6	17.2	79.8	2.4							
	2008 (329)	0.0	**0.0**	[0.0 - 1.1]						3.7	88.2	8.2							
	2009 (403)	0.0	**0.0**	[0.0 - 0.9]						1.0	49.4	49.6							
Ketolides																			
Telithromycin	2004 (510)	0.4	**0.4**	[0.0 - 1.4]		0.2		0.4	0.2	13.1	56.5	23.7	4.9	0.2	0.4	**0.4**			
	2005 (403)	0.0	**0.5**	[0.1 - 1.8]		0.2			1.0	11.4	45.4	35.7	5.7			**0.5**			
	2006 (426)	0.2	**0.7**	[0.1 - 2.0]					0.9	11.5	50.0	31.7	4.9		0.2	**0.7**			
	2007 (332)	0.0	**0.6**	[0.1 - 2.2]					0.6	11.4	39.8	40.1	6.6	0.9		**0.6**			
	2008 (329)	0.9	**0.3**	[0.0 - 1.7]					1.2	10.6	42.9	30.4	13.7		0.9	**0.3**			
	2009 (403)	0.5	**0.2**	[0.0 - 1.4]					0.2	7.7	36.2	41.7	12.4	1.0	0.5	**0.2**			
Lincosamides																			
Clindamycin	2004 (510)	0.0	**0.4**	[0.0 - 1.4]			0.6	10.2	55.5	29.6	2.0	1.2	0.6			**0.4**			
	2005 (403)	0.0	**0.5**	[0.1 - 1.8]			0.5	8.4	55.1	30.3	4.5	0.7			**0.5**				
	2006 (426)	0.0	**0.7**	[0.1 - 2.0]			1.6	14.1	46.9	32.4	4.2				**0.7**				
	2007 (332)	0.0	**0.6**	[0.1 - 2.2]			1.2	12.7	58.4	24.7	2.4						**0.6**		
	2008 (329)	0.3	**0.9**	[0.2 - 2.6]			3.7	20.4	45.3	27.4	1.5	0.6		0.3	**0.6**	**0.3**			
	2009 (403)	0.2	**0.5**	[0.1 - 1.8]				3.7	42.4	46.2	6.2	0.5	0.2	0.2	**0.5**				
Macrolides																			
Azithromycin	2004 (510)	0.0	**0.8**	[0.2 - 2.0]		4.9	49.6	38.2	5.3	0.2	0.2	0.6	0.2						**0.8**
	2005 (403)	0.0	**0.5**	[0.1 - 1.8]			49.9	46.4	3.0	0.2									**0.5**
	2006 (426)	0.0	**0.9**	[0.3 - 2.4]			54.5	39.4	5.2										**0.9**
	2007 (332)	0.0	**0.6**	[0.1 - 2.2]			46.4	48.5	4.5										**0.6**
	2008 (329)	0.0	**1.2**	[0.3 - 3.1]		3.7	32.2	45.6	15.8	1.5									**1.2**
	2009 (403)	0.0	**1.0**	[0.3 - 2.5]		1.2	22.3	64.5	9.9	1.0									**1.0**
Erythromycin	2002 (198)	0.0	**0.0**	[0.0 - 1.8]							6.1	48.0	39.4	6.6					
	2003 (325)	0.0	**0.0**	[0.0 - 1.1]						0.9	18.5	55.7	21.2	3.7					
	2004 (510)	0.0	**0.8**	[0.2 - 2.0]				0.4	2.5	53.1	35.3	7.8							**0.8**
	2005 (403)	0.0	**0.5**	[0.1 - 1.8]				0.5	4.5	36.7	46.2	11.2	0.5						**0.5**
	2006 (426)	0.0	**0.9**	[0.3 - 2.4]					8.0	39.4	39.0	12.7							**0.9**
	2007 (332)	0.0	**0.6**	[0.1 - 2.2]				0.3	6.9	43.7	34.3	13.6	0.6						**0.6**
	2008 (329)	0.0	**1.2**	[0.3 - 3.1]				0.6	6.1	35.9	38.6	14.9	2.7						**1.2**
	2009 (403)	0.0	**1.0**	[0.3 - 2.5]					1.7	34.5	45.2	17.6						**0.2**	**0.7**
Phenicols																			
Florfenicol[5]	2004 (510)	N/A	**0.0**	[0.0 - 0.7]					0.6		5.1	85.9	8.0	0.4					
	2005 (403)	N/A	**0.0**	[0.0 - 0.9]							10.4	77.7	11.7	0.2					
	2006 (426)	N/A	**0.0**	[0.0 - 0.9]					0.2		8.2	77.9	13.6						
	2007 (332)	N/A	**0.0**	[0.0 - 1.1]							9.3	80.7	9.9						
	2008 (329)	N/A	**0.0**	[0.0 - 1.1]						0.6	14.9	73.6	10.3	0.6					
	2009 (403)	N/A	**0.0**	[0.0 - 0.9]						0.2	6.7	80.4	12.7						
Quinolones																			
Ciprofloxacin	2002 (198)	0.0	**15.2**	[10.5 - 20.9]				2.0	41.9	29.8	9.1	2.0				**12.1**	**2.5**	**0.5**	
	2003 (325)	0.3	**14.5**	[10.8 - 18.8]				2.2	58.2	21.5	3.4		0.3	**0.6**	**2.5**	**6.2**	**4.9**	**0.3**	
	2004 (510)	0.0	**15.1**	[12.1 - 18.5]			0.2	39.8	37.3	7.6				**0.4**	**9.0**	**4.5**	**1.2**		
	2005 (403)	0.0	**15.1**	[11.8 - 19.0]				24.8	50.9	8.9	0.2			**0.5**	**6.2**	**6.7**	**1.7**		
	2006 (426)	0.0	**16.7**	[13.3 - 20.6]			0.7	29.8	44.8	8.0				**0.2**	**7.0**	**7.5**	**1.9**		
	2007 (332)	0.0	**17.2**	[13.3 - 21.7]			0.9	30.1	44.0	7.8					**6.3**	**7.5**	**3.3**		
	2008 (329)	0.0	**14.6**	[11.0 - 18.9]			0.3	26.4	46.8	11.6	0.3				**4.0**	**7.9**	**2.7**		
	2009 (403)	0.0	**21.1**	[17.2 - 25.4]			0.5	8.4	58.3	11.7					**5.0**	**7.9**	**8.2**		
Nalidixic acid	2004 (510)	0.2	**15.1**	[12.1 - 18.5]										64.3	20.4		0.2	**0.4**	**14.7**
	2005 (403)	0.2	**14.9**	[11.6 - 18.7]										69.0	15.9		0.2	**0.2**	**14.6**
	2006 (426)	0.0	**16.7**	[13.3 - 20.6]										71.4	12			**0.5**	**16.2**
	2007 (332)	0.0	**17.2**	[13.3 - 21.7]										69.3	13.6			**0.3**	**16.9**
	2008 (329)	0.0	**14.6**	[11.0 - 18.9]										69.3	15.8	0.3		**0.9**	**13.7**
	2009 (403)	0.0	**21.1**	[17.2 - 25.4]										59.6	19.4			**0.5**	**20.6**
Tetracyclines																			
Doxycycline	2002 (198)	9.1	**38.4**	[31.6 - 45.5]				15.2	16.2	6.6	4.0	2.5	8.1	9.1	**17.7**	**11.1**	**9.6**		
	2003 (325)	6.2	**40.6**	[35.2 - 46.2]				23.4	20.9	4.0	1.5	0.6	2.8	6.2	**17.8**	**16.6**	**6.2**		
Tetracycline	2004 (510)	0.2	**50.2**	[45.8 - 54.6]				0.6	24.3	15.3	7.6	1.8			0.2	**2.2**	**4.9**	**25.9**	**17.3**
	2005 (403)	0.0	**46.4**	[41.5 - 51.4]				0.7	19.1	20.6	9.4	3.2	0.5			**1.0**	**3.2**	**17.9**	**24.3**
	2006 (426)	0.0	**47.2**	[42.4 - 52.0]				1.4	23.2	13.8	10.3	2.8	0.7	0.5		**1.2**	**3.3**	**17.4**	**25.4**
	2007 (332)	0.0	**48.5**	[43.0 - 54.0]				1.2	13.3	21.1	10.5	5.1		0.3		**2.4**	**6.3**	**14.5**	**25.3**
	2008 (329)	0.0	**49.8**	[44.3 - 55.4]				0.6	16.1	19.5	9.7	3.7	0.6			**0.6**	**4.6**	**20.4**	**24.3**
	2009 (403)	0.0	**46.2**	[41.2 - 51.2]					16.4	23.8	10.7	2.2	0.7			**1.0**	**5.5**	**13.6**	**26.1**

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant. Discrepancies between %R and sums of distribution %s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single black vertical bars indicate the breakpoints for susceptibility, while double red vertical bars indicate the breakpoints for resistance. Numbers in the shaded area indicate the percentages of isolates with MICs greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent the isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for streptomycin.

[5] For Florfenicol, percent non-susceptible (MIC ≥8 µg/ml) is reported rather than percent resistant because a resistance breakpoint has not been established.

Table 15b. MIC Distribution among *Campylobacter coli* from Chicken Breast, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.008	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128
Aminoglycosides																			
Gentamicin	2002 (198)	0.0	**0.0**	[0.0 - 4.0]						23.3	75.6	1.1							
	2003 (325)	0.0	**0.0**	[0.0 - 2.6]					1.4	36.6	52.8	9.2							
	2004 (196)	0.0	**0.0**	[0.0 - 1.9]					0.5	4.1	85.7	9.7							
	2005 (151)	0.0	**0.0**	[0.0 - 2.4]						4.0	88.1	7.9							
	2006 (145)	0.0	**0.0**	[0.0 - 2.5]						2.8	93.1	4.1							
	2007 (143)	0.0	**0.7**	[0.0 - 3.8]					0.7	2.8	88.8	7.0					**0.7**		
	2008 (181)	0.0	**1.7**	[0.3 - 4.8]						1.1	73.5	23.2	0.6					**1.7**	
	2009 (179)	0.0	**5.6**	[2.7 - 10.0]							56.4	38.0						**5.6**	
Ketolides	.																		
Telithromycin	2004 (196)	2.6	**8.2**	[4.7 - 12.9]		0.5			1.0	20.4	5.6	18.9	35.7	7.1	2.6	**8.2**			
	2005 (151)	2.0	**7.9**	[4.2 - 13.5]					4.0	17.2	5.3	17.2	33.1	13.2	2.0	**7.9**			
	2006 (145)	0.7	**4.8**	[2.0 - 9.7]					1.4	13.1	2.1	11.7	47.6	18.6	0.7	**4.8**			
	2007 (143)	0.0	**7.0**	[3.4 - 12.5]						11.2	8.4	17.5	48.3	7.7		**7.0**			
	2008 (181)	1.7	**7.7**	[4.3 - 12.6]				0.6	0.6	14.4	6.1	22.1	32.6	14.4	1.7	**7.7**			
	2009 (179)	0.6	**4.5**	[1.9 - 8.6]					0.6	17.3	8.9	15.6	39.1	13.4	0.6	**4.5**			
Lincosamides																			
Clindamycin	2004 (196)	2.0	**7.1**	[4.0 - 11.7]				1.5	19.4	51.0	14.3	4.6		2.0	**3.1**	**4.1**			
	2005 (151)	1.3	**8.6**	[4.7 - 14.3]			0.7	0.7	20.5	42.4	25.2		0.7	1.3	**5.3**	**3.3**			
	2006 (145)	0.7	**4.8**	[2.0 - 9.7]			0.7	0.7	22.8	44.1	15.9	5.5	4.8	0.7	**4.8**				
	2007 (143)	1.4	**4.9**	[2.0 - 9.8]				0.7	16.8	60.8	11.9	3.5		1.4	**2.1**	**2.8**			
	2008 (181)	2.8	**5.0**	[2.3 - 9.2]				4.4	27.1	40.9	13.3	5.5	1.1	2.8	**2.8**	**1.1**	**1.1**		
	2009 (179)	1.7	**3.4**	[1.2 - 7.2]				0.6	7.8	61.5	19.0	3.4	2.8	1.7	**0.6**	**1.7**	**1.1**		
Macrolides																			
Azithromycin	2004 (196)	0.0	**9.2**	[5.5 - 14.1]			14.3	42.9	29.6	3.1	0.5	0.5							**9.2**
	2005 (151)	0.0	**9.9**	[5.7 - 15.9]			13.2	44.4	29.1	3.3									**9.9**
	2006 (145)	0.0	**5.5**	[2.4 - 10.6]			11.7	37.9	37.9	5.5	0.7	0.7							**5.5**
	2007 (143)	0.0	**6.3**	[2.9 - 11.6]			9.1	61.5	21.7	0.7		0.7							**6.3**
	2008 (181)	0.0	**9.9**	[6.0 - 15.3]			8.3	40.3	33.2	7.7	0.6								**9.9**
	2009 (179)	0.0	**4.5**	[1.9 - 8.6]			3.4	46.9	40.8	4.5									**4.5**
Erythromycin	2002 (90)	0.0	**7.8**	[11.4 - 28.5]						2.2	26.7	10.0	26.7	15.6	11.1				**7.8**
	2003 (142)	0.7	**7.0**	[5.0 - 15.1]						5.6	11.3	16.9	27.5	29.6	1.4	0.7			**7.0**
	2004 (196)	0.0	**9.2**	[5.5 - 14.1]					1.0	21.9	17.3	39.8	8.7	1.5	0.5				**9.2**
	2005 (151)	0.0	**9.9**	[5.7 - 15.9]					2.6	21.2	10.6	39.1	15.9	0.7					**9.9**
	2006 (145)	0.0	**5.5**	[2.4 - 10.6]					2.1	13.1	10.3	49.0	17.9	2.1					**5.5**
	2007 (143)	0.7	**6.3**	[2.9 - 11.6]				0.7	1.4	19.6	11.2	46.2	14.0			0.7		**6.3**	
	2008 (181)	0.0	**9.9**	[6.0 - 15.3]					2.2	12.7	19.3	39.8	14.9	0.6	0.6			**0.6**	**9.4**
	2009 (179)	0.0	**4.5**	[1.9 - 8.6]					0.6	17.3	25.7	40.2	10.6	1.1					**4.5**
Phenicols																			
Florfenicol[5]	2004 (196)	N/A	**0.0**	[0.0 - 1.9]							1.5	64.3	33.7	0.5					
	2005 (151)	N/A	**0.0**	[0.0 - 2.4]							3.3	55.6	39.1	2.0					
	2006 (145)	N/A	**0.0**	[0.0 - 2.5]							1.4	61.4	33.8	3.4					
	2007 (143)	N/A	**0.0**	[0.0 - 2.5]							2.1	78.3	19.6						
	2008 (181)	N/A	**0.0**	[0.0 - 2.0]							6.6	63.0	29.3	1.1					
	2009 (179)	N/A	**0.0**	[0.0 - 2.0]							1.7	58.1	38.5	1.7					
Quinolones																			
Ciprofloxacin	2002 (90)	0.0	**10.0**	[4.7 - 18.1]				1.1	27.8	36.7	16.7	7.8				**5.6**	**4.4**		
	2003 (142)	0.0	**13.4**	[8.3 - 20.1]				1.4	28.2	37.3	19.7				**0.7**	**0.7**	**11.3**	**0.7**	
	2004 (196)	0.0	**16.3**	[11.4 - 22.3]				23.0	36.7	23.5		0.5			**2.0**	**12.8**	**1.5**		
	2005 (151)	0.0	**29.1**	[22.0 - 37.1]				11.3	29.1	29.1	0.7	0.7			**7.3**	**15.2**	**6.6**		
	2006 (145)	0.0	**22.1**	[15.6 - 29.7]				6.2	36.6	31.7	3.4				**2.8**	**13.8**	**5.5**		
	2007 (143)	0.0	**25.9**	[18.9 - 33.9]				9.8	34.3	30.1					**3.5**	**18.2**	**4.2**		
	2008 (181)	0.0	**20.4**	[14.8 - 27.1]				7.2	45.9	25.4	1.1			**0.6**	**4.4**	**12.2**	**3.3**		
	2009 (179)	0.0	**18.4**	[13.0 - 24.9]				5.0	45.8	30.7				**0.6**	**3.4**	**5.6**	**8.4**	**0.6**	
Nalidixic acid	2004 (196)	0.0	**16.3**	[11.4 - 22.3]										47.4	34.7	1.5		**3.6**	**12.8**
	2005 (151)	0.0	**29.1**	[22.0 - 37.1]										44.4	26.5			**5.3**	**23.8**
	2006 (145)	0.0	**20.7**	[14.4 - 28.2]										51.0	24.8	3.4		**4.8**	**15.9**
	2007 (143)	0.0	**25.9**	[18.9 - 33.9]										50.3	22.4	1.4		**6.3**	**19.6**
	2008 (181)	0.0	**20.4**	[14.8 - 27.1]										47.5	31.5	0.6		**5.5**	**14.9**
	2009 (179)	0.0	**18.4**	[13.0 - 24.9]										40.8	36.9	3.9		**4.5**	**14.0**
Tetracyclines																			
Doxycycline	2002 (90)	0.0	**44.4**	[34.0 - 55.3]				4.4	32.2	12.2	4.4	2.2			**2.2**	**7.8**	**26.7**	**7.8**	
	2003 (142)	0.7	**50.7**	[42.2 - 59.2]				3.5	30.3	7.7	2.1	2.8	2.1	0.7	**5.6**	**14.8**	**23.9**	**6.4**	
Tetracycline	2004 (196)	0.0	**46.4**	[39.3 - 53.7]					6.6	21.4	9.7	9.7	5.6	0.5			**1.0**	**2.6**	**42.9**
	2005 (151)	0.0	**42.4**	[34.4 - 50.7]					2.6	22.5	11.3	13.9	5.3	2.0			**1.3**	**4.6**	**36.4**
	2006 (145)	0.0	**46.9**	[38.6 - 55.4]					2.8	19.3	18.6	6.9	5.5					**3.4**	**43.4**
	2007 (143)	0.0	**39.9**	[31.8 - 48.4]				0.7	0.7	32.9	18.2	6.3	1.4					**3.5**	**36.4**
	2008 (181)	0.6	**46.4**	[39.0 - 54.0]					0.6	24.9	21.5	3.3	1.7	1.1	0.6			**2.8**	**43.6**
	2009 (179)	0.6	**38.0**	[30.9 - 45.5]					2.2	19.0	24.0	9.5	6.7		0.6			**1.7**	**36.3**

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant. Discrepancies between %R and sums of distribution %s are due to rounding.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single black vertical bars indicate the breakpoints for susceptibility, while double red vertical bars indicate the breakpoints for resistance. Numbers in the shaded area indicate the percentages of isolates with MICs greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent the isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available.

[5] For Florfenicol, percent non-susceptible (MIC ≥8 µg/ml) is reported rather than percent resistant because a resistance breakpoint has not been established.

Table 16. *Enterococcus* Species by Meat Type, 2002 - 2009[1]

Total (a) Isolates per Year	Species	2002		2003		2004		2005		2006		2007		2008		2009	
	E. faecalis	893		1014		855		1001		945		852		901		884	
	E. faecium	506		575		757		618		649		357		341		353	
	E. hirae	102		129		129		117		115		87		70		36	
	Total (A)[2]	1520		1742		1755		1765		1731		1312		1337		1307	
Meat Type	**Species**	**n**	**%[3]**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chicken Breast	*E. faecalis*	134	15.0%	188	18.5%	88	10.3%	116	11.6%	126	13.3%	123	14.4%	164	18.2%	138	15.6%
	E. faecium	231	45.7%	248	43.1%	348	46.0%	307	49.7%	315	48.5%	189	52.9%	162	47.5%	202	57.2%
	E. hirae	12	11.8%	28	21.7%	27	20.9%	30	25.6%	27	23.5%	22	25.3%	16	22.9%	8	22.2%
	Total (N)[4]	**381**	**25.1%**	**466**	**26.8%**	**466**	**26.6%**	**457**	**25.9%**	**469**	**27.1%**	**339**	**25.8%**	**346**	**25.9%**	**349**	**26.7%**
Ground Turkey	*E. faecalis*	294	32.9%	289	28.5%	260	30.4%	339	33.9%	291	30.8%	261	30.6%	273	30.3%	260	29.4%
	E. faecium	89	17.6%	118	20.5%	172	22.7%	107	17.3%	139	21.4%	65	18.2%	70	20.5%	66	18.7%
	E. hirae	2	2.0%	3	2.3%	–	–	1	0.9%	3	2.6%	2	2.3%	–	–	–	–
	Total (N)	**387**	**25.5%**	**418**	**24.0%**	**437**	**24.9%**	**452**	**25.6%**	**435**	**25.1%**	**329**	**25.1%**	**345**	**25.8%**	**328**	**25.1%**
Ground Beef	*E. faecalis*	210	23.5%	224	22.1%	194	22.7%	226	22.6%	227	13.1%	205	24.1%	200	22.2%	227	25.7%
	E. faecium	93	18.4%	112	19.5%	162	21.4%	129	20.9%	125	19.3%	70	19.6%	74	21.7%	59	16.7%
	E. hirae	76	74.5%	84	65.1%	88	68.2%	82	70.1%	77	67.0%	57	65.5%	49	70.0%	26	72.2%
	Total (N)	**383**	**25.2%**	**432**	**24.8%**	**448**	**25.5%**	**447**	**25.3%**	**438**	**25.3%**	**334**	**25.5%**	**336**	**25.1%**	**327**	**25.0%**
Pork Chop	*E. faecalis*	255	28.6%	313	30.9%	313	36.6%	320	32.0%	301	31.9%	263	30.9%	264	29.3%	259	29.3%
	E. faecium	93	18.4%	97	16.9%	75	9.9%	75	12.1%	70	10.8%	33	9.2%	35	10.3%	26	7.4%
	E. hirae	12	11.8%	14	10.9%	14	10.9%	4	3.4%	8	7.0%	6	6.9%	5	7.1%	2	5.6%
	Total (N)	**369**	**24.3%**	**426**	**24.5%**	**404**	**23.0%**	**409**	**23.2%**	**389**	**22.5%**	**310**	**23.6%**	**310**	**23.2%**	**303**	**23.2%**

[1] Dashes indicate 0.0% resistance.

[2] Totals reflect all species found including those not shown on chart.

[3] Where % = Number of a given species per meat type (n) / total # of isolates per species (a)

[4] Where Total (N) % = total # of isolates in meat type (N) / total # of isolates in that year (A)

Table 17. Trend in Antimicrobial Resistance among *Enterococcus* by Meat Type, 2002-2009[1]

Meat Type	Year (n)	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Quino-lones	Strepto-gramins	Tetra-cyclines
		GEN	KAN	STR	VAN	TGC*	LIN	DAP*	ERY	TYL	NIT	LZD	PEN	CHL	CIP	QDA[2]	TET
		(MIC ≥ 512)	(MIC ≥ 1024)	(MIC ≥ 1024)	(MIC ≥ 32)	(MIC ≥ 1)	(MIC ≥ 8)	(MIC ≥ 16)	(MIC ≥ 8)	(MIC ≥ 32)	(MIC ≥ 128)	(MIC ≥ 8)	(MIC ≥ 16)	(MIC ≥ 32)	(MIC ≥ 4)	(MIC ≥ 4)	(MIC ≥ 16)
Chicken Breast	2002 (381)	10.0%[3]	15.7%	21.0%	–	Not Tested	91.9%	Not Tested	32.8%	31.2%	33.9%	–	27.3%	–	8.1%	56.3%	61.2%
	2003 (466)	11.2%	18.2%	21.2%	–	Not Tested	92.7%	Not Tested	31.1%	28.1%	35.6%	–	27.9%	–	11.6%	61.9%	59.2%
	2004 (457)	7.1%	11.8%	11.4%	–	Not Tested	86.7%	3.0%	17.0%	15.0%	65.5%	–	30.9%	–	40.8%	29.9%	49.1%
	2005 (457)	9.6%	16.0%	15.5%	–	–	85.1%	–	22.8%	21.7%	38.7%	0.2%	21.4%	0.2%	23.2%	39.0%	58.9%
	2006 (469)	10.4%	12.6%	6.4%	–	–	81.9%	–	16.6%	16.2%	26.4%	–	15.4%	–	26.2%	35.0%	56.7%
	2007 (339)	13.0%	18.6%	9.1%	–	–	90.3%	–	30.1%	29.8%	18.6%	–	7.4%	–	11.5%	54.6%	66.4%
	2008 (346)	15.0%	20.2%	9.5%	–	1.4%	90.8%	0.3%	27.5%	26.6%	22.5%	–	13.0%	0.3%	22.8%	50.6%	65.0%
	2009 (349)	14.3%	18.1%	23.2%	–	–	89.7%	3.7%	27.8%	27.5%	29.8%	–	13.5%	0.6%	19.8%	49.3%	63.3%
	Z Statistic	**-3.2054**	**-1.5978**	**2.8672**	**N/A[4]**	**-1.8428**	**1.1588**	**-0.5653**	**0.9326**	**0.0022**	**8.1024**	**0.1440**	**9.4908**	**-2.1934**	**-2.0067**	**0.9554**	**-2.8584**
	P Value[3]	**0.0013**	**0.1101**	**0.0041**	**N/A**	**0.0654**	**0.2466**	**0.5719**	**0.3510**	**0.9983**	**<0.0001**	**0.8855**	**<0.0001**	**0.0283**	**0.0448**	**0.3394**	**0.0043**
Ground Turkey	2002 (387)	20.4%	28.9%	27.6%	–	Not Tested	96.6%	Not Tested	35.1%	32.6%	13.4%	–	15.2%	0.3%	5.4%	79.6%	85.8%
	2003 (418)	22.7%	33.3%	30.1%	–	Not Tested	96.2%	Not Tested	43.1%	38.5%	15.8%	–	18.4%	–	11.2%	79.8%	87.3%
	2004 (437)	20.1%	31.8%	29.5%	–	Not Tested	94.7%	3.0%	37.1%	34.6%	27.0%	–	24.3%	–	24.7%	62.7%	87.0%
	2005 (452)	17.9%	28.1%	24.8%	–	–	96.2%	–	38.5%	36.1%	11.9%	–	15.5%	–	12.4%	61.1%	85.8%
	2006 (435)	19.8%	32.4%	20.9%	–	–	98.4%	–	46.4%	43.7%	7.6%	–	22.5%	–	12.9%	75.0%	87.8%
	2007 (329)	34.0%	41.6%	32.5%	–	–	97.6%	–	43.2%	41.9%	2.4%	–	12.5%	0.6%	7.6%	73.5%	94.8%
	2008 (345)	34.5%	46.1%	34.2%	–	1.7%	97.4%	1.5%	48.7%	42.9%	5.5%	–	12.5%	0.3%	13.9%	66.7%	87.5%
	2009 (328)	27.4%	37.5%	32.3%	–	–	97.0%	1.8%	41.2%	34.8%	8.5%	–	14.0%	–	8.8%	67.7%	86.6%
	Z Statistic	**-5.1216**	**-4.8381**	**-1.6616**	**N/A**	**-2.0288**	**-1.6773**	**0.5660**	**-2.9895**	**-2.1984**	**7.6604**	**N/A**	**2.5086**	**-0.6130**	**0.5937**	**1.4844**	**-1.4725**
	P Value	**<0.0001**	**<0.0001**	**0.0966**	**N/A**	**0.0425**	**0.0935**	**0.5714**	**0.0028**	**0.0279**	**<0.0001**	**N/A**	**0.0121**	**0.5399**	**0.5527**	**0.1377**	**0.1409**
Ground Beef	2002 (383)	1.8%	2.1%	3.9%	–	Not Tested	91.9%	Not Tested	7.6%	6.5%	4.7%	–	–	0.5%	3.1%	46.2%	28.2%
	2003 (432)	0.9%	4.4%	4.2%	–	Not Tested	85.9%	Not Tested	7.9%	5.8%	10.0%	–	2.1%	–	8.8%	54.3%	27.8%
	2004 (448)	0.4%	4.5%	5.4%	–	Not Tested	84.4%	4.7%	6.5%	5.1%	20.1%	–	1.3%	0.4%	15.8%	7.5%	30.4%
	2005 (447)	1.3%	3.4%	5.6%	–	–	91.1%	–	6.9%	7.2%	7.8%	–	0.7%	0.2%	6.5%	9.0%	38.5%
	2006 (438)	0.7%	2.1%	3.7%	–	–	78.8%	–	6.8%	6.4%	3.7%	–	1.4%	0.7%	6.2%	5.7%	27.6%
	2007 (336)	0.3%	1.2%	3.3%	–	–	88.9%	–	5.4%	5.4%	0.9%	–	0.3%	0.6%	2.4%	6.2%	33.2%
	2008 (336)	1.2%	4.2%	1.5%	–	0.3%	91.7%	3.6%	6.6%	4.5%	5.1%	–	2.1%	0.3%	7.7%	10.3%	35.4%
	2009 (327)	0.9%	2.4%	5.2%	–	–	93.0%	3.4%	3.1%	2.5%	4.3%	–	1.5%	–	4.6%	13.0%	27.2%
	Z Statistic	**0.9298**	**0.9683**	**0.9762**	**N/A**	**-0.8313**	**-1.3801**	**-0.2528**	**2.4384**	**2.1305**	**5.3103**	**N/A**	**-1.0219**	**0.1877**	**2.2279**	**12.2238**	**-1.0076**
	P Value	**0.3525**	**0.3329**	**0.3289**	**N/A**	**0.4058**	**0.1676**	**0.8005**	**0.0148**	**0.0331**	**<0.0001**	**N/A**	**0.3068**	**0.8511**	**0.0259**	**<0.0001**	**0.3137**
Pork Chop	2002 (369)	2.2%	4.1%	8.9%	–	Not Tested	97.0%	Not Tested	11.4%	8.7%	1.4%	–	0.8%	0.3%	1.9%	27.2%	76.2%
	2003 (426)	0.2%	4.0%	6.1%	–	Not Tested	95.8%	Not Tested	6.8%	5.9%	4.2%	–	0.2%	0.9%	1.6%	60.2%	73.7%
	2004 (404)	1.5%	2.7%	8.4%	–	Not Tested	92.1%	–	8.7%	7.7%	7.9%	–	1.7%	0.5%	8.2%	5.5%	73.5%
	2005 (409)	1.2%	3.9%	7.6%	–	–	93.9%	–	6.6%	6.1%	3.2%	–	1.2%	1.0%	3.7%	13.5%	80.0%
	2006 (389)	0.8%	2.3%	6.4%	–	–	91.3%	0.3%	6.9%	7.5%	0.8%	–	0.3%	0.8%	1.5%	8.0%	74.3%
	2007 (310)	0.6%	2.3%	7.7%	–	–	93.5%	–	8.7%	8.7%	1.3%	–	–	0.3%	1.0%	2.1%	82.3%
	2008 (310)	0.3%	2.9%	9.0%	–	1.9%	92.6%	0.3%	9.7%	8.1%	1.3%	–	0.3%	0.3%	5.5%	6.5%	72.3%
	2009 (303)	1.7%	2.3%	7.9%	–	–	95.7%	–	6.6%	5.6%	2.3%	–	1.0%	1.0%	2.0%	11.4%	80.2%
	Z Statistic	**0.8404**	**1.7482**	**-0.2269**	**N/A**	**-2.0122**	**1.6236**	**-0.5897**	**0.9724**	**0.2548**	**2.7133**	**N/A**	**0.7415**	**-0.1935**	**0.2997**	**7.3719**	**-1.4319**
	P Value	**0.4007**	**0.0804**	**0.8205**	**N/A**	**0.0442**	**0.1045**	**0.5554**	**0.3309**	**0.7988**	**0.0067**	**N/A**	**0.4584**	**0.8465**	**0.7644**	**<0.0001**	**0.1522**

* Percent non susceptible is reported rather than percent resistant as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.

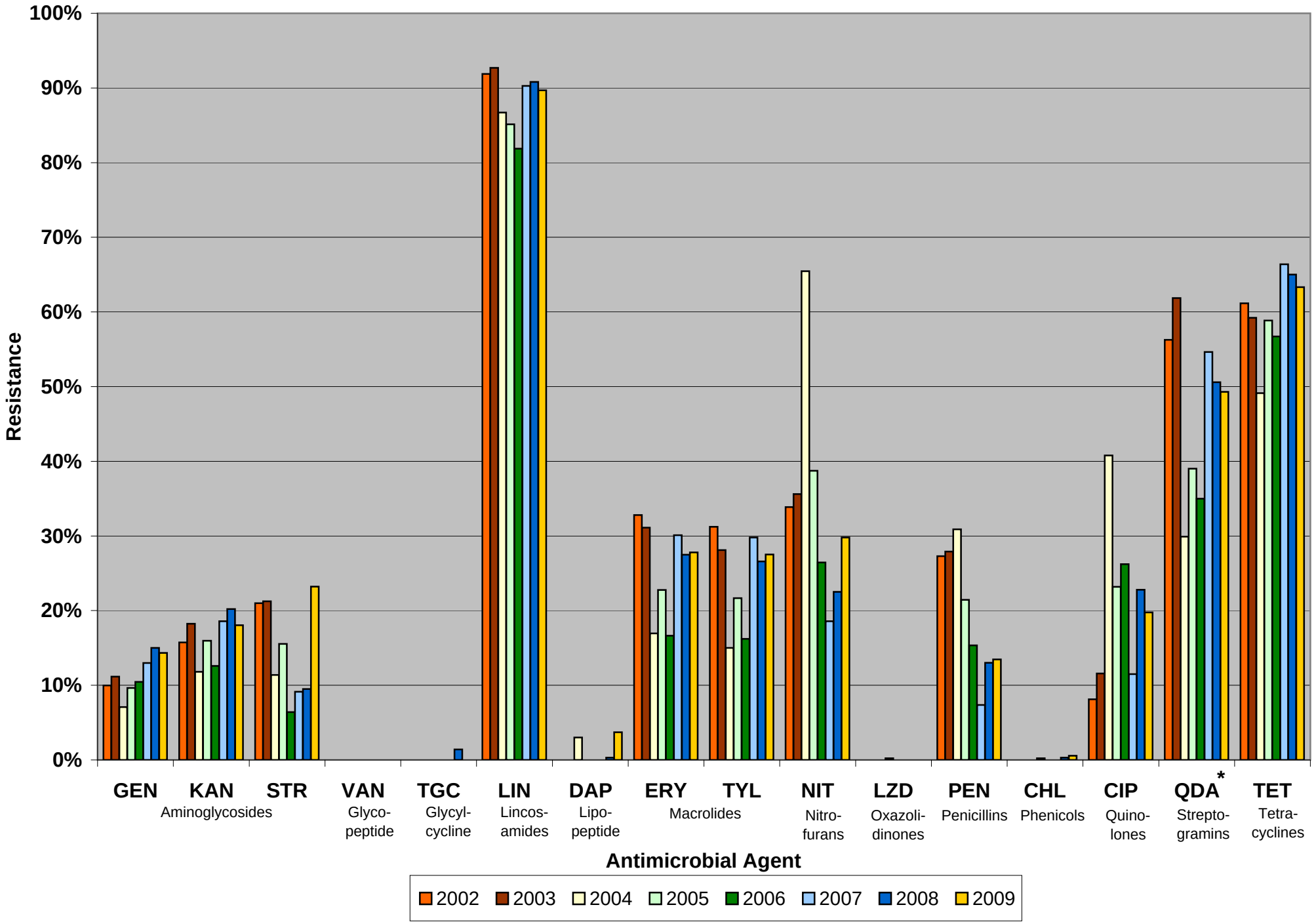
[1] Dashes indicate 0.0% resistance to antimicrobial. Percent resistance (%) = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type)

[2] Data presented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.

[3] P value for percent resistant for trend was calculated using Cochran-Armitage trend test method.

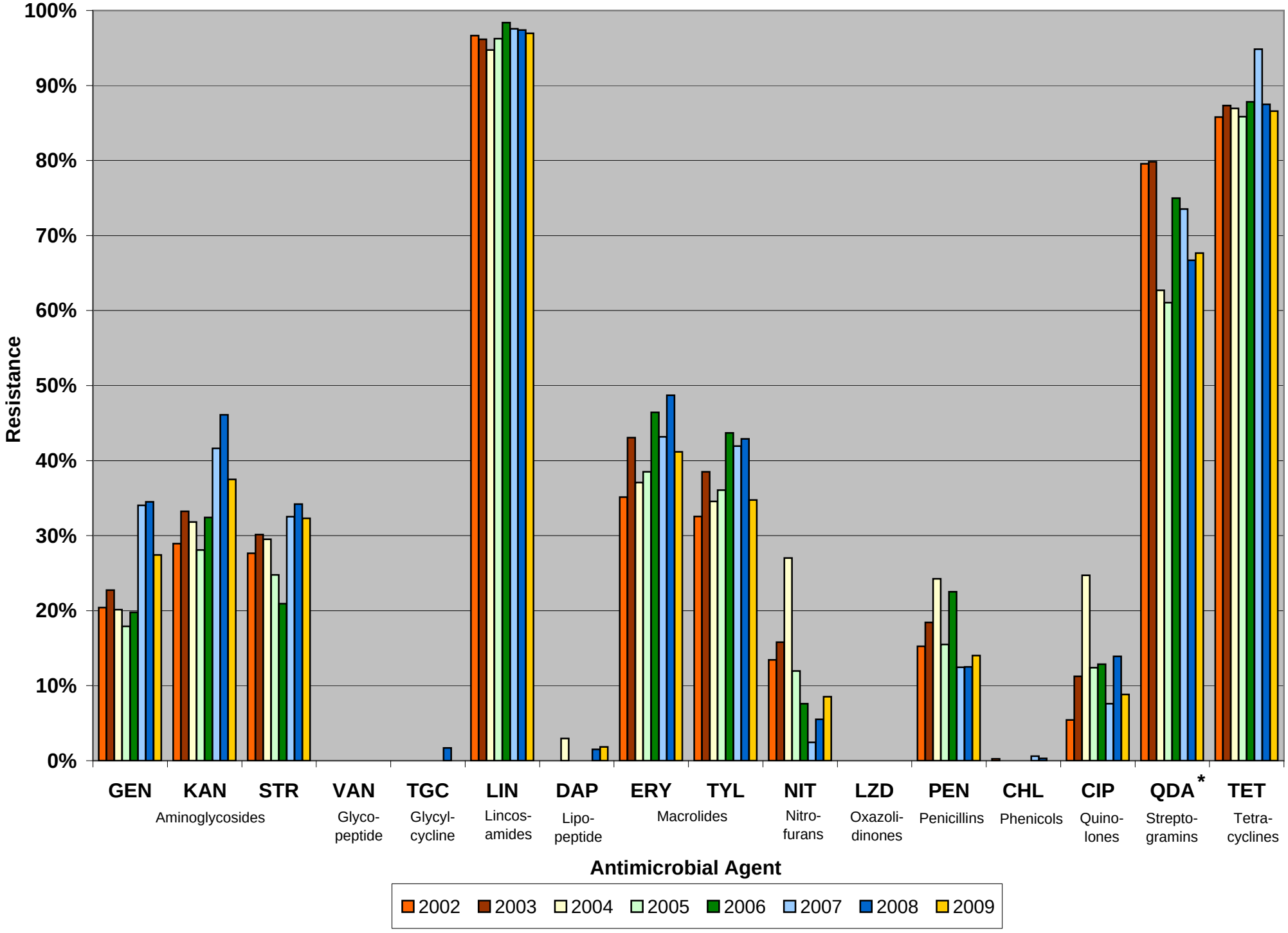
[4] N/A = No Z statistic or P value could be calculated

Figure 5a. Antimicrobial Resistance among *Enterococcus* from Chicken Breast, 2002-2009



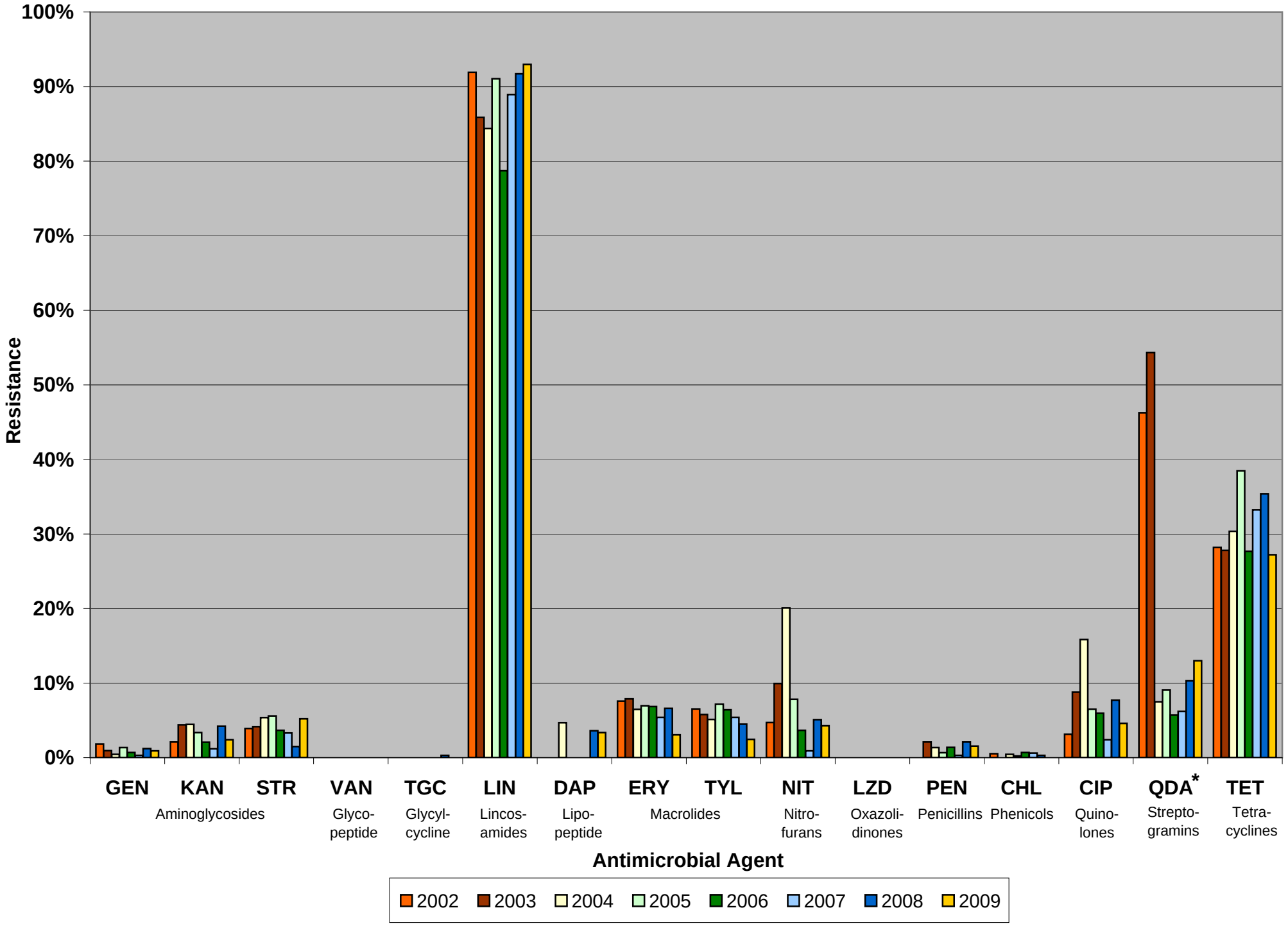
*Data presented for all species except *E. faecalis* , which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 5b. Antimicrobial Resistance among *Enterococcus* from Ground Turkey, 2002-2009



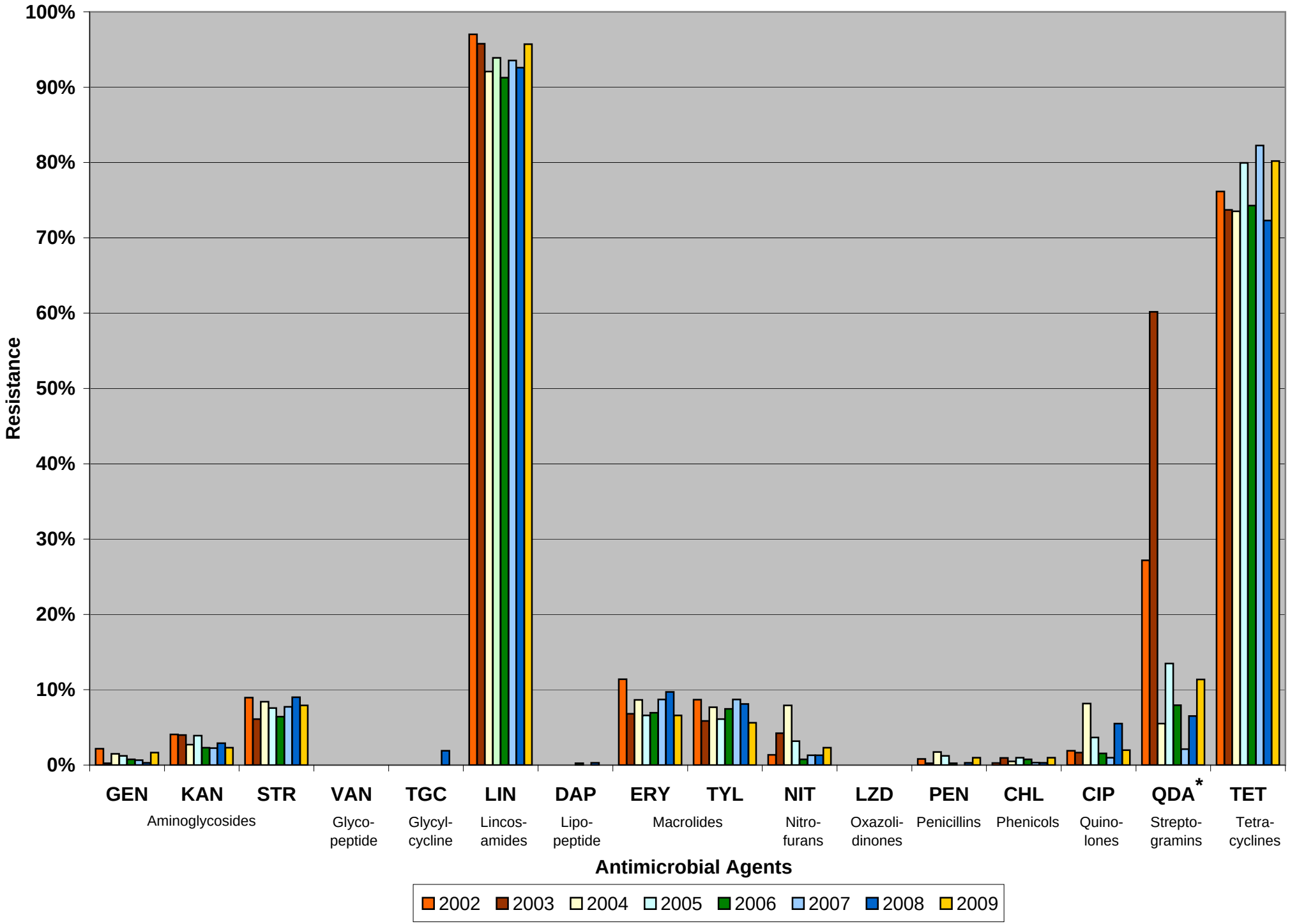
*Data presiented for all species except *E. faecalis* , which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 5c. Antimicrobial Resistance among *Enterococcus* from Ground Beef, 2002-2009



*Data presiented for all species except *E. faecalis* , which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 5d. Antimicrobial Resistance among *Enterococcus* from Pork Chops, 2002-2009



*Data presiented for all species except *E. faecalis* , which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Table 18a. Trends in Antimicrobial Resistance among *Enterococcus faecalis* by Meat Type, 2002-2009[1]

Meat Type	Year (n)	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Quino-lones	Strepto-gramins	Tetra-cyclines
		GEN	KAN	STR	VAN	TGC*	LIN	DAP*	ERY	TYL	NIT	LZD	PEN	CHL	CIP	QDA[2]	TET
Chicken Breast	2002 (134)	22.4%	32.1%	29.1%	–	Not Tested	99.3%	Not Tested	45.5%	48.5%	0.7%	–	–	–	–	–	67.2%
	2003 (188)	20.2%	27.1%	22.9%	–	Not Tested	99.5%	Not Tested	43.1%	42.6%	1.1%	–	–	–	–	–	68.6%
	2004 (88)	19.3%	22.7%	18.2%	–	Not Tested	98.9%	–	35.2%	34.1%	1.1%	–	–	–	8.0%	–	63.6%
	2005 (116)	18.1%	26.7%	18.1%	–	–	99.1%	–	37.1%	37.1%	4.3%	–	–	–	0.9%	–	75.0%
	2006 (126)	23.0%	30.2%	10.3%	–	–	100.0%	–	34.9%	36.5%	–	–	–	–	0.8%	–	70.6%
	2007 (123)	19.5%	28.5%	17.9%	–	–	99.2%	–	44.7%	44.7%	–	–	–	–	–	–	65.9%
	2008 (164)	19.5%	29.9%	11.0%	–	1.2%	100.0%	–	32.3%	32.3%	1.2%	–	–	–	3.1%	–	69.5%
	2009 (138)	25.4%	30.4%	13.0%	–	–	98.6%	–	39.9%	39.9%	–	–	–	1.5%	–	–	72.5%
	Z Statistic	**-0.4599**	**-0.4031**	**4.4805**	**N/A[4]**	**-0.8912**	**0.0679**	**N/A**	**1.5515**	**1.7862**	**0.9727**	**N/A**	**N/A**	**-2.0810**	**-0.2097**	**N/A**	**-0.7801**
	P Value[3]	**0.6456**	**0.6869**	**<0.0001**	**N/A**	**0.3728**	**0.9458**	**N/A**	**0.1208**	**0.0741**	**0.3307**	**N/A**	**N/A**	**0.0374**	**0.8339**	**N/A**	**0.4354**
Ground Turkey	2002 (294)	22.1%	26.2%	24.1%	–	Not Tested	97.3%	Not Tested	31.0%	32.0%	2.0%	–	–	0.3%	0.3%	–	85.0%
	2003 (289)	27.7%	36.0%	30.4%	–	Not Tested	99.0%	Not Tested	43.6%	43.9%	1.4%	–	–	–	–	–	87.9%
	2004 (260)	24.6%	29.6%	26.9%	–	Not Tested	98.8%	–	33.8%	34.6%	1.2%	–	–	–	5.8%	–	88.1%
	2005 (339)	20.1%	27.4%	21.5%	–	–	97.3%	–	38.3%	38.3%	2.4%	–	1.5%	–	2.4%	–	84.4%
	2006 (291)	22.0%	32.0%	20.3%	–	–	98.6%	–	47.1%	47.1%	–	–	0.3%	–	0.7%	–	85.9%
	2007 (261)	42.1%	50.2%	36.4%	–	–	98.9%	–	48.7%	49.4%	–	–	–	0.8%	–	–	94.3%
	2008 (273)	41.0%	55.0%	38.8%	–	1.5%	99.3%	0.4%	51.3%	50.9%	–	–	–	0.4%	3.7%	–	89.4%
	2009 (260)	30.0%	38.8%	27.7%	–	–	97.7%	–	37.7%	37.7%	0.4%	–	–	–	0.8%	–	85.8%
	Z Statistic	**-5.0238**	**-6.5386**	**-2.6826**	**N/A**	**-1.5666**	**-0.6474**	**-0.9330**	**-3.7031**	**-3.4179**	**3.2408**	**N/A**	**0.2745**	**-0.5130**	**-0.4367**	**N/A**	**-1.3066**
	P Value	**<0.0001**	**<0.0001**	**0.0073**	**N/A**	**0.1172**	**0.5173**	**0.3508**	**0.0002**	**0.0006**	**0.0012**	**N/A**	**0.7837**	**0.6080**	**0.6623**	**N/A**	**0.1914**
Ground Beef	2002 (210)	2.4%	1.9%	4.8%	–	Not Tested	98.6%	Not Tested	1.4%	1.9%	–	–	–	–	–	–	18.6%
	2003 (224)	1.8%	3.1%	5.4%	–	Not Tested	96.4%	Not Tested	4.9%	4.9%	–	–	–	–	0.4%	–	20.5%
	2004 (194)	1.0%	3.1%	7.7%	–	Not Tested	97.4%	–	3.6%	3.6%	–	–	–	–	12.9%	–	25.3%
	2005 (226)	1.8%	4.0%	8.4%	–	–	97.8%	–	4.4%	5.8%	0.9%	–	–	0.4%	0.9%	–	34.1%
	2006 (227)	0.9%	2.6%	5.7%	–	–	97.8%	–	4.0%	4.0%	–	–	–	1.3%	–	–	22.5%
	2007 (205)	0.5%	2.0%	4.9%	–	–	98.0%	–	2.4%	2.4%	–	–	–	1.0%	–	–	32.7%
	2008 (200)	2.0%	4.0%	1.5%	–	–	99.0%	–	2.5%	3.0%	0.5%	–	–	–	3.5%	–	32.0%
	2009 (227)	0.9%	1.8%	5.3%	–	–	97.8%	–	2.6%	2.2%	–	–	0.4%	–	1.3%	–	21.1%
	Z Statistic	**1.1857**	**0.1572**	**1.2444**	**N/A**	**N/A**	**-0.7141**	**N/A**	**0.5058**	**0.8352**	**-0.3706**	**N/A**	**-1.5220**	**-0.7028**	**0.9559**	**N/A**	**-2.0778**
	P Value	**0.2357**	**0.8751**	**0.2134**	**N/A**	**N/A**	**0.4751**	**N/A**	**0.6130**	**0.4036**	**0.7110**	**N/A**	**0.1280**	**0.4822**	**0.3391**	**N/A**	**0.0377**
Pork Chop	2002 (255)	2.7%	4.7%	10.6%	–	Not Tested	99.2%	Not Tested	9.0%	9.0%	–	–	–	0.4%	1.2%	–	80.4%
	2003 (313)	0.3%	4.8%	7.3%	–	Not Tested	98.1%	Not Tested	7.0%	7.0%	–	–	–	1.0%	–	–	78.0%
	2004 (313)	1.9%	2.6%	9.3%	–	Not Tested	94.9%	–	9.9%	9.9%	0.3%	–	–	0.6%	6.1%	–	75.7%
	2005 (320)	1.6%	3.1%	7.8%	–	–	95.3%	–	5.9%	6.3%	0.3%	–	1.3%	1.3%	2.5%	–	86.3%
	2006 (301)	0.7%	2.3%	7.6%	–	–	97.3%	0.3%	6.6%	7.3%	–	–	–	1.0%	0.3%	–	81.4%
	2007 (263)	0.8%	2.3%	8.7%	–	–	97.7%	–	9.1%	9.1%	–	–	–	0.4%	–	–	90.1%
	2008 (264)	0.4%	3.0%	10.2%	–	1.9%	97.4%	–	8.3%	8.0%	–	–	0.4%	0.4%	4.6%	–	76.9%
	2009 (259)	1.9%	2.7%	8.9%	–	–	97.3%	–	6.9%	6.6%	–	–	0.4%	1.2%	1.5%	–	83.8%
	Z Statistic	**1.0119**	**1.7817**	**-0.0955**	**N/A**	**-1.7478**	**0.3984**	**0.2122**	**0.4337**	**0.6215**	**0.5820**	**N/A**	**-0.8275**	**-0.1614**	**-0.3618**	**N/A**	**-1.9635**
	P Value	**0.3116**	**0.0748**	**0.9240**	**N/A**	**0.0805**	**0.6904**	**0.8319**	**0.6645**	**0.5343**	**0.5606**	**N/A**	**0.4080**	**0.8718**	**0.7175**	**N/A**	**0.0496**

* Percent non susceptible is reported rather than percent resistant as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.

[1] Dashes indicate 0.0% resistance to antimicrobial. Percent resistance (%) = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type)

[2] Data presented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.

[3] P value for percent resistant for trend was calculated using Cochran-Armitage trend test method.

[4] N/A = No Z statistic or P value could be calculated

Table 18b. Trends in Antimicrobial Resistance among *Enterococcus faecium* by Meat Type, 2002-2009[1]

Meat Type	Year (n)	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Quino-lones	Strepto-gramins	Tetra-cyclines
		GEN	KAN	STR	VAN	TGC*	LIN	DAP*	ERY	TYL	NIT	LZD	PEN	CHL	CIP	QDA	TET
Chicken Breast	2002 (231)	3.0%	6.5%	16.9%	–	Not Tested	87.0%	Not Tested	25.5%	21.2%	54.5%	–	44.2%	–	13.0%	55.4%	56.7%
	2003 (248)	5.6%	10.5%	16.9%	–	Not Tested	86.7%	Not Tested	17.3%	12.5%	64.5%	–	51.2%	–	21.8%	59.7%	51.6%
	2004 (348)	4.3%	9.5%	8.3%	–	Not Tested	83.3%	4.0%	12.6%	10.3%	85.3%	–	39.1%	–	52.3%	31.6%	45.1%
	2005 (307)	6.2%	10.7%	14.0%	–	–	78.2%	–	13.7%	12.4%	54.7%	0.3%	31.9%	–	33.9%	39.1%	54.4%
	2006 (315)	6.0%	6.3%	3.8%	–	–	74.9%	–	9.5%	7.9%	38.4%	–	22.2%	–	37.5%	36.5%	53.0%
	2007 (189)	9.5%	12.2%	3.7%	–	–	84.1%	–	19.6%	19.0%	32.8%	–	12.2%	–	19.6%	57.1%	66.1%
	2008 (162)	11.7%	11.7%	6.8%	–	1.9%	80.9%	–	22.2%	20.4%	46.3%	–	27.8%	0.6%	43.8%	54.9%	64.2%
	2009 (202)	6.9%	9.9%	30.2%	–	–	83.2%	6.4%	19.8%	19.3%	51.5%	–	23.3%	–	34.2%	50.0%	56.9%
	Z Statistic	**-3.2925**	**-1.0954**	**-0.5824**	**N/A[3]**	**-1.5881**	**1.9806**	**-1.0282**	**0.2656**	**-1.2725**	**7.5868**	**0.1056**	**9.0320**	**-1.3035**	**-3.3764**	**-0.1144**	**-2.8902**
	P Value[2]	**0.0010**	**0.2733**	**0.5603**	**N/A**	**0.1123**	**0.0476**	**0.3039**	**0.7906**	**0.2032**	**<0.0001**	**0.9159**	**<0.0001**	**0.1924**	**0.0007**	**0.9089**	**0.0039**
Ground Turkey	2002 (89)	15.7%	39.3%	39.3%	–	Not Tested	94.4%	Not Tested	50.6%	36.0%	50.6%	–	66.3%	–	22.5%	82.0%	88.8%
	2003 (118)	12.7%	28.0%	32.2%	–	Not Tested	89.0%	Not Tested	44.1%	27.1%	52.5%	–	65.3%	–	39.0%	79.7%	91.5%
	2004 (172)	13.4%	35.5%	34.3%	–	Not Tested	88.4%	7.6%	43.0%	35.5%	66.9%	–	61.6%	–	53.5%	64.5%	86.6%
	2005 (107)	12.1%	29.9%	34.6%	–	–	92.5%	–	41.1%	29.9%	43.0%	–	59.8%	–	43.9%	63.6%	91.6%
	2006 (139)	15.1%	33.8%	22.3%	–	–	97.8%	–	44.6%	36.0%	22.3%	–	67.6%	–	37.4%	75.5%	92.8%
	2007 (65)	1.5%	7.7%	16.9%	–	–	92.3%	–	23.1%	13.8%	12.3%	–	60.0%	–	35.4%	76.9%	96.9%
	2008 (70)	10.0%	12.9%	17.1%	–	2.9%	91.4%	5.7%	37.1%	12.9%	27.1%	–	61.4%	–	54.3%	68.6%	81.4%
	2009 (66)	18.2%	33.3%	51.5%	–	–	93.9%	9.1%	56.1%	24.2%	40.9%	–	69.7%	–	40.9%	69.7%	92.4%
	Z Statistic	**0.5906**	**2.9569**	**1.3156**	**N/A**	**-1.3751**	**-1.2140**	**-0.2267**	**0.8243**	**3.0326**	**6.5056**	**N/A**	**-0.1590**	**N/A**	**-1.6257**	**1.2754**	**-0.3803**
	P Value	**0.5548**	**0.0031**	**0.1883**	**N/A**	**0.1691**	**0.2247**	**0.8207**	**0.4098**	**0.0024**	**<0.0001**	**N/A**	**0.8737**	**N/A**	**0.1040**	**0.2022**	**0.7037**
Ground Beef	2002 (93)	1.1%	4.3%	3.2%	–	Not Tested	76.3%	Not Tested	11.8%	6.5%	18.3%	–	–	1.1%	12.9%	47.3%	22.6%
	2003 (112)	–	8.0%	2.7%	–	Not Tested	58.9%	Not Tested	8.9%	0.9%	36.6%	–	8.0%	–	33.0%	50.0%	28.6%
	2004 (162)	–	8.6%	5.6%	–	Not Tested	67.9%	0.6%	9.3%	5.6%	51.9%	–	3.1%	1.2%	27.2%	6.2%	24.7%
	2005 (129)	0.8%	3.9%	1.6%	–	–	74.4%	–	4.7%	2.3%	18.6%	–	2.3%	–	20.9%	7.8%	28.7%
	2006 (125)	–	1.6%	0.8%	–	–	41.6%	–	7.2%	4.8%	12.8%	–	4.8%	–	21.6%	6.4%	20.0%
	2007 (70)	–	–	–	–	–	55.7%	–	4.3%	2.9%	4.3%	–	1.4%	–	10.0%	5.7%	18.6%
	2008 (74)	–	6.8%	2.7%	–	–	75.7%	1.4%	13.5%	4.1%	20.3%	–	9.5%	1.4%	25.7%	16.2%	29.7%
	2009 (59)	1.7%	6.8%	8.5%	–	–	79.7%	–	5.1%	3.4%	16.9%	–	6.8%	–	18.6%	18.6%	39.0%
	Z Statistic	**-0.2227**	**1.0725**	**-0.1230**	**N/A**	**N/A**	**0.2427**	**-0.0808**	**0.9779**	**0.3743**	**4.8694**	**N/A**	**-1.6474**	**0.5582**	**1.0189**	**7.3502**	**-1.0490**
	P Value	**0.8237**	**0.2835**	**0.9021**	**N/A**	**N/A**	**0.8083**	**0.9356**	**0.3281**	**0.7082**	**<0.0001**	**N/A**	**0.0995**	**0.5767**	**0.3083**	**<0.0001**	**0.2942**
Pork Chop	2002 (93)	1.1%	3.2%	5.4%	–	Not Tested	90.3%	Not Tested	20.4%	9.7%	5.4%	–	3.2%	–	4.3%	24.7%	68.8%
	2003 (97)	–	2.1%	3.1%	–	Not Tested	89.7%	Not Tested	6.2%	2.1%	16.5%	–	1.0%	–	6.2%	64.9%	69.1%
	2004 (75)	–	2.7%	6.7%	–	Not Tested	84.0%	–	5.3%	–	37.3%	–	8.0%	–	17.3%	6.7%	72.0%
	2005 (75)	–	8.0%	6.7%	–	–	88.0%	–	9.3%	5.3%	10.7%	–	1.3%	–	9.3%	13.3%	56.0%
	2006 (70)	1.4%	2.9%	2.9%	–	–	64.3%	–	7.1%	5.7%	4.3%	–	1.4%	–	4.3%	10.0%	54.3%
	2007 (33)	–	3.0%	–	–	–	66.7%	–	3.0%	3.0%	9.1%	–	–	–	9.1%	3.0%	33.3%
	2008 (35)	–	2.9%	–	–	2.9%	54.3%	2.9%	14.3%	5.7%	8.6%	–	–	–	14.3%	5.7%	45.7%
	2009 (26)	–	–	3.8%	–	–	84.6%	–	3.8%	–	11.5%	–	7.7%	–	7.7%	19.2%	50.0%
	Z Statistic	**0.3984**	**0.1377**	**1.2453**	**N/A**	**-1.1562**	**4.9782**	**-1.3637**	**2.0321**	**1.0699**	**1.0793**	**N/A**	**0.3098**	**N/A**	**-0.9508**	**6.0582**	**4.2851**
	P Value	**0.6903**	**0.8905**	**0.2130**	**N/A**	**0.2476**	**<0.0001**	**0.1727**	**0.0421**	**0.2847**	**0.2804**	**N/A**	**0.7567**	**N/A**	**0.3417**	**<0.0001**	**<0.0001**

* Percent non susceptible is reported rather than percent resistant as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.

[1] Dashes indicate 0.0% resistance to antimicrobial. Percent resistance (%) = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type)

[2] P value for percent resistant for trend was calculated using Cochran-Armitage trend test method.

[3] N/A = No Z statistic or P value could be calculated

Table 18c. Trends in Antimicrobial Resistance among *Enterococcus hirae* by Meat Type, 2002-2009[1]

Meat Type	Year (n)	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Quino-lones	Strepto-gramins	Tetra-cyclines
		GEN	KAN	STR	VAN	TGC*	LIN	DAP*	ERY	TYL	NIT	LZD	PEN	CHL	CIP	QDA	TET
Chicken Breast	2002 (12)	8.3%	16.7%	16.7%	–	Not Tested	100.0%	Not Tested	16.7%	16.7%	8.3%	–	8.3%	–	8.3%	66.7%	83.3%
	2003 (28)	–	28.6%	42.9%	–	Not Tested	100.0%	Not Tested	67.9%	64.3%	10.7%	–	7.1%	–	–	82.1%	64.3%
	2004 (27)	–	3.7%	22.2%	–	Not Tested	92.6%	–	11.1%	11.1%	14.8%	–	25.9%	–	3.7%	7.4%	51.9%
	2005 (30)	10.0%	26.7%	23.3%	–	–	100.0%	–	63.3%	60.0%	6.7%	–	-	3.3%	–	40.0%	46.7%
	2006 (27)	3.7%	3.7%	18.5%	–	–	77.8%	–	14.8%	18.5%	7.4%	–	7.4%	–	14.8%	18.5%	33.3%
	2007 (22)	4.5%	18.2%	9.1%	–	–	95.5%	–	45.5%	45.5%	–	–	4.5%	–	4.5%	40.9%	81.8%
	2008 (16)	6.3%	12.5%	25.0%	–	–	100.0%	6.3%	37.5%	37.5%	–	–	–	–	–	18.8%	43.8%
	2009 (8)	12.5%	12.5%	25.0%	–	–	100.0%	–	25.0%	25.0%	–	–	–	–	–	25.0%	62.5%
	Z Statistic	**-1.0353**	**0.9916**	**1.3669**	**N/A[3]**	**N/A**	**0.7674**	**-1.3619**	**0.7584**	**0.4981**	**2.0657**	**N/A**	**1.8691**	**0.0982**	**-0.1370**	**3.6279**	**0.9550**
	P Value[2]	**0.3005**	**0.3214**	**0.1717**	**N/A**	**N/A**	**0.4429**	**0.1732**	**0.4482**	**0.6184**	**0.0389**	**N/A**	**0.0616**	**0.9218**	**0.8910**	**0.0003**	**0.3396**
Ground Turkey[4]	2002 (2)	–	–	50.0%	–	Not Tested	100.0%	Not Tested	–	–	50.0%	–	–	–	–	50.0%	100.0%
	2003 (3)	–	66.7%	–	–	Not Tested	100.0%	Not Tested	66.7%	66.7%	–	–	–	–	–	66.7%	–
	2005 (1)	–	–	–	–	–	100.0%	–	–	–	–	–	–	–	–	–	–
	2006 (3)	33.3%	33.3%	33.3%	–	–	100.0%	–	66.7%	66.7%	66.7%	–	66.7%	–	33.3%	33.3%	66.7%
	2007 (2)	–	–	–	–	–	100.0%	–	–	–	–	–	100.0%	–	100.0%	–	100.0%
	Z Statistic	**-0.8130**	**0.5904**	**0.4545**	**N/A**	**N/A**	**N/A**	**N/A**	**0.0607**	**0.0607**	**-0.1312**	**N/A**	**-2.6116**	**N/A**	**-2.2961**	**1.3970**	**0.8800**
	P Value	**0.4162**	**0.5549**	**0.6495**	**N/A**	**N/A**	**N/A**	**N/A**	**0.9516**	**0.9516**	**0.8956**	**N/A**	**0.0090**	**N/A**	**0.0217**	**0.1620**	**0.3790**
Ground Beef	2002 (76)	–	–	2.6%	–	Not Tested	93.4%	Not Tested	19.7%	19.7%	–	–	–	1.3%	–	44.7%	60.5%
	2003 (84)	–	3.6%	3.6%	–	Not Tested	91.7%	Not Tested	15.5%	15.5%	–	–	–	–	–	60.7%	46.4%
	2004 (88)	–	–	–	–	Not Tested	85.2%	22.7%	8.0%	8.0%	6.8%	–	1.1%	–	1.1%	10.2%	53.4%
	2005 (82)	1.2%	1.2%	4.9%	–	–	98.8%	–	17.1%	17.1%	4.9%	–	–	–	–	11.0%	65.9%
	2006 (77)	1.3%	1.3%	2.6%	–	–	81.8%	–	14.3%	15.6%	–	–	–	–	–	5.2%	53.2%
	2007 (57)	–	–	1.8%	–	–	96.5%	–	17.5%	19.3%	–	–	–	–	1.8%	5.3%	52.6%
	2008 (49)	–	2.0%	–	–	2.0%	91.8%	20.4%	12.2%	12.2%	–	–	–	–	–	4.1%	53.1%
	2009 (26)	–	–	–	–	–	88.5%	38.5%	3.8%	3.8%	–	–	–	–	–	7.7%	50.0%
	Z Statistic	**-0.3993**	**0.3068**	**1.0058**	**N/A**	**-1.1426**	**0.2790**	**-1.3566**	**1.1405**	**0.9409**	**0.8126**	**N/A**	**0.4501**	**1.4262**	**-0.3993**	**9.2640**	**0.3772**
	P Value	**0.6897**	**0.7590**	**0.3145**	**N/A**	**0.2532**	**0.7803**	**0.1749**	**0.2541**	**0.3467**	**0.4164**	**N/A**	**0.6527**	**0.1538**	**0.6897**	**<0.0001**	**0.7060**
Pork Chop	2002 (12)	–	–	–	–	Not Tested	100.0%	Not Tested	–	–	–	–	–	–	–	25.0%	66.7%
	2003 (14)	–	–	–	–	Not Tested	100.0%	Not Tested	7.1%	7.1%	7.1%	–	–	–	–	35.7%	14.3%
	2004 (14)	–	7.1%	–	–	Not Tested	71.4%	–	–	–	21.4%	–	7.1%	–	7.1%	–	35.7%
	2005 (4)	–	–	25.0%	–	–	100.0%	–	25.0%	25.0%	25.0%	–	–	–	–	25.0%	50.0%
	2006 (8)	–	–	–	–	–	87.5%	–	25.0%	25.0%	–	–	–	–	12.5%	–	50.0%
	2007 (6)	–	–	16.7%	–	–	83.3%	–	33.3%	33.3%	–	–	–	–	–	–	83.3%
	2008 (5)	–	–	–	–	–	100.0%	–	60.0%	40.0%	20.0%	–	–	–	–	20.0%	60.0%
	2009 (2)	–	–	–	–	–	100.0%	–	–	–	–	–	–	–	–	–	100.0%
	Z Statistic	**N/A**	**0.2290**	**-1.0881**	**N/A**	**N/A**	**0.4706**	**N/A**	**-3.1554**	**-2.6596**	**-0.2597**	**N/A**	**0.2290**	**N/A**	**-0.3808**	**1.7967**	**-1.7964**
	P Value	**N/A**	**0.8189**	**0.2766**	**N/A**	**N/A**	**0.6379**	**N/A**	**0.0016**	**0.0078**	**0.7951**	**N/A**	**0.8189**	**N/A**	**0.7033**	**0.0724**	**0.0724**

* Percent non-susceptible is reported rather than percent resistant as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.

[1] Dashes indicate 0.0% resistance to antimicrobial. Percent resistance (%) = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type)

[2] P value for percent resistant for trend was calculated using Cochran-Armitage trend test method.

[3] N/A = No Z statistic or P value could be calculated

[4] There were no *E. hirae* isolates among any NARMS retail ground turkey isolates in 2004, 2008 and 2009.

Table 19a. Multidrug Resistance among *Enterococcus faecalis* Isolates by Antimicrobial Class, 2002-2009 [1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	134	188	88	116	126	123	164	138
	Ground Turkey	294	289	260	339	291	261	273	260
	Ground Beef	210	224	194	226	227	205	200	227
	Pork Chop	255	313	313	320	301	263	264	259
Resistance Pattern [2]	**Isolate Source**								
1. No Resistance Detected	Chicken Breast	–	–	–	0.9% 1	–	–		0.7% 1
	Ground Turkey	–	–	–	0.6% 2	0.3% 1	–	–	1.5% 4
	Ground Beef	–	–	–	1.3% 3	1.8% 4	2.0% 4	0.5% 1	1.8% 4
	Pork Chop	–	–	–	1.3% 4	–	0.4% 1	0.4% 1	0.4% 1
2. Resistance to ≥ 3 Antimicrobial Classes	Chicken Breast	52.2% 70	47.9% 90	42.0% 37	50.0% 58	43.7% 55	45.5% 56	40.9% 67	43.5% 60
	Ground Turkey	49.3% 145	54.3% 157	52.7% 137	43.4% 147	56.7% 165	67.4% 176	69.2% 189	50.0% 130
	Ground Beef	4.8% 10	6.7% 15	10.8% 21	10.2% 23	7.9% 18	7.3% 15	5.5% 11	6.6% 15
	Pork Chop	16.5% 42	9.9% 31	18.8% 59	14.4% 46	12.3% 37	17.1% 45	18.6% 49	14.7% 38
3. Resistance to ≥ 4 Antimicrobial Classes	Chicken Breast	32.1% 43	19.1% 36	18.2% 16	20.7% 24	19.8% 25	22.8% 28	21.3% 35	21.7% 30
	Ground Turkey	17.7% 52	31.1% 90	22.3% 58	26.0% 88	22.7% 66	36.4% 95	42.5% 116	28.1% 73
	Ground Beef	1.9% 4	3.1% 7	3.1% 6	4.9% 11	2.2% 5	1.5% 3	2.0% 4	1.3% 3
	Pork Chop	5.9% 15	5.1% 16	5.8% 18	4.7% 15	3.3% 10	2.3% 6	5.7% 15	3.9% 10
4. Resistance to ≥ 5 Antimicrobial Classes	Chicken Breast	–	0.5% 1	1.1% 1	1.7% 2	–	–	1.2% 2	1.4% 2
	Ground Turkey	0.7% 2	0.7% 2	–	2.7% 9	0.3% 1	–	1.5% 4	–
	Ground Beef	–	–	–	0.4% 1	0.4% 1	0.5% 1	–	–
	Pork Chop	0.4% 1	0.6% 2	1.0% 3	1.6% 5	0.7% 2	0.4% 1	0.8% 2	0.8% 2
5. Resistance to ≥ 6 Antimicrobial Classes	Chicken Breast	–	–	–	–	–	–	–	–
	Ground Turkey	0.3% 1	–	–	1.2% 4	0.3% 1	–	0.4% 1	–
	Ground Beef	–	–	–	0.4% 1	–	–	–	–
	Pork Chop	–	–	–	–	–	–	–	–

[1] Dash indicates 0.0% resistance.

[2] Resistance pattern does not include QDA, as *E. faecalis* is considered intrinsically resistant.

Table 19b. Multidrug Resistance among *Enterococcus faecium* Isolates by Antimicrobial Class, 2002-2009 [1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	231	248	348	307	315	189	162	202
	Ground Turkey	89	118	172	107	139	65	70	66
	Ground Beef	93	112	162	129	125	70	74	59
	Pork Chop	93	97	75	75	70	33	35	26
Resistance Pattern	**Isolate Source**								
1. No Resistance Detected	Chicken Breast	–	–	–	1.6% 5	1.3% 4	–	4.9% 8	4.5% 9
	Ground Turkey	–	–	–	–	–	–	2.9% 2	1.5% 1
	Ground Beef	–	–	–	1.6% 2	–	2.9% 2	8.1% 6	3.4% 2
	Pork Chop	–	–	–	1.3% 1	1.4% 1	–	17.1% 6	11.5% 3
2. Resistance to ≥ 3 Antimicrobial Classes	Chicken Breast	90.0% 208	95.6% 237	90.8% 316	79.2% 243	71.1% 224	73.5% 139	64.8% 105	67.3% 136
	Ground Turkey	97.8% 87	98.3% 116	96.5% 166	90.7% 97	96.4% 134	96.9% 63	85.7% 60	92.4% 61
	Ground Beef	63.4% 59	68.8% 77	55.6% 90	40.3% 52	27.2% 34	22.9% 16	29.7% 22	20.3% 12
	Pork Chop	80.6% 75	84.5% 82	81.3% 61	57.3% 43	34.3% 24	30.3% 10	14.3% 5	23.1% 6
3. Resistance to ≥ 4 Antimicrobial Classes	Chicken Breast	70.6% 163	79.4% 197	72.1% 251	57.3% 176	49.8% 157	64.0% 121	51.9% 84	56.4% 114
	Ground Turkey	86.5% 77	87.3% 103	91.9% 158	84.1% 90	89.2% 124	83.1% 54	80.0% 56	86.4% 57
	Ground Beef	29.0% 27	39.3% 44	26.5% 43	14.0% 18	8.0% 10	7.1% 5	14.9% 11	13.6% 8
	Pork Chop	32.3% 30	50.5% 49	37.3% 28	17.3% 13	7.1% 5	3.0% 1	5.7% 2	3.8% 1
4. Resistance to ≥ 5 Antimicrobial Classes	Chicken Breast	48.9% 113	52.4% 130	50.9% 177	42.0% 129	27.9% 88	32.3% 61	34.6% 56	41.1% 83
	Ground Turkey	77.5% 69	72.9% 86	78.5% 135	72.0% 77	74.8% 104	61.5% 40	58.6% 41	65.2% 43
	Ground Beef	11.8% 11	18.8% 21	9.9% 16	6.2% 8	4.8% 6	4.3% 3	8.1% 6	1.7% 1
	Pork Chop	8.6% 8	7.2% 7	12.0% 9	9.3% 7	4.3% 3	–	2.9% 1	3.8% 1
5. Resistance to ≥ 6 Antimicrobial Classes	Chicken Breast	29.0% 67	33.9% 84	27.6% 96	23.1% 71	14.0% 44	13.8% 26	23.5% 38	16.3% 33
	Ground Turkey	62.9% 56	67.8% 80	61.6% 106	52.3% 56	54.7% 76	35.4% 23	31.4% 22	48.5% 32
	Ground Beef	5.4% 5	7.1% 8	5.6% 9	4.7% 6	4.0% 5	–	4.1% 3	1.7% 1
	Pork Chop	4.3% 4	5.2% 5	4.0% 3	5.3% 4	2.9% 2	–	2.9% 1	3.8% 1

[1] Dash indicates 0.0% resistance.

Table 20a. MIC Distribution among *Enterococcus faecalis* and *E. faecium* from Chicken Breast, 2009

Antimicrobial	Species	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides																							
Gentamicin	*faecalis*	N/A	**25.4**	[18.3 - 33.5]														73.2	1.4	**1.4**	**4.3**	**19.6**	
	faecium	N/A	**6.9**	[3.8 - 11.4]														93.1				**6.9**	
Kanamycin	*faecalis*	N/A	**30.4**	[22.9 - 38.8]														68.8		0.7	**1.4**	**29.0**	
	faecium	N/A	**9.9**	[6.2 - 14.9]														46.0	33.7	10.4	**4.5**	**5.4**	
Streptomycin	*faecalis*	N/A	**13.0**	[7.9 - 19.8]																87.0	**0.7**	**0.7**	**11.6**
	faecium	N/A	**30.2**	[24.0 - 37.0]																69.8	**13.4**	**13.4**	**3.5**
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 2.6]							61.6	38.4											
	faecium	0.0	**0.0**	[0.0 - 1.8]						59.9	29.2	10.4	0.5										
Glycylcycline																							
Tigecycline	*faecalis*	N/A	**0.0**	[0.0 - 2.6]		0.72	11.6	47.8	39.9														
	faecium	N/A	**0.0**	[0.0 - 1.8]	0.5	8.9	29.7	48.0	12.9														
Lincosamides																							
Lincomycin	*faecalis*	0.7	**98.6**	[94.9 - 99.8]							0.7		0.7		**98.6**								
	faecium	0.0	**83.2**	[77.3 - 88.1]							16.3	0.5		**0.5**	**82.7**								
Lipopeptides																							
Daptomycin	*faecalis*	N/A	**0.0**	[0.0 - 2.6]						8.0	79.0	12.3	0.7										
	faecium	N/A	**6.4**	[3.5 - 10.8]							3.5	25.7	64.4	**6.4**									
Macrolides																							
Erythromicin	*faecalis*	36.2	**39.9**	[31.6 - 48.5]					16.7	7.2	29.7	6.5			**39.9**								
	faecium	52.0	**19.8**	[14.5 - 26.0]					19.8	8.4	20.3	22.8	8.9	**0.5**	**19.3**								
Tylosin	*faecalis*	0.0	**39.9**	[31.6 - 48.5]							3.6	52.9	3.6				**39.9**						
	faecium	0.0	**19.3**	[14.1 - 25.4]							5.9	25.2	32.7	16.8			**19.3**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	2.9	**0.0**	[0.0 - 2.6]										54.3	42.8		2.9						
	faecium	47.0	**51.5**	[44.4 - 58.6]												1.5	47.0	**51.5**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 2.6]							26.8	73.2											
	faecium	0.0	**0.0**	[0.0 - 1.8]							30.2	69.8											
Penicillins																							
Penicillin	*faecalis*	N/A	**0.0**	[0.0 - 2.6]								21.7	78.3										
	faecium	N/A	**23.3**	[17.6 - 29.7]					6.9	1.0	4.5	11.4	43.6	9.4	**9.4**	**13.9**							
Phenicols																							
Chloramphenicol	*faecalis*	10.1	**1.4**	[0.2 - 5.1]									0.7	87.7	10.1	**0.7**	**0.7**						
	faecium	0.5	**0.0**	[0.0 - 1.8]									17.8	81.7	0.5								
Quinolones																							
Ciprofloxacin	*faecalis*	29.0	**0.0**	[0.0 - 2.6]						5.1	65.9	29.0											
	faecium	44.6	**34.2**	[27.6 - 41.1]						1.5	19.8	44.6	**30.7**	**3.5**									
Streptogramins																							
Quinupristin-Dalfopristin	*faecalis*[5]																						
	faecium	34.7	**50.0**	[42.9 - 57.1]						14.9	0.5	34.7	**10.9**	**24.8**	**7.9**	**6.4**							
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**72.5**	[64.2 - 79.7]							26.1	1.4				**5.1**	**67.4**						
	faecium	2.5	**56.9**	[49.8 - 63.9]							38.1		2.5	2.5	**1.5**	**0.5**	**55.0**						

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single vertical black lines indicate the breakpoints for susceptibility, while double vertical red lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

[5] Data not presented as *E. faecalis* is considered intrinsically resistant to Quinupristin-Dalfopristin.

Table 20b. MIC Distribution among *Enterococcus faecalis* and *E. faecium* from Ground Turkey, 2009

Antimicrobial	Species	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4]																
					0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides																							
Gentamicin	*faecalis*	N/A	**30.0**	[24.5 - 36.0]														70.0			**0.8**	**29.2**	
	faecium	N/A	**18.2**	[9.8 - 29.6]														81.8			**3.0**	**15.2**	
Kanamycin	*faecalis*	N/A	**38.8**	[32.9 - 45.1]														60.8	0.4		**0.8**	**38.1**	
	faecium	N/A	**33.3**	[22.2 - 46.0]														21.2	33.3	12.1	**3.0**	**30.3**	
Streptomycin	*faecalis*	N/A	**27.7**	[22.3 - 33.6]																72.3	**0.4**	**0.8**	**26.5**
	faecium	N/A	**51.5**	[38.9 - 64.0]																48.5	**6.1**	**24.2**	**21.2**
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 1.4]							58.5	40.8	0.8										
	faecium	0.0	**0.0**	[0.0 - 5.4]						42.4	28.8	28.8											
Glycylcycline																							
Tigecycline	*faecalis*	N/A	**0.0**	[0.0 - 1.4]	0.8	1.5	4.6	56.2	36.9														
	faecium	N/A	**0.0**	[0.0 - 5.4]			16.7	69.7	13.6														
Lincosamides																							
Lincomycin	*faecalis*	0.8	**97.7**	[95.0 - 99.1]							1.5		0.8	**0.4**	**97.3**								
	faecium	0.0	**93.9**	[85.2 - 98.3]							4.6	1.5		**4.5**	**89.4**								
Lipopeptides																							
Daptomycin	*faecalis*	N/A	**0.0**	[0.0 - 1.4]						11.5	76.9	11.5											
	faecium	N/A	**9.1**	[3.4 - 18.7]							1.5	33.3	56.1	**7.6**	**1.5**								
Macrolides																							
Erythromicin	*faecalis*	31.5	**37.7**	[31.8 - 43.9]					22.7	8.1	25.4	6.2			**37.7**								
	faecium	25.8	**56.1**	[43.3 - 68.3]					9.1	9.1	7.6	10.6	7.6	**6.1**	**50.0**								
Tylosin	*faecalis*	0.0	**37.7**	[31.8 - 43.9]							1.9	57.7	2.7				**37.7**						
	faecium	0.0	**24.2**	[14.5 - 36.4]							3.0	22.7	47.0	3.0			**24.2**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	3.1	**0.4**	[0.0 - 2.1]										63.1	33.1	0.4	3.1	**0.4**					
	faecium	54.5	**40.9**	[29.0 - 53.7]												4.5	54.5	**40.9**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 1.4]						0.8	31.9	67.3											
	faecium	0.0	**0.0**	[0.0 - 5.4]							47.0	53.0											
Penicillins																							
Penicillin	*faecalis*	N/A	**0.0**	[0.0 - 1.4]							0.4	23.5	76.2										
	faecium	N/A	**69.7**	[57.1 - 80.4]					3.0		1.5	4.5	15.2	6.1	**13.6**	**56.1**							
Phenicols																							
Chloramphenicol	*faecalis*	5.8	**0.0**	[0.0 - 1.4]									0.8	93.5	5.8								
	faecium	0.0	**0.0**	[0.0 - 5.4]									33.3	66.7									
Quinolones																							
Ciprofloxacin	*faecalis*	26.9	**0.8**	[0.1 - 2.8]						4.6	67.7	26.9	**0.8**										
	faecium	36.4	**40.9**	[29.0 - 53.7]						3.0	19.7	36.4	**34.8**	**6.1**									
Streptogramins																							
Quinupristin-	*faecalis*[5]																						
Dalfopristin	*faecium*	24.2	**69.7**	[57.1 - 80.4]						3.0	3.0	24.2	**4.5**	**18.2**	**30.3**	**16.7**							
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**85.8**	[80.9 - 89.8]							13.8	0.4				**0.8**	**85.0**						
	faecium	1.5	**92.4**	[83.2 - 97.5]							6.1			1.5		**1.5**	**90.9**						

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single vertical black lines indicate the breakpoints for susceptibility, while double vertical red lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

[5] Data not presented as *E. faecalis* is considered intrinsically resistant to Quinupristin-Dalfopristin.

Table 20c. MIC Distribution among *Enterococcus faecalis* and *E. faecium* from Ground Beef, 2009

Antimicrobial	Species	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides																							
Gentamicin	*faecalis*	N/A	**0.9**	[0.1 - 3.1]														98.2	0.9			**0.9**	
	faecium	N/A	**1.7**	[0.0 - 9.1]														98.3				**1.7**	
Kanamycin	*faecalis*	N/A	**1.8**	[0.5 - 4.5]														97.8	0.4			**1.8**	
	faecium	N/A	**6.8**	[1.9 - 16.5]														57.6	22.0	13.6	**1.7**	**5.1**	
Streptomycin	*faecalis*	N/A	**5.3**	[2.8 - 9.1]																94.7	**0.4**	**1.3**	**3.5**
	faecium	N/A	**8.5**	[2.8 - 18.7]																91.5		**3.4**	**5.1**
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 1.6]						1.3	38.3	58.6	1.8										
	faecium	0.0	**0.0**	[0.0 - 6.1]						84.7	3.4	11.9											
Glycylcycline																							
Tigecycline	*faecalis*	N/A	**0.0**	[0.0 - 1.6]		0.4	24.2	52.0	23.3														
	faecium	N/A	**0.0**	[0.0 - 6.1]		5.1	42.4	50.9	1.7														
Lincosamides																							
Lincomycin	*faecalis*	0.0	**97.8**	[94.9 - 99.3]							1.8	0.4		**0.4**	**97.4**								
	faecium	0.0	**79.7**	[67.2 - 89.0]							20.3			**18.6**	**61.0**								
Lipopeptides																							
Daptomycin	*faecalis*	N/A	**0.0**	[0.0 - 1.6]					0.4	17.6	63.0	18.5	0.4										
	faecium	N/A	**0.0**	[0.0 - 6.1]							10.2	45.8	44.1										
Macrolides																							
Erythromicin	*faecalis*	74.0	**2.6**	[1.0 - 5.7]					11.0	12.3	60.4	12.3	1.3	**0.4**	**2.2**								
	faecium	72.9	**5.1**	[1.1 - 14.1]					22.0		11.9	27.1	33.9	**1.7**	**3.4**								
Tylosin	*faecalis*	0.0	**2.2**	[0.7 - 5.1]							0.9	92.1	4.8				**2.2**						
	faecium	0.0	**3.4**	[0.4 - 11.7]							5.1	18.6	40.7	32.2			**3.4**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	0.0	**0.0**	[0.0 - 1.6]										47.6	52.4								
	faecium	83.1	**16.9**	[8.4 - 29.0]													83.1	**16.9**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 1.6]							9.3	90.7											
	faecium	0.0	**0.0**	[0.0 - 6.1]							16.9	83.1											
Penicillins																							
Penicillin	*faecalis*	N/A	**0.4**	[0.0 - 2.4]							0.4	21.2	78.0			**0.4**							
	faecium	N/A	**6.8**	[1.9 - 16.5]					22.0	1.7		5.1	55.9	8.5	**3.4**	**3.4**							
Phenicols																							
Chloramphenicol	*faecalis*	0.9	**0.0**	[0.0 - 1.6]										99.1	0.9								
	faecium	0.0	**0.0**	[0.0 - 6.1]									5.1	94.9									
Quinolones																							
Ciprofloxacin	*faecalis*	35.7	**1.3**	[0.3 - 3.8]						4.4	58.6	35.7	**0.9**	**0.4**									
	faecium	30.5	**18.6**	[9.7 - 30.9]					1.7	15.3	33.9	30.5	**18.6**										
Streptogramins																							
Quinupristin-	*faecalis*[5]																						
Dalfopristin	*faecium*	61.0	**18.6**	[9.7 - 30.9]						18.6	1.7	61.0	**18.6**										
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**21.1**	[16.0 - 27.0]							78.9					**2.2**	**18.9**						
	faecium	0.0	**39.0**	[26.5 - 52.6]							61.0					**8.5**	**30.5**						

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single vertical black lines indicate the breakpoints for susceptibility, while double vertical red lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

[5] Data not presented as *E. faecalis* is considered intrinsically resistant to Quinupristin-Dalfopristin.

Table 20d. MIC Distribution among *Enterococcus faecalis* and *E. faecium* from Pork Chop, 2009

Antimicrobial	Species	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides																							
Gentamicin	*faecalis*	N/A	**1.9**	[0.6 - 4.4]														98.1			**0.4**	**1.5**	
	faecium	N/A	**0.0**	[0.0 - 13.2]														100.0					
Kanamycin	*faecalis*	N/A	**2.7**	[1.1 - 5.5]														96.9	0.4			**2.7**	
	faecium	N/A	**0.0**	[0.0 - 13.2]														53.8	38.5	7.7			
Streptomycin	*faecalis*	N/A	**8.9**	[5.7 - 13.0]																91.1		**0.4**	**8.5**
	faecium	N/A	**3.8**	[0.1 - 19.6]																96.2		**3.8**	
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 1.4]							49.8	49.0	1.2										
	faecium	0.0	**0.0**	[0.0 - 13.2]					7.7	65.4	19.2	7.7											
Glycylcycline																							
Tigecycline	*faecalis*	N/A	**0.0**	[0.0 - 1.4]			8.11	59.5	32.4														
	faecium	N/A	**0.0**	[0.0 - 13.2]		3.8	34.6	57.7	3.9														
Lincosamides																							
Lincomycin	*faecalis*	0.0	**97.3**	[94.5 - 98.9]							2.7				**97.3**								
	faecium	3.8	**84.6**	[65.1 - 95.6]							11.5		3.8	**15.4**	**69.2**								
Lipopeptides																							
Daptomycin	*faecalis*	N/A	**0.0**	[0.0 - 1.4]					0.4	7.7	73.4	18.5											
	faecium	N/A	**0.0**	[0.0 - 13.2]							15.4	46.2	38.5										
Macrolides																							
Erythromicin	*faecalis*	66.0	**6.9**	[4.2 - 10.8]					13.1	13.9	47.5	15.4	3.1	**0.4**	**6.6**								
	faecium	88.5	**3.8**	[0.1 - 19.6]						7.7	11.5	19.2	57.7	**3.8**									
Tylosin	*faecalis*	0.4	**6.6**	[3.9 - 10.3]							3.1	87.3	2.7		0.4		**6.6**						
	faecium	7.7	**0.0**	[0.0 - 13.2]								19.2	34.6	38.5	7.7								
Nitrofurans																							
Nitrofurantoin	*faecalis*	0.0	**0.0**	[0.0 - 1.4]										52.5	47.5								
	faecium	80.8	**11.5**	[2.4 - 30.2]										3.8		3.8	80.8	**11.5**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 1.4]							13.5	86.5											
	faecium	0.0	**0.0**	[0.0 - 13.2]							11.5	88.5											
Penicillins																							
Penicillin	*faecalis*	N/A	**0.4**	[0.0 - 2.1]								17.0	81.9	0.8	**0.4**								
	faecium	N/A	**7.7**	[0.9 - 25.1]					26.9	3.8	11.5	3.8	11.5	34.6		**7.7**							
Phenicols																							
Chloramphenicol	*faecalis*	2.3	**1.2**	[0.2 - 3.3]									1.2	95.4	2.3		**1.2**						
	faecium	0.0	**0.0**	[0.0 - 13.2]									3.8	96.2									
Quinolones																							
Ciprofloxacin	*faecalis*	27.0	**1.5**	[0.4 - 3.9]						8.9	62.5	27.0	**1.5**										
	faecium	19.2	**7.7**	[0.9 - 25.1]						15.4	57.7	19.2	**7.7**										
Streptogramins																							
Quinupristin-	*faecalis*[5]																						
Dalfopristin	*faecium*	65.4	**19.2**	[6.6 - 39.4]						15.4		65.4	**11.5**	**3.8**	**3.8**								
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**83.8**	[78.7 - 88.1]							16.2						**83.8**						
	faecium	0.0	**50.0**	[29.9 - 70.1]							50.0					**3.8**	**46.2**						

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

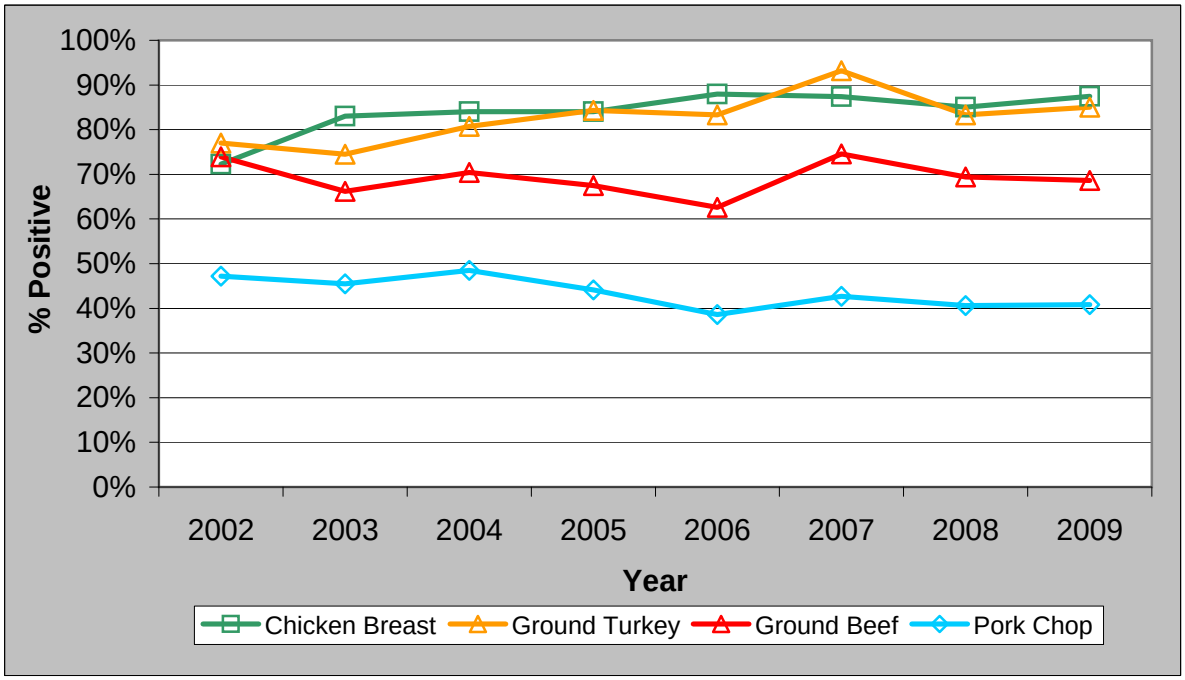
[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Single vertical black lines indicate the breakpoints for susceptibility, while double vertical red lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

[5] Data not presented as *E. faecalis* is considered intrinsically resistant to Quinupristin-Dalfopristin.

Table 21. *Escherichia coli* by Meat Type, 2002-2009

Year	Chicken Breast			Ground Turkey			Ground Beef			Pork Chop		
	N	n	%	N	n	%	N	n	%	N	n	%
2002	390	282	72.3%	395	304	77.0%	399	295	73.9%	390	184	47.2%
2003	477	396	83.0%	447	333	74.5%	470	311	66.2%	479	218	45.5%
2004	476	400	84.0%	466	376	80.7%	480	338	70.4%	478	232	48.5%
2005	468	393	84.0%	470	396	84.3%	468	316	67.5%	465	205	44.1%
2006	475	418	88.0%	466	388	83.3%	471	295	62.6%	472	182	38.6%
2007	342	299	87.4%	338	315	93.2%	343	256	74.6%	356	152	42.7%
2008	360	306	85.0%	360	300	83.3%	360	250	69.4%	360	146	40.6%
2009	360	315	87.5%	360	306	85.0%	360	247	68.6%	360	147	40.8%
Total	3348	2809	83.9%	3302	2718	82.3%	3351	2308	68.9%	3360	1466	43.6%

Figure 6. Percent of Retail Meat Samples Culture Positive for *Escherichia coli* , 2002-2009



N = # of meat samples tested.
n = the number of isolates.
% = the number of isolates (n)/the number of meat samples tested (N).

Table 22. Trends in Antimicrobial Resistance among *Escherichia coli* by Meat Type, 2002-2009[1]

Meat Type	Year (N)	Aminoglycosides				Penicillins	β-Lactamase Inhibitor Combinations	Cephems			Folate Pathway Inhibitors		Phenicols	Quinolones		Tetra-cyclines
		AMI (MIC ≥ 64)	GEN (MIC ≥ 16)	KAN (MIC ≥ 64)	STR (MIC ≥ 64)	AMP (MIC ≥ 32)	AMC (MIC ≥ 32)	TIO (MIC ≥ 32)	AXO (MIC ≥ 4)	FOX (MIC ≥ 32)	FIS[2] (MIC ≥ 512)	COT (MIC ≥ 4)	CHL (MIC ≥ 512)	CIP (MIC ≥ 4)	NAL (MIC ≥ 32)	TET (MIC ≥ 16)
Chicken Breast	2002 (282)	–	23.1%	6.0%	49.3%	21.6%	12.1%	7.1%	7.8%	11.0%	32.3%	3.6%	0.7%	–	2.8%	46.1%
	2003 (396)	–	29.3%	6.8%	56.1%	25.3%	13.6%	7.6%	9.1%	9.3%	38.4%	7.1%	–	–	4.0%	42.9%
	2004 (400)	–	30.0%	6.8%	56.8%	17.0%	10.0%	5.8%	6.5%	8.3%	41.3%	4.3%	1.8%	–	7.0%	48.0%
	2005 (393)	–	37.7%	7.1%	50.6%	24.7%	12.2%	8.7%	10.2%	11.2%	48.1%	7.4%	0.5%	–	6.6%	46.6%
	2006 (418)	–	37.3%	11.5%	48.1%	20.1%	11.5%	8.6%	9.1%	11.2%	46.9%	8.9%	2.6%	–	5.0%	50.5%
	2007 (299)	–	34.4%	9.0%	46.8%	18.1%	7.4%	6.0%	6.4%	7.4%	42.1%	5.0%	2.0%	–	3.0%	40.5%
	2008 (306)	–	34.0%	6.9%	43.8%	23.5%	11.8%	10.8%	11.1%	11.8%	39.2%	3.6%	1.0%	–	2.9%	43.8%
	2009 (315)	–	34.3%	5.4%	38.1%	22.2%	13.3%	11.7%	12.4%	13.3%	40.6%	2.2%	0.6%	0.3%	2.9%	41.6%
	Z Statistic	**N/A[3]**	**-1.8718**	**-0.4489**	**5.0655**	**0.2597**	**0.4139**	**-2.5399**	**-1.9681**	**-1.3229**	**-1.7099**	**1.4534**	**-1.0737**	**-1.6400**	**1.4100**	**1.1513**
	P Value[4]	**N/A**	**0.0612**	**0.6535**	**<0.0001**	**0.7951**	**0.6789**	**0.0111**	**0.0491**	**0.1859**	**0.0873**	**0.1461**	**0.2830**	**0.1010**	**0.1585**	**0.2496**
Ground Turkey	2002 (304)	–	27.0%	13.2%	57.6%	31.3%	5.6%	1.0%	1.3%	3.3%	48.0%	4.0%	0.3%	–	4.3%	77.0%
	2003 (333)	–	29.7%	16.8%	54.7%	35.7%	3.0%	0.3%	0.3%	1.2%	51.7%	6.9%	3.6%	0.3%	11.7%	77.8%
	2004 (376)	–	29.3%	16.0%	49.2%	33.2%	5.3%	1.1%	1.3%	4.5%	48.4%	3.7%	0.8%	0.8%	10.6%	74.2%
	2005 (396)	–	27.5%	11.4%	43.4%	38.1%	3.8%	1.8%	2.3%	3.3%	48.0%	5.1%	4.0%	–	10.4%	78.0%
	2006 (388)	–	29.6%	14.7%	43.8%	42.0%	6.7%	3.1%	3.1%	6.2%	48.5%	8.0%	2.3%	0.5%	5.2%	76.5%
	2007 (315)	–	27.0%	15.6%	44.8%	48.3%	6.3%	6.0%	6.0%	6.3%	48.9%	7.9%	2.9%	0.3%	2.2%	80.0%
	2008 (300)	–	37.0%	19.0%	57.3%	58.0%	8.3%	3.7%	3.7%	6.3%	51.0%	5.3%	3.7%	–	3.7%	85.7%
	2009 (306)	–	37.9%	20.6%	57.5%	56.2%	9.8%	6.2%	6.9%	7.8%	53.9%	5.9%	3.3%	0.7%	2.6%	82.0%
	Z Statistic	**N/A**	**-3.1541**	**-2.3795**	**0.0369**	**-9.2751**	**-3.6245**	**-5.8556**	**-5.7139**	**-4.2615**	**-1.0620**	**-1.3181**	**-2.1290**	**-0.4651**	**4.7865**	**-3.0311**
	P Value	**N/A**	**0.0016**	**0.0173**	**0.9705**	**<0.0001**	**0.0003**	**<0.0001**	**<0.0001**	**<0.0001**	**0.2882**	**0.1874**	**0.0333**	**0.6419**	**<0.0001**	**0.0024**
Ground Beef	2002 (295)	–	0.3%	2.4%	9.5%	6.1%	2.0%	–	–	1.4%	9.8%	0.7%	1.0%	–	–	30.9%
	2003 (311)	–	1.0%	2.9%	9.0%	5.1%	2.3%	0.3%	0.3%	0.3%	10.3%	0.3%	2.3%	–	1.0%	25.1%
	2004 (338)	–	0.6%	2.4%	11.8%	5.3%	3.9%	0.9%	1.5%	1.2%	13.0%	0.6%	3.6%	–	1.5%	22.8%
	2005 (316)	–	–	0.6%	5.4%	3.5%	1.3%	0.6%	1.9%	1.0%	7.0%	0.6%	1.6%	–	1.3%	16.5%
	2006 (295)	–	4.1%	4.7%	14.2%	9.2%	2.4%	1.0%	1.7%	2.0%	12.5%	1.4%	1.4%	–	0.7%	25.4%
	2007 (256)	–	–	1.6%	6.3%	6.6%	0.8%	0.8%	0.8%	0.8%	9.4%	1.2%	3.9%	–	0.4%	21.9%
	2008 (250)	–	2.0%	4.0%	10.4%	6.4%	2.4%	1.6%	1.6%	2.4%	11.6%	2.0%	0.8%	–	0.4%	24.0%
	2009 (247)	–	0.8%	2.0%	8.1%	4.9%	1.6%	0.8%	0.8%	1.6%	7.7%	2.0%	2.4%	–	0.4%	18.6%
	Z Statistic	**N/A**	**-1.4761**	**-0.4190**	**0.4405**	**-0.4781**	**0.9595**	**-1.8333**	**-1.2963**	**-1.3887**	**0.5706**	**-2.5432**	**-0.2672**	**N/A**	**0.5612**	**2.5861**
	P Value	**N/A**	**0.1615**	**0.6752**	**0.6596**	**0.6326**	**0.3373**	**0.0668**	**0.1949**	**0.1649**	**0.5683**	**0.0110**	**0.7893**	**N/A**	**0.5747**	**0.0097**
Pork Chop	2002 (184)	–	1.1%	5.4%	22.3%	13.6%	5.4%	0.5%	0.5%	3.3%	12.5%	1.1%	1.6%	–	0.5%	52.7%
	2003 (218)	–	1.4%	8.7%	19.7%	13.3%	5.1%	0.9%	0.9%	2.3%	15.1%	2.8%	4.1%	–	0.5%	46.3%
	2004 (232)	–	1.3%	8.2%	21.1%	15.1%	5.6%	0.4%	0.4%	2.2%	19.4%	3.9%	4.3%	–	–	56.0%
	2005 (205)	–	–	7.3%	13.2%	16.1%	2.9%	–	0.5%	1.5%	14.2%	1.5%	3.4%	–	1.5%	45.9%
	2006 (182)	–	1.1%	6.0%	13.7%	15.9%	2.2%	–	0.6%	1.6%	20.3%	2.2%	6.6%	–	0.5%	52.7%
	2007 (152)	–	1.3%	4.6%	13.8%	15.8%	0.7%	0.7%	0.7%	0.7%	11.8%	1.3%	3.9%	–	–	50.0%
	2008 (146)	–	1.4%	6.2%	19.9%	15.1%	3.4%	3.4%	3.4%	3.4%	16.4%	6.2%	3.4%	–	–	54.8%
	2009 (147)	–	4.1%	6.1%	19.7%	11.6%	6.8%	6.8%	6.8%	6.8%	14.3%	2.7%	4.8%	–	–	46.9%
	Z Statistic	**N/A**	**-1.7338**	**0.8817**	**1.2484**	**-0.0126**	**0.9516**	**-4.5868**	**-4.4349**	**-1.4454**	**-0.1036**	**-1.1923**	**-1.0975**	**N/A**	**0.9618**	**0.1653**
	P Value	**N/A**	**0.0829**	**0.3779**	**0.2119**	**0.9900**	**0.3413**	**<0.0001**	**<0.0001**	**0.1483**	**0.9175**	**0.2332**	**0.2724**	**N/A**	**0.3362**	**0.8687**

[1] Dashes indicate 0.0% resistance to antimicrobial. Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).

[2] Sulfisoxazole replaced Sulfamethoxazole on the NARMS panel in 2004.

[3] N/A = No Z statistic or P value could be calculated.

[4] P value for percent resistant trend was calculated using the Cochran-Armitage Trend Test method.

Figure 7a. Antimicrobial Resistance among *Escherichia coli* from Chicken Breast, 2002-2009

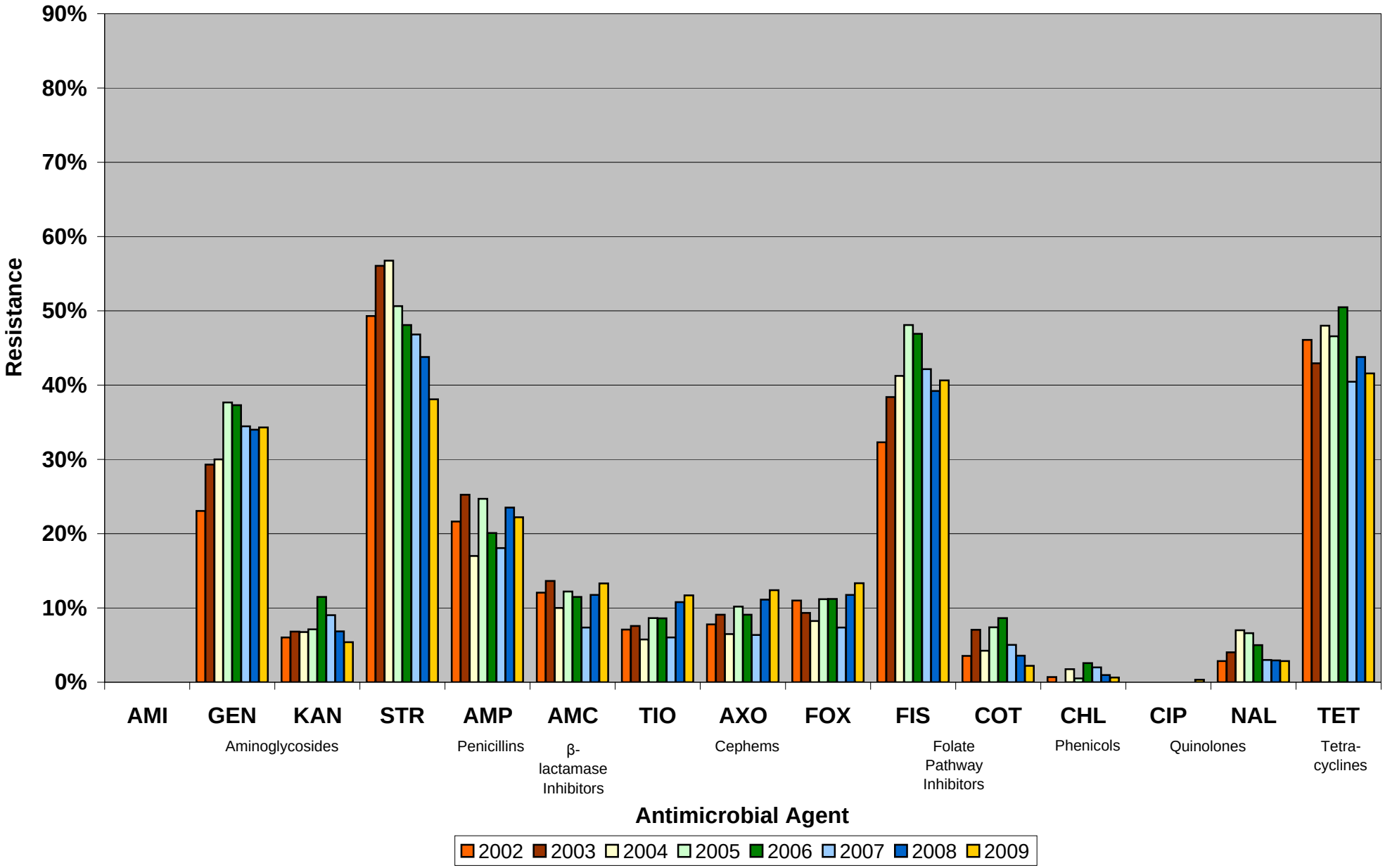


Figure 7b. Antimicrobial Resistance among *Escherichia coli* from Ground Turkey, 2002-2009

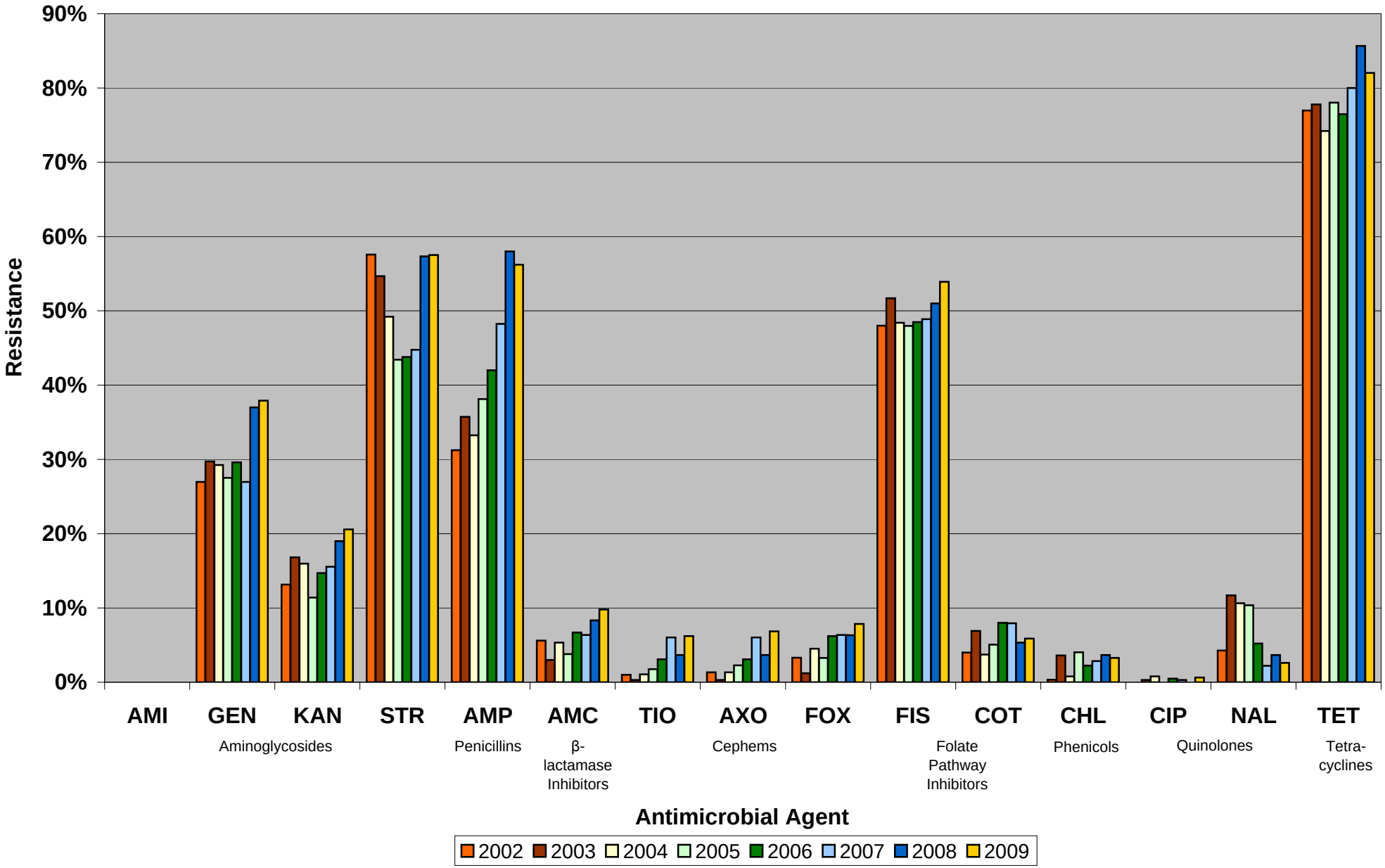


Figure 7c. Antimicrobial Resistance among *Escherichia coli* from Ground Beef, 2002-2009

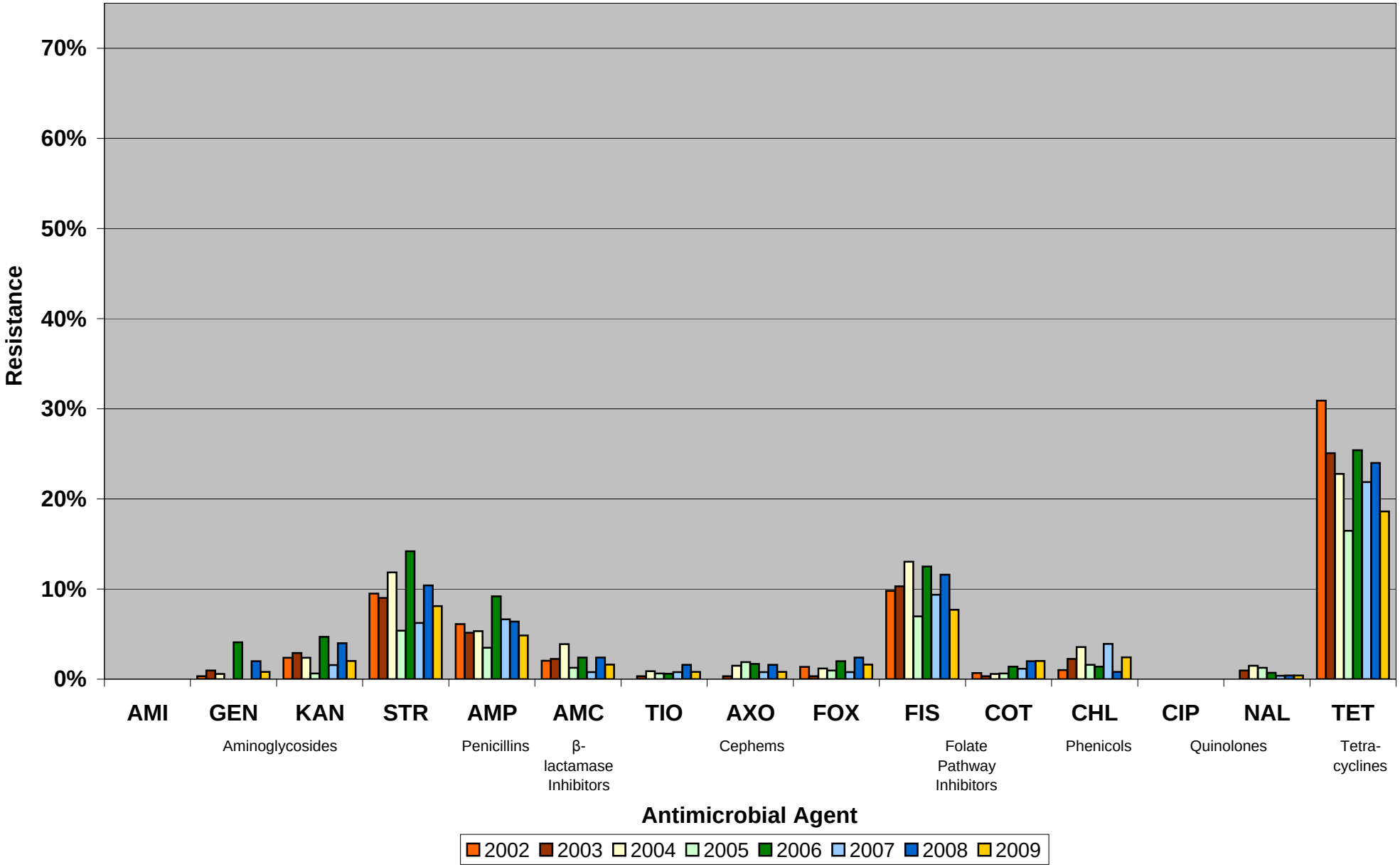


Figure 7d. Antimicrobial Resistance among *Escherichia coli* from Pork Chops, 2002-2009

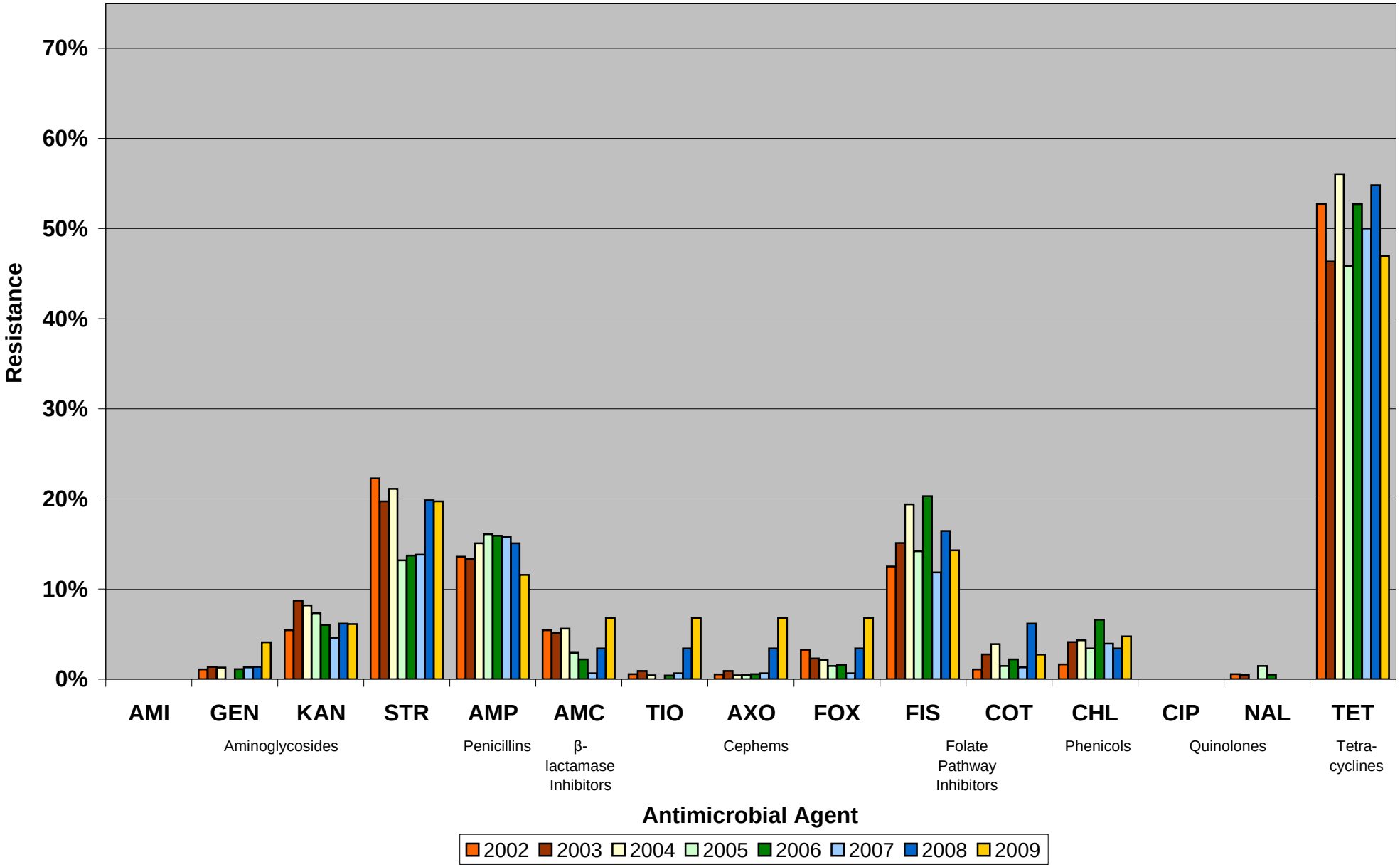


Table 23. Multidrug Resistance Patterns among *Escherichia coli* Isolates by Year, 2002-2009[1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	282	396	400	393	418	299	306	315
	Ground Turkey	304	333	376	397	388	315	300	306
	Ground Beef	295	311	338	316	295	256	250	247
	Pork Chop	184	218	232	205	182	152	146	147
Resistance Pattern	**Isolate Source**								
1. At Least ACSSuT[2] Resistant	Chicken Breast	0.4% 1	–	1.3% 5	0.3% 1	1.4% 6	2.0% 6	1.0% 3	0.6% 2
	Ground Turkey	–	2.7% 9	0.5% 2	1.8% 7	0.8% 3	1.9% 6	2.0% 6	2.3% 7
	Ground Beef	0.3% 1	1.0% 3	1.5% 5	0.6% 2	0.3% 1	0.4% 1	–	–
	Pork Chop	0.5% 1	1.4% 3	1.3% 3	1.0% 2	1.1% 2	0.7% 1	1.4% 2	2.0% 3
2. At Least ACT/S[3] Resistant	Chicken Breast	–	–	0.3% 1	–	–	0.3% 1	–	–
	Ground Turkey	–	0.9% 3	–	0.8% 3	0.3% 1	0.3% 1	–	0.3% 1
	Ground Beef	–	–	–	0.3% 1	0.3% 1	–	–	–
	Pork Chop	0.5% 1	–	0.4% 1	0.5% 1	–	–	–	0.7% 1
3. At Least ACSSuTAuCx[4] Resistant	Chicken Breast	0.4% 1	–	1.0% 4	0.3% 1	1.0% 4	0.7% 2	0.7% 2	0.6% 2
	Ground Turkey	–	0.3% 1	–	0.3% 1	–	1.3% 4	1.3% 4	1.0% 3
	Ground Beef	–	–	0.9% 3	0.3% 1	–	–	–	–
	Pork Chop	–	0.5% 1	0.4% 1	–	–	0.7% 1	0.7% 1	2.0% 3
4. At Least Ceftriaxone and Nalidixic Acid Resistant	Chicken Breast	0.7% 2	0.5% 2	1.5% 6	0.3% 1	0.2% 1	–	1.0% 3	0.6% 2
	Ground Turkey	0.3% 1	0.3% 1	0.3% 1	0.3% 1	–	0.6% 2	–	1.0% 3
	Ground Beef	–	–	0.3% 1	0.3% 1	0.3% 1	–	–	–
	Pork Chop	0.5% 1	–	–	–	–	–	–	2.0% 3

[1] Dashes indicate 0.0% resistance.

[2] ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline.

[3] ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole.

[4] ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone.

Table 24. Multidrug Resistance among *Escherichia coli* Isolates by Antimicrobial Class, 2002-2009[1]

Year		2002	2003	2004	2005	2006	2007	2008	2009
Number of Isolates Tested by Source	Chicken Breast	282	396	400	393	418	299	306	315
	Ground Turkey	304	333	376	396	388	315	300	306
	Ground Beef	295	311	338	316	295	256	250	247
	Pork Chop	184	218	232	205	182	152	146	147
Resistance Pattern[2]	**Isolate Source**								
1. No Resistance Detected	Chicken Breast	27.0% 76	20.5% 81	20.8% 83	20.6% 81	23.7% 99	29.1% 87	33.3% 102	34.3% 108
	Ground Turkey	16.8% 51	14.7% 49	19.1% 72	16.2% 64	16.0% 62	13.0% 41	8.3% 25	11.8% 36
	Ground Beef	63.1% 186	66.9% 208	73.1% 247	80.4% 254	71.5% 211	77.0% 197	73.2% 183	78.1% 193
	Pork Chop	41.3% 76	44.5% 97	37.9% 88	48.8% 100	42.9% 78	48.0% 73	43.8% 64	51.0% 75
2. Resistance to ≥ 3 Antimicrobial Classes	Chicken Breast	36.2% 102	42.2% 167	35.3% 141	45.0% 177	43.3% 181	33.8% 101	36.6% 112	37.5% 118
	Ground Turkey	55.6% 169	55.6% 185	51.9% 195	52.8% 209	55.2% 214	57.5% 181	63.7% 191	66.3% 203
	Ground Beef	10.2% 30	7.4% 23	10.4% 35	5.4% 17	11.5% 34	9.0% 23	11.2% 28	6.9% 17
	Pork Chop	17.4% 32	17.9% 39	21.1% 49	16.1% 33	15.9% 29	15.1% 23	17.8% 26	15.0% 22
3. Resistance to ≥ 4 Antimicrobial Classes	Chicken Breast	13.8% 39	13.6% 54	12.5% 50	12.2% 48	14.6% 61	10.4% 31	13.7% 42	13.7% 43
	Ground Turkey	23.0% 70	30.0% 100	24.5% 92	24.2% 96	25.8% 100	27.0% 85	32.3% 97	38.9% 119
	Ground Beef	1.7% 5	4.2% 13	4.7% 16	1.9% 6	5.8% 17	4.7% 12	4.4% 11	3.6% 9
	Pork Chop	5.4% 10	6.9% 15	7.8% 18	4.9% 10	7.7% 14	3.3% 5	7.5% 11	10.9% 16
4. Resistance to ≥ 5 Antimicrobial Classes	Chicken Breast	6.0% 17	7.3% 29	6.0% 24	5.9% 23	7.4% 31	5.7% 17	8.2% 25	6.3% 20
	Ground Turkey	9.2% 28	14.7% 49	6.9% 26	6.3% 25	5.7% 22	4.1% 13	6.3% 19	7.8% 24
	Ground Beef	0.3% 1	2.6% 8	2.7% 9	1.0% 3	2.4% 7	0.4% 1	2.0% 5	1.2% 3
	Pork Chop	3.3% 6	2.8% 6	2.2% 5	1.5% 3	3.3% 6	1.3% 2	4.1% 6	5.4% 8
5. Resistance to ≥ 6 Antimicrobial Classes	Chicken Breast	3.9% 11	3.5% 14	3.3% 13	3.6% 14	5.3% 22	3.3% 10	6.2% 19	4.4% 14
	Ground Turkey	2.6% 8	4.2% 14	3.2% 12	1.8% 7	3.1% 12	2.9% 9	4.0% 12	3.6% 11
	Ground Beef	0.3% 1	1.3% 4	2.1% 7	0.6% 2	1.7% 5	–[2]	1.6% 4	0.4% 1
	Pork Chop	1.6% 3	1.8% 4	0.4% 1	0.5% 1	1.1% 2	0.7% 1	2.1% 3	4.1% 6

[1] Dashes indicate 0.0% resistance.

[2] Cephem class includes Cephalothin for 2002 and 2003.

Table 25a. MIC Distribution among *Escherichia coli* from Chicken Breast, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (282)	0.0	**0.0**	[0.0 - 1.3]						0.7	19.5	64.2	11.7	3.9							
	2003 (396)	0.0	**0.0**	[0.0 - 0.9]						0.8	20.2	63.4	12.4	3.3							
	2004 (400)	0.0	**0.0**	[0.0 - 0.9]							15.0	65.0	17.0	2.5	0.5						
	2005 (393)	0.0	**0.0**	[0.0 - 0.9]							14.8	64.6	18.6	1.8	0.3						
	2006 (418)	0.0	**0.0**	[0.0 - 0.9]							3.3	60.3	34.4	1.9							
	2007 (299)	0.0	**0.0**	[0.0 - 1.2]							10.0	66.6	19.7	3.3	0.3						
	2008 (306)	0.0	**0.0**	[0.0 - 1.2]							0.7	48.7	46.4	4.3							
	2009 (315)	0.0	**0.0**	[0.0 - 1.2]						0.3	10.8	58.1	30.5	0.3							
Gentamicin	2002 (282)	3.2	**23.0**	[18.3 - 28.4]					3.6	46.1	20.2	2.5	1.4	3.2	**9.2**	**13.8**					
	2003 (396)	1.3	**29.3**	[24.9 - 34.0]					3.5	43.9	20.2	1.5	0.3	1.3	**10.6**	**18.7**					
	2004 (400)	2.8	**30.0**	[25.5 - 34.8]					5.8	43.3	14.8	2.5	1.0	2.8	**10.0**	**20.0**					
	2005 (393)	2.8	**37.7**	[32.9 - 42.7]					3.8	36.6	17.0	1.3	0.8	2.8	**17.6**	**20.1**					
	2006 (418)	1.9	**37.3**	[32.7 - 42.2]					2.4	36.1	18.7	2.4	1.2	1.9	**12.2**	**25.1**					
	2007 (299)	2.0	**34.4**	[29.1 - 40.1]					2.3	43.5	14.4	2.3	1.0	2.0	**14.4**	**20.1**					
	2008 (306)	1.3	**34.0**	[28.7 - 39.6]						15.7	45.8	2.9	0.3	1.3	**3.6**	**30.4**					
	2009 (315)	2.2	**34.3**	[29.1 - 39.8]					2.9	32.4	26.3	1.9		2.2	**8.6**	**25.7**					
Kanamycin	2002 (282)	0.0	**6.0**	[3.6 - 9.5]										91.5	2.5			**6.0**			
	2003 (396)	1.3	**6.8**	[4.5 - 9.8]										84.1	7.8	1.3	**0.5**	**6.3**			
	2004 (400)	1.0	**6.8**	[4.5 - 9.7]										81.8	10.5	1.0		**6.8**			
	2005 (393)	1.0	**7.1**	[4.8 - 10.1]										84.0	7.9	1.0		**7.1**			
	2006 (418)	1.0	**11.5**	[8.6 - 14.9]										77.5	10.0	1.0	**0.5**	**11.0**			
	2007 (299)	0.7	**9.0**	[6.0 - 12.9]										81.9	8.4	0.7	**0.7**	**8.4**			
	2008 (306)	2.6	**6.9**	[4.3 - 10.3]										74.8	15.7	2.6	**0.3**	**6.5**			
	2009 (315)	0.3	**5.4**	[3.2 - 8.5]										83.2	11.1	0.3	**0.6**	**4.8**			
Streptomycin	2002 (282)	N/A	**49.3**	[43.3 - 55.3]												50.7	**11.4**	**37.9**			
	2003 (396)	N/A	**56.1**	[51.0 - 61.0]												44.0	**15.2**	**40.9**			
	2004 (400)	N/A	**56.8**	[51.7 - 61.7]												43.3	**13.0**	**43.8**			
	2005 (393)	N/A	**50.9**	[45.6 - 55.7]												49.1	**17.8**	**33.1**			
	2006 (418)	N/A	**48.1**	[43.2 - 53.0]												51.9	**18.7**	**29.4**			
	2007 (299)	N/A	**46.8**	[41.1 - 52.7]												53.2	**18.1**	**28.8**			
	2008 (306)	N/A	**43.8**	[38.2 - 49.6]												56.2	**13.7**	**30.1**			
	2009 (315)	N/A	**38.1**	[32.7 - 43.7]												61.9	**16.5**	**21.6**			
Penicillins																					
Ampicillin	2002 (282)	0.4	**21.6**	[17.0 - 26.9]							6.0	27.7	39.0	5.3	0.4	**0.4**	**21.3**				
	2003 (396)	0.3	**25.3**	[21.0 - 29.8]							1.5	24.5	43.9	4.5	0.3	**0.5**	**24.7**				
	2004 (400)	0.3	**17.0**	[13.4 - 21.0]							6.8	40.3	34.0	1.8	0.3	**0.3**	**16.8**				
	2005 (393)	0.8	**24.7**	[20.5 - 29.3]							5.9	35.4	31.8	1.5	0.8	**0.3**	**24.4**				
	2006 (418)	0.5	**20.1**	[16.4 - 24.3]							8.1	39.7	30.1	1.4	0.5		**20.1**				
	2007 (299)	0.0	**18.1**	[13.9 - 22.9]							6.4	46.8	28.4	0.3		**0.3**	**17.7**				
	2008 (306)	0.0	**23.5**	[18.9 - 28.7]							5.9	35.6	33.3	1.6		**0.3**	**23.2**				
	2009 (315)	0.0	**22.2**	[17.8 - 27.2]							9.2	41.9	25.7	1.0			**22.2**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (282)	3.2	**12.1**	[8.5 - 16.4]							3.2	21.3	47.9	12.4	3.2	**6.0**	**6.0**				
	2003 (396)	1.5	**13.6**	[10.4 - 17.4]							2.3	21.2	45.7	15.7	1.5	**4.3**	**9.3**				
	2004 (400)	0.5	**10.0**	[7.2 - 13.4]							1.8	21.8	51.3	14.8	0.5	**7.3**	**2.8**				
	2005 (393)	1.8	**12.0**	[9.1 - 15.9]							3.1	16.8	47.3	19.1	1.8	**9.7**	**2.3**				
	2006 (418)	0.7	**11.5**	[8.6 - 14.9]							1.4	23.2	50.0	13.2	0.7	**8.1**	**3.3**				
	2007 (299)	0.3	**7.4**	[4.7 - 10.9]							1.7	31.4	47.5	11.7	0.3	**7.0**	**0.3**				
	2008 (306)	2.9	**11.8**	[8.4 - 15.9]							2.3	21.2	41.8	19.9	2.9	**7.5**	**4.3**				
	2009 (315)	1.0	**13.3**	[9.8 - 17.6]							2.5	23.5	46.0	13.7	1.0	**9.2**	**4.1**				
Cephems																					
Ceftiofur	2002 (282)	0.4	**7.1**	[4.4 - 10.7]				6.4	48.9	29.8	6.0	1.4	0.4	**5.3**	**1.8**						
	2003 (396)	1.5	**7.6**	[5.2 - 10.6]				4.0	43.2	39.4	3.3	1.0	1.5	**4.8**	**2.8**						
	2004 (400)	1.0	**5.8**	[3.7 - 8.5]				4.8	50.5	35.3	2.8		1.0	**4.3**	**1.5**						
	2005 (393)	1.5	**8.9**	[6.1 - 11.9]				2.0	38.4	46.3	2.3	0.5	1.5	**6.9**	**2.0**						
	2006 (418)	0.2	**8.6**	[6.1 - 11.7]				1.2	25.6	60.3	1.9	2.2	0.2	**5.5**	**3.1**						
	2007 (299)	0.3	**6.0**	[3.6 - 9.3]				0.7	37.1	54.5	0.3	1.0	0.3	**3.3**	**2.7**						
	2008 (306)	0.3	**10.8**	[7.5 - 14.8]				1.3	22.9	58.5	5.9	0.3	0.3	**7.5**	**3.3**						
	2009 (315)	0.6	**11.7**	[8.4 - 15.8]				2.5	28.3	54.6	1.3	1.0	0.6	**6.3**	**5.4**						
Ceftriaxone	2002 (282)	0.4	**7.8**	[5.0 - 11.6]					87.6	1.8	2.5	0.4	**1.8**	**3.9**	**2.1**						
	2003 (396)	0.3	**9.1**	[6.4 - 12.4]					87.1	1.0	2.5	0.3	**1.5**	**3.5**	**3.5**	**0.5**					
	2004 (400)	0.3	**6.5**	[4.3 - 9.4]					90.0	1.3	2.0	0.3		**3.5**	**2.0**	**1.0**					
	2005 (393)	0.3	**10.2**	[7.4 - 13.6]					87.0	0.8	1.8	0.3	**1.0**	**5.9**	**2.5**	**0.3**	**0.5**				
	2006 (418)	0.2	**9.1**	[6.5 - 12.3]					88.5	0.7	1.4	0.2		**4.3**	**3.8**	**0.2**	**0.7**				
	2007 (299)	0.0	**6.4**	[3.9 - 9.7]					92.6		1.0		**0.3**	**3.0**	**2.3**	**0.3**	**0.3**				
	2008 (306)	0.3	**11.1**	[7.8 - 15.2]					88.6			0.3	**0.7**	**5.9**	**4.3**	**0.3**					
	2009 (315)	0.0	**12.4**	[9.0 - 16.5]					86.3	0.6	0.6		**0.3**	**5.7**	**4.4**	**1.9**					

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25a. MIC Distribution among *Escherichia coli* from Chicken Breast, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4]															
					0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (282)	5.0	**11.0**	[7.6 - 15.2]							1.1	16.3	52.5	14.2	5.0	**11.0**					
	2003 (396)	3.8	**9.3**	[6.7 - 12.6]								10.6	50.5	25.8	3.8	**9.3**					
	2004 (400)	2.3	**8.3**	[5.7 - 11.4]							0.3	15.5	53.0	20.8	2.3	**3.8**	**4.5**				
	2005 (393)	1.5	**11.2**	[8.3 - 14.7]							1.0	24.9	49.9	11.5	1.5	**4.3**	**6.9**				
	2006 (418)	2.4	**11.2**	[8.4 - 14.7]							0.2	8.6	57.2	20.3	2.4	**3.8**	**7.4**				
	2007 (299)	1.3	**7.4**	[4.7 - 10.9]							0.3	12.7	61.2	17.1	1.3	**2.0**	**5.4**				
	2008 (306)	2.3	**11.8**	[8.4 - 15.9]							1.3	8.8	57.2	18.6	2.3	**3.9**	**7.8**				
	2009 (315)	0.0	**13.3**	[9.8 - 17.6]							1.0	14.9	61.0	9.8		**3.5**	**9.8**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (282)	N/A	**32.3**	[26.8 - 38.1]											66.0	1.42		0.35			**32.3**
	2003 (396)	N/A	**38.4**	[33.6 - 43.4]											59.8	1.3	0.5				**38.4**
Sulfisoxazole	2004 (400)	N/A	**41.3**	[36.4 - 46.2]											48.5	6.3	4.0			**41.3**	
	2005 (393)	N/A	**48.1**	[43.1 - 53.2]											39.4	9.2	2.8	0.3	0.3	**48.1**	
	2006 (418)	N/A	**46.9**	[42.0 - 51.8]											33.0	18.2	1.9			**46.9**	
	2007 (299)	N/A	**42.1**	[36.5 - 48.0]											41.8	14.7	1.3			**42.1**	
	2008 (306)	N/A	**39.2**	[33.7 - 44.9]											47.1	13.4	0.3			**39.2**	
	2009 (315)	N/A	**40.6**	[35.2 - 46.3]											41.0	16.5	1.9			**40.6**	
Trimethoprim-Sulfamethoxazole	2002 (282)	N/A	**3.6**	[1.7 - 6.4]				82.6	6.4	6.0	0.4	1.1		**3.6**							
	2003 (396)	N/A	**7.1**	[4.7 - 10.1]				83.6	5.3	2.3	1.3	0.5		**7.1**							
	2004 (400)	N/A	**4.3**	[2.5 - 6.7]				85.5	7.0	2.5	0.5	0.3		**4.3**							
	2005 (393)	N/A	**7.4**	[5.0 - 10.4]				66.2	17.3	6.4	2.5	0.3	**0.5**	**6.9**							
	2006 (418)	N/A	**8.9**	[6.3 - 12.0]				58.1	18.9	9.8	3.3	1.0	**1.0**	**7.9**							
	2007 (299)	N/A	**5.0**	[2.8 - 8.1]				51.8	28.4	9.7	4.7	0.3	**0.3**	**4.7**							
	2008 (306)	N/A	**3.6**	[1.8 - 6.3]				69.0	20.6	4.6	1.6	0.7		**3.6**							
	2009 (315)	N/A	**2.2**	[0.9 - 4.5]				78.1	13.0	4.1	1.6	1.0		**2.2**							
Phenicols																					
Chloramphenicol	2002 (282)	1.8	**0.7**	[0.1 - 2.5]								3.9	41.5	52.1	1.8		**0.7**				
	2003 (396)	3.5	**0.0**	[0.0 - 0.9]								1.5	25.5	69.4	3.5						
	2004 (400)	2.5	**1.8**	[0.7 - 3.6]								3.3	34.5	58.0	2.5	**0.3**	**1.5**				
	2005 (393)	2.0	**0.5**	[0.1 - 1.8]								2.5	41.2	53.7	2.0		**0.5**				
	2006 (418)	1.0	**2.6**	[1.3 - 4.7]								1.0	39.5	56.0	1.0	**0.2**	**2.4**				
	2007 (299)	1.3	**2.0**	[0.7 - 4.3]								1.0	35.8	59.9	1.3	**0.7**	**1.3**				
	2008 (306)	1.0	**1.0**	[0.2 - 2.8]								1.6	42.5	53.9	1.0		**1.0**				
	2009 (315)	1.0	**0.6**	[0.1 - 2.3]								7.3	57.5	33.7	1.0		**0.6**				
Quinolones																					
Ciprofloxacin	2002 (282)	0.4	**0.0**	[0.0 - 1.3]	90.4	6.4	0.4	0.4	1.4	0.4	0.4	0.4									
	2003 (396)	0.0	**0.0**	[0.0 - 0.9]	92.9	3.0		2.3	1.5	0.3											
	2004 (400)	0.0	**0.0**	[0.0 - 0.9]	90.3	2.3	0.5	1.8	4.0	1.3											
	2005 (393)	0.0	**0.0**	[0.0 - 0.9]	84.0	4.8	2.3	4.1	4.6	0.3											
	2006 (418)	0.0	**0.0**	[0.0 - 0.9]	93.3	1.7	0.2	1.2	2.9	0.7											
	2007 (299)	0.0	**0.0**	[0.0 - 1.2]	96.7	0.3		1.0	1.7	0.3											
	2008 (306)	0.0	**0.0**	[0.0 - 1.2]	93.8	2.9		0.3	2.6	0.3											
	2009 (315)	0.0	**0.3**	[0.0 - 1.8]	96.5	0.3	0.3	0.3	2.2					**0.3**							
Nalidixic Acid	2002 (282)	N/A	**2.8**	[1.2 - 5.5]							1.1	17.7	72.3	5.7	0.4		**2.8**				
	2003 (396)	N/A	**4.0**	[2.3 - 6.5]							4.0	47.5	43.2	1.3		**0.3**	**3.8**				
	2004 (400)	N/A	**7.0**	[4.7 - 10.0]							6.5	63.0	23.3	0.3		**0.3**	**6.8**				
	2005 (393)	N/A	**6.6**	[4.4 - 9.5]							8.1	66.4	15.8	2.0	1.0	**0.5**	**6.1**				
	2006 (418)	N/A	**5.0**	[3.1 - 7.6]						0.5	6.9	72.5	14.8		0.2		**5.0**				
	2007 (299)	N/A	**3.0**	[1.4 - 5.6]							11.0	78.6	7.4				**3.0**				
	2008 (306)	N/A	**2.9**	[1.4 - 5.5]						1.0	13.1	70.3	12.4	0.3		**0.3**	**2.6**				
	2009 (315)	N/A	**2.9**	[1.3 - 5.4]						1.0	17.5	74.0	4.4		0.3	**0.3**	**2.5**				
Tetracyclines																					
Tetracycline	2002 (282)	1.1	**46.1**	[40.2 - 52.1]									52.8	1.1	**1.1**	**1.4**	**43.6**				
	2003 (396)	1.5	**42.9**	[38.0 - 48.0]									55.6	1.5	**0.8**	**1.0**	**41.2**				
	2004 (400)	0.8	**48.0**	[43.0 - 53.0]									51.3	0.8	**0.5**	**3.3**	**44.3**				
	2005 (393)	2.0	**46.6**	[41.5 - 51.6]									51.4	2.0		**2.8**	**43.8**				
	2006 (418)	2.2	**50.5**	[45.6 - 55.4]									47.4	2.2	**1.2**	**4.8**	**44.5**				
	2007 (299)	2.3	**40.5**	[34.9 - 46.3]									57.2	2.3		**2.3**	**38.1**				
	2008 (306)	0.7	**43.8**	[38.2 - 49.6]									55.6	0.7	**1.0**	**2.3**	**40.5**				
	2009 (315)	1.3	**41.6**	[36.1 - 47.2]									57.1	1.3	**1.0**	**2.2**	**38.4**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25b. MIC Distribution among *Escherichia coli* from Ground Turkey, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (304)	0.0	**0.0**	[0.0 - 1.2]							25.0	62.2	10.5	2.3							
	2003 (333)	0.0	**0.0**	[0.0 - 1.1]						0.6	24.9	58.6	14.1	1.8							
	2004 (376)	0.0	**0.0**	[0.0 - 1.0]							17.3	66.5	13.8	2.4							
	2005 (396)	0.0	**0.0**	[0.0 - 0.9]						0.3	16.7	68.2	12.1	2.8							
	2006 (388)	0.0	**0.0**	[0.0 - 0.9]							4.6	60.3	31.2	3.9							
	2007 (315)	0.0	**0.0**	[0.0 - 1.2]						0.3	11.7	67.9	15.6	4.4							
	2008 (300)	0.0	**0.0**	[0.0 - 1.2]							0.7	54.7	41.0	3.7							
	2009 (306)	0.0	**0.0**	[0.0 - 1.2]						0.3	8.5	65.7	23.2	2.0	0.3						
Gentamicin	2002 (304)	1.3	**27.0**	[22.1 - 32.3]					5.9	47.4	16.5	1.6	0.3	1.3	**12.2**	**14.8**					
	2003 (333)	1.5	**29.7**	[24.9 - 35.0]					5.1	42.3	18.3	2.1	0.9	1.5	**10.5**	**19.2**					
	2004 (376)	2.1	**29.3**	[24.7 - 34.1]					4.8	42.6	19.1	2.1		2.1	**12.5**	**16.8**					
	2005 (396)	3.0	**27.5**	[23.2 - 32.2]					4.0	46.2	17.2	2.0		3.0	**12.4**	**15.2**					
	2006 (388)	3.5	**29.6**	[25.1 - 34.5]					0.8	42.3	20.4	2.3	1.0	3.6	**11.9**	**17.8**					
	2007 (315)	5.4	**27.0**	[22.2 - 32.2]					5.4	43.2	18.1	0.3	0.6	5.4	**15.2**	**11.7**					
	2008 (300)	1.7	**37.0**	[31.5 - 42.7]					0.3	15.3	39.3	6.3		1.7	**7.0**	**30.0**					
	2009 (306)	2.0	**37.9**	[32.4 - 43.6]					1.6	27.1	29.1	1.6	0.7	2.0	**12.8**	**25.2**					
Kanamycin	2002 (304)	1.0	**13.2**	[9.6 - 17.5]										82.2	3.6	1.0	**0.3**	**12.8**			
	2003 (333)	1.5	**16.8**	[13.0 - 21.3]										74.2	7.5	1.5	**0.3**	**16.5**			
	2004 (376)	2.1	**16.0**	[12.4 - 20.1]										75.0	6.9	2.1	**0.3**	**15.7**			
	2005 (396)	0.5	**11.4**	[8.4 - 14.9]										84.1	4.0	0.5	**0.3**	**11.1**			
	2006 (388)	1.0	**14.7**	[11.3 - 18.6]										78.4	5.9	1.0	**0.8**	**13.9**			
	2007 (315)	0.3	**15.6**	[11.7 - 20.0]										80.3	3.8	0.3		**15.6**			
	2008 (300)	1.3	**19.0**	[14.7 - 23.9]										69.0	10.7	1.3	**0.3**	**18.7**			
	2009 (306)	0.0	**20.6**	[16.2 - 25.6]										76.1	3.3			**20.6**			
Streptomycin	2002 (304)	N/A	**57.6**	[51.8 - 63.2]												42.4	**23.0**	**34.5**			
	2003 (333)	N/A	**54.7**	[49.1 - 60.1]												45.3	**17.7**	**36.9**			
	2004 (376)	N/A	**49.2**	[44.0 - 54.4]												50.8	**18.6**	**30.6**			
	2005 (396)	N/A	**43.4**	[38.5 - 48.5]												56.6	**19.2**	**24.2**			
	2006 (388)	N/A	**43.8**	[38.8 - 48.9]												56.2	**19.8**	**24.0**			
	2007 (315)	N/A	**44.8**	[39.2 - 50.4]												55.2	**23.2**	**21.6**			
	2008 (300)	N/A	**57.3**	[51.5 - 63.0]												42.7	**14.7**	**42.7**			
	2009 (306)	N/A	**57.5**	[51.8 - 63.1]												42.5	**18.0**	**39.5**			
Penicillins																					
Ampicillin	2002 (304)	0.7	**31.3**	[26.1 - 36.8]							0.7	27.6	36.8	3.0	0.7		**31.3**				
	2003 (333)	0.0	**35.7**	[30.6 - 41.1]							3.0	19.2	40.5	1.5		**0.3**	**35.4**				
	2004 (376)	0.3	**33.2**	[28.5 - 38.3]							6.4	33.2	26.9		0.3	**0.8**	**32.4**				
	2005 (396)	0.0	**38.1**	[33.3 - 43.1]							5.6	36.1	19.9	0.3			**38.1**				
	2006 (388)	0.0	**42.0**	[37.0 - 47.1]							4.1	35.6	18.3			**0.3**	**41.8**				
	2007 (315)	0.3	**48.3**	[42.6 - 53.9]							4.1	34.0	13.3		0.3	**0.3**	**47.9**				
	2008 (300)	0.0	**58.0**	[52.2 - 63.6]							2.0	20.7	19.3				**58.0**				
	2009 (306)	0.3	**56.2**	[50.4 - 61.8]							2.6	26.8	13.4	0.7	0.3		**56.2**				
β-Lactam/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (304)	4.3	**5.6**	[3.3 - 8.8]							1.6	18.1	46.1	24.3	4.3	**4.6**	**1.0**				
	2003 (333)	6.0	**3.0**	[1.4 - 5.5]							3.0	15.3	45.6	27.0	6.0	**1.5**	**1.5**				
	2004 (376)	3.5	**5.3**	[3.3 - 8.1]							1.3	19.9	41.8	28.2	3.5	**4.5**	**0.8**				
	2005 (396)	5.1	**3.8**	[2.1 - 6.2]							4.8	12.4	42.7	31.3	5.1	**2.8**	**1.0**				
	2006 (388)	6.3	**6.7**	[4.4 - 9.7]							2.3	12.4	41.0	31.4	6.2	**6.2**	**0.5**				
	2007 (315)	9.5	**6.3**	[3.9 - 9.6]							1.3	16.2	34.9	31.7	9.5	**4.4**	**1.9**				
	2008 (300)	21.3	**8.3**	[5.5 - 12.1]								8.0	29.7	32.7	21.3	**6.7**	**1.7**				
	2009 (306)	14.4	**9.8**	[6.7 - 13.7]							1.6	10.5	31.0	32.7	14.4	**6.5**	**3.3**				
Cephems																					
Ceftiofur	2002 (304)	0.0	**1.0**	[0.2 - 2.9]				5.3	57.6	33.2	2.6	0.3		**1.0**							
	2003 (333)	0.0	**0.3**	[0.0 - 1.7]				4.2	55.3	38.7	1.2	0.3		**0.3**							
	2004 (376)	0.3	**1.1**	[0.3 - 2.7]				1.9	47.9	45.2	2.4	1.3	0.3	**0.5**	**0.5**						
	2005 (396)	0.3	**1.8**	[0.7 - 3.6]				1.3	51.3	41.7	2.0	1.8	0.3	**0.8**	**1.0**						
	2006 (388)	0.0	**3.1**	[1.6 - 5.3]				1.0	26.8	62.9	5.7	0.5		**0.8**	**2.3**						
	2007 (315)	0.0	**6.0**	[3.7 - 9.3]					31.7	61.0	1.3			**2.2**	**3.8**						
	2008 (300)	0.7	**3.7**	[1.8 - 6.5]				0.7	17.7	71.0	4.7	1.7	0.7	**1.0**	**2.7**						
	2009 (306)	0.7	**6.2**	[3.8 - 9.5]				2.0	29.1	57.8	3.6	0.7	0.7	**3.6**	**2.6**						
Ceftriaxone	2002 (304)	0.0	**1.3**	[0.4 - 3.3]					95.7	2.3	0.7		**0.7**	**0.7**							
	2003 (333)	0.3	**0.3**	[0.0 - 1.7]					97.9	0.3	1.2	0.3			**0.3**						
	2004 (376)	0.0	**1.3**	[0.4 - 3.1]					95.5	1.3	1.9			**0.8**	**0.3**	**0.3**					
	2005 (396)	0.3	**2.3**	[1.0 - 4.3]					93.7	1.8	2.0	0.3		**1.0**	**1.0**	**0.3**					
	2006 (388)	0.3	**3.1**	[1.6 - 5.3]					93.6	1.8	1.3	0.3		**0.5**	**1.5**	**0.8**	**0.3**				
	2007 (315)	0.0	**6.0**	[3.7 - 9.3]					93.3	0.6				**1.3**	**3.2**	**1.3**	**0.3**				
	2008 (300)	1.0	**3.7**	[1.8 - 6.5]					93.0	0.3	2.0	1.0		**2.0**	**1.3**	**0.3**					
	2009 (306)	0.0	**6.9**	[4.3 - 10.3]					91.2	0.7	1.3			**3.6**	**2.9**	**0.3**					

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25b. MIC Distribution among *Escherichia coli* from Ground Turkey, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4]															
					0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (304)	2.3	**3.3**	[1.6 - 6.0]								17.1	57.6	19.7	2.3	**3.3**					
	2003 (333)	3.3	**1.2**	[0.3 - 3.0]							0.3	12.6	60.4	22.2	3.3	**1.2**					
	2004 (376)	0.8	**4.5**	[2.7 - 7.1]							0.8	22.1	55.9	16.0	0.8	**2.7**	**1.9**				
	2005 (396)	1.0	**3.3**	[1.8 - 5.5]							2.0	35.9	47.2	10.6	1.0	**1.3**	**2.0**				
	2006 (388)	2.3	**6.2**	[4.0 - 9.1]							0.3	12.1	60.3	18.8	2.3	**2.6**	**3.6**				
	2007 (315)	0.6	**6.3**	[3.9 - 9.6]							0.3	16.8	61.9	14.0	0.6	**1.6**	**4.8**				
	2008 (300)	1.7	**6.3**	[3.9 - 9.7]							0.3	14.7	59.3	17.7	1.7	**2.0**	**4.3**				
	2009 (306)	1.6	**7.8**	[5.1 - 11.4]							1.0	18.6	59.5	11.4	1.6	**3.3**	**4.6**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (304)	N/A	**48.0**	[2.1 - 6.8]											49.3	1.6	1.0				**48.0**
	2003 (333)	N/A	**51.7**	[4.4 - 10.2]											45.9	2.1			0.3		**51.7**
Sulfisoxazole	2004 (376)	N/A	**48.4**	[43.2 - 53.6]											44.4	3.2	4.0			**48.4**	
	2005 (396)	N/A	**48.0**	[43.0 - 53.0]											33.1	14.4	4.5			**48.0**	
	2006 (388)	N/A	**48.5**	[43.4 - 53.6]											25.3	23.2	2.8		0.3	**48.5**	
	2007 (315)	N/A	**48.9**	[43.2 - 54.6]											34.3	14.6	1.9		0.3	**48.9**	
	2008 (300)	N/A	**51.0**	[45.2 - 56.8]											34.0	14.7	0.3			**51.0**	
	2009 (306)	N/A	**53.9**	[48.2 - 59.6]											29.4	15.0	1.6			**53.9**	
Trimethoprim-	2002 (304)	N/A	**4.0**	[2.1 - 6.8]				77.3	13.5	4.9	0.3			**4.0**							
Sulfamethoxazole	2003 (333)	N/A	**6.9**	[4.4 - 10.2]				81.7	7.5	3.0	0.6	0.3		**6.9**							
	2004 (376)	N/A	**3.7**	[2.1 - 6.2]				83.8	9.3	2.7	0.5			**3.7**							
	2005 (396)	N/A	**5.1**	[3.1 - 7.7]				69.4	18.2	5.8	1.3	0.3	**0.3**	**4.8**							
	2006 (388)	N/A	**8.0**	[5.5 - 11.1]				61.1	17.8	7.2	4.4	1.5	**0.5**	**7.5**							
	2007 (315)	N/A	**7.9**	[5.2 - 11.5]				44.1	35.2	9.2	1.9	1.6		**7.9**							
	2008 (300)	N/A	**5.3**	[3.1 - 8.5]				55.0	24.0	10.3	3.7	1.7		**5.3**							
	2009 (306)	N/A	**5.9**	[3.5 - 9.1]				69.3	16.3	6.2	1.0	1.3		**5.9**							
Phenicols																					
Chloramphenicol	2002 (304)	1.3	**0.3**	[0.0 - 1.8]								3.0	42.1	53.3	1.3		**0.3**				
	2003 (333)	2.4	**3.6**	[1.9 - 6.2]								1.2	24.0	68.8	2.4	**0.6**	**3.0**				
	2004 (376)	0.8	**0.8**	[0.2 - 2.3]								1.3	36.7	60.4	0.8		**0.8**				
	2005 (396)	2.5	**4.0**	[2.3 - 6.5]								0.5	34.1	58.8	2.5		**4.0**				
	2006 (388)	1.3	**2.3**	[1.1 - 4.4]								1.0	42.3	53.1	1.3		**2.3**				
	2007 (315)	1.0	**2.9**	[1.3 - 5.4]								0.3	38.1	57.8	1.0		**2.9**				
	2008 (300)	1.0	**3.7**	[1.8 - 6.5]								1.7	43.3	50.3	1.0		**3.7**				
	2009 (306)	0.3	**3.3**	[1.6 - 5.9]								4.6	52.0	39.9	0.3	**0.3**	**2.9**				
Quinolones																					
Ciprofloxacin	2002 (304)	0.0	**0.0**	[0.0 - 1.2]	90.1	5.6		1.0	2.3	0.3	0.7										
	2003 (333)	0.0	**0.3**	[0.0 - 1.7]	83.5	3.9	0.6	4.2	6.3	1.2				**0.3**							
	2004 (376)	0.0	**0.8**	[0.2 - 2.3]	84.3	3.5	0.8	2.9	7.4	0.3				**0.8**							
	2005 (396)	0.0	**0.0**	[0.0 - 0.9]	81.3	4.8	1.3	4.0	8.6												
	2006 (388)	0.0	**0.5**	[0.1 - 1.8]	91.8	2.6	0.3	2.1	2.3	0.5				**0.5**							
	2007 (315)	0.0	**0.3**	[0.0 - 1.8]	96.5	1.3		1.0	1.0					**0.3**							
	2008 (300)	0.0	**0.0**	[0.0 - 1.2]	92.7	3.3		0.3	3.7												
	2009 (306)	0.0	**0.7**	[0.1 - 2.3]	93.8	3.6		0.3	1.6				**0.3**	**0.3**							
Nalidixic Acid	2002 (304)	N/A	**4.3**	[2.3 - 7.2]							0.7	16.1	72.7	6.3			**4.3**				
	2003 (333)	N/A	**11.7**	[8.5 - 15.7]						0.3	3.0	41.7	41.4	1.5	0.3		**11.7**				
	2004 (376)	N/A	**10.6**	[7.7 - 14.2]							3.7	62.0	21.5	1.6	0.5	**0.5**	**10.1**				
	2005 (396)	N/A	**10.4**	[7.5 - 13.8]							7.1	60.9	19.2	1.8	0.8	**0.8**	**9.6**				
	2006 (388)	N/A	**5.2**	[3.2 - 7.8]						0.3	3.4	74.0	16.8	0.3	0.3	**0.3**	**4.9**				
	2007 (315)	N/A	**2.2**	[0.9 - 4.5]							9.2	76.5	12.1			**0.3**	**1.9**				
	2008 (300)	N/A	**3.7**	[1.8 - 6.5]							7.0	74.7	14.7				**3.7**				
	2009 (306)	N/A	**2.6**	[1.1 - 5.1]						0.7	16.7	71.2	8.8				**2.6**				
Tetracyclines																					
Tetracycline	2002 (304)	0.3	**77.0**	[71.8 - 81.6]									22.7	0.3	**0.3**	**1.6**	**75.0**				
	2003 (333)	0.9	**77.8**	[72.9 - 82.1]									21.3	0.9	**0.3**	**0.9**	**76.6**				
	2004 (376)	0.5	**74.2**	[69.5 - 78.6]									25.3	0.5		**6.9**	**67.3**				
	2005 (396)	0.3	**78.0**	[73.6 - 82.0]									21.7	0.3		**2.0**	**76.0**				
	2006 (388)	0.3	**76.5**	[72.0 - 80.7]									23.2	0.3	**0.3**	**1.8**	**74.5**				
	2007 (315)	0.0	**80.0**	[75.2 - 84.3]									20.0			**4.1**	**75.9**				
	2008 (300)	0.3	**85.7**	[81.2 - 89.4]									14.0	0.3		**1.0**	**84.7**				
	2009 (306)	0.0	**82.0**	[77.3 - 86.2]									18.0			**3.9**	**78.1**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25c. MIC Distribution among *Escherichia coli* from Ground Beef, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (295)	0.0	**0.0**	[0.0 - 1.2]						0.7	27.1	61.0	9.8	1.4							
	2003 (311)	0.0	**0.0**	[0.0 - 1.2]							18.6	68.8	11.6	1.0							
	2004 (338)	0.0	**0.0**	[0.0 - 1.1]							15.7	69.8	12.4	1.8	0.3						
	2005 (316)	0.0	**0.0**	[0.0 - 1.2]						0.3	11.7	68.4	18.0	1.6							
	2006 (295)	0.0	**0.0**	[0.0 - 1.2]						0.3	1.7	60.3	31.9	5.4	0.3						
	2007 (256)	0.0	**0.0**	[0.0 - 1.4]						0.4	5.5	68.0	21.5	4.7							
	2008 (250)	0.0	**0.0**	[0.0 - 1.5]								47.6	48.4	3.6	0.4						
	2009 (247)	0.0	**0.0**	[0.0 - 1.5]							11.3	64.4	22.7	1.6							
Gentamicin	2002 (295)	0.0	**0.3**	[0.0 - 1.9]					6.8	69.8	19.3	3.1	0.7		**0.3**						
	2003 (311)	0.6	**1.0**	[0.2 - 2.8]					4.2	62.7	28.0	3.5		0.6	**0.6**	**0.3**					
	2004 (338)	0.0	**0.6**	[0.1 - 2.1]					9.2	67.8	20.7	1.8				**0.6**					
	2005 (316)	0.0	**0.0**	[0.0 - 1.2]					6.3	65.2	26.3	2.2									
	2006 (295)	1.7	**4.1**	[2.1 - 7.0]					1.0	64.1	23.1	6.1		1.7	**2.0**	**2.0**					
	2007 (256)	1.2	**0.0**	[0.0 - 1.4]					3.5	66.8	25.4	2.7	0.4	1.2							
	2008 (250)	0.0	**2.0**	[0.7 - 4.6]						26.0	68.0	4.0			**0.4**	**1.6**					
	2009 (247)	0.4	**0.8**	[0.1 - 2.9]					3.2	47.8	45.3	2.4		0.4	**0.4**	**0.4**					
Kanamycin	2002 (295)	0.0	**2.4**	[1.0 - 4.8]										96.6	1.0		**0.3**	**2.0**			
	2003 (311)	0.0	**2.9**	[1.3 - 5.4]										93.2	3.9			**2.9**			
	2004 (338)	0.0	**2.4**	[1.0 - 4.6]										95.6	2.1			**2.4**			
	2005 (316)	0.0	**0.6**	[0.1 - 2.3]										98.1	1.3			**0.6**			
	2006 (295)	0.3	**4.7**	[2.6 - 7.8]										92.2	2.7	0.3	**0.7**	**4.1**			
	2007 (256)	0.0	**1.6**	[0.4 - 4.0]										97.7	0.8			**1.6**			
	2008 (250)	0.4	**4.0**	[1.9 - 7.2]										94.4	1.2	0.4		**4.0**			
	2009 (247)	0.0	**2.0**	[0.7 - 4.7]										97.6	0.4		**0.8**	**1.2**			
Streptomycin	2002 (295)	N/A	**9.5**	[6.4 - 13.4]												90.5	**5.4**	**4.1**			
	2003 (311)	N/A	**9.0**	[6.1 - 12.7]												91.0	**3.5**	**5.5**			
	2004 (338)	N/A	**11.8**	[8.6 - 15.8]												88.2	**4.7**	**7.1**			
	2005 (316)	N/A	**5.4**	[3.2 - 8.5]												94.6	**3.5**	**1.9**			
	2006 (295)	N/A	**14.2**	[10.5 - 18.8]												85.8	**6.1**	**8.1**			
	2007 (256)	N/A	**6.3**	[3.6 - 10.0]												93.8	**2.0**	**4.3**			
	2008 (250)	N/A	**10.4**	[6.9 - 14.9]												89.6	**3.6**	**6.8**			
	2009 (247)	N/A	**8.1**	[5.0 - 12.2]												91.9	**2.4**	**5.7**			
Penicillins																					
Ampicillin	2002 (295)	0.3	**6.1**	[3.7 - 9.5]							4.8	32.2	51.9	4.8	0.3	**2.0**	**4.1**				
	2003 (311)	0.3	**5.1**	[3.0 - 8.2]							8.4	28.3	52.4	5.5	0.3		**5.1**				
	2004 (338)	0.9	**5.3**	[3.2 - 8.3]							8.9	46.2	37.9	0.9	0.9	**0.3**	**5.0**				
	2005 (316)	1.3	**3.5**	[1.8 - 6.1]							14.9	49.7	30.1	0.6	1.3		**3.5**				
	2006 (295)	0.7	**9.2**	[6.1 - 13.0]							5.1	46.4	37.6	1.0	0.7		**9.2**				
	2007 (256)	0.0	**6.6**	[3.9 - 10.4]							11.3	49.2	32.4	0.4		**0.4**	**6.3**				
	2008 (250)	0.0	**6.4**	[3.7 - 10.2]							4.8	41.2	45.6	2.0		**0.4**	**6.0**				
	2009 (247)	0.0	**4.9**	[2.5 - 8.3]							15.8	51.4	27.9				**4.9**				
β-Lactam/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (295)	0.3	**2.0**	[0.7 - 4.4]							3.7	22.0	61.7	10.2	0.3	**1.4**	**0.7**				
	2003 (311)	0.6	**2.3**	[0.9 - 4.6]							7.4	19.6	62.4	7.7	0.6	**1.6**	**0.6**				
	2004 (338)	0.3	**3.8**	[2.1 - 6.5]							4.4	23.4	60.9	7.1	0.3	**3.6**	**0.3**				
	2005 (316)	0.0	**1.3**	[0.3 - 3.2]							9.8	20.3	60.8	7.9		**0.6**	**0.6**				
	2006 (295)	1.4	**2.4**	[1.0 - 4.8]							1.4	19.0	64.1	11.9	1.4	**2.0**	**0.3**				
	2007 (256)	0.0	**0.8**	[0.1 - 2.8]							4.7	25.0	59.0	10.5		**0.8**					
	2008 (250)	2.0	**2.4**	[0.9 - 5.2]							2.0	18.8	57.6	17.2	2.0	**0.8**	**1.6**				
	2009 (247)	0.0	**1.6**	[0.4 - 4.1]							5.7	26.7	59.5	6.5		**1.6**					
Cephems																					
Ceftiofur	2002 (295)	0.0	**0.0**	[0.0 - 1.2]				11.9	60.7	26.4	0.7	0.3									
	2003 (311)	0.0	**0.3**	[0.0 - 1.8]				11.3	55.3	31.5	1.6			**0.3**							
	2004 (338)	0.6	**0.9**	[0.2 - 2.6]				5.0	49.4	41.7	2.1	0.3	0.6		**0.9**						
	2005 (316)	1.0	**0.9**	[0.1 - 2.3]				8.5	54.4	32.9	1.3	0.9	0.9	**0.6**	**0.3**						
	2006 (295)	0.3	**1.0**	[0.2 - 2.9]				0.7	31.9	64.1	2.0		0.3	**0.7**	**0.3**						
	2007 (256)	0.0	**0.8**	[0.1 - 2.8]				5.1	43.0	51.2				**0.4**	**0.4**						
	2008 (250)	0.0	**1.6**	[0.4 - 4.0]				3.2	24.0	69.2	1.6	0.4		**0.8**	**0.8**						
	2009 (247)	0.0	**0.8**	[0.1 - 2.9]				7.3	39.3	51.8	0.4	0.4			**0.8**						
Ceftriaxone	2002 (295)	0.3	**0.0**	[0.0 - 1.2]					99.3	0.3		0.3									
	2003 (311)	0.3	**0.3**	[0.0 - 1.8]					98.4	0.6	0.3	0.3		**0.3**							
	2004 (338)	0.3	**1.5**	[0.5 - 3.4]					95.9	1.8	0.6	0.3		**0.3**	**0.6**	**0.6**					
	2005 (316)	0.0	**1.9**	[0.7 - 4.1]					94.6	1.6	1.6		**0.6**	**0.6**	**0.6**	**0.3**					
	2006 (295)	0.0	**1.7**	[0.6 - 3.9]					97.6	0.3	0.3		**0.3**	**0.3**	**0.7**	**0.3**					
	2007 (256)	0.0	**0.8**	[0.1 - 2.8]					99.2						**0.4**	**0.4**					
	2008 (250)	0.4	**1.6**	[0.4 - 4.0]					98.0			0.4		**0.8**	**0.4**	**0.4**					
	2009 (247)	0.0	**0.8**	[0.1 - 2.9]					98.4		0.8				**0.4**	**0.4**					

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25c. MIC Distribution among *Escherichia coli* from Ground Beef, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (295)	1.0	**1.4**	[0.4 - 3.4]							1.7	23.7	57.6	14.6	1.0	**1.4**					
	2003 (311)	2.6	**0.3**	[0.0 - 1.8]							1.6	21.2	56.3	18.0	2.6	**0.3**					
	2004 (338)	1.8	**1.2**	[0.3 - 3.0]							4.1	30.2	53.8	8.9	1.8	**0.3**	**0.9**				
	2005 (316)	0.3	**0.9**	[0.2 - 2.7]							7.9	37.3	45.9	7.6	0.3	**0.3**	**0.6**				
	2006 (295)	1.7	**2.0**	[0.7 - 4.4]							0.3	12.5	66.8	16.6	1.7	**0.3**	**1.7**				
	2007 (256)	1.2	**0.8**	[0.1 - 2.8]						0.4	2.3	18.8	66.8	9.8	1.2		**0.8**				
	2008 (250)	0.4	**2.4**	[0.9 - 5.2]							2.0	22.0	62.8	10.4	0.4	**0.4**	**2.0**				
	2009 (247)	0.0	**1.6**	[0.4 - 4.1]							2.0	30.4	57.1	8.9		**0.8**	**0.8**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (295)	N/A	**9.8**	[6.7 - 13.8]											88.1	1.69			0.34		**9.8**
	2003 (311)	N/A	**10.3**	[33.6 - 43.4]											89.1	0.6				**0.3**	**10.0**
Sulfisoxazole	2004 (338)	N/A	**13.0**	[9.6 - 17.1]											84.6		2.4			**13.0**	
	2005 (316)	N/A	**7.0**	[4.4 - 10.4]											75.3	13.6	4.1			**7.0**	
	2006 (295)	N/A	**12.5**	[9.0 - 16.9]											58.6	27.1	0.7	0.3	0.7	**12.5**	
	2007 (256)	N/A	**9.4**	[6.1 - 13.6]											75.4	15.2				**9.4**	
	2008 (250)	N/A	**11.6**	[7.9 - 16.2]											80.4	7.6	0.4			**11.6**	
	2009 (247)	N/A	**7.7**	[4.7 - 11.8]											70.4	19.0	2.8			**7.7**	
Trimethoprim-	2002 (295)	N/A	**0.7**	[0.1 - 2.4]				93.6	3.4	2.4				**0.7**							
Sulfamethoxazole	2003 (311)	N/A	**0.3**	[0.0 - 1.8]				97.4	1.3	1.0				**0.3**							
	2004 (338)	N/A	**0.6**	[0.1 - 2.1]				97.0	2.1		0.3			**0.6**							
	2005 (316)	N/A	**0.6**	[0.1 - 2.3]				89.6	8.5	0.9	0.3			**0.6**							
	2006 (295)	N/A	**1.4**	[0.4 - 3.4]				84.1	10.8	2.4	1.4		**0.3**	**1.0**							
	2007 (256)	N/A	**1.2**	[0.2 - 3.4]				73.8	24.2	0.4	0.4		**0.4**	**0.8**							
	2008 (250)	N/A	**2.0**	[0.7 - 4.6]				80.0	13.6	4.0	0.4			**2.0**							
	2009 (247)	N/A	**2.0**	[0.7 - 4.7]				93.9	3.6	0.4				**2.0**							
Phenicols																					
Chloramphenicol	2002 (295)	0.7	**1.0**	[0.2 - 2.9]								0.3	30.2	67.8	0.7		**1.0**				
	2003 (311)	5.1	**2.3**	[0.9 - 4.6]								1.0	15.4	76.2	5.1	**1.3**	**1.0**				
	2004 (338)	0.9	**3.6**	[1.8 - 6.1]								0.3	26.9	68.3	0.9	**0.3**	**3.3**				
	2005 (316)	1.3	**1.6**	[0.5 - 3.7]								1.9	36.7	58.5	1.3	**0.3**	**1.3**				
	2006 (295)	0.7	**1.4**	[0.4 - 3.4]								1.0	32.5	64.4	0.7	**0.3**	**1.0**				
	2007 (256)	1.6	**3.9**	[1.9 - 7.1]								1.6	32.8	60.2	1.6		**3.9**				
	2008 (250)	1.6	**0.8**	[0.1 - 2.9]								2.8	32.4	62.4	1.6		**0.8**				
	2009 (247)	0.4	**2.4**	[0.9 - 5.2]								6.5	50.2	40.5	0.4		**2.4**				
Quinolones																					
Ciprofloxacin	2002 (295)	0.0	**0.0**	[0.0 - 1.2]	95.3	4.8															
	2003 (311)	0.0	**0.0**	[0.0 - 1.2]	95.5	3.5		0.6	0.3												
	2004 (338)	0.0	**0.0**	[0.0 - 1.1]	94.4	3.8		0.6	0.9	0.3											
	2005 (316)	0.0	**0.0**	[0.0 - 1.2]	90.2	3.8	1.9	2.5	1.3		0.3										
	2006 (295)	0.0	**0.0**	[0.0 - 1.2]	98.0	1.4		0.3	0.3												
	2007 (256)	0.0	**0.0**	[0.0 - 1.4]	99.2				0.8												
	2008 (250)	0.0	**0.0**	[0.0 - 1.5]	97.6	2.0			0.4												
	2009 (247)	0.0	**0.0**	[0.0 - 1.5]	97.6	1.6			0.4	0.4											
Nalidixic Acid	2002 (295)	N/A	**0.0**	[0.0 - 1.2]							1.0	15.6	80.7	2.7							
	2003 (311)	N/A	**1.0**	[0.2 - 2.8]							1.6	44.1	51.1	2.3			**1.0**				
	2004 (338)	N/A	**1.5**	[0.5 - 3.4]							3.0	67.5	26.9	1.2		**0.9**	**0.6**				
	2005 (316)	N/A	**1.3**	[0.3 - 3.2]						0.3	6.3	70.9	17.1	1.3	2.8	**0.9**	**0.3**				
	2006 (295)	N/A	**0.7**	[0.1 - 2.4]							4.7	74.6	20.0				**0.7**				
	2007 (256)	N/A	**0.4**	[0.0 - 2.2]						0.4	7.4	80.1	11.3	0.4			**0.4**				
	2008 (250)	N/A	**0.4**	[0.0 - 2.2]						0.8	3.2	83.6	12.0				**0.4**				
	2009 (247)	N/A	**0.4**	[0.0 - 2.2]						1.2	10.9	80.6	6.5	0.4			**0.4**				
Tetracyclines																					
Tetracycline	2002 (295)	4.8	**30.8**	[25.6 - 36.5]									64.4	4.8	**4.4**	**2.0**	**24.4**				
	2003 (311)	3.5	**25.1**	[20.4 - 30.3]									71.4	3.5	**2.6**	**1.0**	**21.5**				
	2004 (338)	6.5	**22.8**	[18.4 - 27.6]									70.7	6.5	**2.7**	**1.2**	**18.9**				
	2005 (316)	6.3	**16.5**	[12.5 - 21.0]									77.2	6.3	**1.6**	**0.6**	**14.2**				
	2006 (295)	7.5	**25.4**	[20.6 - 30.8]									67.1	7.5	**2.0**	**4.1**	**19.3**				
	2007 (256)	4.3	**21.9**	[17.0 - 27.4]									73.8	4.3	**1.6**	**2.3**	**18.0**				
	2008 (250)	3.2	**24.0**	[18.8 - 29.8]									72.8	3.2	**0.8**	**2.8**	**20.4**				
	2009 (247)	4.9	**18.6**	[14.0 - 24.0]									76.5	4.9	**1.2**	**0.8**	**16.6**				

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25d. MIC Distribution among *Escherichia coli* from Pork Chop, 2002-2009

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4]														
					0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (184)	0.0	**0.0**	[0.0 - 2.0]						0.5	17.4	64.7	14.7	2.7							
	2003 (218)	0.0	**0.0**	[0.0 - 1.7]						0.5	16.5	61.5	15.6	6.0							
	2004 (232)	0.0	**0.0**	[0.0 - 1.6]						0.4	15.5	56.0	26.3	1.3	0.4						
	2005 (205)	0.5	**0.0**	[0.0 - 1.8]						1.5	11.2	62.0	19.5	5.4		0.5					
	2006 (182)	0.0	**0.0**	[0.0 - 2.0]							4.4	47.8	39.6	7.7	0.5						
	2007 (152)	0.0	**0.0**	[0.0 - 2.4]							4.6	58.6	32.2	3.9	0.7						
	2008 (146)	0.0	**0.0**	[0.0 - 2.5]							0.7	41.8	48.6	7.5	1.4						
	2009 (147)	0.0	**0.0**	[0.0 - 2.5]							9.5	59.9	26.5	4.1							
Gentamicin	2002 (184)	0.0	**1.1**	[0.1 - 3.9]					4.9	66.3	21.2	6.0	0.5		**1.1**						
	2003 (218)	0.0	**1.4**	[0.3 - 4.0]					3.7	53.2	36.2	5.0	0.5		**0.5**	**0.9**					
	2004 (232)	0.4	**1.3**	[0.3 - 3.7]					10.3	57.8	26.7	3.4		0.4		**1.3**					
	2005 (205)	1.0	**0.0**	[0.0 - 1.8]					6.8	56.1	34.1	2.0		1.0							
	2006 (182)	1.7	**1.1**	[0.1 - 3.9]					2.7	47.8	41.2	4.4	1.1	1.6	**0.5**	**0.5**					
	2007 (152)	0.7	**1.3**	[0.2 - 4.7]					4.6	54.6	32.9	5.9		0.7	**0.7**	**0.7**					
	2008 (146)	0.7	**1.4**	[0.2 - 4.9]						22.6	62.3	12.3	0.7	0.7	**0.7**	**0.7**					
	2009 (147)	0.0	**4.1**	[1.5 - 8.7]					2.7	47.6	42.9	2.7				**4.1**					
Kanamycin	2002 (184)	0.5	**5.4**	[2.6 - 9.8]										92.9	1.1	0.5		**5.4**			
	2003 (218)	0.0	**8.7**	[5.3 - 13.3]										89.9	1.4			**8.7**			
	2004 (232)	0.0	**8.2**	[5.0 - 12.5]										89.2	2.6			**8.2**			
	2005 (205)	0.0	**7.3**	[4.2 - 11.8]										92.7			**1.5**	**5.9**			
	2006 (182)	0.0	**6.0**	[3.1 - 10.6]										91.2	2.7			**6.0**			
	2007 (152)	0.0	**4.6**	[1.9 - 9.3]										94.1	1.3		**0.7**	**3.9**			
	2008 (146)	0.0	**6.2**	[2.9 - 11.4]										91.8	2.1			**6.2**			
	2009 (147)	0.0	**6.1**	[2.8 - 11.3]										91.8	2.0			**6.1**			
Streptomycin	2002 (184)	N/A	**22.3**	[16.5 - 29.0]												77.7	**10.9**	**11.4**			
	2003 (218)	N/A	**19.7**	[14.7 - 25.6]												80.3	**6.9**	**12.8**			
	2004 (232)	N/A	**21.1**	[16.1 - 26.9]												78.9	**8.6**	**12.5**			
	2005 (205)	N/A	**13.2**	[8.9 - 18.6]												86.8	**7.3**	**5.9**			
	2006 (182)	N/A	**13.7**	[9.1 - 19.6]												86.3	**7.7**	**6.0**			
	2007 (152)	N/A	**13.8**	[8.8 - 20.3]												86.2	**7.9**	**5.9**			
	2008 (146)	N/A	**19.9**	[13.7 - 27.3]												80.1	**5.5**	**14.4**			
	2009 (147)	N/A	**19.7**	[13.6 - 27.1]												80.3	**7.5**	**12.2**			
Penicillins																					
Ampicillin	2002 (184)	1.6	**13.6**	[9.0 - 19.4]							1.1	30.4	47.8	5.4	1.6		**13.6**				
	2003 (218)	1.4	**13.3**	[9.1 - 18.5]							1.8	25.7	52.8	5.0	1.4		**13.3**				
	2004 (232)	0.9	**15.1**	[10.7 - 20.4]							12.9	44.4	25.0	1.7	0.9	**0.9**	**14.2**				
	2005 (205)	2.4	**16.1**	[11.3 - 21.9]							9.3	40.5	28.3	3.4	2.4	**2.0**	**14.1**				
	2006 (182)	1.6	**15.9**	[10.9 - 22.1]							3.8	47.8	30.2	0.5	1.6	**1.6**	**14.3**				
	2007 (152)	0.0	**15.8**	[10.4 - 22.6]							5.9	48.0	28.9	1.3			**15.8**				
	2008 (146)	0.0	**15.1**	[9.7 - 21.9]							8.2	30.8	42.5	3.4			**15.1**				
	2009 (147)	0.0	**11.6**	[6.9 - 17.9]							12.9	52.4	21.8	1.4			**11.6**				
β-Lactam/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (184)	0.5	**5.4**	[2.6 - 9.8]							1.6	23.9	56.0	12.5	0.5	**4.4**	**1.1**				
	2003 (218)	0.5	**5.0**	[2.5 - 8.8]							3.2	17.9	54.1	19.3	0.5	**2.8**	**2.3**				
	2004 (232)	0.4	**5.6**	[3.0 - 9.4]							4.3	27.6	46.6	15.5	0.4	**4.7**	**0.9**				
	2005 (205)	0.5	**2.9**	[1.1 - 6.3]							2.9	21.0	52.2	20.5	0.5	**2.0**	**1.0**				
	2006 (182)	3.3	**2.2**	[0.6 - 5.5]								23.1	59.3	12.1	3.3	**2.2**					
	2007 (152)	0.0	**0.7**	[0.0 - 3.6]							1.3	18.4	63.8	15.8		**0.7**					
	2008 (146)	0.7	**3.4**	[1.1 - 7.8]							1.4	20.6	42.5	31.5	0.7	**3.4**					
	2009 (147)	0.0	**6.8**	[3.3 - 12.2]							5.4	32.0	46.9	8.8		**5.4**	**1.4**				
Cephems																					
Ceftiofur	2002 (184)	0.0	**0.5**	[0.0 - 3.0]				7.1	64.1	27.2	0.5	0.5		**0.5**							
	2003 (218)	0.0	**0.9**	[0.1 - 3.3]				5.5	53.7	38.1	1.8			**0.9**							
	2004 (232)	0.0	**0.4**	[0.0 - 2.4]				7.3	51.7	39.7	0.9			**0.4**							
	2005 (205)	1.0	**0.0**	[0.0 - 1.8]				3.4	58.5	34.6	2.0	0.5	1.0								
	2006 (182)	0.5	**0.0**	[0.0 - 2.0]				0.5	41.2	53.8	3.8		0.5								
	2007 (152)	0.0	**0.7**	[0.0 - 3.6]				1.3	50.0	48.0					**0.7**						
	2008 (146)	0.0	**3.4**	[1.1 - 7.8]				0.7	29.5	64.4	2.1				**3.4**						
	2009 (147)	0.0	**6.8**	[3.3 - 12.2]				10.2	42.2	39.5	1.4			**3.4**	**3.4**						
Ceftriaxone	2002 (184)	0.0	**0.5**	[0.0 - 3.0]					97.8	1.1	0.5			**0.5**							
	2003 (218)	0.0	**0.9**	[0.1 - 3.3]					97.7	0.9	0.5			**0.5**	**0.5**						
	2004 (232)	0.0	**0.4**	[0.0 - 2.4]					97.0	1.7	0.9				**0.4**						
	2005 (205)	0.0	**0.5**	[0.0 - 2.7]					96.1	2.4	1.0				**0.5**						
	2006 (182)	0.0	**0.5**	[0.0 - 3.0]					97.8	0.5	1.1			**0.5**							
	2007 (152)	0.0	**0.7**	[0.0 - 3.6]					99.3						**0.7**						
	2008 (146)	0.0	**3.4**	[1.1 - 7.8]					96.6						**2.7**	**0.7**					
	2009 (147)	0.0	**6.8**	[3.3 - 12.2]					93.2					**3.4**	**2.7**	**0.7**					

[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

Table 25d. MIC Distribution among *Escherichia coli* from Pork Chop, 2002-2009 continued

Antimicrobial	Year (n)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4] 0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Cephems																					
Cefoxitin	2002 (184)	1.6	**3.3**	[1.2 - 7.0]								20.1	58.2	16.9	1.6	**3.3**					
	2003 (218)	3.2	**2.3**	[0.7 - 5.3]								12.4	54.1	28.0	3.2	**2.3**					
	2004 (232)	0.4	**2.2**	[0.7 - 5.0]						0.9	2.6	26.7	59.9	7.3	0.4	**1.3**	**0.9**				
	2005 (205)	0.5	**2.0**	[0.3 - 4.2]							1.5	30.2	55.6	10.2	0.5	**0.5**	**1.5**				
	2006 (182)	2.7	**1.6**	[0.3 - 4.7]								12.6	68.7	14.3	2.7	**1.6**					
	2007 (152)	0.0	**0.7**	[0.0 - 3.6]							0.7	18.4	63.8	16.4		**0.7**					
	2008 (146)	2.7	**3.4**	[1.1 - 7.8]								17.1	63.7	13.0	2.7	**0.7**	**2.7**				
	2009 (147)	0.7	**6.8**	[3.3 - 12.2]							2.0	28.6	55.1	6.8	0.7	**3.4**	**3.4**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (184)	N/A	**12.5**	[0.0 - 100.0]											83.2	3.26	0.5	0.54			**12.5**
	2003 (218)	N/A	**15.1**	[33.6 - 43.4]											83.5	0.9	0.5				**15.1**
Sulfisoxazole	2004 (232)	N/A	**19.4**	[14.5 - 25.1]											69.8	3.0	6.9	0.4	0.4	**19.4**	
	2005 (205)	N/A	**14.1**	[9.7 - 19.7]											62.4	18.0	4.4	0.5	0.5	**14.1**	
	2006 (182)	N/A	**20.3**	[14.7 - 26.9]											48.4	28.6	1.1	0.5	1.1	**20.3**	
	2007 (152)	N/A	**11.8**	[7.2 - 18.1]											72.4	15.1	0.7			**11.8**	
	2008 (146)	N/A	**16.4**	[10.8 - 23.5]											65.8	17.8				**16.4**	
	2009 (147)	N/A	**14.3**	[9.1 - 21.0]											53.7	27.2	4.8			**14.3**	
Trimethoprim-Sulfamethoxazole	2002 (184)	N/A	**1.1**	[0.1 - 3.9]				88.6	4.4	5.4	0.5		**0.5**	**0.5**							
	2003 (218)	N/A	**2.8**	[1.0 - 5.9]				92.2	3.2	1.4	0.5			**2.8**							
	2004 (232)	N/A	**3.9**	[1.8 - 7.2]				93.1	2.2	0.9				**3.9**							
	2005 (205)	N/A	**1.5**	[0.3 - 4.2]				75.1	18.0	4.4	1.0			**1.5**							
	2006 (182)	N/A	**2.2**	[0.6 - 5.5]				73.1	15.4	8.2	1.1			**2.2**							
	2007 (152)	N/A	**1.3**	[0.2 - 4.7]				65.1	29.6	2.6	0.7	0.7		**1.3**							
	2008 (146)	N/A	**6.2**	[2.9 - 11.4]				68.5	21.2	2.1	0.7	1.4		**6.2**							
	2009 (147)	N/A	**2.7**	[0.7 - 6.8]				88.4	6.1	2.7				**2.7**							
Phenicols																					
Chloramphenicol	2002 (184)	2.2	**1.6**	[0.3 - 4.7]								0.5	31.5	64.1	2.2	**1.6**					
	2003 (218)	6.9	**4.1**	[1.9 - 7.7]								0.9	15.1	72.9	6.9	**2.3**	**1.8**				
	2004 (232)	0.9	**4.3**	[2.1 - 7.8]								0.9	34.1	59.9	0.9	**1.3**	**3.0**				
	2005 (205)	2.4	**3.4**	[1.4 - 6.9]								2.9	35.1	56.1	2.4	**2.0**	**1.5**				
	2006 (182)	1.1	**6.6**	[3.5 - 11.2]								0.5	33.0	58.8	1.1	**2.7**	**3.8**				
	2007 (152)	1.3	**3.9**	[1.5 - 8.4]								0.7	27.0	67.1	1.3	**0.7**	**3.3**				
	2008 (146)	3.4	**3.4**	[1.1 - 7.8]								0.7	33.6	58.9	3.4	**0.7**	**2.7**				
	2009 (147)	1.4	**4.8**	[1.9 - 9.6]								6.8	55.8	31.3	1.4	**1.4**	**3.4**				
Quinolones																					
Ciprofloxacin	2002 (184)	0.0	**0.0**	[0.0 - 2.0]	96.2	2.7	1.1														
	2003 (218)	0.0	**0.0**	[0.0 - 1.7]	96.3	3.2			0.5												
	2004 (232)	0.0	**0.0**	[0.0 - 1.6]	97.8	0.9	0.4	0.4	0.4												
	2005 (205)	0.0	**0.0**	[0.0 - 2.7]	91.2	4.9	1.0	2.4	0.5												
	2006 (182)	0.0	**0.0**	[0.0 - 2.0]	97.8	1.6			0.5												
	2007 (152)	0.0	**0.0**	[0.0 - 2.4]	99.3	0.7															
	2008 (146)	0.0	**0.0**	[0.0 - 2.5]	97.3	2.7															
	2009 (147)	0.0	**0.0**	[0.0 - 2.5]	99.3	0.7															
Nalidixic Acid	2002 (184)	N/A	**0.5**	[0.0 - 3.0]							2.2	16.9	74.5	5.4	0.5	**0.5**					
	2003 (218)	N/A	**0.5**	[0.0 - 2.5]							2.8	44.5	50.0	2.3			**0.5**				
	2004 (232)	N/A	**0.0**	[0.0 - 1.6]							9.9	68.5	19.4	1.3	0.9						
	2005 (205)	N/A	**1.5**	[0.3 - 4.2]							9.8	67.3	18.0	2.4	1.0	**1.5**					
	2006 (182)	N/A	**0.5**	[0.0 - 3.0]							9.9	75.8	12.6	1.1			**0.5**				
	2007 (152)	N/A	**0.0**	[0.0 - 2.4]						0.7	11.2	77.0	11.2								
	2008 (146)	N/A	**0.0**	[0.0 - 2.5]							8.9	72.6	16.4	2.1							
	2009 (147)	N/A	**0.0**	[0.0 - 2.5]						4.8	16.3	68.7	10.2								
Tetracyclines																					
Tetracycline	2002 (184)	0.5	**52.7**	[45.2 - 60.1]									46.7	0.5	**2.2**	**1.6**	**48.9**				
	2003 (218)	0.9	**46.3**	[39.6 - 53.2]									52.8	0.9	**1.8**	**0.9**	**43.6**				
	2004 (232)	2.2	**56.0**	[49.4 - 62.5]									41.8	2.2		**6.0**	**50.0**				
	2005 (205)	1.0	**45.9**	[38.9 - 52.9]									53.2	1.0		**2.4**	**43.4**				
	2006 (182)	0.5	**52.7**	[45.2 - 60.2]									46.7	0.5	**1.6**	**4.9**	**46.2**				
	2007 (152)	1.3	**50.0**	[41.8 - 58.2]									48.7	1.3	**1.3**	**3.3**	**45.4**				
	2008 (146)	1.4	**54.8**	[46.4 - 63.0]									43.8	1.4	**1.4**	**3.4**	**50.0**				
	2009 (147)	2.7	**46.9**	[38.7 - 55.3]									50.3	2.7		**4.1**	**42.9**				

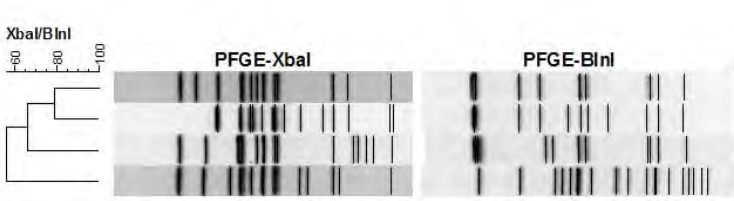
[1] Percent of isolates with intermediate susceptibility. N/A used when there is no intermediate breakpoint established.

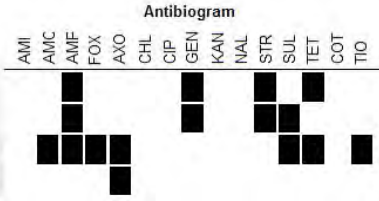
[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] Unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Susceptibility breakpoints are indicated by single black vertical bars and resistance breakpoints are double vertical red bars. Numbers in shaded areas indicate % of isolates with MIC's greater than the highest concentrations on the Sensititre plate. Numbers listed for the lowest tested concentrations represent % of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints used when available. There are no CLSI breakpoints for streptomycin.

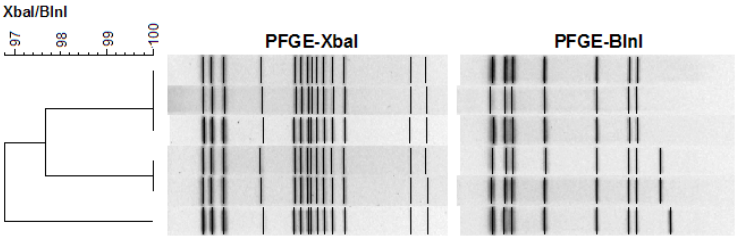
A-1a. PFGE Profiles for *Salmonella* Agona

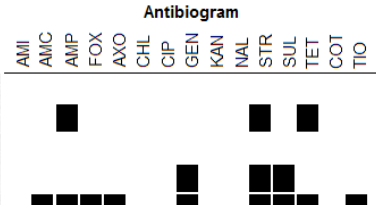




CVM #	State	Source	Date Isolated	Serotype
N20055	CT	Ground Turkey	05/09	Agona
N23623	PA	Ground Turkey	04/09	Agona
N20038	CO	Ground Turkey	12/09	Agona
N19987	CA	Chicken Breast	05/09	Agona

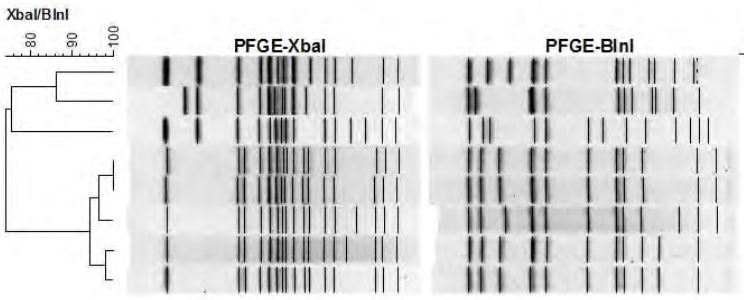
A-1b. PFGE Profiles for *Salmonella* Albany

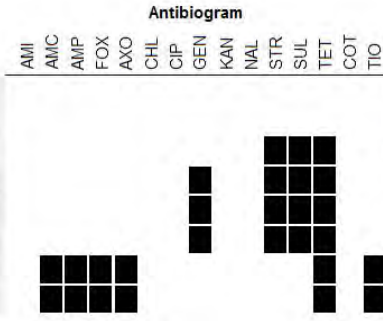




CVM #	State	Source	Date Isolated	Serotype
N20104	GA	Ground Turkey	04/09	Albany
N20255	NM	Ground Turkey	04/09	Albany
N23668	TN	Ground Turkey	06/09	Albany
N20024	CO	Ground Turkey	05/09	Albany
N20215	MN	Ground Turkey	05/09	Albany
N23667	TN	Ground Turkey	06/09	Albany

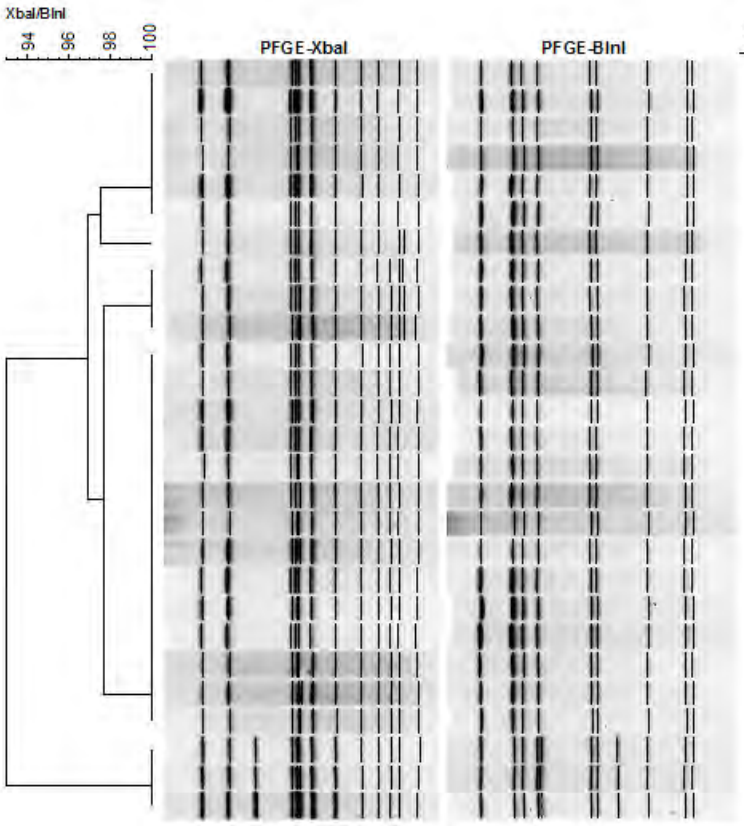
A-1c. PFGE Profiles for *Salmonella* Derby

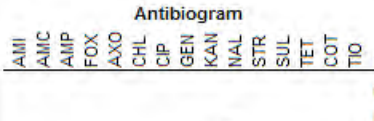




CVM #	State	Source	Date Isolated	Serotype
N20075	CT	Pork Chop	10/09	Derby
N20103	GA	Pork Chop	03/09	Derby
N23624	PA	Pork Chop	04/09	Derby
N20088	GA	Ground Turkey	01/09	Derby
N20089	GA	Ground Turkey	01/09	Derby
N20116	GA	Ground Turkey	06/09	Derby
N23665	TN	Ground Turkey	06/09	Derby
N23666	TN	Ground Turkey	06/09	Derby

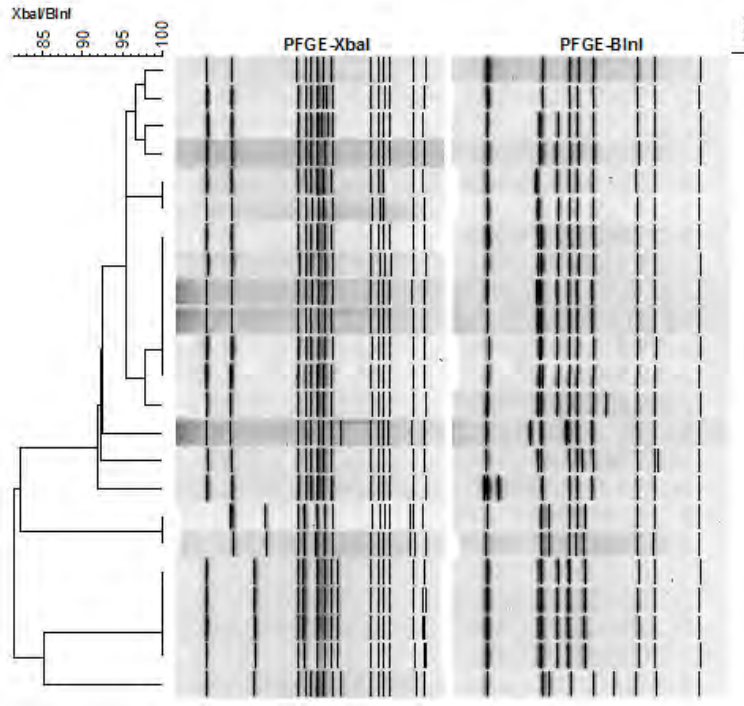
A-1d. PFGE Profiles for *Salmonella* Enteritidis

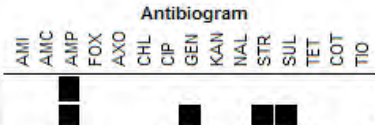




CVM #	State	Source	Date Isolated	Serotype
N19993	CA	Chicken Breast	08/09	Enteritidis
N20083	GA	Chicken Breast	01/09	Enteritidis
N20121	GA	Chicken Breast	07/09	Enteritidis
N20124	GA	Chicken Breast	08/09	Enteritidis
N20168	MD	Chicken Breast	07/09	Enteritidis
N23540	NY	Chicken Breast	09/09	Enteritidis
N23496	NY	Chicken Breast	03/09	Enteritidis
N20183	MD	Chicken Breast	10/09	Enteritidis
N23494	NY	Chicken Breast	03/09	Enteritidis
N23614	PA	Chicken Breast	03/09	Enteritidis
N20050	CT	Chicken Breast	03/09	Enteritidis
N20119	GA	Chicken Breast	07/09	Enteritidis
N20165	MD	Chicken Breast	06/09	Enteritidis
N20178	MD	Chicken Breast	09/09	Enteritidis
N20192	MD	Chicken Breast	12/09	Enteritidis
N20238	NM	Chicken Breast	02/09	Enteritidis
N20252	NM	Chicken Breast	04/09	Enteritidis
N20253	NM	Chicken Breast	04/09	Enteritidis
N23480	NM	Chicken Breast	12/09	Enteritidis
N23536	NY	Chicken Breast	09/09	Enteritidis
N23556	NY	Chicken Breast	11/10	Enteritidis
N23612	PA	Chicken Breast	01/09	Enteritidis
N23629	PA	Chicken Breast	05/09	Enteritidis
N23645	PA	Chicken Breast	09/09	Enteritidis
N19969	CA	Chicken Breast	03/09	Enteritidis
N19971	CA	Chicken Breast	03/09	Enteritidis
N20133	GA	Chicken Breast	09/09	Enteritidis

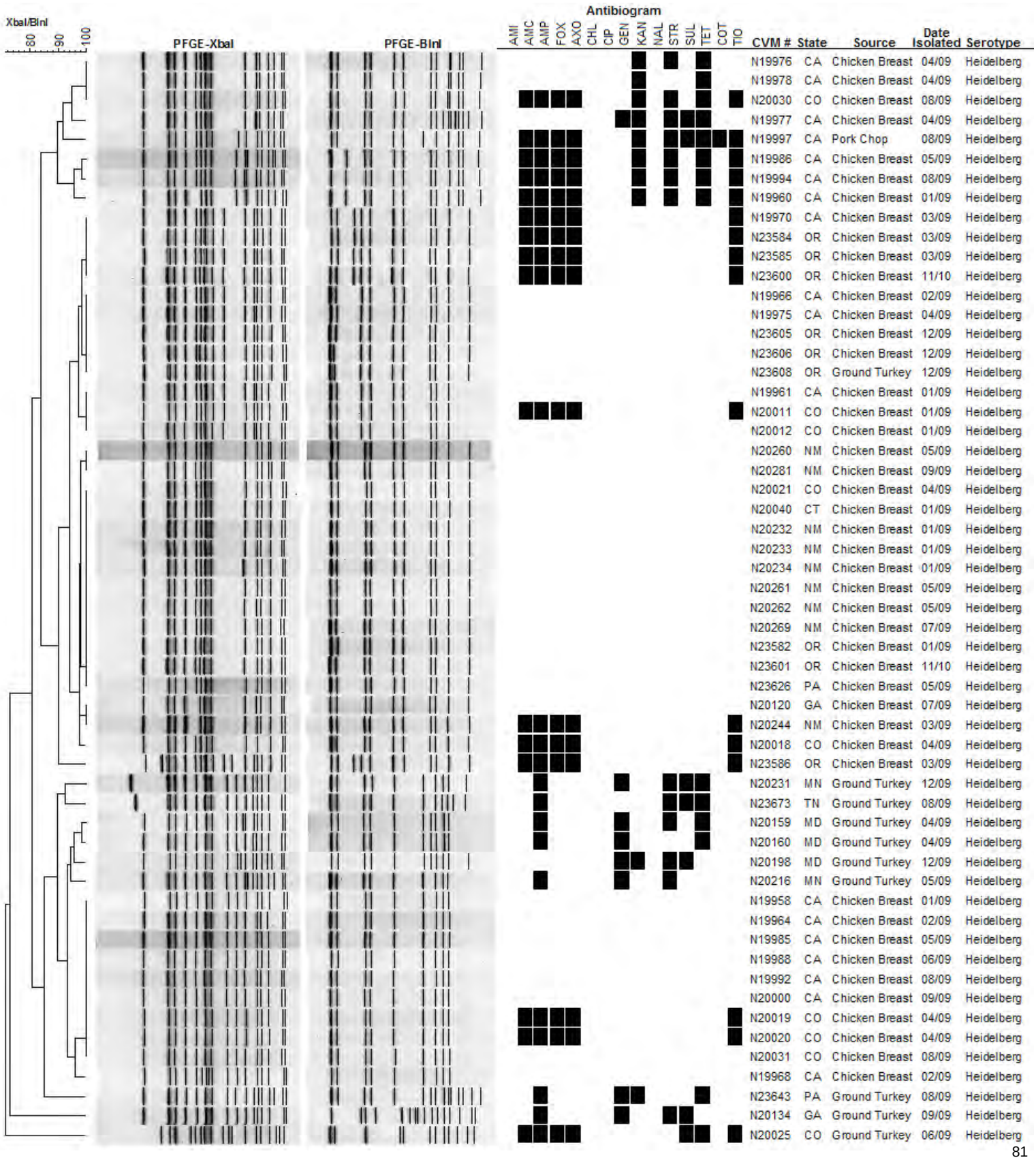
A-1e. PFGE Profiles for *Salmonella* Hadar



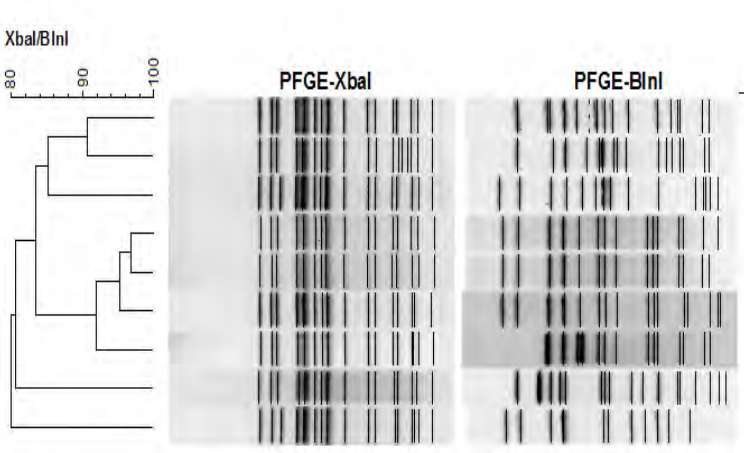


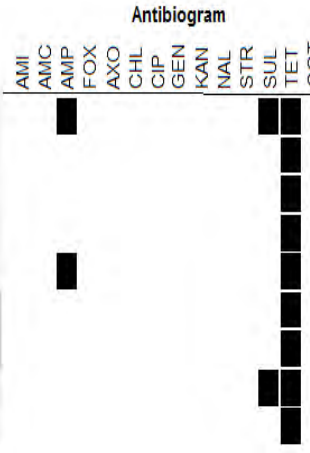
CVM #	State	Source	Date Isolated	Serotype
N20125	GA	Ground Turkey	08/09	Hadar
N20267	NM	Ground Turkey	06/09	Hadar
N19967	CA	Chicken Breast	02/09	Hadar
N20049	CT	Ground Turkey	02/09	Hadar
N23502	NY	Ground Turkey	03/09	Hadar
N23654	PA	Ground Turkey	10/09	Hadar
N20235	NM	Ground Turkey	01/09	Hadar
N20236	NM	Ground Turkey	01/09	Hadar
N20239	NM	Ground Turkey	02/09	Hadar
N20241	NM	Ground Turkey	02/09	Hadar
N23681	TN	Chicken Breast	12/09	Hadar
N23683	TN	Ground Turkey	12/09	Hadar
N20212	MN	Ground Turkey	04/09	Hadar
N20240	NM	Ground Turkey	02/09	Hadar
N20211	MN	Ground Turkey	04/09	Hadar
N20223	MN	Chicken Breast	09/09	Hadar
N20044	CT	Ground Turkey	01/09	Hadar
N20113	GA	Ground Turkey	05/09	Hadar
N20058	CT	Ground Turkey	06/09	Hadar
N20059	CT	Ground Turkey	06/09	Hadar
N20060	CT	Ground Turkey	06/09	Hadar
N20061	CT	Ground Turkey	06/09	Hadar
N20029	CO	Ground Turkey	07/09	Hadar

A-1f. PFGE Profiles for *Salmonella* Heidelberg



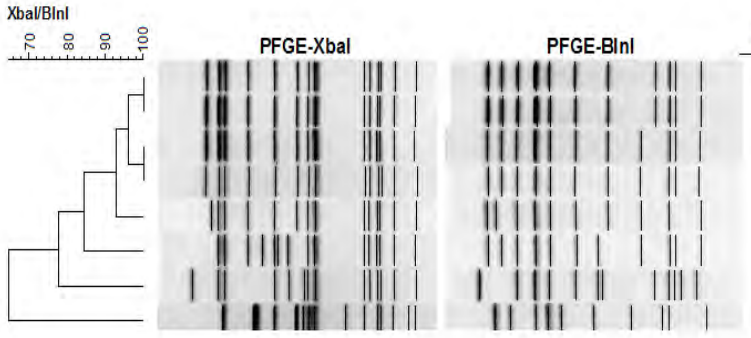
A-1g. PFGE Profiles for *Salmonella* I 4,[5],12:d:-

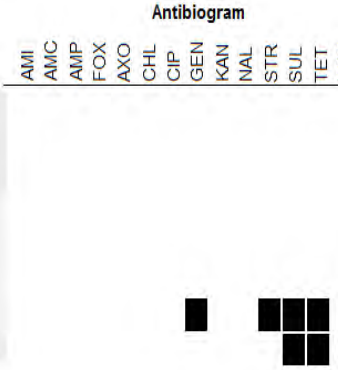




CVM #	State	Source	Date Isolated	Serotype
N20136	GA	Ground Turkey	10/09	I 4,[5],12:d:-
N20169	MD	Ground Turkey	07/09	I 4,[5],12:d:-
N20166	MD	Ground Turkey	06/09	I 4,[5],12:d:-
N20106	GA	Ground Turkey	04/09	I 4,[5],12:d:-
N20107	GA	Ground Turkey	04/09	I 4,[5],12:d:-
N23516	NY	Ground Turkey	05/09	I 4,[5],12:d:-
N23519	NY	Ground Turkey	06/09	I 4,[5],12:d:-
N23630	PA	Ground Turkey	05/09	I 4,[5],12:d:-
N23493	NY	Ground Turkey	02/09	I 4,[5],12:d:-

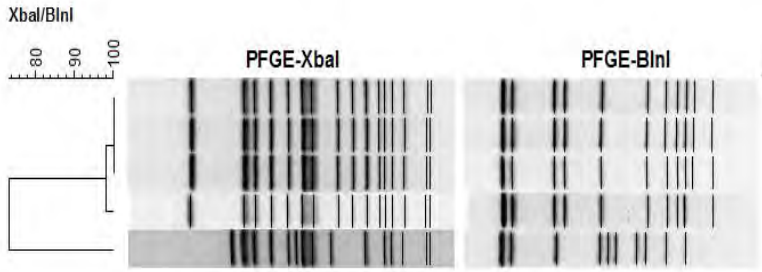
A-1h. PFGE Profiles for *Salmonella* I 4,[5],12:i:-

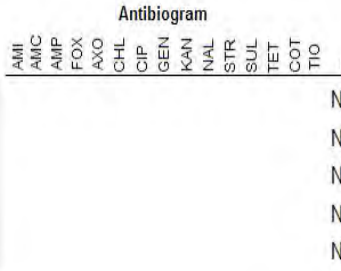




CVM #	State	Source	Date Isolated	Serotype
N23677	TN	Chicken Breast	10/09	I 4,[5],12:i:-
N23682	TN	Chicken Breast	12/09	I 4,[5],12:i:-
N19972	CA	Chicken Breast	03/09	I 4,[5],12:i:-
N19998	CA	Chicken Breast	09/09	I 4,[5],12:i:-
N20010	CO	Chicken Breast	01/09	I 4,[5],12:i:-
N20276	NM	Chicken Breast	08/09	I 4,[5],12:i:-
N20001	CA	Chicken Breast	10/09	I 4,[5],12:i:-
N20154	MD	Chicken Breast	03/09	I 4,[5],12:i:-

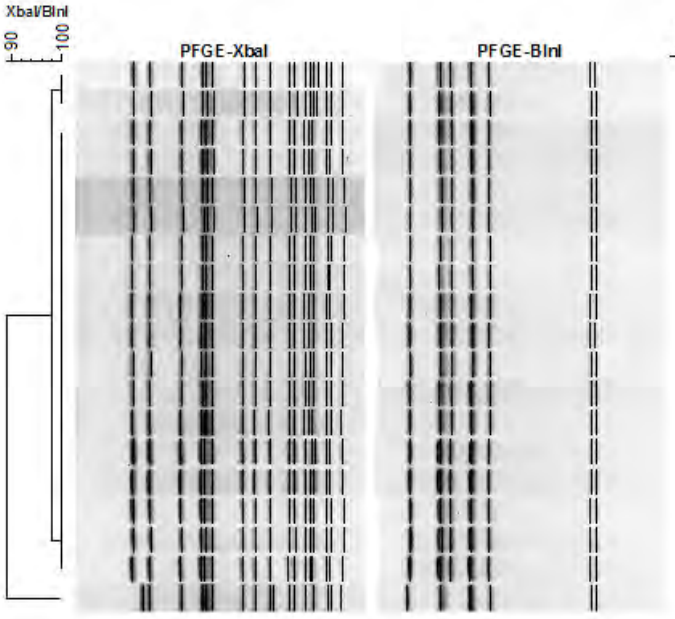
A-1i. PFGE Profiles for *Salmonella* I 4,[5],12:r:-





CVM #	State	Source	Date Isolated	Serotype
N20128	GA	Ground Turkey	08/09	I 4,[5],12:r:-
N20131	GA	Ground Turkey	08/09	I 4,[5],12:r:-
N20132	GA	Ground Turkey	08/09	I 4,[5],12:r:-
N23544	NY	Ground Turkey	09/09	I 4,[5],12:r:-
N20063	CT	Chicken Breast	09/09	I 4,[5],12:r:-

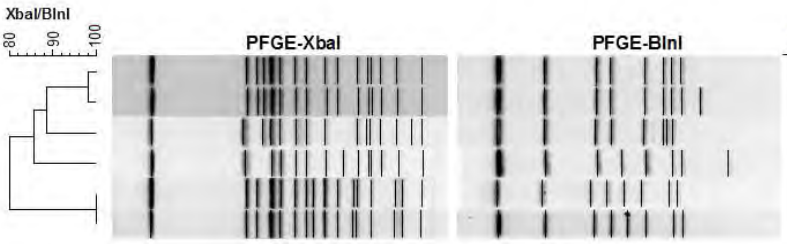
A-1j. PFGE Profiles for *Salmonella* IIIa 18:z4,z23:-



Antibiogram: AMI AMC AMP FOX AXO CHL CIP GEN KAN NAL STR SUL TET COT TIO

CVM #	State	Source	Date Isolated	Serotype
N23609	OR	Ground Turkey	12/09	IIIa 18:z4,z23:-
N23610	PA	Chicken Breast	01/09	IIIa 18:z4,z23:-
N19962	CA	Ground Turkey	01/09	IIIa 18:z4,z23:-
N19963	CA	Ground Turkey	01/09	IIIa 18:z4,z23:-
N19980	CA	Ground Turkey	04/09	IIIa 18:z4,z23:-
N19981	CA	Ground Turkey	04/09	IIIa 18:z4,z23:-
N19989	CA	Ground Turkey	06/09	IIIa 18:z4,z23:-
N19990	CA	Ground Turkey	06/09	IIIa 18:z4,z23:-
N20003	CA	Ground Turkey	10/09	IIIa 18:z4,z23:-
N20006	CA	Ground Turkey	11/10	IIIa 18:z4,z23:-
N20009	CA	Ground Turkey	12/09	IIIa 18:z4,z23:-
N20014	CO	Ground Turkey	02/09	IIIa 18:z4,z23:-
N20026	CO	Ground Turkey	06/09	IIIa 18:z4,z23:-
N23589	OR	Ground Turkey	08/09	IIIa 18:z4,z23:-
N23590	OR	Ground Turkey	08/09	IIIa 18:z4,z23:-
N23597	OR	Ground Turkey	09/09	IIIa 18:z4,z23:-
N23598	OR	Ground Turkey	09/09	IIIa 18:z4,z23:-
N23599	OR	Ground Turkey	09/09	IIIa 18:z4,z23:-
N20028	CO	Ground Turkey	06/09	IIIa 18:z4,z23:-

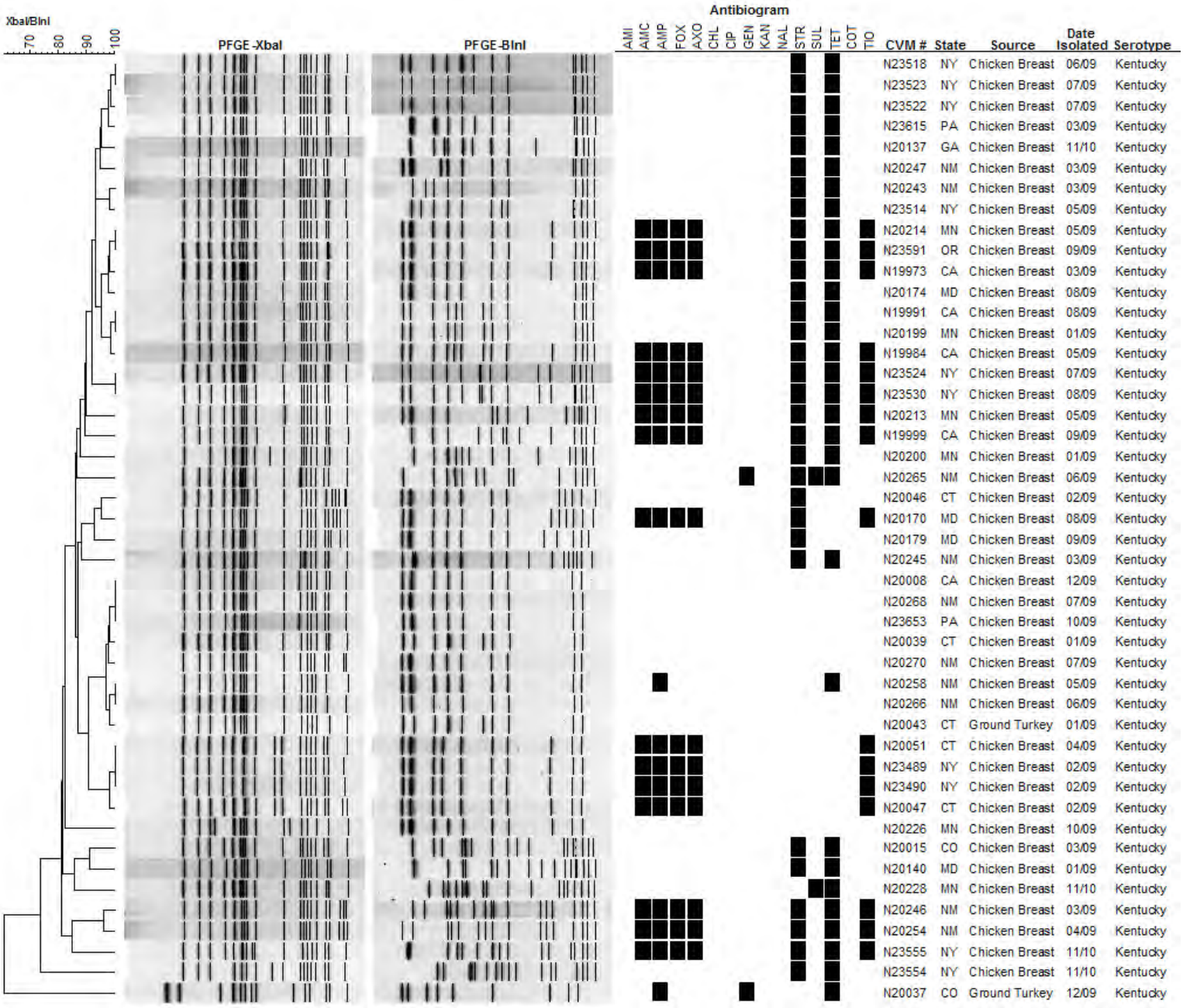
A-1k. PFGE Profiles for *Salmonella* Infantis



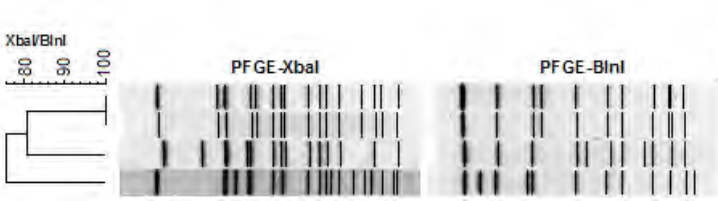
Antibiogram: AMI AMC AMP FOX AXO CHL CIP GEN KAN NAL STR SUL TET COT TIO

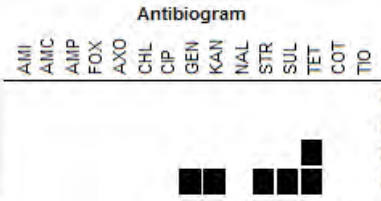
CVM #	State	Source	Date Isolated	Serotype
N19982	CA	Pork Chop	04/09	Infantis
N19983	CA	Pork Chop	04/09	Infantis
N20272	NM	Ground Turkey	07/09	Infantis
N23532	NY	Chicken Breast	08/09	Infantis
N20078	CT	Chicken Breast	12/09	Infantis
N23511	NY	Chicken Breast	05/09	Infantis

A-1l. PFGE Profiles for *Salmonella* Kentucky



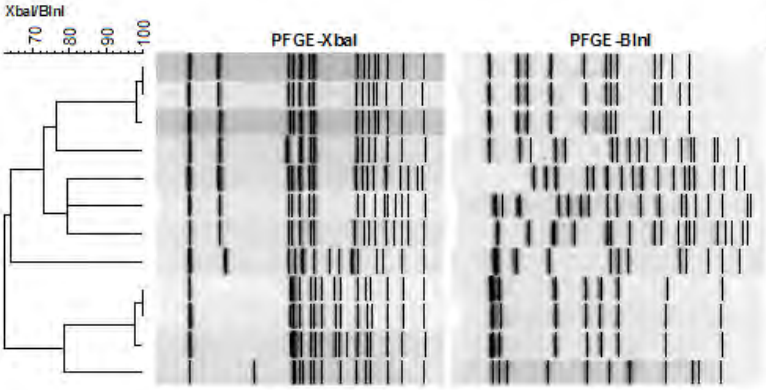
A-1m. PFGE Profiles for *Salmonella* Mbandaka

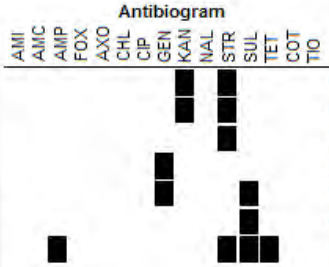




CVM #	State	Source	Date Isolated	Serotype
N23533	NY	Chicken Breast	08/09	Mbandaka
N23655	PA	Chicken Breast	11/09	Mbandaka
N23676	TN	Chicken Breast	10/09	Mbandaka
N20062	CT	Chicken Breast	08/09	Mbandaka

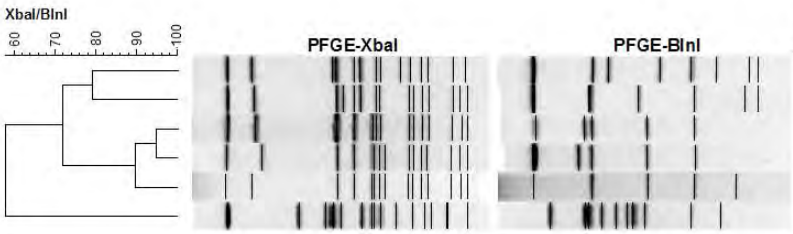
A-1n. PFGE Profiles for *Salmonella* Montevideo

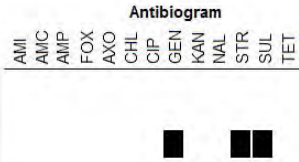




CVM #	State	Source	Date Isolated	Serotype
N20142	MD	Ground Turkey	01/09	Montevideo
N20189	MD	Ground Turkey	10/09	Montevideo
N20141	MD	Ground Turkey	01/09	Montevideo
N20221	MN	Ground Turkey	08/09	Montevideo
N20068	CT	Chicken Breast	10/09	Montevideo
N23558	NY	Chicken Breast	11/10	Montevideo
N20171	MD	Chicken Breast	08/09	Montevideo
N19965	CA	Chicken Breast	02/09	Montevideo
N23485	NM	Ground Beef	12/09	Montevideo
N23674	TN	Ground Beef	08/09	Montevideo
N20222	MN	Ground Beef	08/09	Montevideo
N20123	GA	Ground Beef	07/09	Montevideo

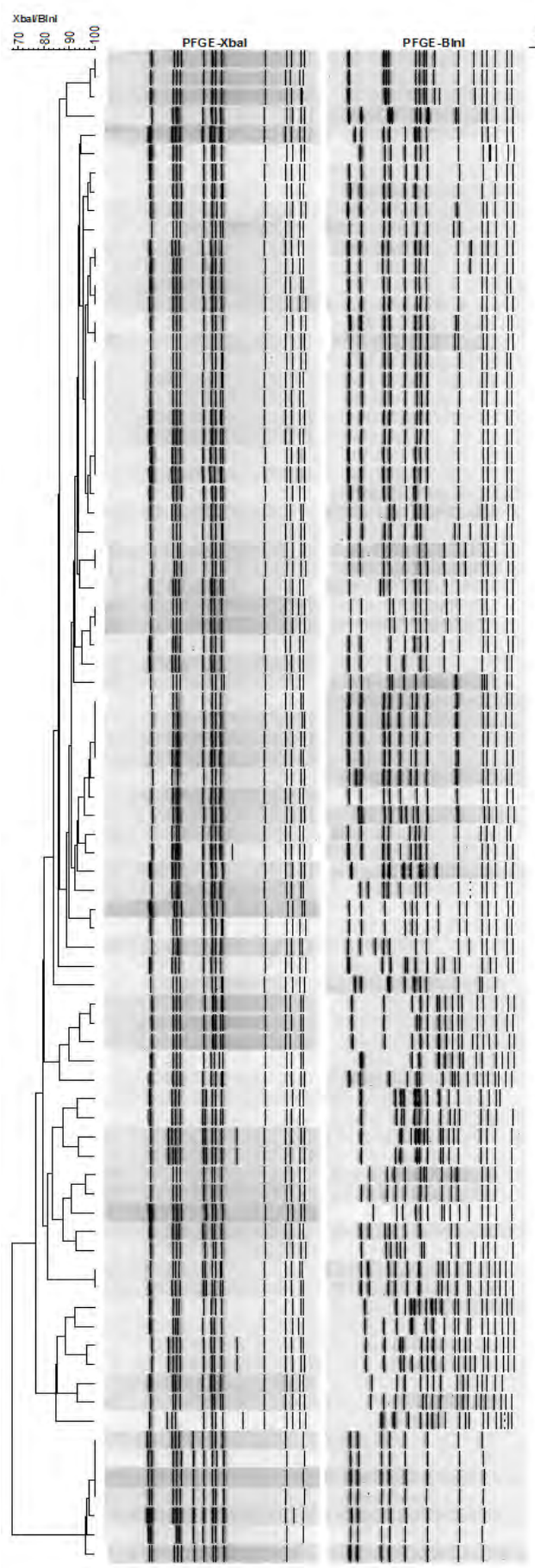
A-1o. PFGE Profiles for *Salmonella* Newport

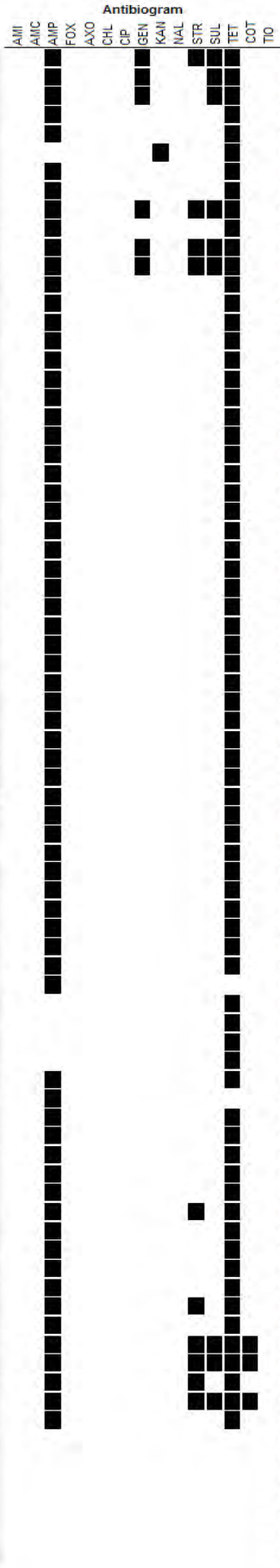




CVM #	State	Source	Date Isolated	Serotype
N20275	NM	Ground Beef	07/09	Newport
N20284	NM	Ground Beef	09/09	Newport
N20135	GA	Ground Turkey	10/09	Newport
N23488	NY	Ground Turkey	01/09	Newport
N20256	NM	Ground Turkey	04/09	Newport
N23639	PA	Chicken Breast	08/09	Newport

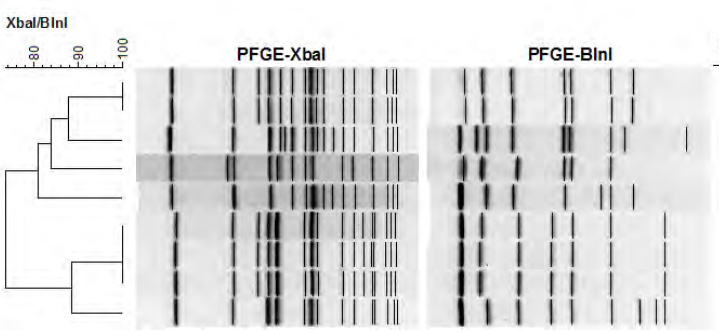
A-1p. PFGE Profiles for *Salmonella* Saintpaul

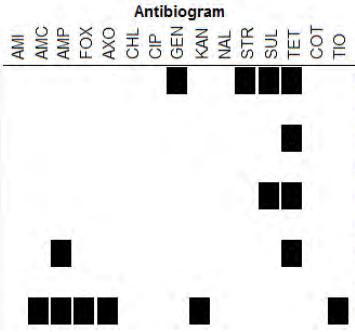




CVM #	State	Source	Date Isolated	Serotype
N23663	TN	Ground Beef	05/09	Saintpaul
N23664	TN	Ground Beef	05/09	Saintpaul
N23662	TN	Ground Turkey	05/09	Saintpaul
N20249	NM	Ground Turkey	03/09	Saintpaul
N20242	NM	Ground Turkey	02/09	Saintpaul
N23642	PA	Ground Turkey	08/09	Saintpaul
N20036	CO	Ground Turkey	11/10	Saintpaul
N23672	TN	Ground Turkey	08/09	Saintpaul
N20224	MN	Chicken Breast	09/09	Saintpaul
N20205	MN	Ground Turkey	02/09	Saintpaul
N23501	NY	Ground Turkey	03/09	Saintpaul
N23503	NY	Ground Turkey	03/09	Saintpaul
N20017	CO	Ground Turkey	03/09	Saintpaul
N20217	MN	Ground Turkey	06/09	Saintpaul
N20117	GA	Ground Turkey	06/09	Saintpaul
N20118	GA	Ground Turkey	06/09	Saintpaul
N20084	GA	Ground Turkey	01/09	Saintpaul
N20086	GA	Ground Turkey	01/09	Saintpaul
N20087	GA	Ground Turkey	01/09	Saintpaul
N20129	GA	Ground Turkey	08/09	Saintpaul
N20130	GA	Ground Turkey	08/09	Saintpaul
N23587	OR	Ground Turkey	06/09	Saintpaul
N23588	OR	Ground Turkey	06/09	Saintpaul
N23671	TN	Ground Turkey	08/09	Saintpaul
N20210	MN	Ground Turkey	03/09	Saintpaul
N20085	GA	Ground Turkey	01/09	Saintpaul
N20114	GA	Ground Turkey	05/09	Saintpaul
N20115	GA	Ground Turkey	05/09	Saintpaul
N20209	MN	Ground Turkey	03/09	Saintpaul
N20110	GA	Ground Turkey	05/09	Saintpaul
N20111	GA	Ground Turkey	05/09	Saintpaul
N20263	NM	Ground Turkey	05/09	Saintpaul
N20013	CO	Ground Turkey	02/09	Saintpaul
N20105	GA	Ground Turkey	04/09	Saintpaul
N20093	GA	Ground Turkey	02/09	Saintpaul
N20095	GA	Ground Turkey	02/09	Saintpaul
N20097	GA	Ground Turkey	02/09	Saintpaul
N20098	GA	Ground Turkey	02/09	Saintpaul
N20094	GA	Ground Turkey	02/09	Saintpaul
N20099	GA	Ground Turkey	02/09	Saintpaul
N20096	GA	Ground Turkey	02/09	Saintpaul
N20208	MN	Ground Turkey	03/09	Saintpaul
N20251	NM	Ground Turkey	03/09	Saintpaul
N20250	NM	Ground Turkey	03/09	Saintpaul
N20100	GA	Ground Turkey	03/09	Saintpaul
N20033	CO	Ground Turkey	08/09	Saintpaul
N20034	CO	Ground Turkey	08/09	Saintpaul
N20101	GA	Ground Turkey	03/09	Saintpaul
N23477	NM	Ground Turkey	11/10	Saintpaul
N20204	MN	Ground Turkey	02/09	Saintpaul
N23647	PA	Ground Turkey	09/09	Saintpaul
N23649	PA	Ground Beef	09/09	Saintpaul
N23648	PA	Ground Turkey	09/09	Saintpaul
N23543	NY	Ground Turkey	09/09	Saintpaul
N23670	TN	Ground Turkey	07/09	Saintpaul
N20283	NM	Ground Turkey	09/09	Saintpaul
N23675	TN	Ground Turkey	09/09	Saintpaul
N20218	MN	Ground Turkey	06/09	Saintpaul
N20219	MN	Ground Turkey	06/09	Saintpaul
N20108	GA	Ground Turkey	05/09	Saintpaul
N20109	GA	Ground Turkey	05/09	Saintpaul
N20032	CO	Ground Turkey	08/09	Saintpaul
N20016	CO	Ground Turkey	03/09	Saintpaul
N20023	CO	Ground Turkey	04/09	Saintpaul
N20206	MN	Ground Turkey	03/09	Saintpaul
N20207	MN	Ground Turkey	03/09	Saintpaul
N20271	NM	Ground Turkey	07/09	Saintpaul
N20273	NM	Ground Turkey	07/09	Saintpaul
N20126	GA	Ground Turkey	08/09	Saintpaul
N20127	GA	Ground Turkey	08/09	Saintpaul
N20007	CA	Ground Turkey	11/10	Saintpaul
N20122	GA	Ground Turkey	07/09	Saintpaul
N23475	NM	Ground Turkey	11/10	Saintpaul
N20004	CA	Ground Turkey	10/09	Saintpaul
N20035	CO	Ground Turkey	10/09	Saintpaul
N20048	CT	Ground Turkey	02/09	Saintpaul
N20148	MD	Ground Turkey	02/09	Saintpaul
N20072	CT	Ground Turkey	10/09	Saintpaul
N20177	MD	Ground Turkey	08/09	Saintpaul
N23661	TN	Ground Turkey	03/09	Saintpaul

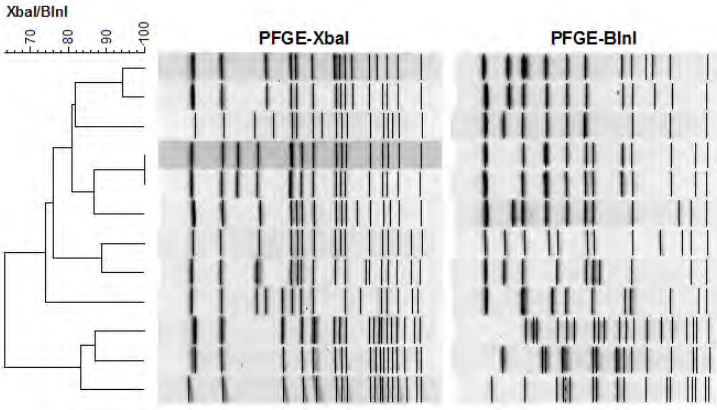
A-1q. PFGE Profiles for *Salmonella* Schwarzengrund

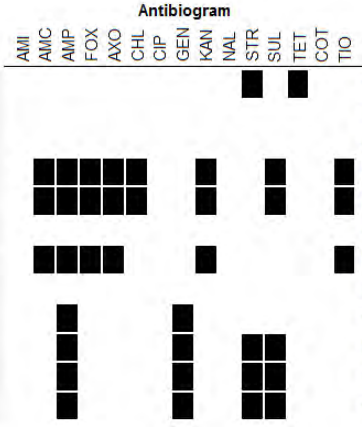




CVM #	State	Source	Date Isolated	Serotype
N20285	NM	Ground Turkey	10/09	Schwarzengrund
N20286	NM	Ground Turkey	10/09	Schwarzengrund
N19974	CA	Ground Turkey	03/09	Schwarzengrund
N20052	CT	Ground Turkey	04/09	Schwarzengrund
N23660	PA	Ground Turkey	12/09	Schwarzengrund
N20027	CO	Ground Turkey	06/09	Schwarzengrund
N20264	NM	Ground Turkey	05/09	Schwarzengrund
N20274	NM	Ground Turkey	07/09	Schwarzengrund
N23483	NM	Ground Turkey	12/09	Schwarzengrund

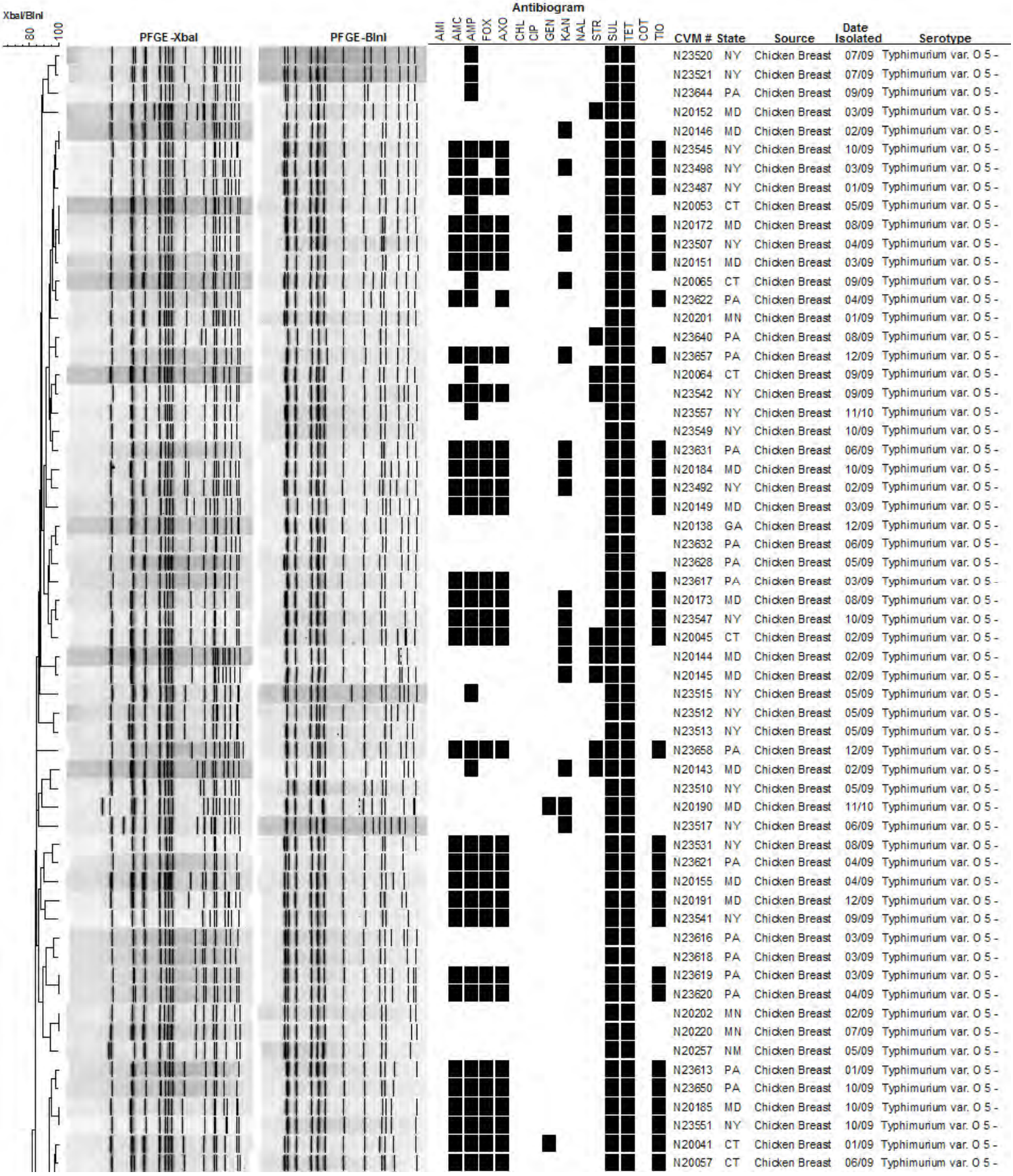
A-1r. PFGE Profiles for *Salmonella* Senftenberg





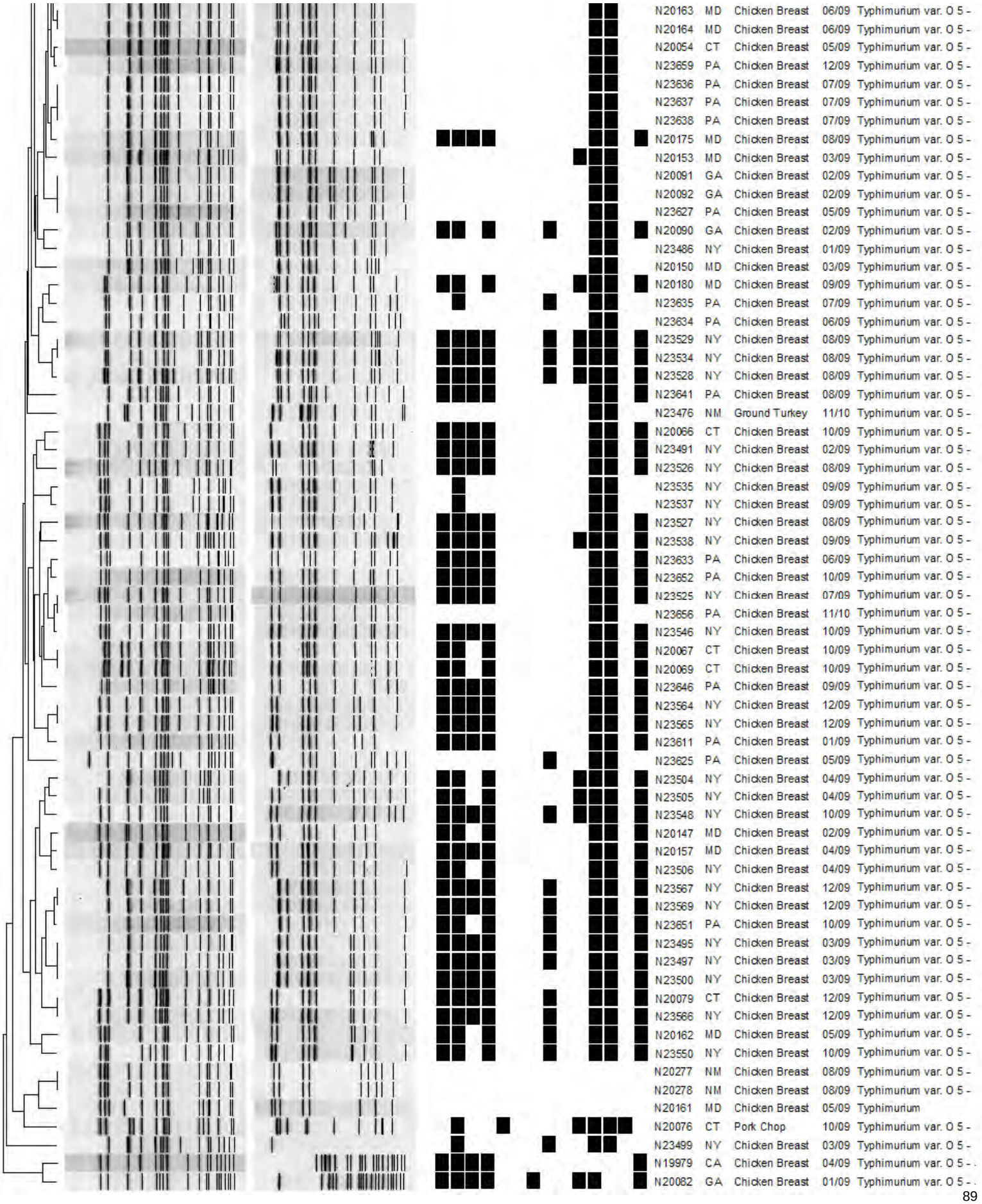
CVM #	State	Source	Date Isolated	Serotype
N20229	MN	Ground Turkey	11/10	Senftenberg
N23539	NY	Chicken Breast	09/09	Senftenberg
N20203	MN	Ground Turkey	02/09	Senftenberg
N20139	GA	Ground Turkey	12/09	Senftenberg
N23484	NM	Ground Turkey	12/09	Senftenberg
N23583	OR	Ground Turkey	01/09	Senftenberg
N20022	CO	Ground Turkey	04/09	Senftenberg
N20280	NM	Ground Turkey	08/09	Senftenberg
N20282	NM	Ground Turkey	09/09	Senftenberg
N20081	CT	Ground Turkey	12/09	Senftenberg
N23563	NY	Chicken Breast	12/09	Senftenberg
N20197	MD	Ground Turkey	12/09	Senftenberg

A-1s. PFGE Profiles for *Salmonella* Typhimurium



CVM #	State	Source	Date Isolated	Serotype
N23520	NY	Chicken Breast	07/09	Typhimurium var. O 5 -
N23521	NY	Chicken Breast	07/09	Typhimurium var. O 5 -
N23644	PA	Chicken Breast	09/09	Typhimurium var. O 5 -
N20152	MD	Chicken Breast	03/09	Typhimurium var. O 5 -
N20146	MD	Chicken Breast	02/09	Typhimurium var. O 5 -
N23545	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N23498	NY	Chicken Breast	03/09	Typhimurium var. O 5 -
N23487	NY	Chicken Breast	01/09	Typhimurium var. O 5 -
N20053	CT	Chicken Breast	05/09	Typhimurium var. O 5 -
N20172	MD	Chicken Breast	08/09	Typhimurium var. O 5 -
N23507	NY	Chicken Breast	04/09	Typhimurium var. O 5 -
N20151	MD	Chicken Breast	03/09	Typhimurium var. O 5 -
N20065	CT	Chicken Breast	09/09	Typhimurium var. O 5 -
N23622	PA	Chicken Breast	04/09	Typhimurium var. O 5 -
N20201	MN	Chicken Breast	01/09	Typhimurium var. O 5 -
N23640	PA	Chicken Breast	08/09	Typhimurium var. O 5 -
N23657	PA	Chicken Breast	12/09	Typhimurium var. O 5 -
N20064	CT	Chicken Breast	09/09	Typhimurium var. O 5 -
N23542	NY	Chicken Breast	09/09	Typhimurium var. O 5 -
N23557	NY	Chicken Breast	11/10	Typhimurium var. O 5 -
N23549	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N23631	PA	Chicken Breast	06/09	Typhimurium var. O 5 -
N20184	MD	Chicken Breast	10/09	Typhimurium var. O 5 -
N23492	NY	Chicken Breast	02/09	Typhimurium var. O 5 -
N20149	MD	Chicken Breast	03/09	Typhimurium var. O 5 -
N20138	GA	Chicken Breast	12/09	Typhimurium var. O 5 -
N23632	PA	Chicken Breast	06/09	Typhimurium var. O 5 -
N23628	PA	Chicken Breast	05/09	Typhimurium var. O 5 -
N23617	PA	Chicken Breast	03/09	Typhimurium var. O 5 -
N20173	MD	Chicken Breast	08/09	Typhimurium var. O 5 -
N23547	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N20045	CT	Chicken Breast	02/09	Typhimurium var. O 5 -
N20144	MD	Chicken Breast	02/09	Typhimurium var. O 5 -
N20145	MD	Chicken Breast	02/09	Typhimurium var. O 5 -
N23515	NY	Chicken Breast	05/09	Typhimurium var. O 5 -
N23512	NY	Chicken Breast	05/09	Typhimurium var. O 5 -
N23513	NY	Chicken Breast	05/09	Typhimurium var. O 5 -
N23658	PA	Chicken Breast	12/09	Typhimurium var. O 5 -
N20143	MD	Chicken Breast	02/09	Typhimurium var. O 5 -
N23510	NY	Chicken Breast	05/09	Typhimurium var. O 5 -
N20190	MD	Chicken Breast	11/10	Typhimurium var. O 5 -
N23517	NY	Chicken Breast	06/09	Typhimurium var. O 5 -
N23531	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23621	PA	Chicken Breast	04/09	Typhimurium var. O 5 -
N20155	MD	Chicken Breast	04/09	Typhimurium var. O 5 -
N20191	MD	Chicken Breast	12/09	Typhimurium var. O 5 -
N23541	NY	Chicken Breast	09/09	Typhimurium var. O 5 -
N23616	PA	Chicken Breast	03/09	Typhimurium var. O 5 -
N23618	PA	Chicken Breast	03/09	Typhimurium var. O 5 -
N23619	PA	Chicken Breast	03/09	Typhimurium var. O 5 -
N23620	PA	Chicken Breast	04/09	Typhimurium var. O 5 -
N20202	MN	Chicken Breast	02/09	Typhimurium var. O 5 -
N20220	MN	Chicken Breast	07/09	Typhimurium var. O 5 -
N20257	NM	Chicken Breast	05/09	Typhimurium var. O 5 -
N23613	PA	Chicken Breast	01/09	Typhimurium var. O 5 -
N23650	PA	Chicken Breast	10/09	Typhimurium var. O 5 -
N20185	MD	Chicken Breast	10/09	Typhimurium var. O 5 -
N23551	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N20041	CT	Chicken Breast	01/09	Typhimurium var. O 5 -
N20057	CT	Chicken Breast	06/09	Typhimurium var. O 5 -

A-1s. PFGE Profiles for *Salmonella* Typhimurium



N20163	MD	Chicken Breast	06/09	Typhimurium var. O 5 -
N20164	MD	Chicken Breast	06/09	Typhimurium var. O 5 -
N20054	CT	Chicken Breast	05/09	Typhimurium var. O 5 -
N23659	PA	Chicken Breast	12/09	Typhimurium var. O 5 -
N23636	PA	Chicken Breast	07/09	Typhimurium var. O 5 -
N23637	PA	Chicken Breast	07/09	Typhimurium var. O 5 -
N23638	PA	Chicken Breast	07/09	Typhimurium var. O 5 -
N20175	MD	Chicken Breast	08/09	Typhimurium var. O 5 -
N20153	MD	Chicken Breast	03/09	Typhimurium var. O 5 -
N20091	GA	Chicken Breast	02/09	Typhimurium var. O 5 -
N20092	GA	Chicken Breast	02/09	Typhimurium var. O 5 -
N23627	PA	Chicken Breast	05/09	Typhimurium var. O 5 -
N20090	GA	Chicken Breast	02/09	Typhimurium var. O 5 -
N23486	NY	Chicken Breast	01/09	Typhimurium var. O 5 -
N20150	MD	Chicken Breast	03/09	Typhimurium var. O 5 -
N20180	MD	Chicken Breast	09/09	Typhimurium var. O 5 -
N23635	PA	Chicken Breast	07/09	Typhimurium var. O 5 -
N23634	PA	Chicken Breast	06/09	Typhimurium var. O 5 -
N23529	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23534	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23528	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23641	PA	Chicken Breast	08/09	Typhimurium var. O 5 -
N23476	NM	Ground Turkey	11/10	Typhimurium var. O 5 -
N20066	CT	Chicken Breast	10/09	Typhimurium var. O 5 -
N23491	NY	Chicken Breast	02/09	Typhimurium var. O 5 -
N23526	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23535	NY	Chicken Breast	09/09	Typhimurium var. O 5 -
N23537	NY	Chicken Breast	09/09	Typhimurium var. O 5 -
N23527	NY	Chicken Breast	08/09	Typhimurium var. O 5 -
N23538	NY	Chicken Breast	09/09	Typhimurium var. O 5 -
N23633	PA	Chicken Breast	06/09	Typhimurium var. O 5 -
N23652	PA	Chicken Breast	10/09	Typhimurium var. O 5 -
N23525	NY	Chicken Breast	07/09	Typhimurium var. O 5 -
N23656	PA	Chicken Breast	11/10	Typhimurium var. O 5 -
N23546	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N20067	CT	Chicken Breast	10/09	Typhimurium var. O 5 -
N20069	CT	Chicken Breast	10/09	Typhimurium var. O 5 -
N23646	PA	Chicken Breast	09/09	Typhimurium var. O 5 -
N23564	NY	Chicken Breast	12/09	Typhimurium var. O 5 -
N23565	NY	Chicken Breast	12/09	Typhimurium var. O 5 -
N23611	PA	Chicken Breast	01/09	Typhimurium var. O 5 -
N23625	PA	Chicken Breast	05/09	Typhimurium var. O 5 -
N23504	NY	Chicken Breast	04/09	Typhimurium var. O 5 -
N23505	NY	Chicken Breast	04/09	Typhimurium var. O 5 -
N23548	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N20147	MD	Chicken Breast	02/09	Typhimurium var. O 5 -
N20157	MD	Chicken Breast	04/09	Typhimurium var. O 5 -
N23506	NY	Chicken Breast	04/09	Typhimurium var. O 5 -
N23567	NY	Chicken Breast	12/09	Typhimurium var. O 5 -
N23569	NY	Chicken Breast	12/09	Typhimurium var. O 5 -
N23651	PA	Chicken Breast	10/09	Typhimurium var. O 5 -
N23495	NY	Chicken Breast	03/09	Typhimurium var. O 5 -
N23497	NY	Chicken Breast	03/09	Typhimurium var. O 5 -
N23500	NY	Chicken Breast	03/09	Typhimurium var. O 5 -
N20079	CT	Chicken Breast	12/09	Typhimurium var. O 5 -
N23566	NY	Chicken Breast	12/09	Typhimurium var. O 5 -
N20162	MD	Chicken Breast	05/09	Typhimurium var. O 5 -
N23550	NY	Chicken Breast	10/09	Typhimurium var. O 5 -
N20277	NM	Chicken Breast	08/09	Typhimurium var. O 5 -
N20278	NM	Chicken Breast	08/09	Typhimurium var. O 5 -
N20161	MD	Chicken Breast	05/09	Typhimurium
N20076	CT	Pork Chop	10/09	Typhimurium var. O 5 -
N23499	NY	Chicken Breast	03/09	Typhimurium var. O 5 -
N19979	CA	Chicken Breast	04/09	Typhimurium var. O 5 -
N20082	GA	Chicken Breast	01/09	Typhimurium var. O 5 -

NATIONAL ANTIMICROBIAL RESISTANCE MONITORING SYSTEM -- RETAIL FOOD SURVEILLANCE ISOLATES MONTHLY LOG SHEET

STATE _____
MONTH _____
YEAR _____

Completed By (Initials): _____

Chicken Breast

PART I

Sample #	Sample ID	Store Name	Address	Organic Product (X One) Y	Organic Product (X One) N	Cut/Ground IN-STORE (X One) Y	Cut/Ground IN-STORE (X One) N	Sell-by Date (MM/DD/YY)	Purchase Date (MM/DD/YY)	Lab Process Date (MM/DD/YY)	Brand Code	Brand Name	Establishment Number
1	00CB01												
2	00CB02												
3	00CB03												
4	00CB04												
5	00CB05												
6	00CB06												
7	00CB07												
8	00CB08												
9	00CB09												
10	00CB10												

CONT.

PART II

	Salmonella Growth (X One) Y	*Salmonella* Growth (X One) N	*Salmonella* IF GROWTH Serotype	*Salmonella* IF GROWTH Isolate ID	*Campylobacter* Growth (X One) Y	*Campylobacter* Growth (X One) N	*Campylobacter* IF GROWTH Species	*Campylobacter* IF GROWTH Isolate ID	*E. coli* (GA, MD, OR, TN) Growth (X One) Y	*E. coli* (GA, MD, OR, TN) Growth (X One) N	*E. coli* (GA, MD, OR, TN) IF GROWTH Isolate ID	*Enterococci* (GA, MD, OR, TN) Growth (X One) Y	*Enterococci* (GA, MD, OR, TN) Growth (X One) N	*Enterococci* (GA, MD, OR, TN) IF GROWTH Isolate ID
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Send original log sheet with isolates to FDA-CVM and keep a copy for your records. Thank you.

FOR CVM USE: DATE RECEIVED _____