2008 Retail Meat Report

National Antimicrobial Resistance Monitoring System

NARMS

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ABBREVIATIONS USED IN THE REPORT, 2008

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		

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NARMS Retail Meat Annual Report 2008

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 2008 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. For calendar year 2008, test sites began retail meat sampling in January with exception to Maryland, who began in February. 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*. With the exception of Pennsylvania, test sites culture poultry samples for *Campylobacter*. In 2008, 3 of the 10 participating FoodNet laboratories (Georgia, Oregon, and Tennessee) also cultured 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 2008

A total of 5,236 meat samples were collected in 2008, compared with 4,282 in 2007. The Maryland FoodNet site, did not collect samples in 2007, but in 2008 Maryland collected samples to test for *Salmonella* and *Campylobacter*. The Pennsylvania Department of Public Health Laboratory is the newest addition to the NARMS retail meat surveillance program and they joined in 2008 testing only *Salmonella*. In previous years, *Campylobacter* was tested in all meat and poultry, but due to low recovery ground beef and pork chop were not tested for *Campylobacter* in 2008.

In previous reports, the resistance breakpoint for ceftriaxone was defined as MIC ≥ 64 μg/mL. In January 2010, the Clinical and Laboratory Standards Institute (CLSI) published revised interpretive criteria for ceftriaxone. The revised ceftriaxone breakpoints are as follows: Susceptible ≤ 1 μg/mL, Intermediate = 2 μg/mL, and Resistant ≥ 4 μg/mL. The new CLSI resistance breakpoint for ceftriaxone was applied to the interpretation of all *Salmonella* and *Escherichia coli* data in this report.

In 2008, the Sensititre™ CMV2AGPF plate used for testing *Enterococcus* was replaced by CMV3AGPF for the final 100 *Enterococcus* isolates. Resistance data for flavomycin has been excluded from this report as the new CMV3AGPF plate does not include this antimicrobial. The CMV3AGPF range of dilutions tested expanded for daptomycin, erythromycin, penicillin, quinupristin-dalfopristin and tetracycline, while ranges decreased for lincomycin and vancomycin. Since both CMV2AGPF and CMV3AGPF were used for *Enterococcus* testing in 2008, data is presented using the smaller range from either plate.

New tables have been added to this report for each surveillance component. In addition to highlighting clinically important resistance patterns, tables showing the number of isolates resistant to multiple antimicrobial classes are included in this report.

Highlights of the NARMS Retail 2008 Report

Salmonella[1]

Salmonella serotypes Heidelberg, Typhimurium, and Hadar account for 48% of isolates from retail meats (Table 4). The proportion of *Salmonella* Hadar increased markedly from an average of 6.6% from 2002–2006 to 14.7% in 2008, and has become the most common serotype in ground turkey. Heidelberg decreased from 22.8–17.7% from 2002–2008, while typhimurium has increased from 9.8–15.5% of retail meats.

First-line antimicrobial agents recommended for treating salmonellosis are ciprofloxacin, ceftriaxone and trimethoprim-sulfamethoxazole (IDSA, Practice Guidelines for the Management of Infectious Diarrhea. *Clinical Infectious Diseases* 2001; 32:331–50).

- 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 0.4% of *Salmonella* from ground turkey were nalidixic acid resistant compared with 1.1% in 2005 and 8.1% in 2002 (Table 5). There were no retail meat isolates resistant to both nalidixic acid and ceftiofur in 2008.
- Cephalosporins - In 2008, 4.5% of *Salmonella* isolated from ground turkey showed resistance to the third-generation cephalosporins decreasing from 5.3% in 2007. In chicken breast isolates, 22.6% were resistant rising from 16.2% in 2007.
- There was a highly significant increase in ampicillin resistance among ground turkey isolates, rising from 16.2% in 2002 to 50.6% in 2008.
- Trimethoprim-Sulfamethoxazole - Resistance to this antimicrobial is extremely rare and only 1 ground turkey isolate (of 245) was resistant in 2008.
- Multidrug Resistance – 38.2% of chicken breast *Salmonella* isolates were resistant to ≥ 3 antimicrobial classes in 2008 compared to 51% in ground turkey, an increase in both from previous years. From 2002–2007, multidrug resistance to ≥ 3 antimicrobial classes ranged from 20–34.4% among chicken breast and 20.3–42.6% for ground turkey. More than 15% of chicken breast and ground turkey isolates showed resistance to ≥ 4 classes in 2008 (Table 8).
- The percentage of *Salmonella* isolates susceptible to all antimicrobials (Table 8) showed a decrease from 2007 to 2008 among chicken breast (47.5–45.2%) and ground beef (92.3–79.2%). Meanwhile, an increase in *Salmonella* pansusceptibility was seen among ground turkey (15.3–20.8%) and pork chop (44.4–65.2%) isolates.

Campylobacter[2]

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 NARMS data.

- Macrolide resistance in chicken breast isolates was seen in 9.9% of *C. coli* and 1.2% of *C. jejuni* in 2008, with no significant changes over time (Table 13).
- 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,

[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] Beginning in 2008, 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* has decreased to 20.4% in 2008 (Table 13) and showed no significant change in *C. jejuni*.
- Tetracycline resistance in *C. jejuni* continued to increase with 49.9% in 2008, up from 38.4% in 2002 (p=0.0103) and 46.4% in 2005.
- Gentamicin resistance in *C. coli* has increased with 1.7% in 2008, up from 0% in 2002–2006 and 0.7% in 2007 (p=0.0082).
- Multidrug resistance is rare in *Campylobacter*. In 2008, there were only 14 *Campylobacter* isolates resistant to ≥ 3 antimicrobial classes (Table 14).

Enterococcus

E. faecalis (67.4% [901/1337]) was more prevalent than *E. faecium* (25.5% [341/1337]) in 2008 (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 (46.2–10.3%) and pork chop (27.2–6.5%) but has remained above 50% in poultry isolates.
- *E. faecalis* from poultry showed markedly higher aminoglycoside and macrolide resistance than *E. faecium*. *E. faecium* had much higher resistance to nitrofurantoin, penicillin and ciprofloxacin from all sources compared to *E. faecalis* (Table 18a-b).
- Multidrug resistance from 2002–2008 was highest in *E. faecium* isolates from poultry. *E. faecium* isolates from poultry ranged from 13.8–67.8% from 2002–2008 in resistance to ≥ 6 antimicrobial classes, while *E. faecalis* isolates were all <2% during this time (Table 19a-b).

Escherichia coli

E. coli are common in all retail meat products tested in NARMS. Nearly 70% of the 1,440 retail meats tested in 2008 were culture positive for *E. coli*, with pork chops having the lowest prevalence (40.6%) and chicken breasts the highest (85%).

- Ceftiofur resistance among *E. coli* isolates from chicken breast is consistently higher than any other retail meat tested. Ground turkey (1–3.7%) and pork chop (0.5–3.4%) had statistically significant trends in ceftiofur resistance from 2002–2008 at the $p < 0.05$ level (Table 22).
- Ciprofloxacin resistance remained low (< 1.0%) among *E. coli* isolates from retail meats.
- 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 3.7% 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 (< 2%), with a statistically significant decline among chicken breast.
- A highly statistically significant trend ($p<0.0001$) in ampicillin resistance was seen among ground turkey with 58% resistance in 2008, up from 31.3% in 2002.

Surveillance and Laboratory Testing Methods

Sample Collection and Isolate Submission

For 2008, retail meat samples were collected from 10 CDC FoodNet sites including California, Colorado, Connecticut, Georgia, Maryland, Minnesota, New Mexico, New York, Oregon, Tennessee and 1 Department of Health laboratory, Pennsylvania. 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*, with exception to Pennsylvania who only cultured *Campylobacter*. In addition for 2008, only Tennessee, Georgia and Oregon cultured the same samples for *E. coli* and *Enterococcus*. Isolates from each culture-positive meat sample were submitted by the 11 sites to the FDA/CVM for serotype or species confirmation. NARMS testing and reporting are based on a single isolate from each culture-positive meat sample.

Microbiological Analysis and Testing Methods at the FoodNet Site

In the 11 participating laboratories, meat samples were stored at 4°C and processed no later than 96 hours after purchase. Retail meat packages were kept intact until they were aseptically opened in the laboratory. For chicken and pork samples, one piece of meat microbiological sampling includes one chicken breast or one pork chop, aseptically removed from the total meat package. For ground beef and ground turkey, a 25 gram (g) sample is aseptically aliquot from the total meat product. Portions from each sample were placed in separate sterile plastic bags with 250 milliliters (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 tubes of RVR10 medium. The tubes of RVR10 medium were incubated in a water bath at 42°C for 16-20 hours before transferring 1 mL to pre-warmed (35-37°C) 10 mL tubes of M Broth. The inoculated M Broth tubes were incubated in a water bath at 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 tested 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. The inoculated plate was 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 to be used for *Campylobacter* isolation. The broth and rinsate were mixed thoroughly, but gently to avoid aeration, and incubated at 42°C for 24 hours in a reduced oxygen atmosphere that was obtained using a commercial gas-generating envelope or a gas mixture containing 85% nitrogen, 10% carbon dioxide, and 5% oxygen. The Bolton broth culture 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. Each CCA plate was examined for typical *Campylobacter* colonies (round to irregular with smooth edges; thick translucent white growth to spreading, film-like transparent growth). 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. If the Gram stain showed small, Gram-negative curved rods, and the isolate was positive for catalase and oxidase, the isolate was presumptively identified as *Campylobacter*. Otherwise, the culture was considered negative. 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 2008)**

Fifty milliliters of double strength MacConkey broth was added to flasks containing 50 mL of rinsate to be used for *E. coli* isolation. The contents were mixed thoroughly and incubated at 35°C for 16-20 hours. One loopful from each flask was transferred to an Eosin Methylene Blue (EMB) agar plate and streaked for isolation. Agar plates were incubated at 35°C for 16-20 hours in ambient air and examined for typical *E. coli*

colonies (colonies having a dark center and usually a green metallic sheen). If no typical growth was observed on an EMB agar plate, the sample was considered negative and the appropriate documentation was made on the log sheet accompanying the sample. When *E. coli*-like growth was present, one typical, well-isolated colony was streaked for isolation onto a BAP. The BAP(s) were incubated at 35°C for 16-20 hours in ambient air and examined for purity. 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 2008)**

Fifty milliliters of double-strength Enterococcosel broth was added to the flasks containing 50 mL of rinsate to be used for *Enterococcus* isolation. The contents were mixed thoroughly and incubated at 45°C for 18-24 hours in ambient air. 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). The plates were incubated at 35°C for 18-24 hours in ambient air and examined for *Enterococcus*-like colonies (small colonies surrounded by a blackening of the agar). 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 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). CLSI recommendations were followed by testing quality control organisms each time antimicrobial susceptibility testing was performed. 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 some *Campylobacter* isolates. All Campylobacter isolated from 2002 to 2005 were tested by PFGE. Since 2006, only those Campylobacter isolates that show resistance to ciprofloxacin or erythromycin have been tested by PFGE. PFGE was performed according to protocols developed by CDC (1). Agarose-embedded DNA was digested with the enzymes *Xba*I and BinI for *Salmonella* isolates and *Sma*I and *KpnI* for *Campylobacter* isolates. DNA restriction fragments were separated by electrophoresis using a CHEF Mapper electrophoresis system (Bio-Rad, Hercules, CA). Genomic-DNA profiles or "fingerprints" were analyzed using BioNumerics software (Applied-Maths, Kortrijk, Belgium), and banding patterns were compared using Dice coefficients with a 1.5% band position tolerance.

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Table 1. Interpretive Criteria used for Antimicrobial Susceptibility Testing: NARMS Retail Meat, 2008[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, 2008[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). In 2008 *Enterococcus* plate CMV3AGPF replaced CMV2AGPF midyear. MIC ranges for *Enterococcus* reflect the smaller range.

[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, 2002-2008

		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%						
	Total	**715**	**514**	**71.9%**	**716**	**89**	**12.4%**						
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%						
	Total	**573**	**258**	**45.0%**	**573**	**26**	**4.5%**						
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%						
	Total	**779**	**481**	**61.7%**	**780**	**117**	**15.0%**						
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%
	Total	**840**	**469**	**55.8%**	**840**	**72**	**8.6%**	**840**	**836**	**99.5%**	**840**	**804**	**95.7%**
MD[4]	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%						
	Total	**710**	**331**	**46.6%**	**710**	**133**	**18.7%**	**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%						
	Total	**826**	**287**	**34.7%**	**826**	**94**	**11.4%**						
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%						
	Total	**598**	**212**	**35.5%**	**599**	**92**	**15.4%**						
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%						
	Total	**715**	**355**	**49.7%**	**720**	**101**	**14.0%**						
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%
	Total	**759**	**297**	**39.1%**	**760**	**72**	**9.5%**	**750**	**742**	**98.9%**	**758**	**520**	**68.6%**
PA	2008				120	25	20.8%						
	Total				**120**	**25**	**20.8%**						
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%
	Total	**813**	**370**	**45.5%**	**813**	**82**	**10.1%**	**812**	**780**	**96.1%**	**790**	**638**	**80.8%**
Grand Total		**7328**	**3574**	**48.8%**	**7457**	**903**	**12.1%**	**2190**	**2147**	**98.0%**	**2988**	**2494**	**83.5%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008.

[2] N= # of meat samples collected.

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

[4] MD did not collect samples for NARMS retail meat testing in 2007.

Table 2b. Percent Positive Samples for Ground Turkey by Bacterium and Site, 2002-2008

		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%						
	Total	**718**	**2**	**0.3%**	**718**	**55**	**7.7%**						
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%						
	Total	**577**	**34**	**5.9%**	**577**	**92**	**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%						
	Total	**780**	**11**	**1.4%**	**780**	**98**	**12.6%**						
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%
	Total	**840**	**24**	**2.9%**	**840**	**239**	**28.5%**	**840**	**837**	**99.6%**	**840**	**812**	**96.7%**
MD[4]	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%						
	Total	**710**	**6**	**0.8%**	**710**	**101**	**14.2%**	**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%						
	Total	**836**	**27**	**3.2%**	**837**	**128**	**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%						
	Total	**596**	**11**	**1.8%**	**596**	**143**	**24.0%**						
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%						
	Total	**719**	**5**	**0.7%**	**719**	**86**	**12.0%**						
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%
	Total	**760**	**1**	**0.1%**	**760**	**43**	**5.7%**	**750**	**699**	**93.2%**	**760**	**460**	**60.5%**
PA	2008				120	11	9.2%						
	Total				**120**	**11**	**9.2%**						
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%
	Total	**762**	**9**	**1.2%**	**762**	**111**	**14.6%**	**761**	**747**	**98.2%**	**742**	**618**	**83.3%**
Grand Total		**7298**	**130**	**1.8%**	**7419**	**1107**	**14.9%**	**2190**	**2068**	**94.4%**	**2942**	**2412**	**82.0%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008.

[2] N= # of meat samples collected.

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

[4] MD did not collect samples for NARMS retail meat testing in 2007.

Table 2c. Percent Positive Samples for Ground Beef by Bacterium and Site, 2002-2008

		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	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%						
	Total	**599**	**0**	**0.0%**	**719**	**8**	**1.1%**						
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%						
	Total	**462**	**0**	**0.0%**	**582**	**3**	**0.5%**						
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%						
	Total	**656**	**0**	**0.0%**	**776**	**15**	**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%
	Total	**720**	**0**	**0.0%**	**840**	**9**	**1.1%**	**840**	**827**	**98.5%**	**839**	**670**	**79.9%**
MD[4]	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%						
	Total	**600**	**1**	**0.2%**	**710**	**9**	**1.3%**	**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%						
	Total	**713**	**0**	**0.0%**	**833**	**6**	**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%						
	Total	**480**	**0**	**0.0%**	**600**	**10**	**1.7%**						
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%						
	Total	**600**	**0**	**0.0%**	**720**	**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%
	Total	**640**	**0**	**0.0%**	**760**	**12**	**1.6%**	**750**	**693**	**92.4%**	**759**	**451**	**59.4%**
PA	2008				120	2	1.7%						
	Total				**120**	**2**	**1.7%**						
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%
	Total	**700**	**5**	**0.7%**	**821**	**23**	**2.8%**	**818**	**787**	**96.2%**	**792**	**539**	**68.1%**
Grand Total		**6170**	**6**	**0.1%**	**7481**	**97**	**1.3%**	**3008**	**2819**	**93.7%**	**2990**	**2060**	**68.9%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008.

[2] N= # of meat samples collected.

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

[4] MD did not collect samples for NARMS retail meat testing in 2007.

Table 2d. Percent Positive Samples for Pork Chop by Bacterium and Site, 2002-2008

		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%						
	Total	**597**	**3**	**0.5%**	**714**	**5**	**0.7%**						
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%						
	Total	**451**	**2**	**0.4%**	**571**	**3**	**0.5%**						
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%						
	Total	**660**	**3**	**0.5%**	**780**	**8**	**1.0%**						
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%
	Total	**720**	**0**	**0.0%**	**840**	**9**	**1.1%**	**840**	**816**	**97.1%**	**840**	**455**	**54.2%**
MD[4]	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%						
	Total	**600**	**2**	**0.3%**	**710**	**12**	**1.7%**	**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%						
	Total	**702**	**1**	**0.1%**	**823**	**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%						
	Total	**479**	**2**	**0.4%**	**599**	**11**	**1.8%**						
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%						
	Total	**600**	**1**	**0.2%**	**720**	**7**	**1.0%**						
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%
	Total	**640**	**4**	**0.6%**	**760**	**10**	**1.3%**	**750**	**647**	**86.3%**	**758**	**238**	**31.4%**
PA	2008				120	0	0.0%						
	Total				**120**	**0**	**0.0%**						
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%
	Total	**699**	**3**	**0.4%**	**819**	**17**	**2.1%**	**815**	**725**	**89.0%**	**802**	**333**	**41.5%**
Grand Total		**6148**	**21**	**0.3%**	**7456**	**84**	**1.1%**	**3005**	**2620**	**87.2%**	**3000**	**1319**	**44.0%**

[1] CT, GA, MD, OR, MN, TN joined surveillance in 2002; NY, CA in 2003; CO, NM in 2004; PA in 2008.

[2] N= # of meat samples collected.

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

[4] MD did not collect samples for NARMS retail meat testing in 2007.

Table 3. Percent Positive Samples by Bacterium and Meat Type, 2002-2008

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)

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, 2002-2008

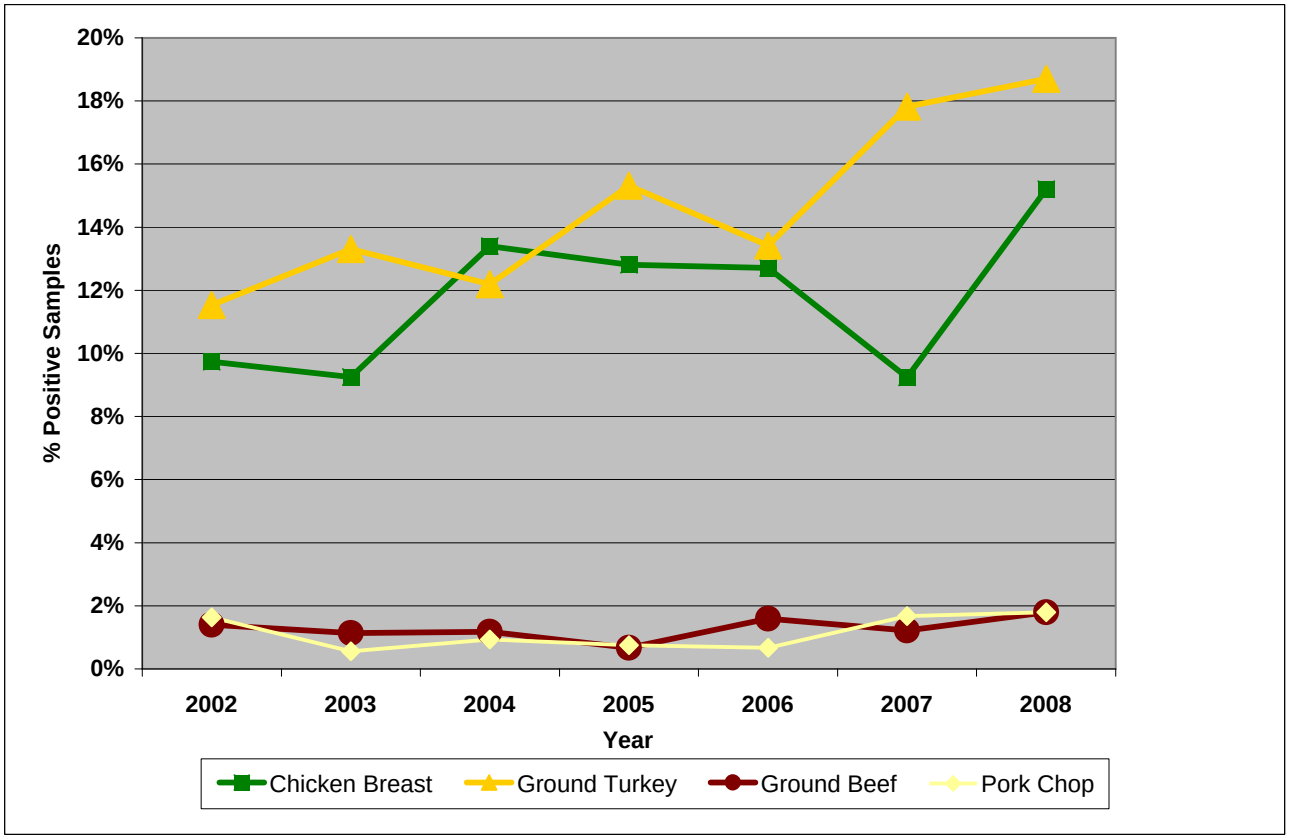
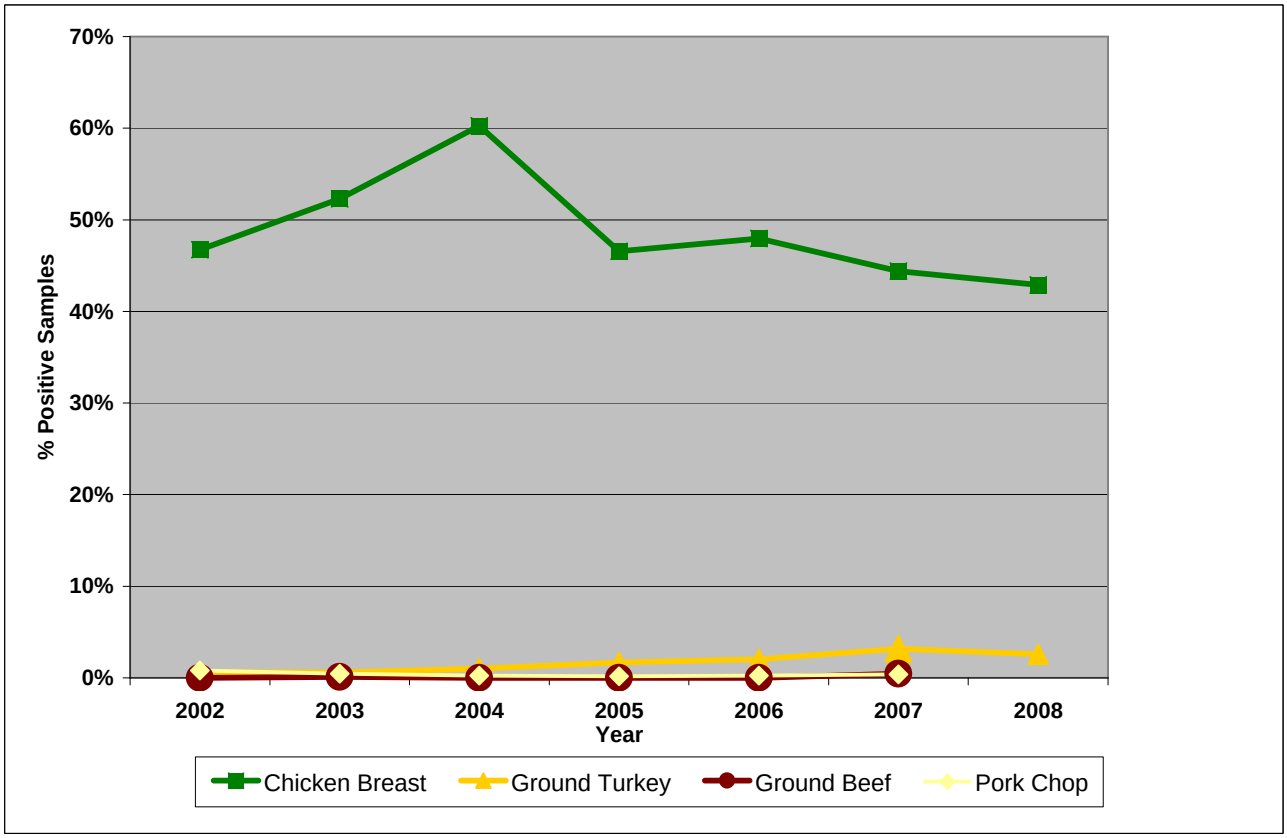


Figure 2. Percent Positive Samples for *Campylobacter* by Meat Type, All Sites, 2002-2008[1]



[1] Ground Beef and Pork Chop were not tested for *Campylobacter* in 2008 due to low recovery.

Table 4. *Salmonella* Serotype Distribution among all Meat Types, 2008

Serotype (N)[1]	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
	n[2]	%[3]	n	%	n	%	n	%
1. Heidelberg (87)	30	34.5%	56	64.4%	1	1.2%		
2. Typhimurium (76)	68	89.5%	3	4.0%	2	2.6%	3	4.0%
3. Hadar (72)	2	2.8%	70	97.2%				
4. Enteritidis (32)	30	93.8%	1	3.1%	1	3.1%		
5. Saintpaul (32)			31	96.9%	1	3.1%		
6. Kentucky (31)	30	96.8%			1	3.2%		
7. Mbandaka (19)	7	36.8%			6	31.6%	6	31.6%
8. IIIa 18:z4,z23:- (16)			16	100.0%				
9. Senftenberg (14)	4	28.6%	9	64.3%			1	7.1%
10. Anatum (9)	2	22.2%	7	77.8%				
11. Derby (8)	1	12.5%	6	75.0%			1	12.5%
12. Infantis (7)	5	71.4%	1	14.3%			1	14.3%
13. Montevideo (7)	4	57.1%	1	14.3%	2	28.6%		
14. Norwich (7)	1	14.3%	3	42.9%	2	28.6%	1	14.3%
15. Uganda (7)	1	14.3%	4	57.1%	1	14.3%	1	14.3%
16. Bareilly (6)	2	33.3%			2	33.3%	2	33.3%
17. Newport (6)			3	50.0%	3	50.0%		
18. Schwarzengrund (6)			6	100.0%				
19. Albany (5)			5	100.0%				
20. Berta (5)			5	100.0%				
21. Reading (5)			5	100.0%				
22. Agona (4)	1	25.0%	3	75.0%				
23. Adelaide (3)							3	100.0%
24. Alachua (3)			1	33.3%			2	66.7%
25. Braenderup (3)	3	100.0%						
26. Brandenburg (3)			2	66.7%	1	33.3%		
27. I 4, 12:i:- (3)	3	100.0%						
28. Muenchen (3)	1	33.3%	2	66.7%				
29. I 4,5,12:d:- (2)			2	100.0%				
30. Johannesburg (2)							2	100.0%
31. Meleagridis (2)	1	50.0%			1	50.0%		
32. I 4,5,12:i:- (1)	1	100.0%						
33. I 4,5,12:r:- (1)			1	100.0%				
34. Litchfield (1)	1	100.0%						
35. Muenster (1)			1	100.0%				
36. Ohio (1)	1	100.0%						
37. Stanley (1)			1	100.0%				
Total (491)	**199**	**40.5%**	**245**	**49.9%**	**24**	**4.9%**	**23**	**4.7%**

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

[2] Where n = # of isolates with a given a 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, 2002-2008[1]

Meat Type	Year (N)	Aminoglycosides				Amino-penicillins	β-Lactamase Inhibitor Combinations	Cephalosporins		Cepha-mycins	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%
	Z Statistic	**N/A[4]**	**-0.4776**	**-0.8844**	**0.4454**	**0.2645**	**-0.1783**	**-0.2002**	**-0.9610**	**0.1093**	**-4.3459**	**-0.3853**	**0.6069**	**N/A**	**0.7664**	**-2.2397**
	P Value[3]	**N/A**	**0.6329**	**0.3765**	**0.6560**	**0.7914**	**0.8585**	**0.8413**	**0.3366**	**0.9129**	**<0.0001**	**0.7000**	**0.5439**	**N/A**	**0.4434**	**0.0251**
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%
	Z Statistic	**N/A**	**-2.2004**	**0.8004**	**-3.8963**	**-7.2966**	**2.8379**	**0.4084**	**0.4182**	**0.4084**	**-0.4657**	**0.1228**	**-0.1042**	**N/A**	**3.2642**	**-5.0275**
	P Value	**N/A**	**0.0278**	**0.4235**	**<0.0001**	**<0.0001**	**0.0045**	**0.6830**	**0.6758**	**0.6830**	**0.6414**	**0.9022**	**0.9170**	**N/A**	**0.0011**	**<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%
	Z Statistic	**N/A**	**-1.1715**	**-0.9424**	**1.1745**	**2.0798**	**2.6277**	**2.6277**	**2.6277**	**2.6277**	**0.9632**	**0.7911**	**2.0082**	**N/A**	**N/A**	**0.9632**
	P Value	**N/A**	**0.2414**	**0.3460**	**0.2402**	**0.0375**	**0.0086**	**0.0086**	**0.0086**	**0.0086**	**0.3354**	**0.4289**	**0.4460**	**N/A**	**N/A**	**0.3354**
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%
	Z Statistic	**N/A**	**0.3300**	**0.8195**	**3.2964**	**2.0676**	**2.8919**	**2.8919**	**2.8919**	**2.8919**	**1.7701**	**1.0569**	**4.1179**	**N/A**	**N/A**	**2.2349**
	P Value	**N/A**	**0.7414**	**0.4125**	**0.0010**	**0.0387**	**0.0038**	**0.0038**	**0.0038**	**0.0038**	**0.0767**	**0.2906**	**<0.0001**	**N/A**	**N/A**	**0.0254**

[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, 2002-2008

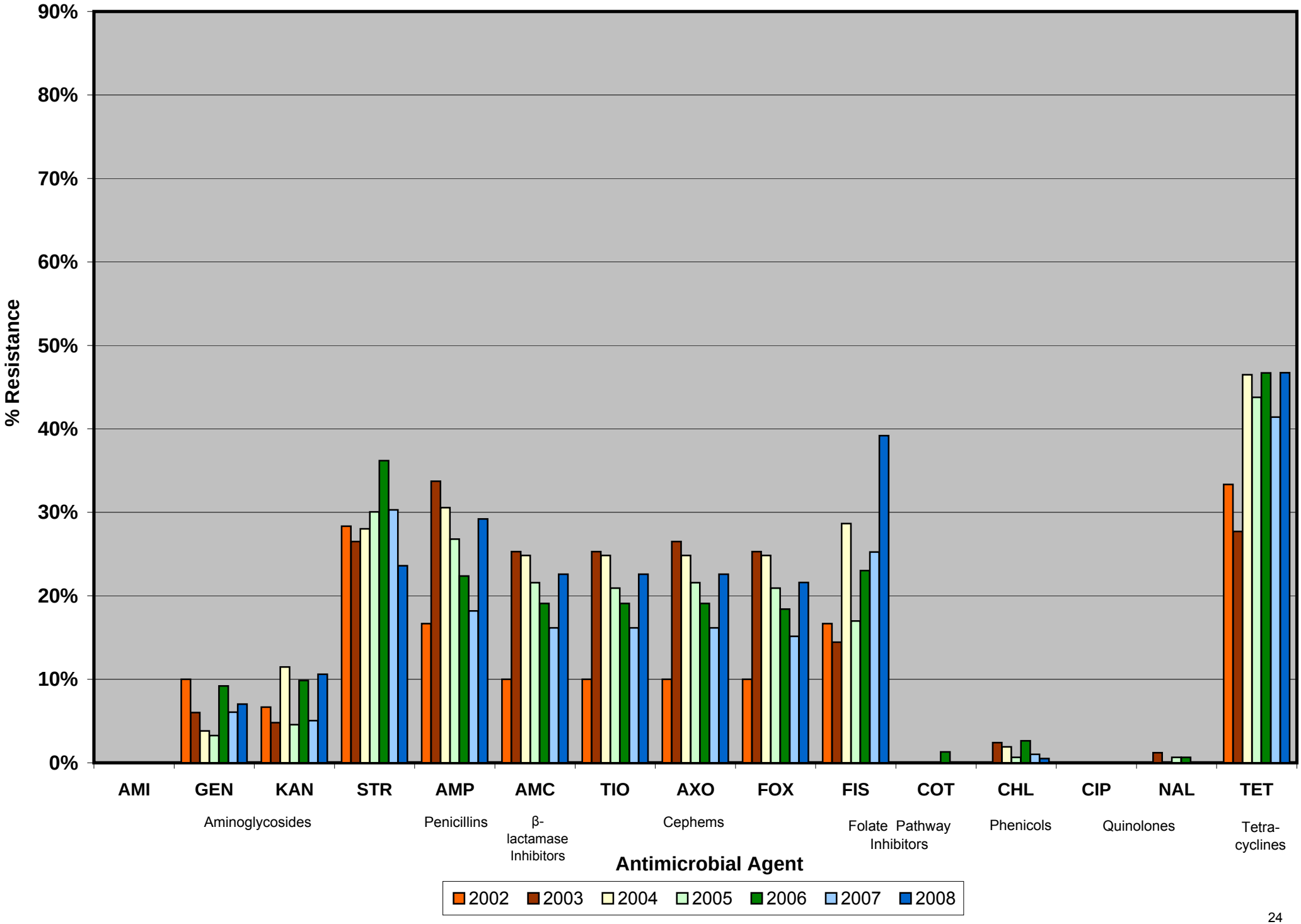


Figure 3b. Antimicrobial Resistance among *Salmonella* from Ground Turkey, 2002-2008

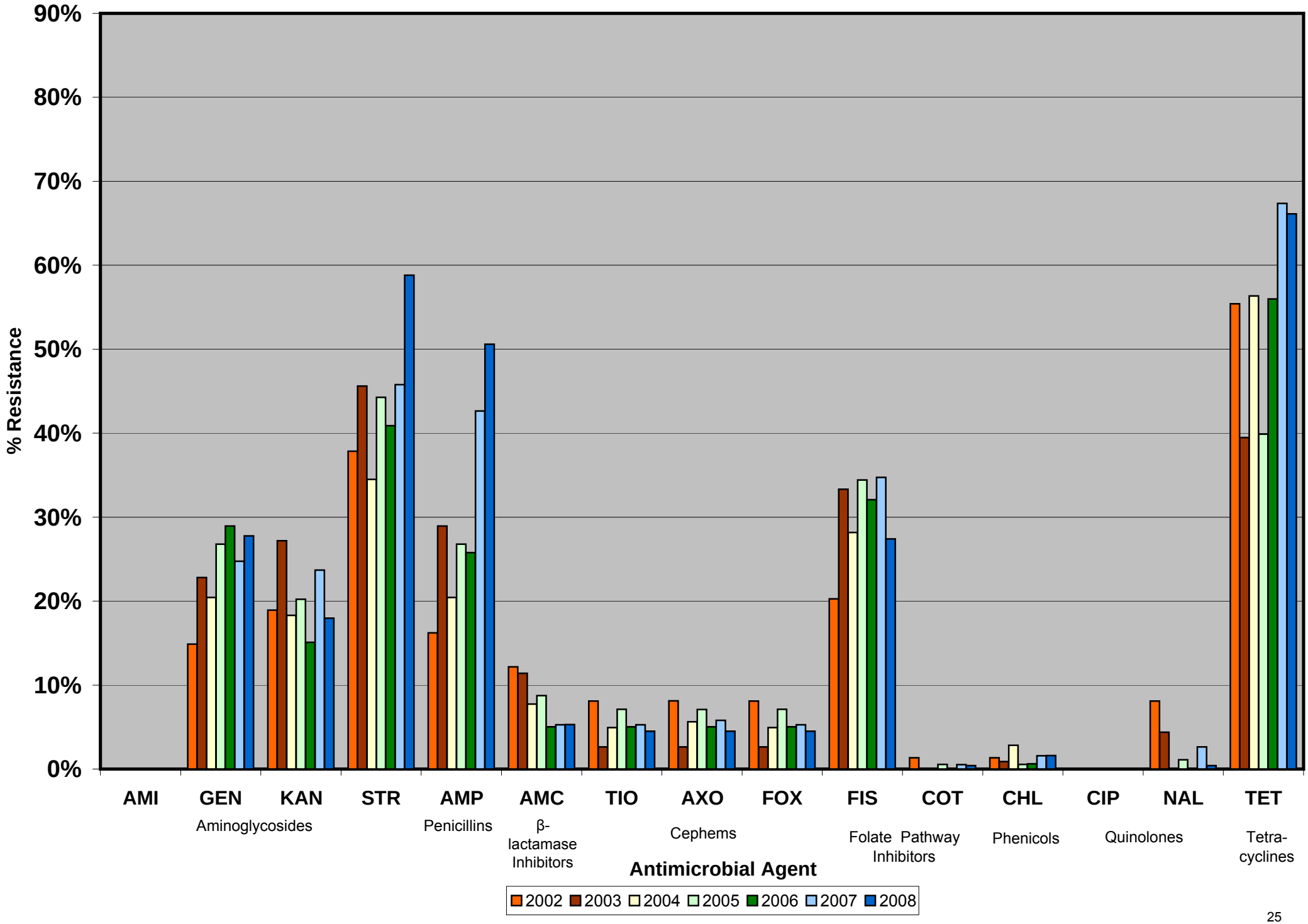


Figure 3c. Antimicrobial Resistance among *Salmonella* from Ground Beef, 2002-2008

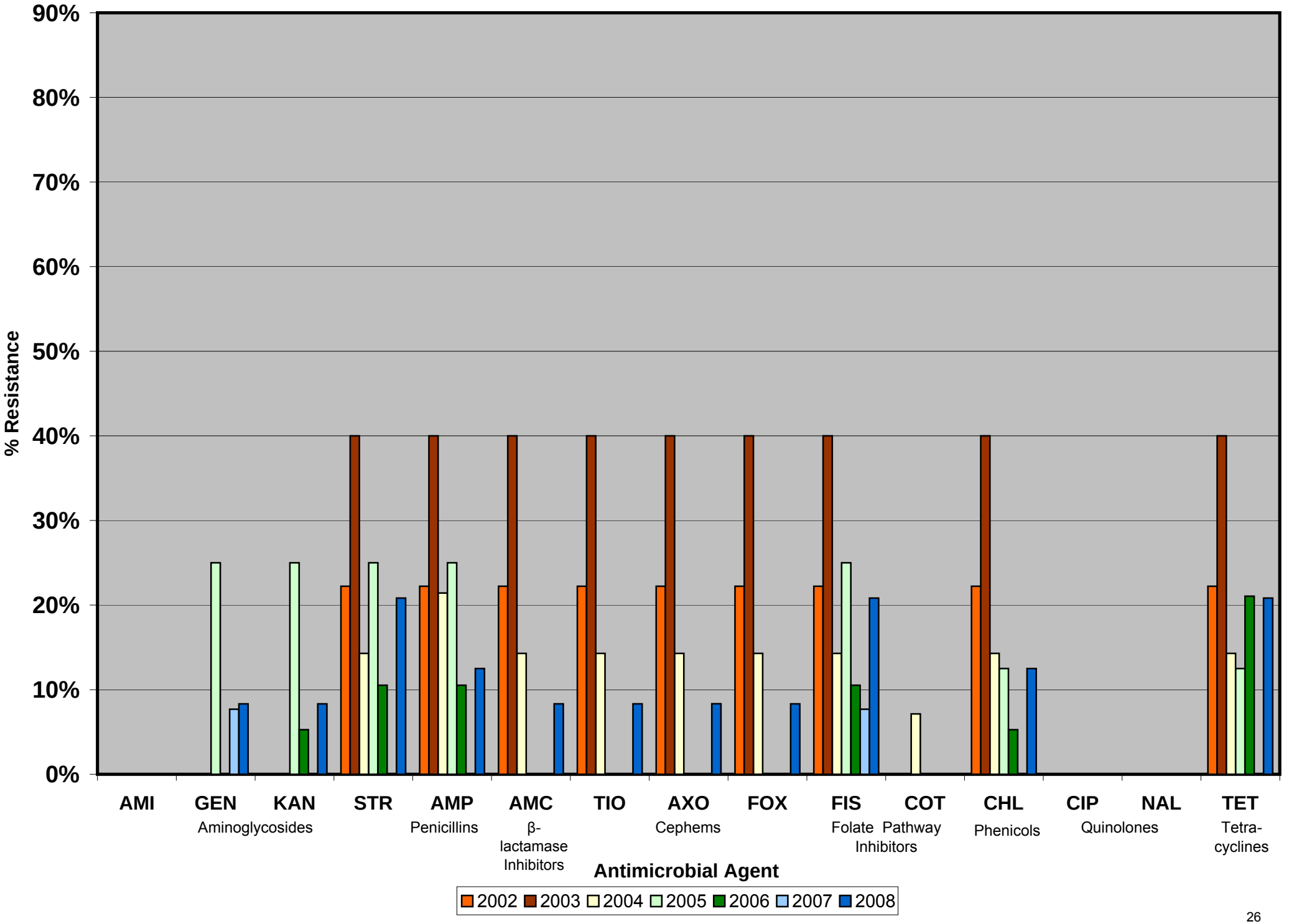


Figure 3d. Antimicrobial Resistance among *Salmonella* from Pork Chop, 2002-2008

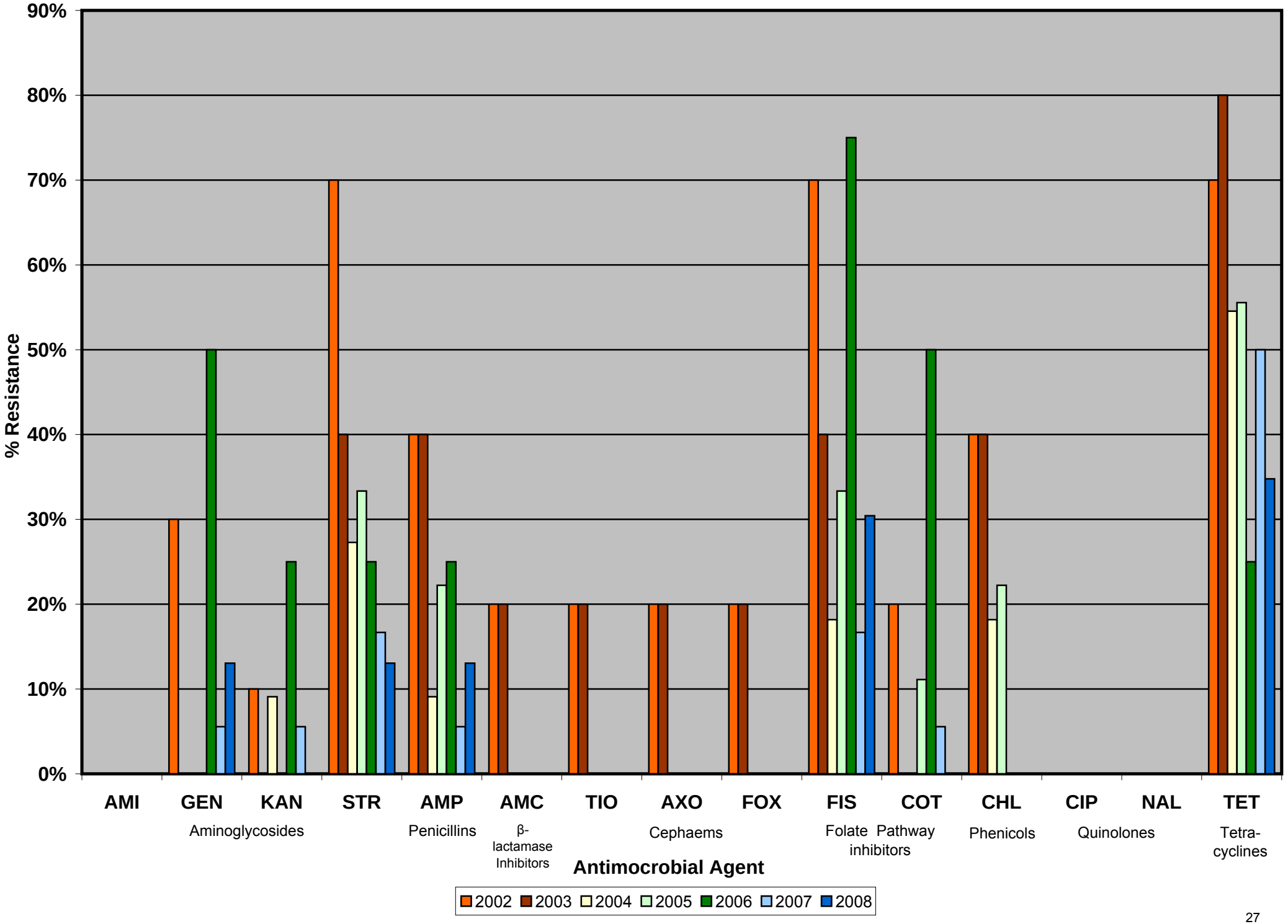


Table 6. Antimicrobial Resistance among *Salmonella* by Top 6 Serotypes within Meat Type, 2008[1]

		Antimicrobial Agent Class														
		Aminoglycosides				Penicillins	β-lactamase inhibitors	Cephems			Folate Pathway inhibitors		Phenicols	Quinolones		Tetra-cyclines
Meat Type	Serotype (N)	AMI	GEN	KAN	STR	AMP	AMC	TIO	AXO	FOX	FIS	COT	CHL	CIP	NAL	TET
Chicken Breast	*Typhimurium* (68)	-	1.5%	25.0%	16.2%	61.8%	50.0%	50.0%	50.0%	47.1%	95.6%	-	-	-	-	94.1%
	Enteritidis (30)	-	3.3%	-	3.3%	6.7%	-	-	-	-	3.3%	-	-	-	-	3.3%
	Heidelberg (30)	-	30.0%	13.3%	40.0%	23.3%	16.7%	16.7%	16.7%	16.7%	30.0%	-	3.3%	-	-	26.7%
	Kentucky (30)	-	6.7%	-	66.7%	20.0%	20.0%	20.0%	20.0%	20.0%	6.7%	-	-	-	-	56.7%
	Mbandaka (7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Infantis (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ground Turkey	*Hadar* (70)	-	14.3%	10.0%	100.0%	61.4%	-	-	-	-	25.7%	-	-	-	1.4%	97.1%
	Heidelberg (56)	-	57.1%	53.6%	71.4%	83.9%	7.1%	3.6%	3.6%	3.6%	28.6%	-	-	-	-	80.4%
	Saintpaul (31)	-	9.7%	3.2%	25.8%	41.9%	-	-	-	-	16.1%	-	-	-	-	67.7%
	Illa 18:z4,z23:- (16)	-	6.3%	6.3%	6.3%	6.3%	-	-	-	-	6.3%	-	6.3%	-	-	6.3%
	Senftenberg (9)	-	22.2%	22.2%	33.3%	33.3%	22.2%	22.2%	22.2%	22.2%	22.2%	-	11.1%	-	-	22.2%
	Anatum (7)	-	14.3%	-	14.3%	42.9%	42.9%	42.9%	42.9%	42.9%	14.3%	-	-	-	-	42.9%
Ground Beef	*Mbandaka* (6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Newport (3)	-	-	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	-	66.7%	-	-	66.7%
	Bareilly (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Montevideo (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Norwich (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Typhimurium (2)	-	-	-	50.0%	50.0%	-	-	-	-	50.0%	-	50.0%	-	-	50.0%
Pork Chop	*Mbandaka* (6)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Adelaide (3)	-	100.0%	-	66.7%	100.0%	-	-	-	-	100.0%	-	-	-	-	100.0%
	Typhimurium (3)	-	-	-	33.3%	-	-	-	-	-	33.3%	-	-	-	-	33.3%
	Alachua (2)	-	-	-	-	-	-	-	-	-	100.0%	-	-	-	-	100.0%
	Bareilly (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Johannesburg (2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%

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

Table 7. Multidrug Resistance Patterns among *Salmonella* Isolates, 2002-2008[1]

Year		2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Source	Chicken Breast	60	83	157	153	152	99	199
	Ground Turkey	74	114	142	183	159	190	245
	Ground Beef	9	10	14	8	19	13	24
	Pork Chop	10	5	11	9	8	18	23
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
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3
	Pork Chop	40.0% 4	40.0% 2	9.1% 1	22.2% 2	–	–	–
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	–	–	–
3. At Least ACSSuTAuCf[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
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	–	–	–	8.3% 2
	Pork Chop	20.0% 2	20.0% 1	–	–	–	–	–
4. At Least Ceftiofur and Nalidixic Acid Resistant	Chicken Breast	–	–	–	–	–	–	–
	Ground Turkey	–	0.9% 1	–	–	–	0.5% 1	–
	Ground Beef	–	–	–	–	–	–	–
	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] ACSSuTAuCf = ACSSuT, amoxicillin-clavulanic acid, and ceftiofur.

Table 8. Multidrug Resistance among *Salmonella* Isolates by Antimicrobial Class, 2002-2008[1]

Year		2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Source	Chicken Breast	60	83	157	153	152	99	199
	Ground Turkey	74	114	142	183	159	190	245
	Ground Beef	9	10	14	8	19	13	24
	Pork Chop	10	5	11	9	8	18	23
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
	Ground Turkey	37.8% 28	34.2% 39	28.9% 41	30.1% 55	17.6% 28	15.3% 29	20.8% 51
	Ground Beef	77.8% 7	60.0% 6	78.6% 11	75.0% 6	73.7% 14	92.3% 12	79.2% 19
	Pork Chop	20.0% 2	20.0% 1	45.5% 5	44.4% 4	25.0% 2	44.4% 8	65.2% 15
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
	Ground Turkey	20.3% 15	29.0% 33	26.1% 37	29.0% 53	24.5% 39	42.6% 81	51.0% 125
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	25.0% 2	10.5% 2	–[2]	20.8% 5
	Pork Chop	60.0% 6	40.0% 2	18.2% 2	22.2% 2	25.0% 2	5.6% 1	17.4% 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
	Ground Turkey	13.5% 10	24.6% 28	12.7% 18	7.7% 14	8.2% 13	14.7% 28	15.1% 37
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3
	Pork Chop	40.0% 4	40.0% 2	18.2% 2	22.2% 2	25.0% 2	5.6% 1	13.0% 3
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
	Ground Turkey	12.2% 9	14.0% 16	4.9% 7	2.7% 5	3.1% 5	3.2% 6	2.9% 7
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	12.5% 1	5.3% 1	–	12.5% 3
	Pork Chop	40.0% 4	40.0% 2	9.1% 1	22.2% 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
	Ground Turkey	10.8% 8	3.5% 4	2.8% 4	2.2% 4	1.9% 3	2.1% 4	2.0% 5
	Ground Beef	22.2% 2	40.0% 4	14.3% 2	–	–	–	8.3% 2
	Pork Chop	20.0% 2	40.0% 2	–	–	–	–	–

[1] Dashes indicate 0.0% resistance.

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

Table 9a. MIC Distribution among *Salmonella* from Chicken Breast, 2002-2008

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							
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**					
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**			
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**			
Aminopenicillins																					
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**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (60)	1.7	**0.1**	[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**				
Cephalosporins																					
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**						
Ceftriaxone	2002 (60)	0.0	**10.0**	[0.0 - 6.0]					90.0					**5.0**	**3.3**	**1.7**					
	2003 (83)	0.0	**26.5**	[0.0 - 4.3]					73.5				**1.2**	**1.2**	**16.9**	**7.2**					
	2004 (157)	0.0	**24.8**	[0.0 - 2.3]					75.2					**1.9**	**18.5**	**4.5**					
	2005 (153)	0.0	**21.6**	[0.0 - 2.4]					77.8	0.7				**2.0**	**17.0**	**2.6**					
	2006 (152)	0.0	**19.1**	[0.0 - 3.6]					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**					

[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 black vertical bars and resistance breakpoints are double 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 9a. MIC Distribution among *Salmonella* from Chicken Breast, 2002-2008 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
Cephamycins																					
Cefoxitin	2002 (60)	0.0	**10.0**	[3.8 - 20.5]								60.2	13.3	1.2		**25.3**					
	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**				
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**	
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											
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**				
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														
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							
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**				

[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, 2002-2008

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)	0.0	**0.4**	[0.0 - 1.5]							11.0	74.7	12.7	1.2		0.4					
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**					
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**			
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	**58.4**	[52.3 - 65.0]												41.2	**25.7**	**33.1**			
Aminopenicillins																					
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**				
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**				
Cephalosporins																					
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**						
Ceftriaxone	2002 (74)	0.0	**8.1**	[0.0 - 4.9]					91.9				**1.4**	**5.4**	**1.4**						
	2003 (114)	0.0	**2.6**	[0.0 - 3.2]					97.4					**0.9**		**1.8**					
	2004 (142)	0.0	**5.6**	[0.0 - 2.6]					94.4						**2.1**	**3.5**					
	2005 (183)	0.0	**7.1**	[0.9 - 6.3]					92.9						**3.3**	**1.1**	**1.6**	**1.1**			
	2006 (159)	0.0	**5.0**	[0.0 - 3.5]					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**			

[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 black vertical bars and resistance breakpoints are double 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 9b. MIC Distribution among *Salmonella* from Ground Turkey, 2002-2008 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
Cephamycins																					
Cefoxitin	2002 (74)	1.4	**8.1**	[3.0 - 16.8]							1.8	55.3	31.6	7.0	1.8	**2.6**					
	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**				
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**	
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**							
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**				
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												
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**				
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**				

[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, 2002-2008

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]						1.1	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								
Gentamicin	2002 (9)	0.0	**0.0**	[7.7 - 25.0]					55.6	44.4											
	2003 (10)	0.0	**0.0**	[15.5 - 31.6]					30.0	40.0	30.0										
	2004 (14)	0.0	**0.0**	[14.1 - 28.0]					57.1	42.9											
	2005 (8)	0.0	**25.0**	[20.5 - 33.8]					37.5	37.5					**25.0**						
	2006 (19)	0.0	**0.0**	[22.0 - 36.6]					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**					
Kanamycin	2002 (9)	0.0	**0.0**	[10.7 - 29.7]										100.0							
	2003 (10)	0.0	**0.0**	[19.3 - 36.3]										100.0							
	2004 (14)	0.0	**0.0**	[12.3 - 25.7]										100.0							
	2005 (8)	0.0	**25.0**	[14.7 - 26.8]										75.0				**25.0**			
	2006 (19)	0.0	**5.3**	[9.9 - 21.6]										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**			
Streptomycin	2002 (9)	N/A	**22.2**	[26.8 - 49.9]												77.8		**22.2**			
	2003 (10)	N/A	**40.0**	[36.3 - 55.2]												60.0		**40.0**			
	2004 (14)	N/A	**14.3**	[26.7 - 42.9]												85.7		**14.3**			
	2005 (8)	N/A	**25.0**	[36.9 - 51.8]												75.0	**12.5**	**12.5**			
	2006 (19)	N/A	**10.5**	[33.2 - 48.9]												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**			
Aminopenicillins																					
Ampicillin	2002 (9)	0.0	**22.2**	[8.7 - 26.6]							33.3	33.3	11.1				**22.2**				
	2003 (10)	0.0	**40.0**	[20.8 - 38.2]							10.0	50.0						40.0			
	2004 (14)	0.0	**21.4**	[14.1 - 28.0]							78.6						**21.4**				
	2005 (8)	0.0	**25.0**	[20.5 - 33.8]							75.0						**25.0**				
	2006 (19)	0.0	**10.5**	[19.2 - 33.3]							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**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (9)	0.0	**22.2**	[5.7 - 21.8]							55.6	22.2					**22.2**				
	2003 (10)	0.0	**40.0**	[6.2 - 18.7]							50.0	10.0					**40.0**				
	2004 (14)	0.0	**14.3**	[3.9 - 13.4]							71.4	7.1		7.1			**14.3**				
	2005 (8)	25.0	**0.0**	[5.1 - 13.8]							75.0				25.0						
	2006 (19)	5.3	**0.0**	[2.2 - 9.7]							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**				
Cephalosporins																					
Ceftiofur	2002 (9)	0.0	**22.2**	[3.0 - 16.8]						44.4	33.3				**22.2**						
	2003 (10)	0.0	**40.0**	[0.5 - 7.5]				30.0	30.0						**40.0**						
	2004 (14)	0.0	**14.3**	[2.0 - 9.9]						50.0	35.7				**14.3**						
	2005 (8)	0.0	**0.0**	[3.8 - 11.8]						37.5	62.5										
	2006 (19)	0.0	**0.0**	[2.2 - 9.7]						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**						
Ceftriaxone	2002 (9)	0.0	**22.2**	[0.0 - 4.9]					77.8						**11.1**	**11.1**					
	2003 (10)	0.0	**40.0**	[0.0 - 3.2]					60.0						**30.0**		**10.0**				
	2004 (14)	0.0	**14.3**	[0.0 - 2.6]					85.7							**7.1**	**7.1**				
	2005 (8)	0.0	**0.0**	[0.9 - 6.3]					100.0												
	2006 (19)	0.0	**0.0**	[0.0 - 3.5]					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**					

[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 black vertical bars and resistance breakpoints are double 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 9c. MIC Distribution among *Salmonella* from Ground Beef, 2002-2008 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
Cephamycins																					
Cefoxitin	2002 (9)	11.1	**22.2**	[3.0 - 16.8]								40.0	20.0			**40.0**					
	2003 (10)	0.0	**40.0**	[0.5 - 7.5]								40.0	20.0			**40.0**					
	2004 (14)	0.0	**14.3**	[2.0 - 9.9]								50.0	14.3	21.4			**14.3**				
	2005 (8)	0.0	**0.0**	[3.8 - 11.8]								50.0	37.5	12.5							
	2006 (19)	0.0	**0.0**	[2.2 - 9.7]								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**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (9)	N/A	**22.2**	[11.8 - 31.2]											22.2	44.44	11.1				**22.2**
	2003 (10)	N/A	**40.0**	[24.8 - 42.8]											20.0	30.0	10.0				**40.0**
Sulfisoxazole	2004 (14)	N/A	**14.3**	[20.9 - 36.3]											7.1	7.1	71.4			**14.3**	
	2005 (8)	N/A	**25.0**	[27.6 - 41.8]											0.0	12.5	62.5			**25.0**	
	2006 (19)	N/A	**10.5**	[24.9 - 39.9]											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**	
Trimethoprim-	2002 (9)	N/A	**0.0**	[0.0 - 7.3]				100.0													
Sulfamethoxazole	2003 (10)	N/A	**0.0**	[0.0 - 3.2]				60.0	40.0												
	2004 (14)	N/A	**7.1**	[0.0 - 2.6]				92.9						**7.1**							
	2005 (8)	N/A	**0.0**	[0.0 - 3.0]				87.5	12.5												
	2006 (19)	N/A	**0.0**	[0.0 - 2.3]				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											
Phenicols																					
Chloramphenicol	2002 (9)	0.0	**22.2**	[0.0 - 7.3]									11.1	66.7			**22.2**				
	2003 (10)	0.0	**40.0**	[0.0 - 4.8]									10.0	50.0			**40.0**				
	2004 (14)	0.0	**14.3**	[0.8 - 7.1]									7.1	78.6			**14.3**				
	2005 (8)	0.0	**12.5**	[0.0 - 3.0]									12.5	75.0			**12.5**				
	2006 (19)	5.3	**5.3**	[0.0 - 3.5]									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**				
Quinolones																					
Ciprofloxacin	2002 (9)	0.0	**0.0**	[0.0 - 4.9]	66.7	22.2	11.1														
	2003 (10)	0.0	**0.0**	[0.0 - 3.2]	70.0	30.0															
	2004 (14)	0.0	**0.0**	[0.0 - 2.6]	100.0																
	2005 (8)	0.0	**0.0**	[0.0 - 2.0]	75.0	25.0															
	2006 (19)	0.0	**0.0**	[0.0 - 2.3]	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															
Nalidixic Acid	2002 (9)	N/A	**0.0**	[3.0 - 16.8]									66.7	22.2	11.1						
	2003 (10)	N/A	**0.0**	[1.4 - 9.9]								10.0	70.0	20.0							
	2004 (14)	N/A	**0.0**	[0.0 - 2.6]								7.1	92.9								
	2005 (8)	N/A	**0.0**	[0.1 - 3.9]									100.0								
	2006 (19)	N/A	**0.0**	[0.0 - 2.3]								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								
Tetracyclines																					
Tetracycline	2002 (9)	0.0	**22.2**	[43.4 - 67.0]									77.8				**22.2**				
	2003 (10)	0.0	**40.0**	[30.4 - 49.1]									60.0				**40.0**				
	2004 (14)	0.0	**14.3**	[47.8 - 64.6]									85.7				**14.3**				
	2005 (8)	0.0	**12.5**	[32.7 - 47.4]									87.5				**12.5**				
	2006 (19)	0.0	**21.1**	[47.9 - 63.8]									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**				

[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, 2002-2008

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 - 4.9]							80.0	20.0									
	2003 (5)	0.0	**0.0**	[0.0 - 3.2]							100.0										
	2004 (11)	0.0	**0.0**	[0.0 - 2.6]							63.6	27.3	9.1								
	2005 (9)	0.0	**0.0**	[0.0 - 2.0]							55.6	33.3	11.1								
	2006 (8)	0.0	**0.0**	[0.0 - 2.3]							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								
Gentamicin	2002 (10)	0.0	**30.0**	[7.7 - 25.0]					30.0	40.0						**30.0**					
	2003 (5)	20.0	**0.0**	[15.5 - 31.6]					40.0	40.0				20.0							
	2004 (11)	0.0	**0.0**	[14.1 - 28.0]					63.6	36.4											
	2005 (9)	0.0	**0.0**	[20.5 - 33.8]					55.6	33.3		11.1									
	2006 (8)	12.5	**50.0**	[22.0 - 36.6]					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**					
Kanamycin	2002 (10)	0.0	**10.0**	[10.7 - 29.7]										70.0	20.0			**10.0**			
	2003 (5)	20.0	**0.0**	[19.3 - 36.3]										80.0		20.0					
	2004 (11)	0.0	**9.1**	[12.3 - 25.7]										81.8	9.1			**9.1**			
	2005 (9)	0.0	**0.0**	[14.7 - 26.8]										100.0							
	2006 (8)	0.0	**25.0**	[9.9 - 21.6]										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							
Streptomycin	2002 (10)	N/A	**70.0**	[26.8 - 49.9]												30.0	**10.0**	**60.0**			
	2003 (5)	N/A	**40.0**	[36.3 - 55.2]												60.0	**20.0**	**20.0**			
	2004 (11)	N/A	**27.3**	[26.7 - 42.9]												72.7		**27.3**			
	2005 (9)	N/A	**33.3**	[36.9 - 51.8]												66.7	**22.2**	**11.1**			
	2006 (8)	N/A	**25.0**	[33.2 - 48.9]												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**			
Aminopenicillins																					
Ampicillin	2002 (10)	0.0	**40.0**	[8.7 - 26.6]							50.0	10.0					**40.0**				
	2003 (5)	0.0	**40.0**	[20.8 - 38.2]							40.0	20.0					**40.0**				
	2004 (11)	0.0	**9.1**	[14.1 - 28.0]							81.8		9.1				**9.1**				
	2005 (9)	0.0	**22.2**	[20.5 - 33.8]							66.7		11.1				**22.2**				
	2006 (8)	0.0	**25.0**	[19.2 - 33.3]							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**				
β-Lactams/ β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (10)	20.0	**20.0**	[5.7 - 21.8]							60.0				20.0		**20.0**				
	2003 (5)	20.0	**20.0**	[6.2 - 18.7]							40.0	20.0			20.0		**20.0**				
	2004 (11)	18.2	**0.0**	[3.9 - 13.4]							72.7	9.1			18.2						
	2005 (9)	22.2	**0.0**	[5.1 - 13.8]							66.7	11.1		22.2							
	2006 (8)	25.0	**0.0**	[2.2 - 9.7]							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							
Cephalosporins																					
Ceftiofur	2002 (10)	0.0	**20.0**	[3.0 - 16.8]						50.0	30.0				**20.0**						
	2003 (5)	0.0	**20.0**	[0.5 - 7.5]						60.0		20.0			**20.0**						
	2004 (11)	0.0	**0.0**	[2.0 - 9.9]						72.7	27.3										
	2005 (9)	0.0	**0.0**	[3.8 - 11.8]						22.2	66.7	11.0									
	2006 (8)	0.0	**0.0**	[2.2 - 9.7]							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										
Ceftriaxone	2002 (10)	0.0	**20.0**	[0.0 - 4.9]					80.0						**20.0**						
	2003 (5)	0.0	**20.0**	[0.0 - 3.2]					80.0							**20.0**					
	2004 (11)	0.0	**0.0**	[0.0 - 2.6]					100.0												
	2005 (9)	0.0	**0.0**	[0.9 - 6.3]					100.0												
	2006 (8)	0.0	**0.0**	[0.0 - 3.5]					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												

[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 black vertical bars and resistance breakpoints are double 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 9d. MIC Distribution among *Salmonella* from Pork Chop, 2002-2008 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
Cephamycins																					
Cefoxitin	2002 (10)	0.0	**20.0**	[3.0 - 16.8]								20.0	20.0	40.0		**20.0**					
	2003 (5)	0.0	**20.0**	[0.5 - 7.5]								20.0	20.0	40.0		**20.0**					
	2004 (11)	0.0	**0.0**	[2.0 - 9.9]								81.8	18.2								
	2005 (9)	11.1	**0.0**	[3.8 - 11.8]							11.1	22.2	55.6		11.1						
	2006 (8)	25.0	**0.0**	[2.2 - 9.7]								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								
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (10)	N/A	**70.0**	[11.8 - 31.2]											10.0		20.0				**70.0**
	2003 (5)	N/A	**40.0**	[24.8 - 42.8]											20.0	40.0					**40.0**
Sulfisoxazole	2004 (11)	N/A	**18.2**	[20.9 - 36.3]												9.1	72.7			**18.2**	
	2005 (9)	N/A	**33.3**	[27.6 - 41.8]											11.1	22.2	33.3			**33.3**	
	2006 (8)	N/A	**75.0**	[24.9 - 39.9]												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**	
Trimethoprim-	2002 (10)	N/A	**20.0**	[0.0 - 7.3]				70.0	10.0					**20.0**							
Sulfamethoxazole	2003 (5)	N/A	**0.0**	[0.0 - 3.2]				60.0	40.0												
	2004 (11)	N/A	**0.0**	[0.0 - 2.6]				100.0													
	2005 (9)	N/A	**11.1**	[0.0 - 3.0]				77.8	11.1					**11.1**							
	2006 (8)	N/A	**50.0**	[0.0 - 2.3]				37.5	12.5				**50.0**								
	2007 (18)	N/A	**5.6**	[0.0 - 18.5]				88.9	5.6					**5.6**							
	2008 (23)	N/A	**0.0**	[0.0 - 14.8]				91.3	4.4	4.4											
Phenicols																					
Chloramphenicol	2002 (10)	0.0	**40.0**	[0.0 - 7.3]									30.0	30.0			**40.0**				
	2003 (5)	0.0	**40.0**	[0.0 - 4.8]										60.0			**40.0**				
	2004 (11)	0.0	**18.2**	[0.8 - 7.1]										81.8			**18.2**				
	2005 (9)	11.1	**22.2**	[0.0 - 3.0]								11.1	22.2	33.3	11.1		**22.2**				
	2006 (8)	37.5	**0.0**	[0.0 - 3.5]										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							
Quinolones																					
Ciprofloxacin	2002 (10)	0.0	**0.0**	[0.0 - 4.9]	80.0	20.0															
	2003 (5)	0.0	**0.0**	[0.0 - 3.2]	60.0	20.0	20.0														
	2004 (11)	0.0	**0.0**	[0.0 - 2.6]	100.0																
	2005 (9)	0.0	**0.0**	[0.0 - 2.0]	77.8	22.2															
	2006 (8)	0.0	**0.0**	[0.0 - 2.3]	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														
Nalidixic Acid	2002 (10)	N/A	**0.0**	[3.0 - 16.8]									60.0	40.0							
	2003 (5)	N/A	**0.0**	[1.4 - 9.9]									80.0		20.0						
	2004 (11)	N/A	**0.0**	[0.0 - 2.6]									100.0								
	2005 (9)	N/A	**0.0**	[0.1 - 3.9]								11.1	77.8	11.1							
	2006 (8)	N/A	**0.0**	[0.0 - 2.3]									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							
Tetracyclines																					
Tetracycline	2002 (10)	0.0	**70.0**	[43.4 - 67.0]									30.0			**10.0**	**60.0**				
	2003 (5)	0.0	**80.0**	[30.4 - 49.1]									20.0				**80.0**				
	2004 (11)	0.0	**54.5**	[47.8 - 64.6]									45.5			**18.2**	**36.4**				
	2005 (9)	0.0	**55.6**	[32.7 - 47.4]									44.4			**11.1**	**44.4**				
	2006 (8)	0.0	**25.0**	[47.9 - 63.8]									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**				

[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, 2002-2008[1]

	Species	2002	2003	2004	2005	2006	2007	2008
Total Species (a) Per Year	***C. jejuni***	**202**	**330**	**517**	**414**	**439**	**356**	**339**
	C. coli	**95**	**147**	**204**	**160**	**157**	**162**	**200**
	C. lari	**0**	**2**	**0**	**2**	**3**	**0**	**2**
Total (A)		**297**	**479**	**721**	**576**	**599**	**518**	**541**
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
	C. coli	94.7% 90	96.6% 142	96.1% 196	94.4% 151	92.4% 145	88.3% 143	90.5% 181
	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**
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
	C. coli	2.1% 2	0.7% 1	2.5% 5	5.6% 9	6.4% 10	8.6% 14	9.5% 19
	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**

[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, 2002-2008

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

Table 11b. *Campylobacter coli* Isolates from Chicken Breast by Month for All Sites, 2002-2008

Month	2002 n (%)	2003 n (%)	2004 n (%)	2005 n (%)	2006 n (%)	2007 n (%)	2008 n (%)
January	5 (5.6)	4 (2.8)	18 (9.2)	15 (9.9)	7 (4.8)	5 (3.5)	14 (7.7)
February	4 (4.4)	5 (3.5)	19 (9.7)	16 (10.6)	8 (5.5)	10 (7.0)	12 (6.6)
March	6 (6.7)	6 (4.2)	15 (7.7)	9 (6.0)	10 (6.9)	10 (7.0)	29 (16.0)
April	6 (6.7)	15 (10.6)	8 (4.1)	11 (7.3)	11 (7.6)	12 (8.4)	11 (6.1)
May	11 (12.2)	11 (7.7)	10 (5.1)	10 (6.6)	12 (8.3)	14 (9.8)	9 (5.0)
June	17 (18.9)	11 (7.7)	10 (5.1)	17 (11.3)	12 (8.3)	10 (7.0)	13 (7.2)
July[3]		24 (16.9)	16 (8.2)	15 (9.9)	16 (11.0)	14 (9.8)	14 (7.7)
August	7 (7.8)	5 (3.5)	17 (8.7)	6 (4.0)	7 (4.8)	11 (7.7)	16 (8.8)
September	8 (8.9)	20 (14.1)	20 (10.2)	7 (4.6)	14 (9.7)	10 (7.0)	16 (8.8)
October	10 (11.1)	19 (13.4)	18 (9.2)	19 (12.6)	14 (9.7)	16 (11.2)	18 (9.9)
November	2 (2.2)	4 (2.8)	25 (12.8)	11 (7.3)	23 (15.9)	14 (9.8)	10 (5.5)
December	14 (15.6)	18 (12.7)	20 (10.2)	15 (9.9)	11 (7.6)	17 (11.9)	19 (10.5)
Total N (%)	**90 (100)**	**142 (100)**	**196 (100)**	**151 (100)**	**145 (100)**	**143 (100)**	**181 (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, 2002-2008[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%	48.6%
		2008 (329)	-	0.3%	0.9%	1.2%	1.2%	-	14.6%	14.6%	49.9%
		Total (2523)	< 0.1%	0.5%	0.6%	0.8%	0.6%	-	15.5%	15.7%	46.7%
	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%
		Total (1048)	0.4%	7.2%	6.1%	8.3%	8.1%	-	20.0%	22.1%	45.4%
	C. lari	2003 (2)	-				-		-		-
		2006 (1)	-	-	-	-	-	-	100.0%	100.0%	-
		Total (3)	-	-	-	-	-	-	33.3%	100.0%	-
	Total (N=3574)		0.1%	1.9%	2.2%	3.0%	2.8%	-	16.8%	33.7%	46.3%
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%
		Total (65)	-	3.4%	3.4%	3.4%	3.1%	-	33.8%	35.6%	80.0%
	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%
		Total (60)	-	5.3%	-	5.3%	5.0%	-	43.3%	42.1%	75.0%
	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=130)		-	3.8%	1.7%	4.1%	3.8%	-	40.8%	41.3%	74.6%
Grand Total (N=3704)			0.1%	2.0%	2.2%	3.0%	2.9%	-	17.7%	34.0%	47.2%

[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, 2002-2008[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]	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 (48.6)
	2008 (329)		–	1 (0.3)	3 (0.9)	4 (1.2)	4 (1.2)	–	48 (14.6)	48 (14.6)	164 (49.9)
	Z Statistic		**1.1759**	**-0.0370***	**-0.9417***	**-0.6150***	**-1.9332**	**N/A[6]**	**-0.5454**	**-0.2945***	**-2.5646**
	P Value[5]		**0.1198**	**0.9705**	**0.3463**	**0.5385**	**0.0532**	**N/A**	**0.5855**	**0.7684**	**0.0103**
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)
	Z Statistic		**-2.6440**	**0.2960***	**1.3435***	**0.2416***	**-0.1667**	**N/A**	**-3.0156**	**-0.6470***	**0.7340**
	P Value		**0.0082**	**0.7672**	**0.1791**	**0.8091**	**0.8676**	**N/A**	**0.0026**	**0.5176**	**0.4630**

[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 5 years data.

Figure 4a. Antimicrobial Resistance among *Campylobacter jejuni* from Chicken Breast, 2002-2008

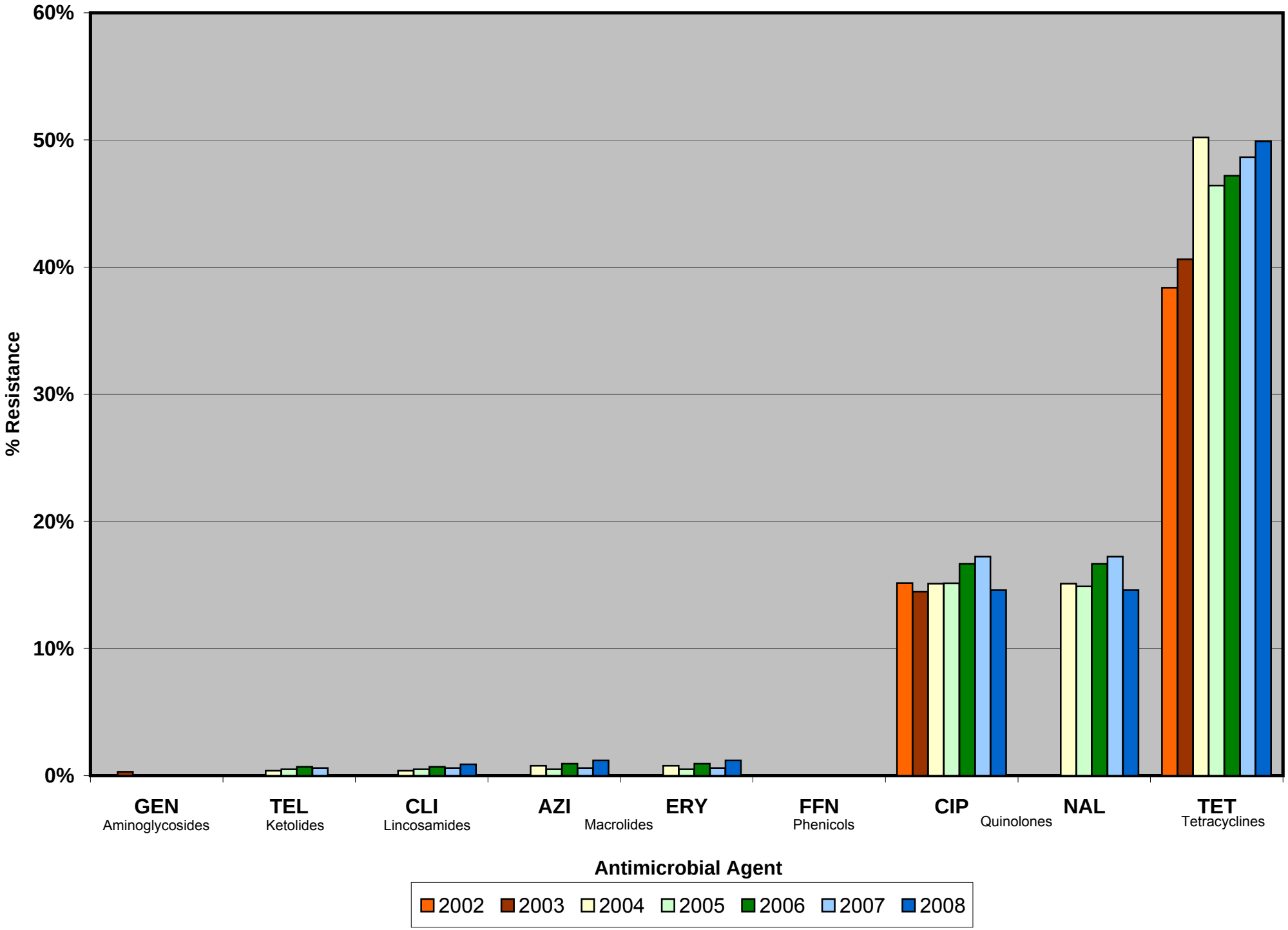


Figure 4b. Antimicrobial Resistance among *Campylobacter coli* from Chicken Breast, 2002-2008

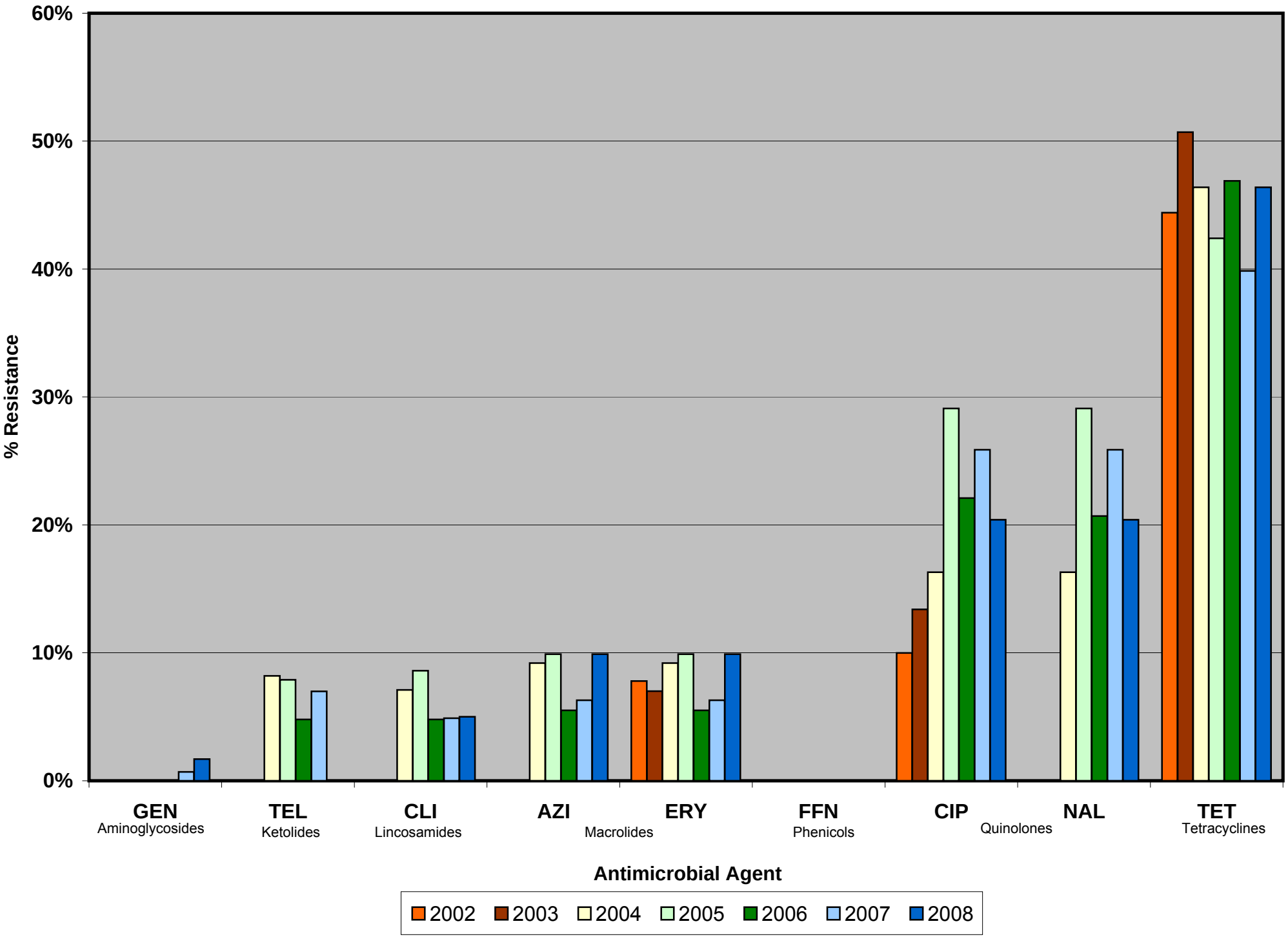


Table 14. Multidrug Resistance among *Campylobacter* Isolates by Species, 2002-2008[1]

Year			2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Species and Source	*C. jejuni*	Chicken Breast	198	325	510	403	426	332	329
		Ground Turkey	2	4	7	10	12	20	10
	C. coli	Chicken Breast	90	142	196	151	145	143	181
		Ground Turkey	2	1	5	9	10	14	19
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
		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
		Ground Turkey	50.0% 1	–	100.0% 5	11.1% 1	20.0% 2	28.6% 4	5.3% 1
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
		Ground Turkey	50.0% 1	–	14.3% 1	10.0% 1	41.7% 5	30.0% 6	70.0% 7
	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
		Ground Turkey	50.0% 1	100.0% 1	–	55.6% 5	30.0% 3	42.9% 6	52.6% 10
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
		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
		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
		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	–
		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, 2002-2008

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							
	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							
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**			
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**			
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**
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**
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					
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**		
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**
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	**49.9**	[44.3 - 55.4]				0.6	16.1	19.5	9.7	3.7	0.6			**0.6**	**4.6**	**20.4**	**24.3**

[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. 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, 2002-2008

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**	
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**			
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**		
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**
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	**10.0**	[6.0 - 15.3]					2.2	12.7	19.3	39.8	14.9	0.6	0.6			**0.6**	**9.4**
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					
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	**20.5**	[14.8 - 27.1]				7.2	45.9	25.4	1.1			**0.6**	**4.4**	**12.2**	**3.3**		
Nalidixic acid	2004 (196)	0.0	**16.3**	[11.4 - 22.3]										47.4	34.7	1.5		**3.6**	**14.7**
	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**
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**	**6.3**	
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	**46.5**	[39.0 - 54.0]					0.6	24.9	21.6	3.3	1.7	1.1	0.6			**2.8**	**43.7**

[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 16. *Enterococcus* Species by Meat Type, 2002 - 2008[1]

	Species	2002		2003		2004		2005		2006		2007		2008	
Total (a) Isolates per Year	*E. faecalis*	893		1014		855		1001		945		852		901	
	E. faecium	506		575		757		618		649		357		341	
	E. hirae	102		129		129		117		115		87		70	
	Total (A)[2]	1520		1742		1755		1765		1731		1312		1337	
Meat Type	**Species**	**n**	**%[3]**	**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%
	E. faecium	231	45.7%	248	43.1%	348	46.0%	307	49.7%	315	48.5%	189	52.9%	162	47.5%
	E. hirae	12	11.8%	28	21.7%	27	20.9%	30	25.6%	27	23.5%	22	25.3%	16	22.9%
	Total (N)[4]	**381**	**25.1%**	**466**	**26.8%**	**466**	**26.6%**	**457**	**25.9%**	**469**	**27.1%**	**339**	**25.8%**	**346**	**25.9%**
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%
	E. faecium	89	17.6%	118	20.5%	172	22.7%	107	17.3%	139	21.4%	65	18.2%	70	20.5%
	E. hirae	2	2.0%	3	2.3%	–[4]	–	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%**
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%
	E. faecium	93	18.4%	112	19.5%	162	21.4%	129	20.9%	125	19.3%	70	19.6%	74	21.7%
	E. hirae	76	74.5%	84	65.1%	88	68.2%	82	70.1%	77	67.0%	57	65.5%	49	70.0%
	Total (N)	**383**	**25.2%**	**432**	**24.8%**	**448**	**25.5%**	**447**	**25.3%**	**438**	**25.3%**	**334**	**25.5%**	**336**	**25.1%**
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%
	E. faecium	93	18.4%	97	16.9%	75	9.9%	75	12.1%	70	10.8%	33	9.2%	35	10.3%
	E. hirae	12	11.8%	14	10.9%	14	10.9%	4	3.4%	8	7.0%	6	6.9%	5	7.1%
	Total (N)	**369**	**24.3%**	**426**	**24.5%**	**404**	**23.0%**	**409**	**23.2%**	**389**	**22.5%**	**310**	**23.6%**	**310**	**23.2%**

[1] Dashes indicate 0.0% resistance.

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

[3] Where % = Number of Isolates per 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, 2002-2008[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%	–	1.5%	90.8%	0.3%	27.5%	26.6%	22.5%	–	13.0%	0.3%	22.8%	50.6%	65.0%
	Z Statistic	**-2.5099**	**-1.2349**	**7.1176**	**N/A[5]**	**N/A**	**1.9822**	**N/A**	**1.9797**	**1.1702**	**8.3571**	**-0.0638**	**9.1063**	**-1.2176**	**-2.9054**	**2.8241**	**-2.3784**
	P Value[4]	**0.0121**	**0.2169**	**<0.0001**	**N/A**	**N/A**	**0.0475**	**N/A**	**0.0477**	**0.2419**	**<0.0001**	**0.9491**	**<0.0001**	**0.2234**	**0.0037**	**0.0047**	**0.0174**
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%
	Z Statistic	**-5.1745**	**-5.0284**	**-0.9419**	**N/A**	**N/A**	**-1.8518**	**N/A**	**-3.7200**	**-3.5572**	**7.7602**	**N/A**	**1.9049**	**-1.1517**	**-0.7141**	**3.0704**	**-2.2354**
	P Value	**<0.0001**	**<0.0001**	**0.3463**	**N/A**	**N/A**	**0.0641**	**N/A**	**0.0002**	**0.0004**	**<0.0001**	**N/A**	**0.0568**	**0.2495**	**0.4752**	**0.0021**	**0.0254**
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%
	Z Statistic	**1.0797**	**0.6833**	**1.8997**	**N/A**	**N/A**	**0.4116**	**N/A**	**1.1085**	**0.7841**	**4.7363**	**N/A**	**-0.8237**	**-0.5254**	**1.3550**	**12.8453**	**-2.3085**
	P Value	**0.2803**	**0.4944**	**0.0575**	**N/A**	**N/A**	**0.6807**	**N/A**	**0.2677**	**0.433**	**<0.0001**	**N/A**	**0.4101**	**0.5993**	**0.1754**	**<0.0001**	**0.0210**
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%
	Z Statistic	**1.8136**	**1.5141**	**-0.1734**	**N/A**	**N/A**	**2.8624**	**N/A**	**0.4709**	**-0.4798**	**2.7896**	**N/A**	**1.3484**	**0.3123**	**-0.5030**	**8.7440**	**-0.5896**
	P Value	**0.0697**	**0.1300**	**0.8624**	**N/A**	**N/A**	**0.0042**	**N/A**	**0.6377**	**0.6313**	**0.0053**	**N/A**	**0.1775**	**0.7548**	**0.6150**	**<0.0001**	**0.5554**

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

[3] Dashes indicate 0.0% resistance to antimicrobial.

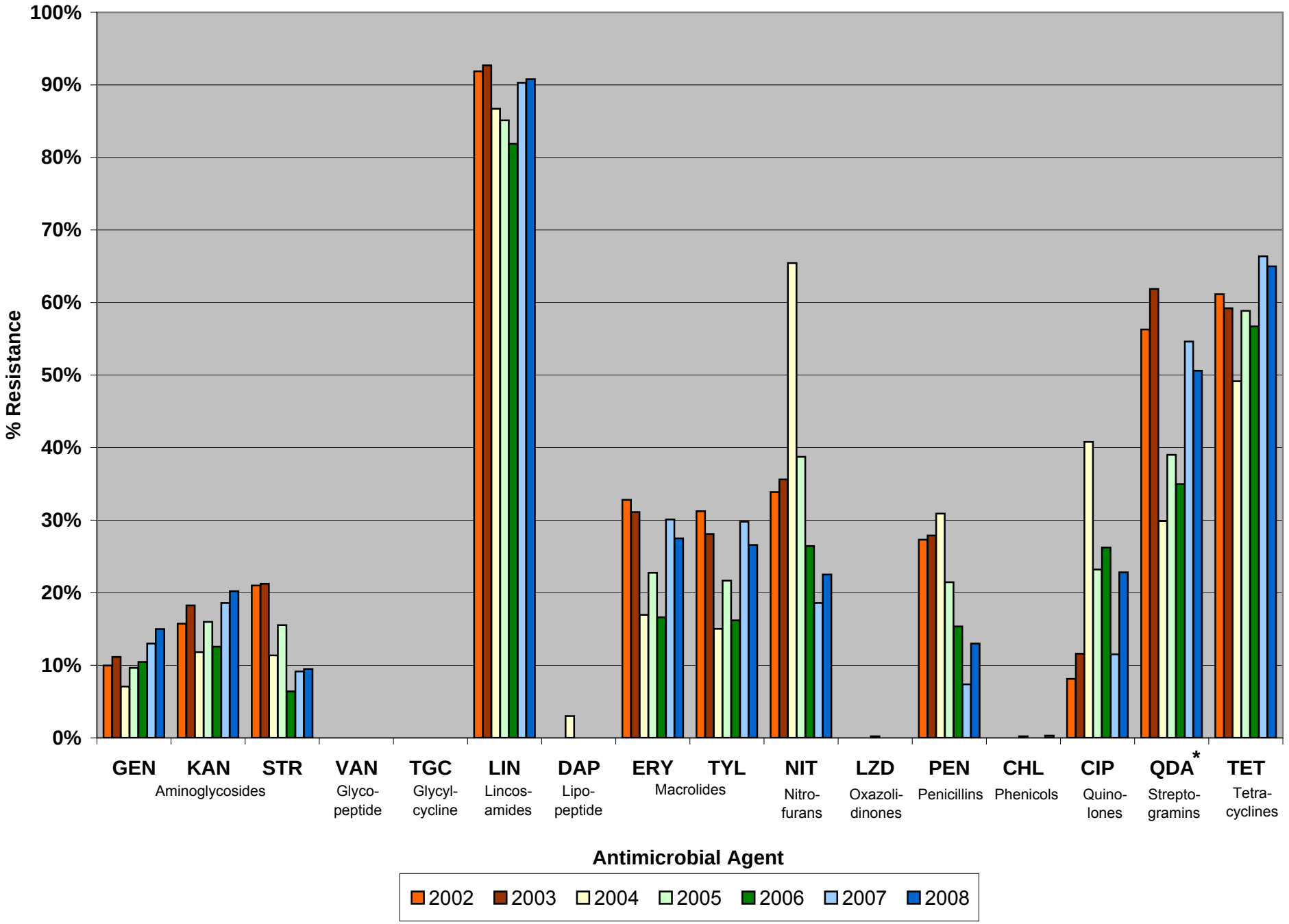
[2] Data presented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.

[3] Where % resistance = (# isolates resistant to antimicrobial per meat type) / (Total # isolates per meat type).

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

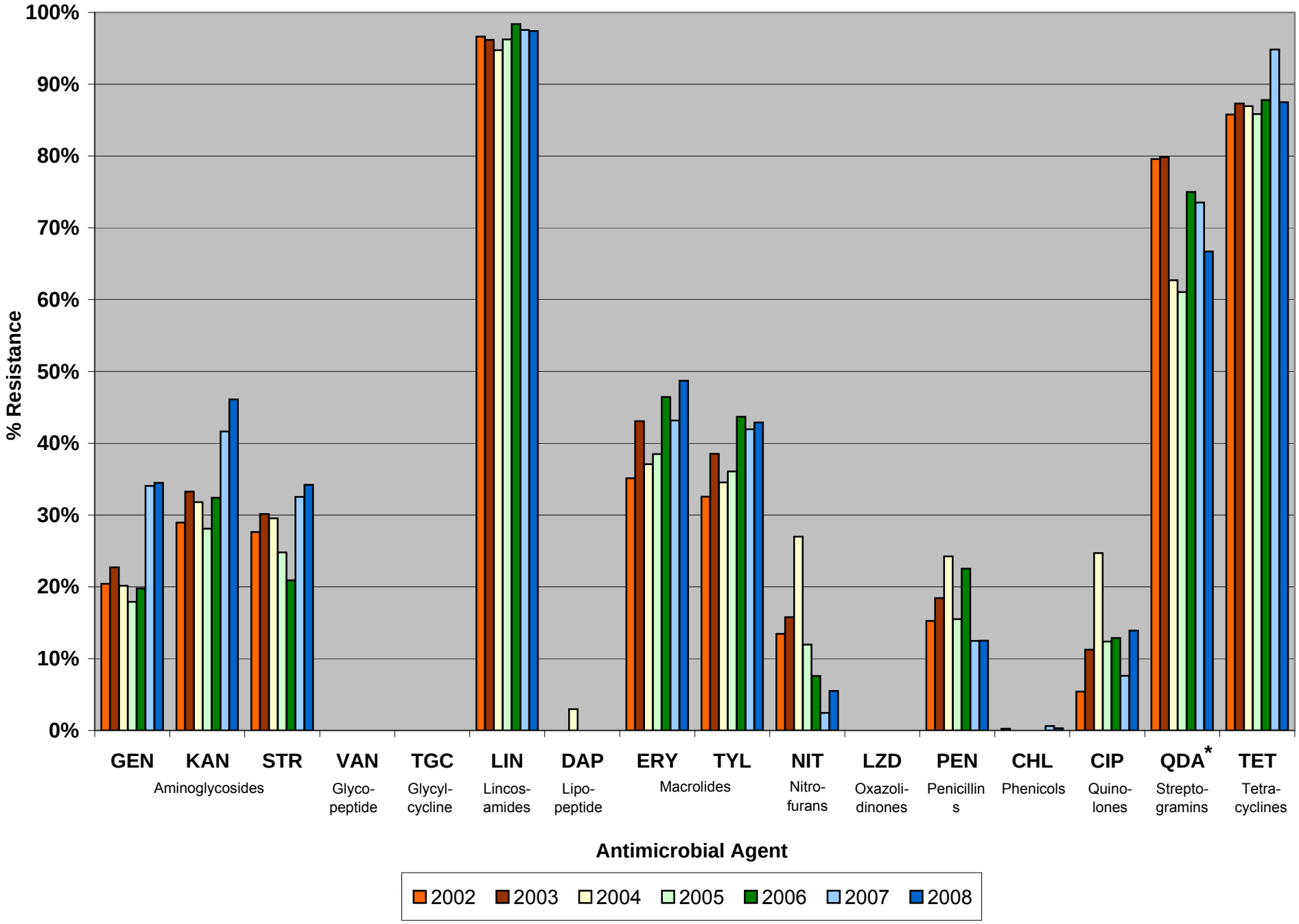
[5] N/A = No Z statistic or P value could be calculated.

Figure 5a. Antimicrobial Resistance among *Enterococcus* from Chicken Breast, 2002-2008



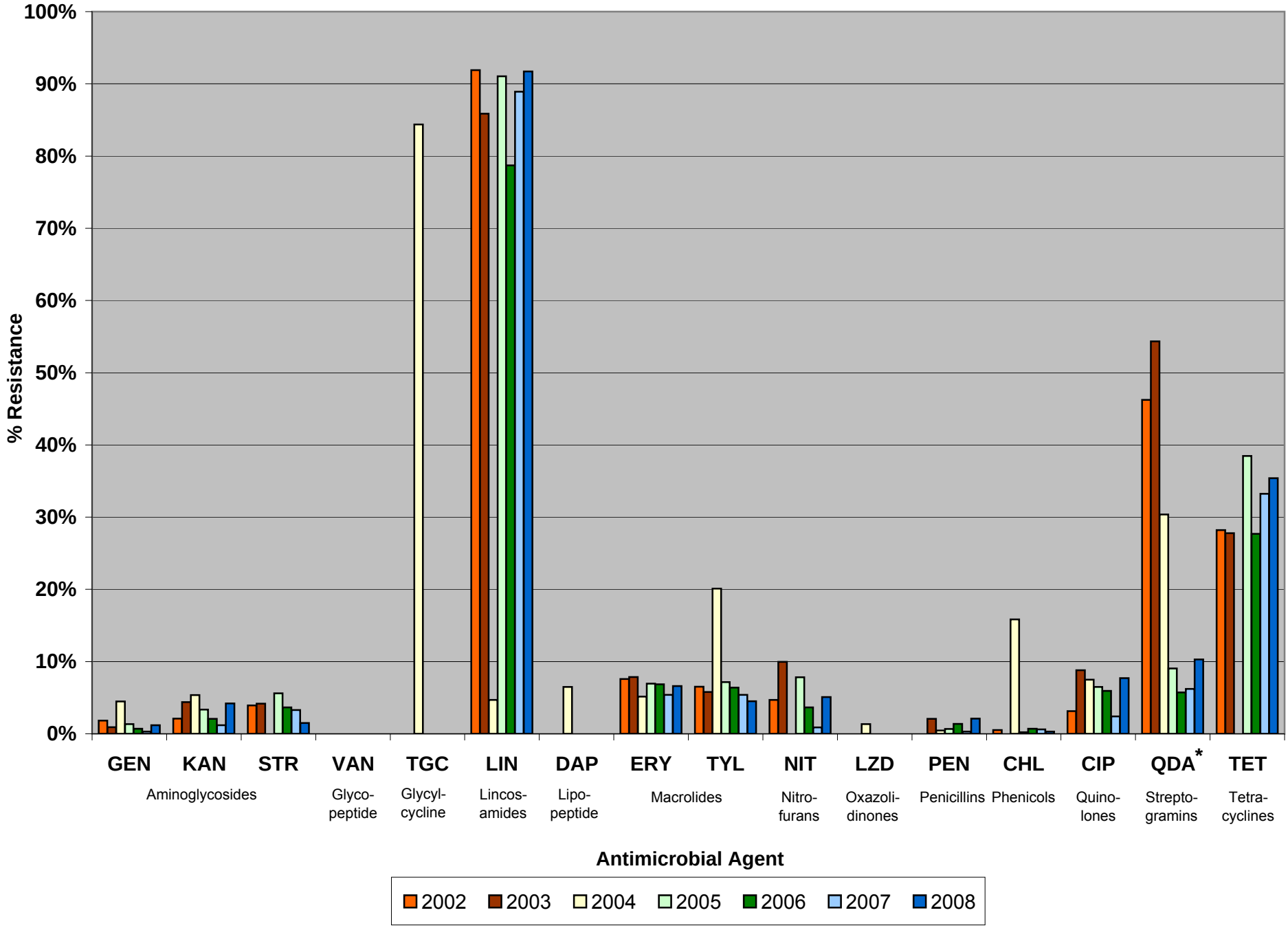
*Data presented for all species except *E. faecalis* , which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 5b. Antimicrobial Resistance among *Enterococcus* from Ground Turkey, 2002-2008



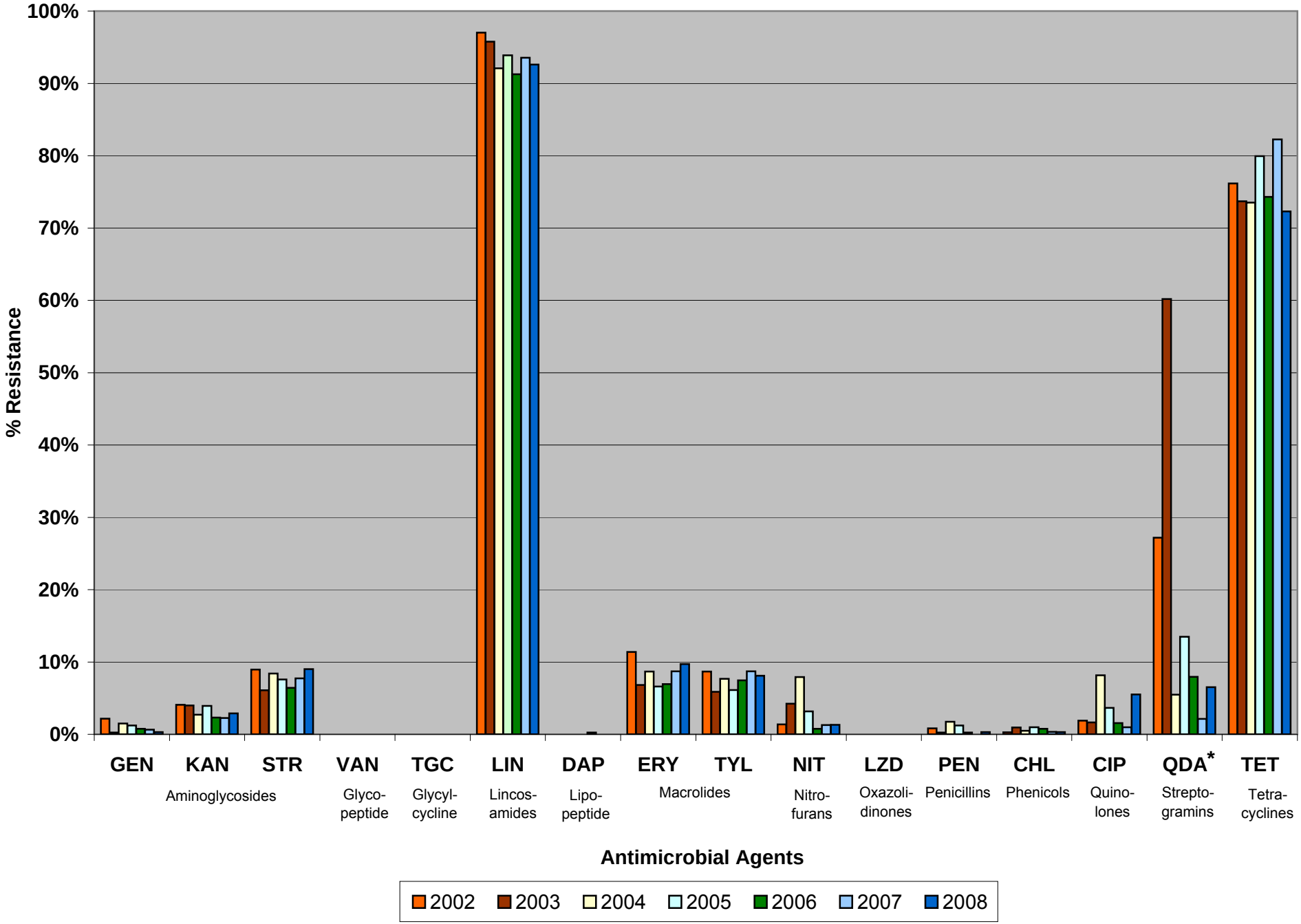
*Data presiented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 5c. Antimicrobial Resistance among *Enterococcus* from Ground Beef, 2002-2008



*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, 2002-2008



*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, 2002-2008[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%[3]	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%
	Z Statistic	**-1.7697**	**-0.1574**	**4.3247**	**N/A[5]**	**N/A**	**-0.8519**	**N/A**	**1.9807**	**2.1992**	**0.2855**	**N/A**	**N/A**	**N/A**	**-1.1580**	**N/A**	**-0.3481**
	P Value[4]	**0.0768**	**0.8749**	**<0.0001**	**N/A**	**N/A**	**0.3942**	**N/A**	**0.0476**	**0.0279**	**0.7753**	**N/A**	**N/A**	**N/A**	**0.2469**	**N/A**	**0.7278**
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%
	Z Statistic	**-5.6699**	**-7.3325**	**-3.3342**	**N/A**	**N/A**	**-1.4054**	**N/A**	**-5.3726**	**-5.0991**	**3.1145**	**N/A**	**-0.2611**	**-1.0567**	**-1.3248**	**N/A**	**-2.1993**
	P Value	**<0.0001**	**<0.0001**	**0.0009**	**N/A**	**N/A**	**0.1599**	**N/A**	**<0.0001**	**<0.0001**	**0.0018**	**N/A**	**0.7940**	**0.2907**	**0.1852**	**N/A**	**0.0279**
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%
	Z Statistic	**0.9201**	**-0.5438**	**1.4384**	**N/A**	**N/A**	**-0.9248**	**N/A**	**0.2051**	**0.1877**	**-0.8962**	**N/A**	**N/A**	**-1.4754**	**0.4471**	**N/A**	**-3.8098**
	P Value	**0.3575**	**0.5866**	**0.1503**	**N/A**	**N/A**	**0.3551**	**N/A**	**0.8375**	**0.8511**	**0.3701**	**N/A**	**N/A**	**0.1401**	**0.6548**	**N/A**	**0.0001**
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%
	Z Statistic	**2.0172**	**1.8275**	**-0.0576**	**N/A**	**N/A**	**0.6448**	**N/A**	**0.1383**	**0.1762**	**0.3352**	**N/A**	**-0.7432**	**0.3179**	**-0.8611**	**N/A**	**-1.6740**
	P Value	**0.0437**	**0.0676**	**0.9541**	**N/A**	**N/A**	**0.5190**	**N/A**	**0.8900**	**0.8601**	**0.7374**	**N/A**	**0.4573**	**0.7506**	**0.3892**	**N/A**	**0.0941**

* 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.

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

[3] Where % resistance = (# isolates resistant to antimicrobial per meat type) / (Total # isolates per meat type).

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

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

Table 18b. Trends in Antimicrobial Resistance among *Enterococcus faecium* by Meat Type, 2002-2008[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%[2]	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%
	Z Statistic	**-3.8001**	**-1.1902**	**5.8100**	**N/A[4]**	**N/A**	**2.8127**	**N/A**	**1.3154**	**-0.0123**	**8.5240**	**-0.1101**	**9.0025**	**-1.7709**	**-3.9786**	**0.7678**	**-3.0829**
	P Value[3]	**0.0001**	**0.2340**	**<0.0001**	**N/A**	**N/A**	**0.0049**	**N/A**	**0.1884**	**0.9902**	**<0.0001**	**0.9123**	**<0.0001**	**0.0766**	**<0.0001**	**0.4426**	**0.0020**
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%
	Z Statistic	**1.6510**	**4.0538**	**4.1708**	**N/A**	**N/A**	**-1.0943**	**N/A**	**2.5115**	**3.0246**	**7.6310**	**N/A**	**0.4932**	**N/A**	**-2.0594**	**1.2436**	**-0.0096**
	P Value	**0.0987**	**<0.0001**	**<0.0001**	**N/A**	**N/A**	**0.2738**	**N/A**	**0.0120**	**0.0025**	**<0.0001**	**N/A**	**0.6219**	**N/A**	**0.0395**	**0.2137**	**0.9924**
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%
	Z Statistic	**0.9974**	**1.6376**	**1.5548**	**N/A**	**N/A**	**1.8001**	**N/A**	**0.5885**	**0.3126**	**4.7315**	**N/A**	**-1.3465**	**0.2979**	**0.7564**	**8.6615**	**0.2693**
	P Value	**0.3186**	**0.1015**	**0.1200**	**N/A**	**N/A**	**0.0718**	**N/A**	**0.5562**	**0.7546**	**<0.0001**	**N/A**	**0.1781**	**0.7658**	**0.4494**	**<0.0001**	**0.7877**
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%
	Z Statistic	**0.2636**	**-0.3915**	**1.3842**	**N/A**	**N/A**	**5.9928**	**N/A**	**1.7368**	**0.5775**	**1.0523**	**N/A**	**1.3171**	**N/A**	**0.4593**	**6.6911**	**4.3043**
	P Value	**0.7921**	**0.6954**	**0.1663**	**N/A**	**N/A**	**<0.0001**	**N/A**	**0.0824**	**0.5636**	**0.2927**	**N/A**	**0.1878**	**N/A**	**0.6460**	**<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.

[2] Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).

[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 18c. Trends in Antimicrobial Resistance among *Enterococcus hirae* by Meat Type, 2002-2008[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%[2]	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%
	Z Statistic	**-0.6559**	**0.9689**	**1.5737**	**N/A[4]**	**N/A**	**1.1645**	**N/A**	**0.4560**	**0.1829**	**1.8672**	**N/A**	**1.6363**	**0.0000**	**-0.4373**	**3.6585**	**1.2525**
	P Value[3]	**0.5119**	**0.3326**	**0.1156**	**N/A**	**N/A**	**0.2442**	**N/A**	**0.6484**	**0.8549**	**0.0619**	**N/A**	**0.1018**	**1.0000**	**0.6619**	**0.0003**	**0.2104**
Ground Turkey[5]	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%
	Z Statistic	**0.591**	**0.064**	**0.713**	**N/A**	**N/A**	**0.09**	**N/A**	**0.487**	**0.249**	**0.536**	**N/A**	**0.381**	**1.446**	**0.591**	**9.389**	**0.163**
	P Value	**0.554**	**0.949**	**0.476**	**N/A**	**N/A**	**0.928**	**N/A**	**0.626**	**0.804**	**0.592**	**N/A**	**0.703**	**0.148**	**0.554**	**<0.0001**	**0.87**
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%
	Z Statistic	**N/A**	**0.169**	**1.278**	**N/A**	**N/A**	**0.702**	**N/A**	**3.642**	**3.091**	**0.475**	**N/A**	**0.169**	**N/A**	**0.518**	**1.671**	**1.308**
	P Value	**N/A**	**0.866**	**0.201**	**N/A**	**N/A**	**0.483**	**N/A**	**0.0003**	**0.002**	**0.635**	**N/A**	**0.866**	**N/A**	**0.604**	**0.095**	**0.191**

* 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.

[2] Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).

[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.

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

Table 19a. Multidrug Resistance among *Enterococcus faecalis* Isolates by Antimicrobial Class, 2002-2008[1]

Year		2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Source	Chicken Breast	134	188	88	116	126	123	164
	Ground Turkey	294	289	260	339	291	261	273
	Ground Beef	210	224	194	226	227	205	200
	Pork Chop	255	313	313	320	301	263	264
Resistance Pattern[2]	**Isolate Source**							
1. No Resistance Detected	Chicken Breast	–	–	–	0.9% 1	–	–	–
	Ground Turkey	–	–	–	0.6% 2	0.3% 1	–	–
	Ground Beef	–	–	–	1.3% 3	1.8% 4	2.0% 4	0.5% 1
	Pork Chop	–	–	–	1.3% 4	–	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
	Ground Turkey	49.3% 145	54.3% 157	52.7% 137	43.4% 147	56.7% 165	67.4% 176	69.2% 189
	Ground Beef	4.8% 10	6.7% 15	10.8% 21	10.2% 23	7.9% 18	7.3% 15	5.5% 11
	Pork Chop	16.5% 42	9.9% 31	18.8% 59	14.4% 46	12.3% 37	17.1% 45	18.6% 49
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
	Ground Turkey	17.7% 52	31.1% 90	22.3% 58	26.0% 88	22.7% 66	36.4% 95	42.5% 116
	Ground Beef	1.9% 4	3.1% 7	3.1% 6	4.9% 11	2.2% 5	1.5% 3	2.0% 4
	Pork Chop	5.9% 15	5.1% 16	5.8% 18	4.7% 15	3.3% 10	2.3% 6	5.7% 15
4. Resistance to ≥ 5 Antimicrobial Classes	Chicken Breast	–	0.5% 1	1.1% 1	1.7% 2	–	–	1.2% 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
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, 2002-2008 [1]

Year		2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Source	Chicken Breast	231	248	348	307	315	189	162
	Ground Turkey	89	118	172	107	139	65	70
	Ground Beef	93	112	162	129	125	70	74
	Pork Chop	93	97	75	75	70	33	35
Resistance Pattern	**Isolate Source**							
1. No Resistance Detected	Chicken Breast	–	–	–	1.6% 5	1.3% 4	–	4.9% 8
	Ground Turkey	–	–	–	–	–	–	2.9% 2
	Ground Beef	–	–	–	1.6% 2	–	2.9% 2	8.1% 6
	Pork Chop	–	–	–	1.3% 1	1.4% 1	–	17.1% 6
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
	Ground Turkey	97.8% 87	98.3% 116	96.5% 166	90.7% 97	96.4% 134	96.9% 63	85.7% 60
	Ground Beef	63.4% 59	68.8% 77	55.6% 90	40.3% 52	27.2% 34	22.9% 16	29.7% 22
	Pork Chop	80.6% 75	84.5% 82	81.3% 61	57.3% 43	34.3% 24	30.3% 10	14.3% 5
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
	Ground Turkey	86.5% 77	87.3% 103	91.9% 158	84.1% 90	89.2% 124	83.1% 54	80.0% 56
	Ground Beef	29.0% 27	39.3% 44	26.5% 43	14.0% 18	8.0% 10	7.1% 5	14.9% 11
	Pork Chop	32.3% 30	50.5% 49	37.3% 28	17.3% 13	7.1% 5	3.0% 1	5.7% 2
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
	Ground Turkey	77.5% 69	72.9% 86	78.5% 135	72.0% 77	74.8% 104	61.5% 40	58.6% 41
	Ground Beef	11.8% 11	18.8% 21	9.9% 16	6.2% 8	4.8% 6	4.3% 3	8.1% 6
	Pork Chop	8.6% 8	7.2% 7	12.0% 9	9.3% 7	4.3% 3	–	2.9% 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
	Ground Turkey	62.9% 56	67.8% 80	61.6% 106	52.3% 56	54.7% 76	35.4% 23	31.4% 22
	Ground Beef	5.4% 5	7.1% 8	5.6% 9	4.7% 6	4.0% 5	–	4.1% 3
	Pork Chop	4.3% 4	5.2% 5	4.0% 3	5.3% 4	2.9% 2	–	2.9% 1

[1] Dash indicates 0.0% resistance.

Table 20a. MIC Distribution among *Enterococcus faecalis* and *E. faecium* from Chicken Breast, 2008

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	**19.5**	[24.1 - 38.8]														75.0	5.5	**1.8**	**1.2**	**16.5**	
	faecium	N/A	**11.7**	[7.2 - 17.7]														87.7	0.6	**3.1**	**4.9**	**3.7**	
Kanamycin	*faecalis*	N/A	**29.9**	[23.0 - 37.5]														64.0	6.1		**0.6**	**29.3**	
	faecium	N/A	**11.7**	[7.2 - 17.7]														53.1	24.7	10.5	**3.1**	**8.6**	
Streptomycin	*faecalis*	N/A	**11.0**	[6.6 - 16.8]																89.0	**1.8**	**3.1**	**6.1**
	faecium	N/A	**6.8**	[3.4 - 11.8]																93.2	**3.7**	**3.1**	
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 2.2]							49.4	42.7	7.9										
	faecium	0.0	**0.0**	[0.0 - 2.3]						58.6	29.6	9.9	1.9										
Glycylcycline																							
Tigecycline[5]	*faecalis*	N/A	**1.2**	[0.1 - 4.3]		0.6	11.0	62.8	24.4	1.2													
	faecium	N/A	**1.9**	[0.4 - 5.3]		3.1	16.1	51.2	27.8	1.9													
Lincosamides																							
Lincomycin	*faecalis*	0.0	**100.0**	[97.8 - 100.0]										**1.2**	**98.8**								
	faecium	0.6	**80.8**	[74.0 - 86.6]							18.5		0.6	**8.6**	**72.2**								
Lipopeptides																							
Daptomycin[5]	*faecalis*	N/A	**0.0**	[0.0 - 2.2]						18.3	76.8	4.3	0.6										
	faecium	N/A	**0.0**	[0.0 - 2.3]						1.9	8.6	39.5	50.0										
Macrolides																							
Erythromicin	*faecalis*	47.0	**32.4**	[25.2 - 40.1]						20.7	28.1	17.7	1.2	**3.1**	**29.3**								
	faecium	58.6	**22.3**	[16.1 - 29.4]						19.1	17.3	26.5	14.8	**1.9**	**20.4**								
Tylosin	*faecalis*	0.0	**32.3**	[25.2 - 40.1]						0.6	14.0	45.7	7.3				**32.3**						
	faecium	0.0	**20.4**	[14.5 - 27.4]							14.8	23.5	30.9	10.5			**20.4**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	0.6	**1.2**	[0.1 - 4.3]										57.3	35.4	5.5	0.6	**1.2**					
	faecium	47.5	**46.3**	[38.4 - 54.3]										1.2		4.9	47.5	**46.3**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 2.2]						0.6	54.9	44.5											
	faecium	2.5	**0.0**	[0.0 - 2.3]							11.7	85.8	2.5										
Penicillins																							
Penicillin	*faecalis*	N/A	**0.0**	[0.0 - 2.2]								20.1	67.7	12.2									
	faecium	N/A	**27.8**	[21.0 - 35.3]						4.3	3.7	4.3	40.7	19.1	**20.4**	**7.4**							
Phenicols																							
Chloramphenicol	*faecalis*	2.4	**0.0**	[0.0 - 2.2]								0.6	31.1	65.9	2.4								
	faecium	0.6	**0.6**	[0.0 - 3.4]									30.9	67.9	0.6	**0.6**							
Quinolones																							
Ciprofloxacin	*faecalis*	32.9	**3.0**	[1.0 - 7.0]						6.1	57.9	32.9	**1.8**	**1.2**									
	faecium	40.7	**43.8**	[36.1 - 51.8]						2.5	13.0	40.7	**35.2**	**8.6**									
Streptogramins																							
Quinupristin-	*faecalis*[6]																						
Dalfopristin	*faecium*	21.6	**54.9**	[46.9 - 62.8]							23.5	21.6	**15.4**	**21.6**	**14.2**	**3.7**							
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**69.6**	[61.9 - 76.5]									30.5		**4.3**	**9.8**	**55.5**						
	faecium	1.2	**64.3**	[56.3 - 71.6]									34.6	1.2	**1.9**	**2.5**	**59.9**						

[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] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Both CMV2AGPF and CMV3AGPF plates were used for 2008 retail meat testing. Data is presented using the smaller range from either plate. 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

[5] For daptomycin and tigecycline, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been established.

[6] 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, 2008

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	**41.0**	[35.1 - 47.1]														57.5	1.5	**0.7**	**1.1**	**39.2**	
	faecium	N/A	**10.0**	[4.1 - 19.5]														90.0		**2.9**	**5.7**	**1.4**	
Kanamycin	*faecalis*	N/A	**54.9**	[48.8 - 60.9]														40.3	4.0	0.7	**0.7**	**54.2**	
	faecium	N/A	**12.8**	[6.1 - 23.0]														48.6	24.3	14.3	**1.4**	**11.4**	
Streptomycin	*faecalis*	N/A	**38.8**	[33.0 - 44.9]																61.2	**2.9**	**9.5**	**26.4**
	faecium	N/A	**17.1**	[9.2 - 28.0]																82.9	**8.6**	**7.1**	**1.4**
Glycopeptides																							
Vancomycin	*faecalis*	0.4	**0.0**	[0.0 - 1.3]							59.0	35.9	4.8	0.4									
	faecium	0.0	**0.0**	[0.0 - 5.1]						52.9	27.1	20.0											
Glycylcycline																							
Tigecycline[5]	*faecalis*	N/A	**1.5**	[0.4 - 3.7]		0.7	10.3	57.1	30.4	1.5													
	faecium	N/A	**2.8**	[0.3 - 9.9]		1.4	18.6	35.7	41.4	1.4	1.4												
Lincosamides																							
Lincomycin	*faecalis*	0.0	**99.2**	[97.4 - 99.9]								0.7		**0.7**	**98.5**								
	faecium	2.9	**91.5**	[82.3 - 96.8]							4.3	1.4	2.9	**8.6**	**82.9**								
Lipopeptides																							
Daptomycin[5]	*faecalis*	N/A	**0.4**	[0.0 - 2.0]						31.5	64.5	3.7		0.4									
	faecium	N/A	**5.7**	[1.6 - 14.0]							12.9	41.4	40.0	5.7									
Macrolides																							
Erythromicin	*faecalis*	32.0	**51.3**	[45.2 - 57.4]						16.9	20.2	11.4	0.4	**2.9**	**48.4**								
	faecium	45.7	**37.2**	[25.9 - 49.5]						17.1	17.1	15.7	12.9	**12.9**	**24.3**								
Tylosin	*faecalis*	0.0	**50.9**	[44.8 - 57.0]							9.5	33.0	5.9	0.7		**50.9**							
	faecium	1.4	**12.9**	[6.1 - 23.0]							8.6	17.1	51.4	8.6	1.4	**12.9**							
Nitrofurans																							
Nitrofurantoin	*faecalis*	1.8	**0.0**	[0.0 - 1.3]									1.5	63.4	29.7	3.7	1.8						
	faecium	55.7	**27.1**	[17.2 - 39.1]											5.7	11.4	55.7	**27.1**					
Oxazolidinones																							
Linezolid	*faecalis*	0.4	**0.0**	[0.0 - 1.3]						0.4	64.5	34.8	0.4										
	faecium	1.4	**0.0**	[0.0 - 5.1]						1.4	14.3	82.9	1.4										
Penicillins																							
Penicillin	*faecalis*	N/A	**0.0**	[0.0 - 1.3]							0.4	21.6	69.2	8.8									
	faecium	N/A	**61.4**	[49.0 - 72.8]						8.6	2.9	1.4	14.3	11.4	**31.4**	**30.0**							
Phenicols																							
Chloramphenicol	*faecalis*	0.7	**0.4**	[0.0 - 2.0]								0.4	28.9	69.6	0.7	**0.4**							
	faecium	0.0	**0.0**	[0.0 - 5.1]									24.3	75.7									
Quinolones																							
Ciprofloxacin	*faecalis*	30.8	**3.7**	[1.8 - 6.6]						1.8	63.7	30.8	**2.6**	**1.1**									
	faecium	24.3	**54.3**	[41.9 - 66.3]					1.4	5.7	14.3	24.3	**42.9**	**11.4**									
Streptogramins																							
Quinupristin-Dalfopristin	*faecalis*[6]																						
	faecium	25.7	**68.6**	[56.4 - 79.1]							5.7	25.7	**8.6**	**14.3**	**31.4**	**14.3**							
Tetracyclines																							
Tetracycline	*faecalis*	0.4	**89.4**	[85.1 - 92.8]									10.3	0.4	**0.7**	**5.9**	**82.8**						
	faecium	1.4	**81.4**	[70.3 - 89.7]									17.2	1.4	**1.4**		**80.0**						

[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. % 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] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Both CMV2AGPF and CMV3AGPF plates were used for 2008 retail meat testing. Data is presented using the smaller range from either plate. 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

[5] For daptomycin and tigecycline, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been established.

[6] 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, 2008

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	**2.0**	[0.5 - 5.0]														96.5	1.5	**0.5**	**1.0**	**0.5**	
	faecium	N/A	**0.0**	[0.0 - 4.9]														100.0					
Kanamycin	*faecalis*	N/A	**4.0**	[1.7 - 7.7]														90.5	5.5		**0.5**	**3.5**	
	faecium	N/A	**6.8**	[2.2 - 15.1]														48.7	35.1	9.5	**1.4**	**5.4**	
Streptomycin	*faecalis*	N/A	**1.5**	[0.3 - 4.3]																98.5	**1.0**	**0.5**	
	faecium	N/A	**2.7**	[0.3 - 9.4]																97.3		**2.7**	
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 1.8]							40.0	51.0	9.0										
	faecium	0.0	**0.0**	[0.0 - 4.9]						60.8	24.3	14.9											
Glycylcycline																							
Tigecycline[5]	*faecalis*	N/A	**0.0**	[0.0 - 1.8]		2.5	16.0	64.5	17.0														
	faecium	N/A	**0.0**	[0.0 - 4.9]			14.9	55.4	29.7														
Lincosamides																							
Lincomycin	*faecalis*	0.5	**99.0**	[96.4 - 99.9]							0.5		0.5	**1.0**	**98.0**								
	faecium	1.4	**75.7**	[64.3 - 84.9]							23.0		1.4	**17.6**	**58.1**								
Lipopeptides																							
Daptomycin[5]	*faecalis*	N/A	**0.0**	[0.0 - 1.8]						23.0	73.0	3.5	0.5										
	faecium	N/A	**1.4**	[0.0 - 7.3]						1.4	12.2	33.8	51.4	1.4									
Macrolides																							
Erythromicin	*faecalis*	73.5	**2.5**	[0.8 - 5.7]						24.0	48.5	22.5	2.5		**2.5**								
	faecium	59.4	**13.5**	[6.7 - 23.5]						27.0	10.8	32.4	16.2	**5.4**	**8.1**								
Tylosin	*faecalis*	0.0	**3.0**	[1.1 - 6.4]							18.0	61.0	17.0	1.0			**3.0**						
	faecium	2.7	**4.1**	[0.8 - 11.4]							9.5	28.4	27.0	28.4	2.7		**4.1**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	0.5	**0.5**	[0.0 - 2.8]										49.5	46.0	3.5	0.5	**0.5**					
	faecium	64.9	**20.3**	[11.8 - 31.2]										1.4		13.5	64.9	**20.3**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 1.8]						1.5	41.5	57.0											
	faecium	1.4	**0.0**	[0.0 - 4.9]							8.1	90.5	1.4										
Penicillins																							
Penicillin	*faecalis*	N/A	**0.0**	[0.0 - 1.8]							1.5	21.5	62.5	14.5									
	faecium	N/A	**9.5**	[3.9 - 18.5]						17.6	2.7	9.5	47.3	13.5		**9.5**							
Phenicols																							
Chloramphenicol	*faecalis*	0.5	**0.0**	[0.0 - 1.8]									34.5	65.0	0.5								
	faecium	0.0	**1.4**	[0.0 - 7.3]									33.8	64.9		**1.4**							
Quinolones																							
Ciprofloxacin	*faecalis*	43.5	**3.5**	[1.4 - 7.1]						5.0	48.0	43.5	**3.0**	**0.5**									
	faecium	37.8	**25.7**	[16.2 - 37.2]						12.2	24.3	37.8	**21.6**	**4.1**									
Streptogramins																							
Quinupristin-	*faecalis*[6]																						
Dalfopristin	*faecium*	59.5	**16.3**	[8.7 - 26.6]							24.3	59.5	**8.1**	**1.4**	**5.4**	**1.4**							
Tetracyclines																							
Tetracycline	*faecalis*	0.5	**32.0**	[25.6 - 38.9]									67.5	0.5	**3.0**	**7.0**	**22.0**						
	faecium	0.0	**29.8**	[19.7 - 41.5]									70.3		**1.4**	**8.1**	**20.3**						

[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] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Both CMV2AGPF and CMV3AGPF plates were used for 2008 retail meat testing. Data is presented using the smaller range from either plate. 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

[5] For daptomycin and tigecycline, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been established.

[6] 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, 2008

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	**0.4**	[0.0 - 2.1]														99.2	0.4			**0.4**	
	faecium	N/A	**0.0**	[0.0 - 10.0]														100.0					
Kanamycin	*faecalis*	N/A	**3.0**	[1.3 - 5.9]														88.3	8.7			**3.0**	
	faecium	N/A	**2.9**	[0.1 - 14.9]														82.9	11.4	2.9		**2.9**	
Streptomycin	*faecalis*	N/A	**10.3**	[6.8 - 14.5]																89.8	**2.7**	**4.9**	**2.7**
	faecium	N/A	**0.0**	[0.0 - 10.0]																100.0			
Glycopeptides																							
Vancomycin	*faecalis*	0.0	**0.0**	[0.0 - 1.4]						0.4	59.1	34.1	6.4										
	faecium	0.0	**0.0**	[0.0 - 10.0]						82.9	17.1												
Glycylcycline																							
Tigecycline[5]	*faecalis*	N/A	**1.9**	[0.6 - 4.4]		0.8	8.7	56.4	32.2	1.9													
	faecium	N/A	**2.9**	[0.1 - 14.9]		8.6	25.7	48.6	14.3	2.9													
Lincosamides																							
Lincomycin	*faecalis*	0.0	**97.4**	[94.6 - 98.9]							2.7			**5.7**	**91.7**								
	faecium	22.9	**54.3**	[36.6 - 71.2]							22.9		22.9	**22.9**	**31.4**								
Lipopeptides																							
Daptomycin[5]	*faecalis*	N/A	**N/A**	[0.0 - 1.4]						19.7	74.6	5.7											
	faecium	N/A	**2.9**	[0.1 - 14.9]						2.9	25.7	57.1	11.4			2.9							
Macrolides																							
Erythromicin	*faecalis*	65.2	**8.3**	[5.3 - 12.3]						26.5	43.2	20.5	1.5		**8.3**								
	faecium	82.8	**14.3**	[4.8 - 30.3]						2.9	17.1	40.0	25.7	**8.6**	**5.7**								
Tylosin	*faecalis*	0.0	**8.0**	[5.0 - 11.9]						0.4	14.4	64.8	12.5				**8.0**						
	faecium	2.9	**5.7**	[0.7 - 19.2]							8.6	17.1	45.7	20.0	2.9		**5.7**						
Nitrofurans																							
Nitrofurantoin	*faecalis*	0.4	**0.0**	[0.0 - 1.4]									0.8	57.6	40.2	1.1	0.4						
	faecium	57.1	**8.6**	[1.8 - 23.1]											5.7	28.6	57.1	**8.6**					
Oxazolidinones																							
Linezolid	*faecalis*	0.0	**0.0**	[0.0 - 1.4]						0.4	43.9	55.7											
	faecium	5.7	**0.0**	[0.0 - 10.0]						2.9	20.0	71.4	5.7										
Penicillins																							
Penicillin	*faecalis*	N/A	**0.4**	[0.0 - 2.1]							2.3	21.2	62.9	13.3			**0.4**						
	faecium	N/A	**0.0**	[0.0 - 10.0]						31.4	17.1	14.3	31.4	5.7									
Phenicols																							
Chloramphenicol	*faecalis*	0.0	**0.4**	[0.0 - 2.1]								1.1	37.9	60.6			**0.4**						
	faecium	0.0	**0.0**	[0.0 - 10.0]								2.9	54.3	42.9									
Quinolones																							
Ciprofloxacin	*faecalis*	38.3	**4.6**	[2.4 - 7.8]				0.4	0.8	6.8	49.2	38.3	**3.8**	**0.8**									
	faecium	40.0	**14.3**	[4.8 - 30.3]						5.7	40.0	40.0	**11.4**	**2.9**									
Streptogramins																							
Quinupristin-	*faecalis*[6]																						
Dalfopristin	*faecium*	71.4	**5.7**	[0.7 - 19.2]							22.9	71.4	**5.7**										
Tetracyclines																							
Tetracycline	*faecalis*	0.0	**76.9**	[71.3 - 81.8]									23.1		**0.4**	**15.5**	**61.0**						
	faecium	0.0	**45.7**	[28.8 - 63.4]									54.3			**5.7**	**40.0**						

[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. % 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] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Both CMV2AGPF and CMV3AGPF plates were used for 2008 retail meat testing. Data is presented using the smaller range from either plate. 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

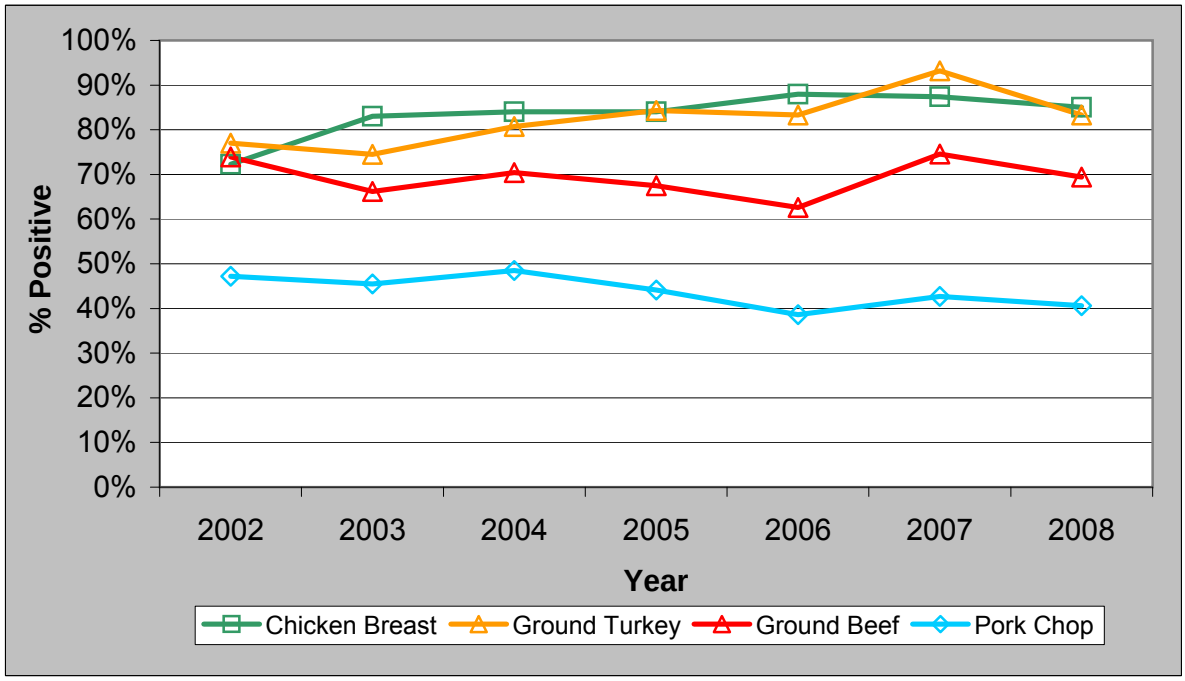
[5] For daptomycin and tigecycline, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been established.

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

Table 21. *Escherichia coli* by Meat Type, 2002-2008

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%
Total	2988	2494	83.5%	2942	2412	82.0%	2991	2061	68.9%	3000	1319	44.0%

Figure 6. Percent of Retail Meat Samples Culture Positive for *Escherichia coli* , 2002-2008



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, 2002-2008

Meat Type	Year (N)	Aminoglycosides				Amino-penicillins	β-Lactamase Inhibitor Combinations	Cephalosporins		Cepha-mycins	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[1] (MIC ≥ 512)	COT (MIC ≥ 4)	CHL (MIC ≥ 512)	CIP (MIC ≥ 4)	NAL (MIC ≥ 32)	TET (MIC ≥ 16)
Chicken Breast	2002 (282)	–[2]	23.1%[3]	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%	50.7%
	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%
	Z Statistic	**N/A[4]**	**2.9301**	**-1.6253**	**3.2332**	**0.5333**	**1.2810**	**-1.4295**	**-0.8680**	**-0.3329**	**-2.3525**	**-0.1410**	**-1.9430**	**N/A**	**0.6583**	**0.3913**
	P Value[5]	**N/A**	**0.0034**	**0.1041**	**0.0012**	**0.5938**	**0.2002**	**0.1529**	**0.3854**	**0.7392**	**0.0186**	**0.8879**	**0.0520**	**N/A**	**0.5104**	**0.6956**
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%
	Z Statistic	**N/A**	**-1.7453**	**-1.1740**	**1.8800**	**-7.7234**	**-2.4290**	**-4.8342**	**-4.4093**	**-3.5014**	**-0.1853**	**-1.5958**	**-2.0997**	**0.1775**	**3.6339**	**-2.6146**
	P Value	**N/A**	**0.0809**	**0.2404**	**0.0601**	**<0.0001**	**0.0151**	**<0.0001**	**<0.0001**	**0.0005**	**0.8530**	**0.1105**	**0.0358**	**0.8591**	**0.0003**	**0.0089**
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%	0.9%	1.7%	2.0%	12.5%	1.4%	1.6%	–	0.6%	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%
	Z Statistic	**N/A**	**-1.7936**	**-0.4186**	**1.0178**	**-0.5667**	**0.4465**	**-1.9297**	**-1.5741**	**-1.4641**	**0.7360**	**-1.8438**	**0.2664**	**N/A**	**0.4942**	**3.4347**
	P Value	**N/A**	**0.0729**	**0.6755**	**0.3088**	**0.5709**	**0.6552**	**0.0536**	**0.1155**	**0.1432**	**0.4614**	**0.0652**	**0.7899**	**N/A**	**0.6212**	**0.0006**
Pork Chop	2002 (194)	–	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%
	Z Statistic	**N/A**	**-0.0200**	**0.8476**	**1.9341**	**-0.7781**	**2.4781**	**-1.9795**	**-1.9300**	**0.6727**	**-0.4706**	**-1.4242**	**-1.0141**	**N/A**	**0.5693**	**-0.4694**
	P Value	**N/A**	**0.9841**	**0.3967**	**0.0531**	**0.4365**	**0.0132**	**0.0478**	**0.0536**	**0.5011**	**0.6379**	**0.1544**	**0.3105**	**N/A**	**0.5691**	**0.6388**

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

[2] Dashes indicate 0.0% resistance to antimicrobial.

[3] Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).

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

[5] 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, 2002-2008

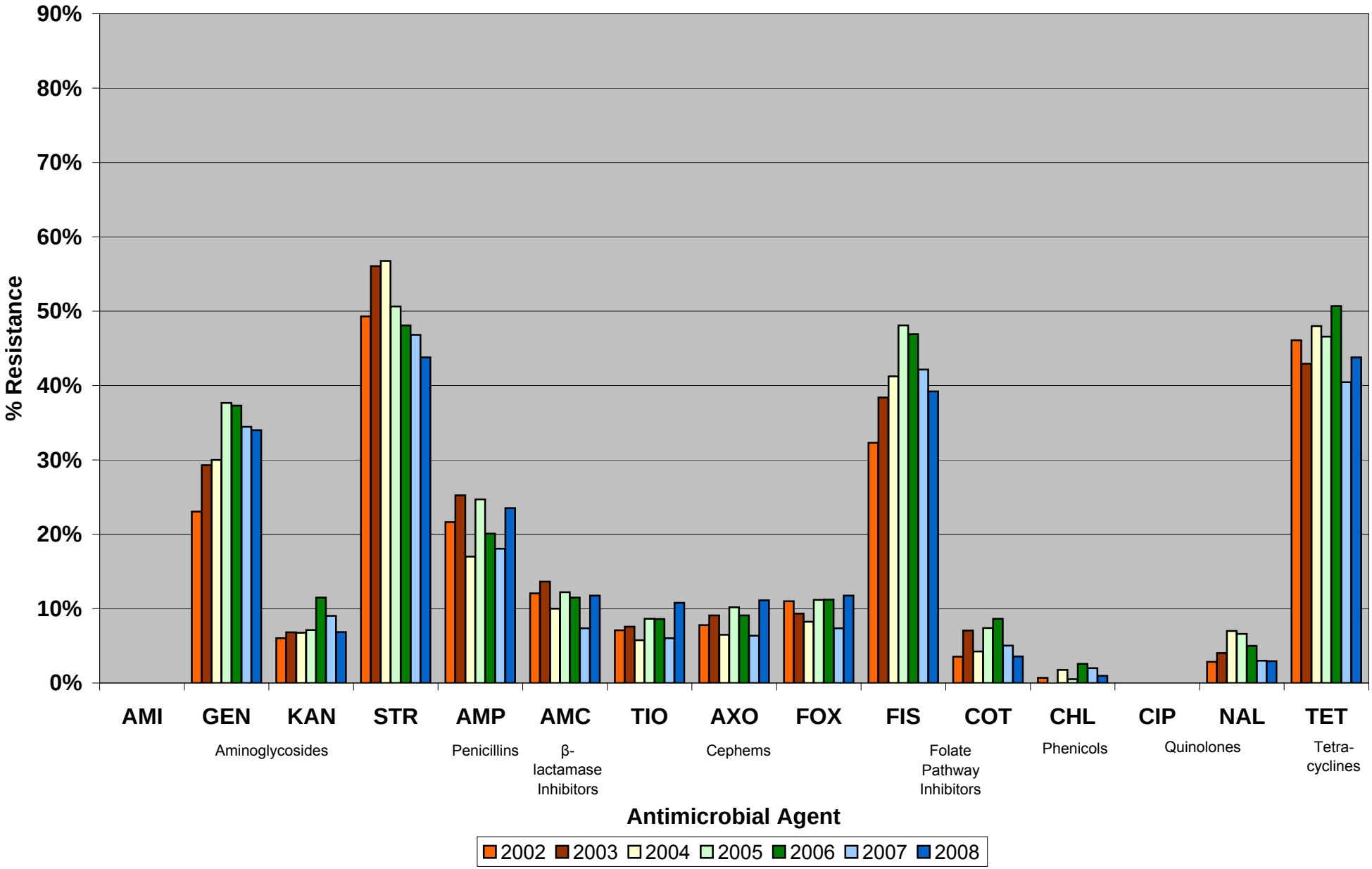


Figure 7b. Antimicrobial Resistance among *Escherichia coli* from Ground Turkey, 2002-2008

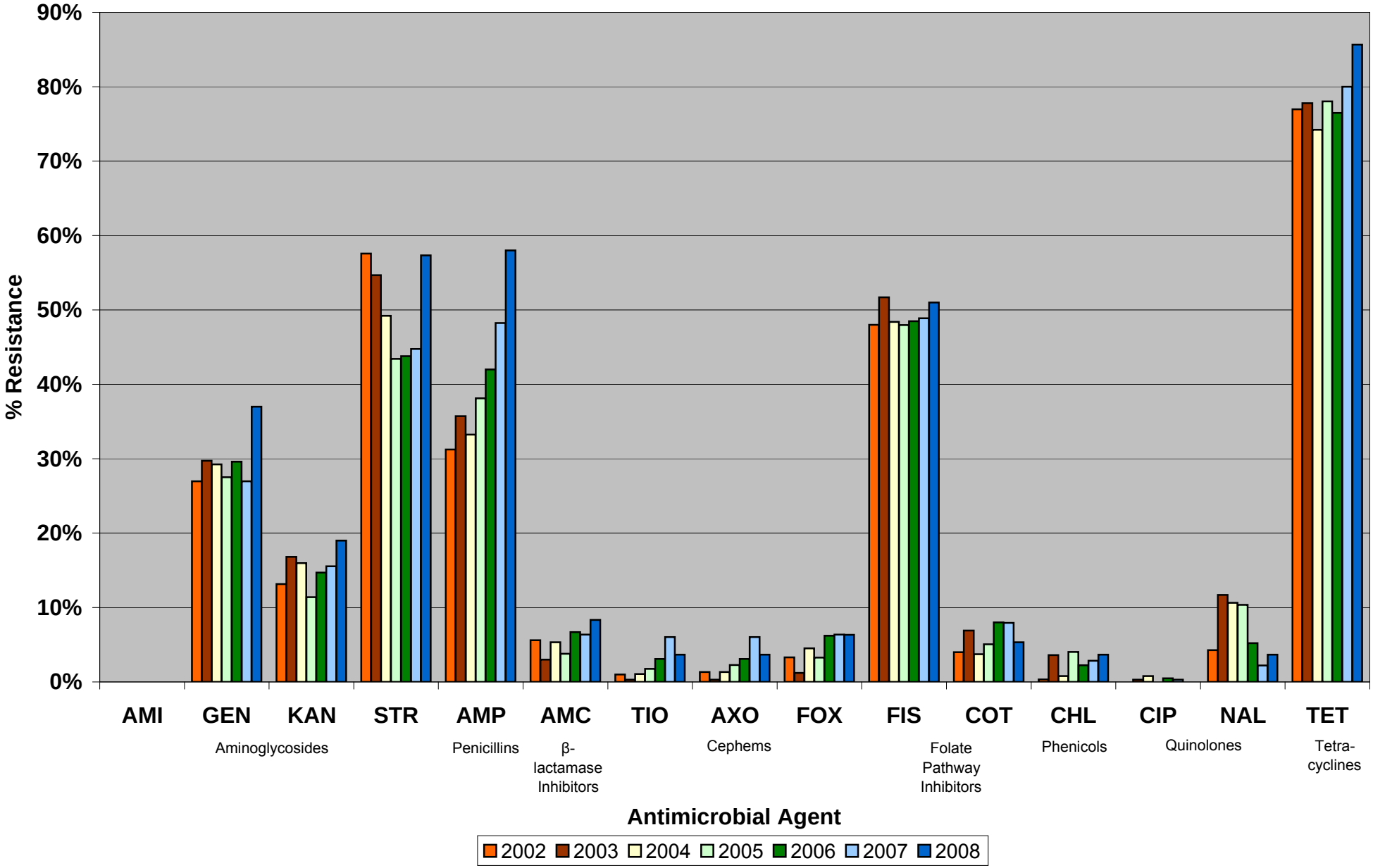


Figure 7c. Antimicrobial Resistance among *Escherichia coli* from Ground Beef, 2002-2008

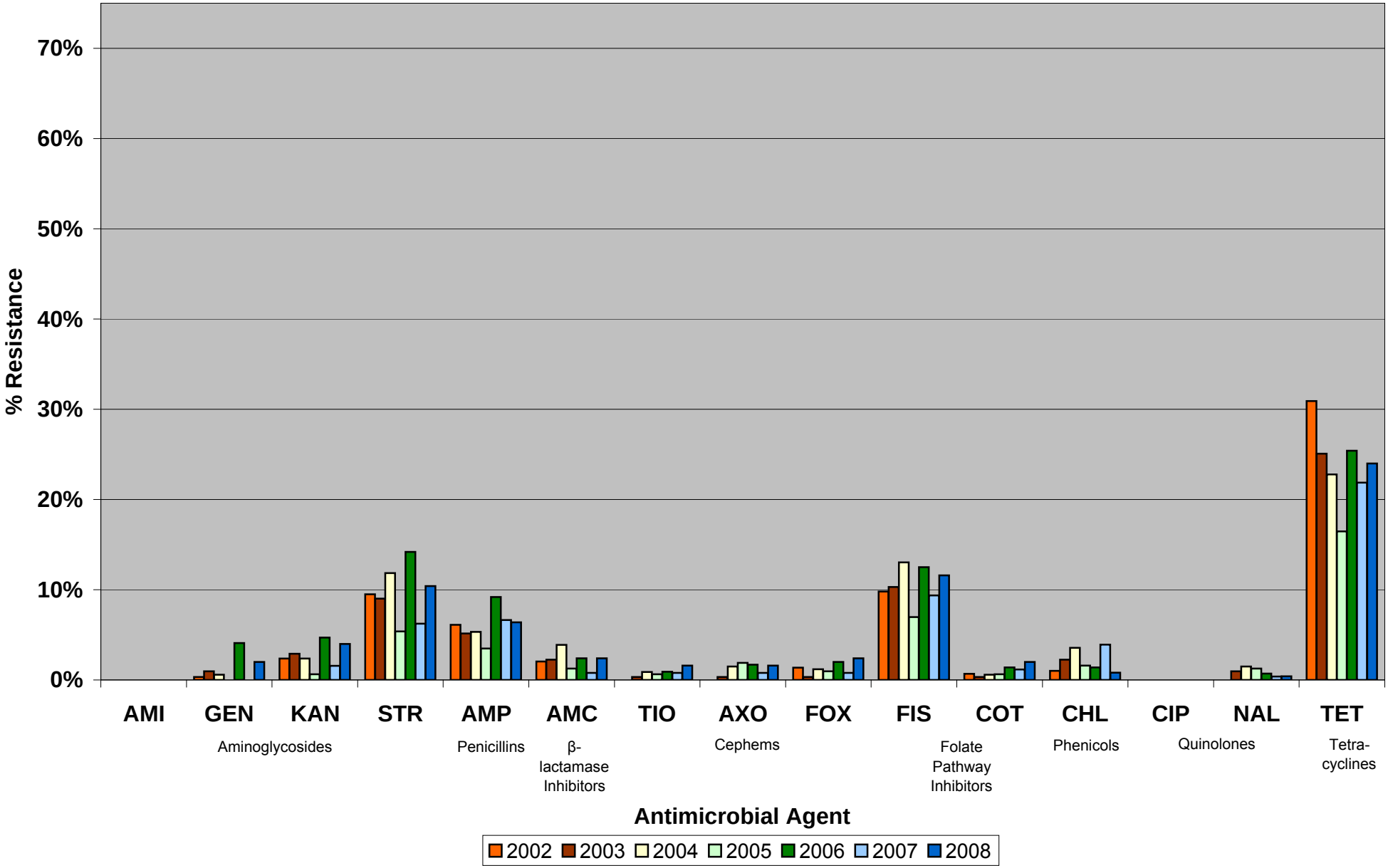


Figure 7d. Antimicrobial Resistance among *Escherichia coli* from Pork Chops, 2002-2008

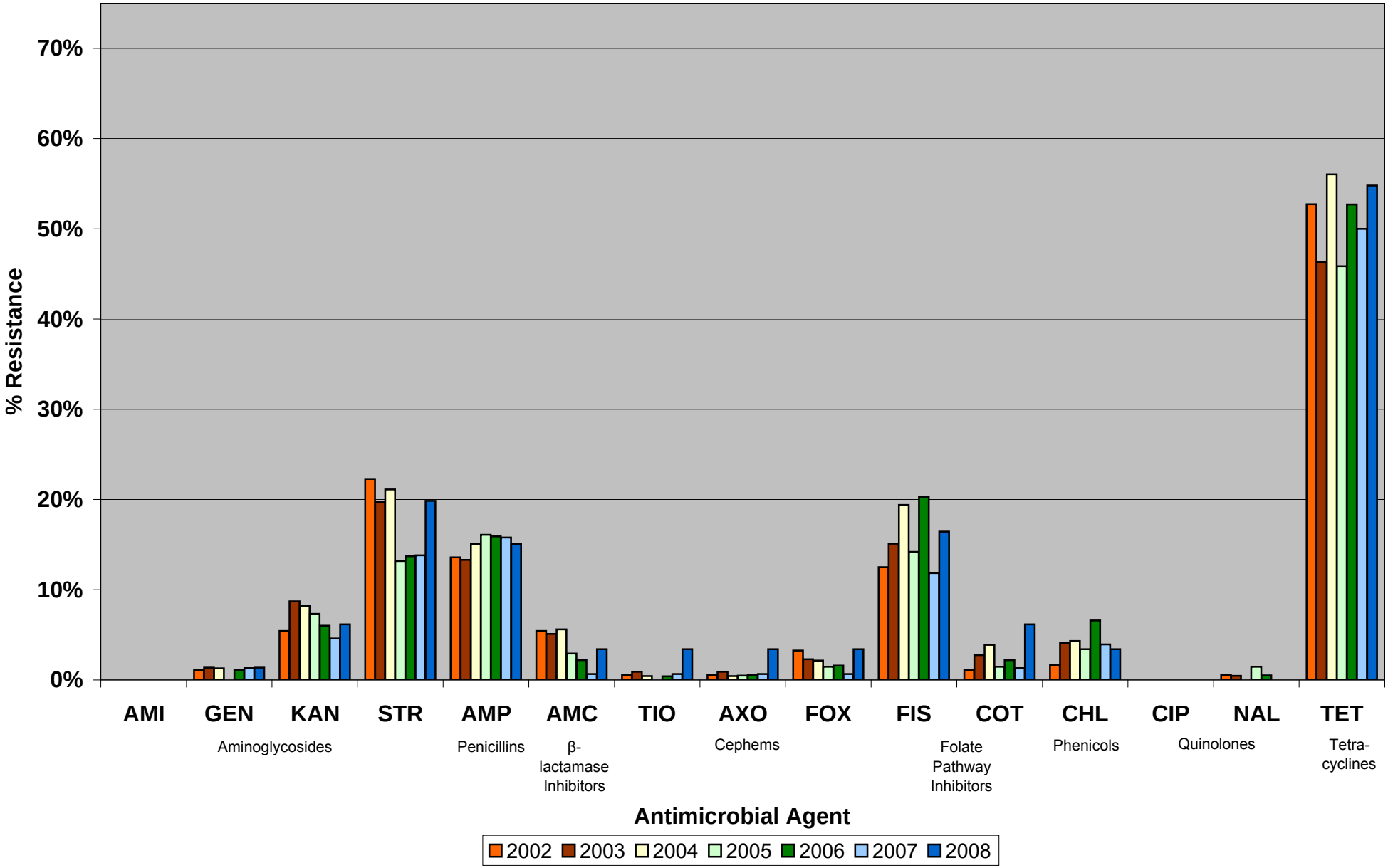


Table 23. Multidrug Resistance Patterns among *Escherichia coli* Isolates by Year, 2002-2008

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

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

[2] Dashes indicate 0.0% resistance.

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

[4] ACSSuTAuCf = ACSSuT, amoxicillin-clavulanic acid, and ceftiofur.

Table 24. Multidrug Resistance among *Escherichia coli* Isolates by Antimicrobial Class, 2002-2008

Year		2002	2003	2004	2005	2006	2007	2008
Number of Isolates Tested by Source	Chicken Breast	282	396	400	393	418	299	306
	Ground Turkey	304	333	376	396	388	315	300
	Ground Beef	295	311	338	316	295	256	250
	Pork Chop	184	218	232	205	182	152	146
Resistance Pattern[1]	**Isolate Source**							
1. No Resistance Detected	Chicken Breast	27.0% 76	20.5% 81	20.8% 83	20.6% 81	23.4% 98	29.1% 87	33.3% 102
	Ground Turkey	16.8% 51	14.7% 49	19.1% 72	16.2% 64	16.0% 62	13.0% 41	8.3% 25
	Ground Beef	63.1% 186	66.9% 208	73.1% 247	81.3% 257	71.5% 211	77.0% 197	73.2% 183
	Pork Chop	41.3% 76	44.5% 97	37.9% 88	48.8% 100	42.9% 78	48.0% 73	43.8% 64
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
	Ground Turkey	55.6% 169	55.6% 185	51.9% 195	52.8% 209	55.2% 214	57.5% 181	63.7% 191
	Ground Beef	10.2% 30	7.4% 23	10.4% 35	5.4% 17	11.5% 34	9.0% 23	11.2% 28
	Pork Chop	17.4% 32	17.9% 39	21.1% 49	16.1% 33	15.9% 29	15.1% 23	17.8% 26
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
	Ground Turkey	23.0% 70	30.0% 100	24.5% 92	24.2% 96	25.8% 100	27.0% 85	32.3% 97
	Ground Beef	1.7% 5	4.2% 13	4.7% 16	1.9% 6	5.8% 17	4.7% 12	4.4% 11
	Pork Chop	5.4% 10	6.9% 15	7.8% 18	4.9% 10	7.7% 14	3.3% 5	7.5% 11
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
	Ground Turkey	9.2% 28	14.7% 49	6.9% 26	6.3% 25	5.7% 22	4.1% 13	6.3% 19
	Ground Beef	0.3% 1	2.6% 8	2.7% 9	1.0% 3	2.4% 7	0.4% 1	2.0% 5
	Pork Chop	3.3% 6	2.8% 6	2.2% 5	1.5% 3	3.3% 6	1.3% 2	4.1% 6
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
	Ground Turkey	2.6% 8	4.2% 14	3.2% 12	1.8% 7	3.1% 12	2.9% 9	4.0% 12
	Ground Beef	0.3% 1	1.3% 4	2.1% 7	0.6% 2	1.7% 5	–[2]	1.6% 4
	Pork Chop	1.6% 3	1.8% 4	0.4% 1	0.5% 1	1.1% 2	0.7% 1	2.1% 3

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

[2] Dashes indicate 0.0% resistance.

Table 25a. MIC Distribution among *Escherichia coli* from Chicken Breast, 2002-2008

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							
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**					
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**			
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**			
Aminopenicillins																					
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**				
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**				
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**						
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**					

[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, 2002-2008 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**				
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**	
Trimethoprim-	2002 (282)	N/A	**3.5**	[1.7 - 6.4]				82.6	6.4	6.0	0.4	1.1		**3.6**							
Sulfamethoxazole	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**							
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**				
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											
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**				
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	**50.7**	[45.8 - 55.6]									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**				

[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, 2002-2008

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							
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**					
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**	[8.6 - 15.2]										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**			
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**			
Aminopenicillins																					
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**				
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**				
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**						
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**					

[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, 2002-2008 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**				
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**	
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**							
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**				
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												
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**				
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**				

[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, 2002-2008

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						
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)	1.6	**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**					
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	**4.8**	[2.6 - 7.9]										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**			
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	**14.3**	[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**			
Aminopenicillins																					
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 - 13.1]							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**				
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**				
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 - 3.0]				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**						
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**					

[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, 2002-2008 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)	1.6	**2.0**	[0.8 - 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**				
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	**12.6**	[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**	
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**							
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**				
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												
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**				
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 - 30.9]									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**				

[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, 2002-2008

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						
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**					
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**			
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**			
Aminopenicillins																					
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**				
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**					
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	**0.5**	[0.0 - 1.8]				3.4	58.0	34.6	2.0	0.5	1.0		**0.5**						
	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**						
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**					

[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, 2002-2008 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**				
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**	
Trimethoprim-	2002 (184)	N/A	**1.1**	[0.1 - 3.9]				88.6	4.4	5.4	0.5		**0.5**	**0.5**							
Sulfamethoxazole	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**							
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**				
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															
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							
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**				

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

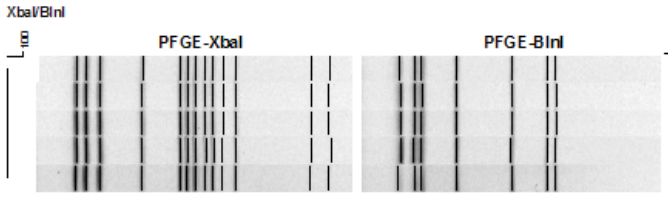
[2] Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s are due to rounding. % non-susceptible is reported when no CLSI breakpoint available.

[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

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

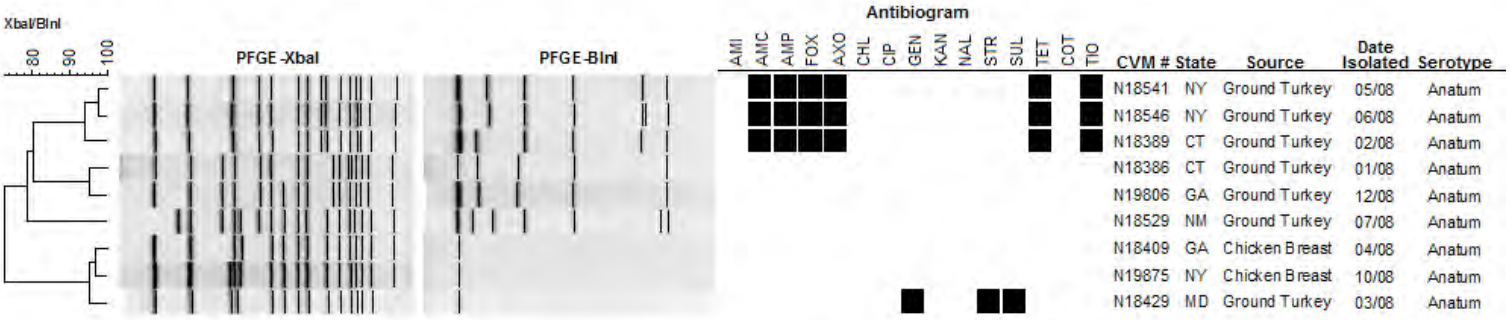


Antibiogram

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

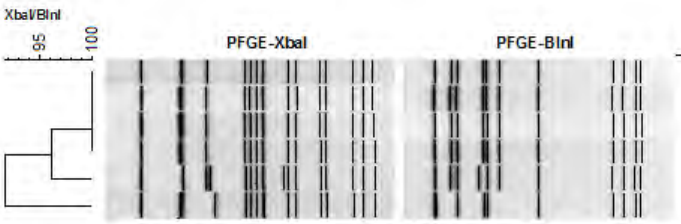
CVM #	State	Source	Date Isolated	Serotype
N18359	PA	Ground Turkey	09/08	Albany
N18360	PA	Ground Turkey	09/08	Albany
N18361	PA	Ground Turkey	09/08	Albany
N18390	CT	Ground Turkey	03/08	Albany
N19899	MD	Ground Turkey	09/08	Albany

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



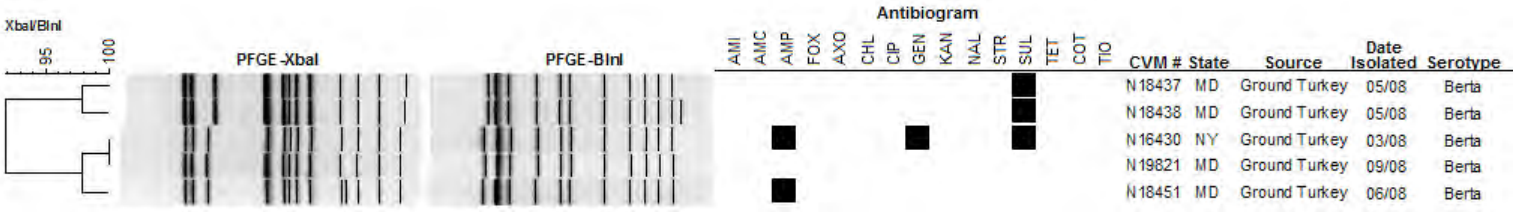
CVM #	State	Source	Date Isolated	Serotype
N18541	NY	Ground Turkey	05/08	Anatum
N18546	NY	Ground Turkey	06/08	Anatum
N18389	CT	Ground Turkey	02/08	Anatum
N18386	CT	Ground Turkey	01/08	Anatum
N19806	GA	Ground Turkey	12/08	Anatum
N18529	NM	Ground Turkey	07/08	Anatum
N18409	GA	Chicken Breast	04/08	Anatum
N19875	NY	Chicken Breast	10/08	Anatum
N18429	MD	Ground Turkey	03/08	Anatum

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



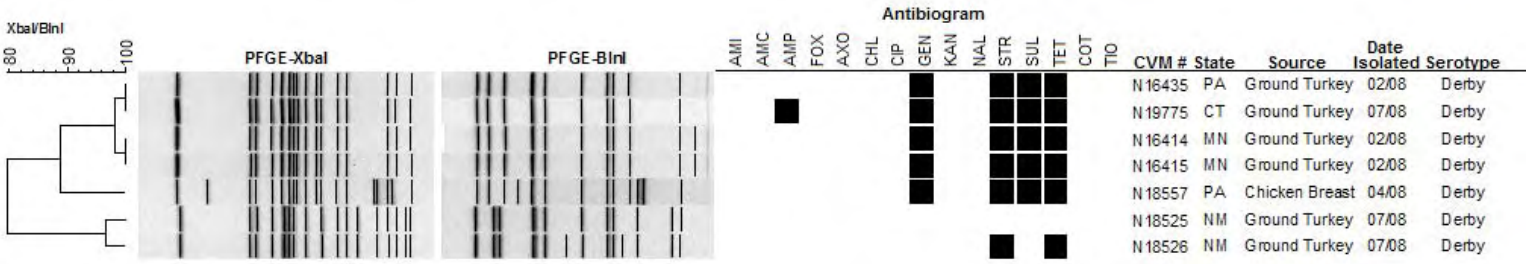
Antibiogram															CVM #	State	Source	Date Isolated	Serotype
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO					
															N18596	TN	Ground Beef	07/08	Bareilly
															N18601	TN	Ground Beef	07/08	Bareilly
															N18605	TN	Pork Chop	07/08	Bareilly
															N18611	TN	Pork Chop	07/08	Bareilly
															N18580	TN	Chicken Breast	07/08	Bareilly
															N18581	TN	Chicken Breast	07/08	Bareilly

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



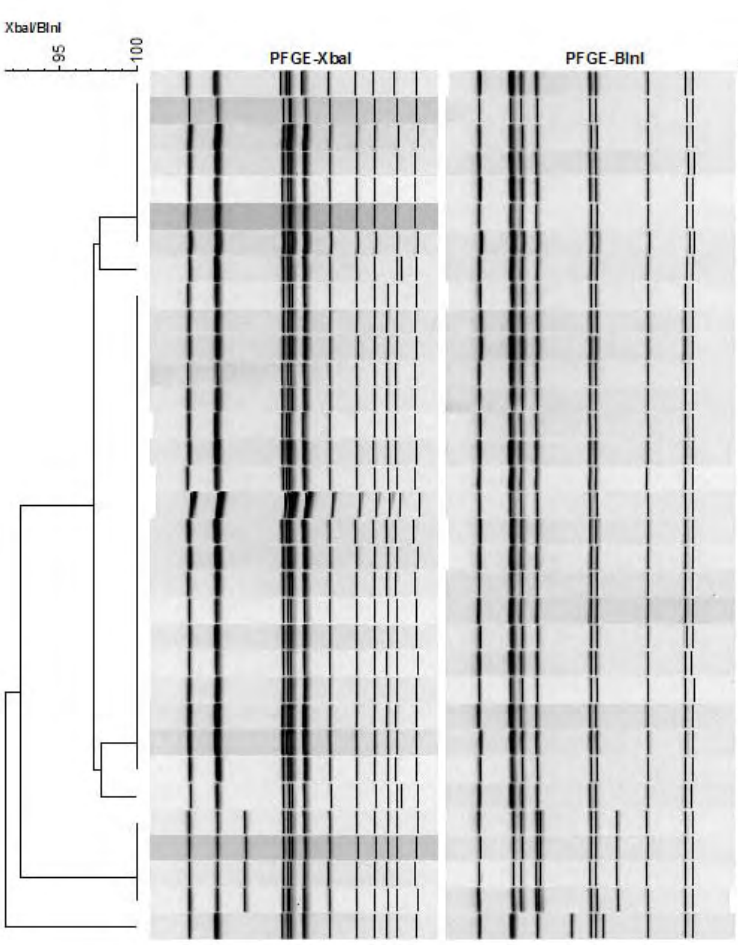
CVM #	State	Source	Date Isolated	Serotype
N18437	MD	Ground Turkey	05/08	Berta
N18438	MD	Ground Turkey	05/08	Berta
N16430	NY	Ground Turkey	03/08	Berta
N19821	MD	Ground Turkey	09/08	Berta
N18451	MD	Ground Turkey	06/08	Berta

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



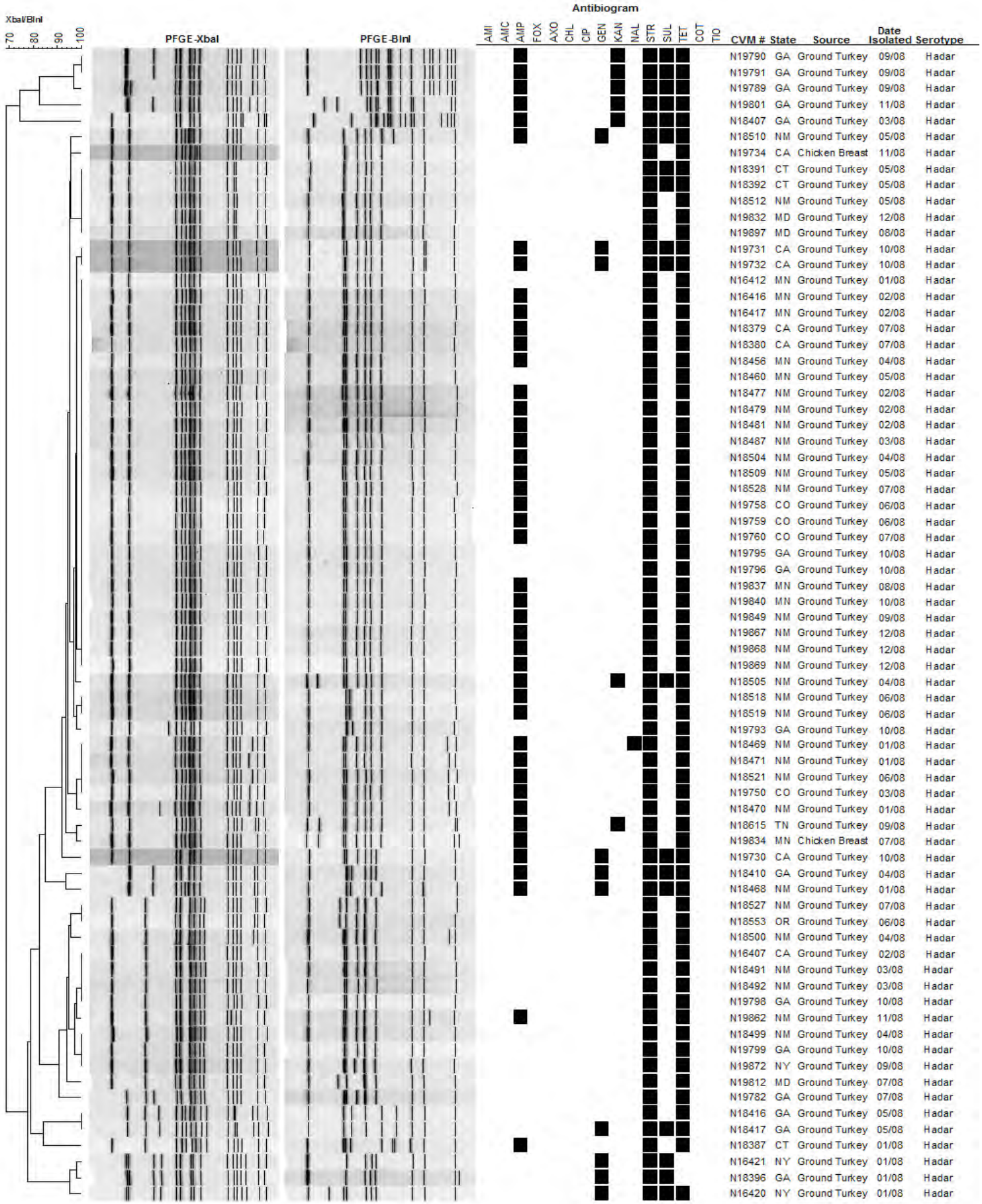
CVM #	State	Source	Date Isolated	Serotype
N16435	PA	Ground Turkey	02/08	Derby
N19775	CT	Ground Turkey	07/08	Derby
N16414	MN	Ground Turkey	02/08	Derby
N16415	MN	Ground Turkey	02/08	Derby
N18557	PA	Chicken Breast	04/08	Derby
N18525	NM	Ground Turkey	07/08	Derby
N18526	NM	Ground Turkey	07/08	Derby

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



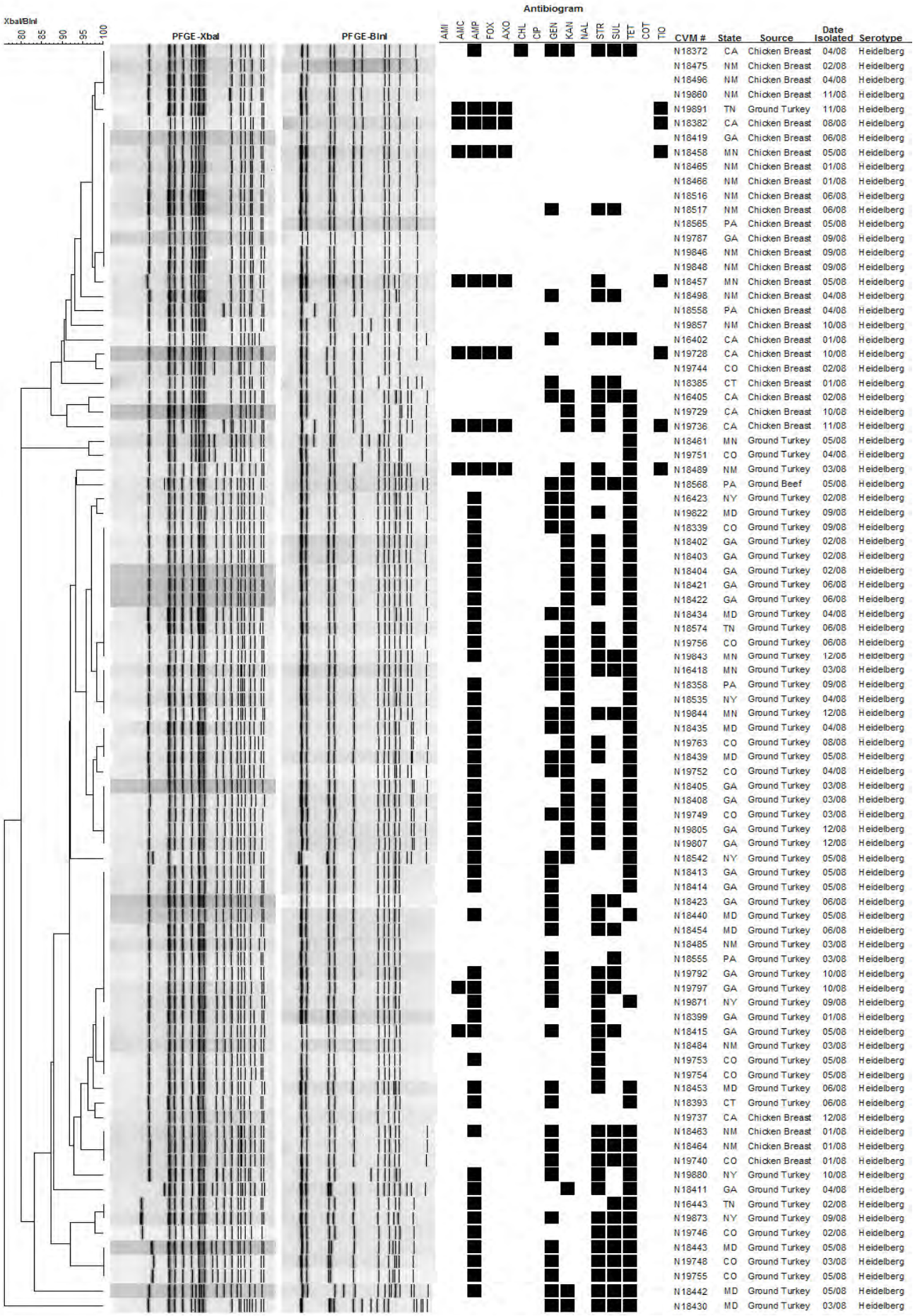
CVM #	State	Source	Date Isolated	Serotype
N18344	MD	Chicken Breast	09/08	Enteritidis
N18418	GA	Chicken Breast	06/08	Enteritidis
N18497	NM	Chicken Breast	04/08	Enteritidis
N18513	NM	Ground Beef	05/08	Enteritidis
N18563	PA	Ground Turkey	04/08	Enteritidis
N19727	CA	Chicken Breast	10/08	Enteritidis
N19878	NY	Chicken Breast	10/08	Enteritidis
N19818	MD	Chicken Breast	08/08	Enteritidis
N16413	MN	Chicken Breast	02/08	Enteritidis
N16428	NY	Chicken Breast	03/08	Enteritidis
N16429	NY	Chicken Breast	03/08	Enteritidis
N16444	TN	Chicken Breast	04/08	Enteritidis
N16445	TN	Chicken Breast	04/08	Enteritidis
N18394	GA	Chicken Breast	01/08	Enteritidis
N18412	GA	Chicken Breast	05/08	Enteritidis
N18431	MD	Chicken Breast	04/08	Enteritidis
N18436	MD	Chicken Breast	05/08	Enteritidis
N18493	NM	Chicken Breast	04/08	Enteritidis
N18494	NM	Chicken Breast	04/08	Enteritidis
N18556	PA	Chicken Breast	04/08	Enteritidis
N18564	PA	Chicken Breast	05/08	Enteritidis
N19819	MD	Chicken Breast	09/08	Enteritidis
N19825	MD	Chicken Breast	10/08	Enteritidis
N19847	NM	Chicken Breast	09/08	Enteritidis
N19864	NM	Chicken Breast	12/08	Enteritidis
N19876	NY	Chicken Breast	10/08	Enteritidis
N19890	TN	Chicken Breast	10/08	Enteritidis
N19813	MD	Chicken Breast	08/08	Enteritidis
N16404	CA	Chicken Breast	02/08	Enteritidis
N18420	GA	Chicken Breast	06/08	Enteritidis
N18616	TN	Ground Turkey	09/08	Enteritidis
N19747	CO	Chicken Breast	03/08	Enteritidis
N19817	MD	Chicken Breast	08/08	Enteritidis

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



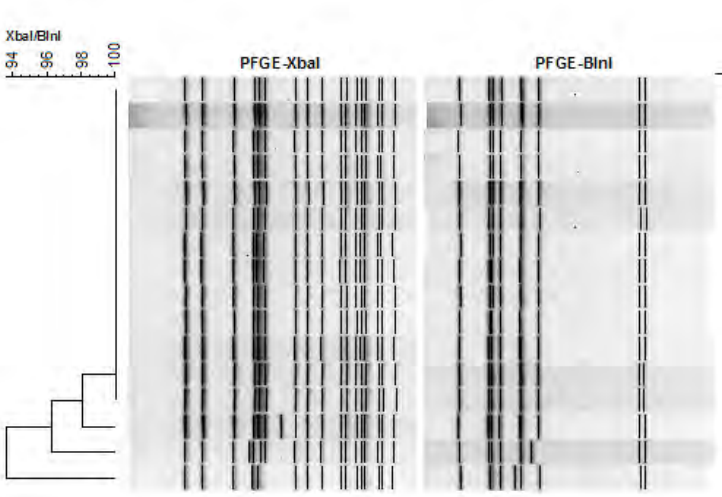
CVM #	State	Source	Date Isolated	Serotype
N19790	GA	Ground Turkey	09/08	Hadar
N19791	GA	Ground Turkey	09/08	Hadar
N19789	GA	Ground Turkey	09/08	Hadar
N19801	GA	Ground Turkey	11/08	Hadar
N18407	GA	Ground Turkey	03/08	Hadar
N18510	NM	Ground Turkey	05/08	Hadar
N19734	CA	Chicken Breast	11/08	Hadar
N18391	CT	Ground Turkey	05/08	Hadar
N18392	CT	Ground Turkey	05/08	Hadar
N18512	NM	Ground Turkey	05/08	Hadar
N19832	MD	Ground Turkey	12/08	Hadar
N19897	MD	Ground Turkey	08/08	Hadar
N19731	CA	Ground Turkey	10/08	Hadar
N19732	CA	Ground Turkey	10/08	Hadar
N16412	MN	Ground Turkey	01/08	Hadar
N16416	MN	Ground Turkey	02/08	Hadar
N16417	MN	Ground Turkey	02/08	Hadar
N18379	CA	Ground Turkey	07/08	Hadar
N18380	CA	Ground Turkey	07/08	Hadar
N18456	MN	Ground Turkey	04/08	Hadar
N18460	MN	Ground Turkey	05/08	Hadar
N18477	NM	Ground Turkey	02/08	Hadar
N18479	NM	Ground Turkey	02/08	Hadar
N18481	NM	Ground Turkey	02/08	Hadar
N18487	NM	Ground Turkey	03/08	Hadar
N18504	NM	Ground Turkey	04/08	Hadar
N18509	NM	Ground Turkey	05/08	Hadar
N18528	NM	Ground Turkey	07/08	Hadar
N19758	CO	Ground Turkey	06/08	Hadar
N19759	CO	Ground Turkey	06/08	Hadar
N19760	CO	Ground Turkey	07/08	Hadar
N19795	GA	Ground Turkey	10/08	Hadar
N19796	GA	Ground Turkey	10/08	Hadar
N19837	MN	Ground Turkey	08/08	Hadar
N19840	MN	Ground Turkey	10/08	Hadar
N19849	NM	Ground Turkey	09/08	Hadar
N19867	NM	Ground Turkey	12/08	Hadar
N19868	NM	Ground Turkey	12/08	Hadar
N19869	NM	Ground Turkey	12/08	Hadar
N18505	NM	Ground Turkey	04/08	Hadar
N18518	NM	Ground Turkey	06/08	Hadar
N18519	NM	Ground Turkey	06/08	Hadar
N19793	GA	Ground Turkey	10/08	Hadar
N18469	NM	Ground Turkey	01/08	Hadar
N18471	NM	Ground Turkey	01/08	Hadar
N18521	NM	Ground Turkey	06/08	Hadar
N19750	CO	Ground Turkey	03/08	Hadar
N18470	NM	Ground Turkey	01/08	Hadar
N18615	TN	Ground Turkey	09/08	Hadar
N19834	MN	Chicken Breast	07/08	Hadar
N19730	CA	Ground Turkey	10/08	Hadar
N18410	GA	Ground Turkey	04/08	Hadar
N18468	NM	Ground Turkey	01/08	Hadar
N18527	NM	Ground Turkey	07/08	Hadar
N18553	OR	Ground Turkey	06/08	Hadar
N18500	NM	Ground Turkey	04/08	Hadar
N16407	CA	Ground Turkey	02/08	Hadar
N18491	NM	Ground Turkey	03/08	Hadar
N18492	NM	Ground Turkey	03/08	Hadar
N19798	GA	Ground Turkey	10/08	Hadar
N19862	NM	Ground Turkey	11/08	Hadar
N18499	NM	Ground Turkey	04/08	Hadar
N19799	GA	Ground Turkey	10/08	Hadar
N19872	NY	Ground Turkey	09/08	Hadar
N19812	MD	Ground Turkey	07/08	Hadar
N19782	GA	Ground Turkey	07/08	Hadar
N18416	GA	Ground Turkey	05/08	Hadar
N18417	GA	Ground Turkey	05/08	Hadar
N18387	CT	Ground Turkey	01/08	Hadar
N16421	NY	Ground Turkey	01/08	Hadar
N18396	GA	Ground Turkey	01/08	Hadar
N16420	NY	Ground Turkey	01/08	Hadar

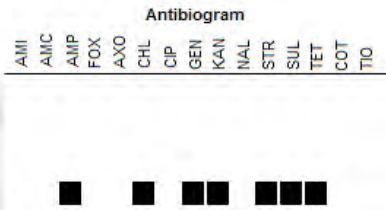
A-1i. PFGE Profiles for *Salmonella* Heidelberg



CVM #	State	Source	Date Isolated	Serotype
N18372	CA	Chicken Breast	04/08	Heidelberg
N18475	NM	Chicken Breast	02/08	Heidelberg
N18496	NM	Chicken Breast	04/08	Heidelberg
N19860	NM	Chicken Breast	11/08	Heidelberg
N19891	TN	Ground Turkey	11/08	Heidelberg
N18382	CA	Chicken Breast	08/08	Heidelberg
N18419	GA	Chicken Breast	06/08	Heidelberg
N18458	MN	Chicken Breast	05/08	Heidelberg
N18465	NM	Chicken Breast	01/08	Heidelberg
N18466	NM	Chicken Breast	01/08	Heidelberg
N18516	NM	Chicken Breast	06/08	Heidelberg
N18517	NM	Chicken Breast	06/08	Heidelberg
N18565	PA	Chicken Breast	05/08	Heidelberg
N19787	GA	Chicken Breast	09/08	Heidelberg
N19846	NM	Chicken Breast	09/08	Heidelberg
N19848	NM	Chicken Breast	09/08	Heidelberg
N18457	MN	Chicken Breast	05/08	Heidelberg
N18498	NM	Chicken Breast	04/08	Heidelberg
N18558	PA	Chicken Breast	04/08	Heidelberg
N19857	NM	Chicken Breast	10/08	Heidelberg
N16402	CA	Chicken Breast	01/08	Heidelberg
N19728	CA	Chicken Breast	10/08	Heidelberg
N19744	CO	Chicken Breast	02/08	Heidelberg
N18385	CT	Chicken Breast	01/08	Heidelberg
N16405	CA	Chicken Breast	02/08	Heidelberg
N19729	CA	Chicken Breast	10/08	Heidelberg
N19736	CA	Chicken Breast	11/08	Heidelberg
N18461	MN	Ground Turkey	05/08	Heidelberg
N19751	CO	Ground Turkey	04/08	Heidelberg
N18489	NM	Ground Turkey	03/08	Heidelberg
N18568	PA	Ground Beef	05/08	Heidelberg
N16423	NY	Ground Turkey	02/08	Heidelberg
N19822	MD	Ground Turkey	09/08	Heidelberg
N18339	CO	Ground Turkey	09/08	Heidelberg
N18402	GA	Ground Turkey	02/08	Heidelberg
N18403	GA	Ground Turkey	02/08	Heidelberg
N18404	GA	Ground Turkey	02/08	Heidelberg
N18421	GA	Ground Turkey	06/08	Heidelberg
N18422	GA	Ground Turkey	06/08	Heidelberg
N18434	MD	Ground Turkey	04/08	Heidelberg
N18574	TN	Ground Turkey	06/08	Heidelberg
N19756	CO	Ground Turkey	06/08	Heidelberg
N19843	MN	Ground Turkey	12/08	Heidelberg
N16418	MN	Ground Turkey	03/08	Heidelberg
N18358	PA	Ground Turkey	09/08	Heidelberg
N18535	NY	Ground Turkey	04/08	Heidelberg
N19844	MN	Ground Turkey	12/08	Heidelberg
N18435	MD	Ground Turkey	04/08	Heidelberg
N19763	CO	Ground Turkey	08/08	Heidelberg
N18439	MD	Ground Turkey	05/08	Heidelberg
N19752	CO	Ground Turkey	04/08	Heidelberg
N18405	GA	Ground Turkey	03/08	Heidelberg
N18408	GA	Ground Turkey	03/08	Heidelberg
N19749	CO	Ground Turkey	03/08	Heidelberg
N19805	GA	Ground Turkey	12/08	Heidelberg
N19807	GA	Ground Turkey	12/08	Heidelberg
N18542	NY	Ground Turkey	05/08	Heidelberg
N18413	GA	Ground Turkey	05/08	Heidelberg
N18414	GA	Ground Turkey	05/08	Heidelberg
N18423	GA	Ground Turkey	06/08	Heidelberg
N18440	MD	Ground Turkey	05/08	Heidelberg
N18454	MD	Ground Turkey	06/08	Heidelberg
N18485	NM	Ground Turkey	03/08	Heidelberg
N18555	PA	Ground Turkey	03/08	Heidelberg
N19792	GA	Ground Turkey	10/08	Heidelberg
N19797	GA	Ground Turkey	10/08	Heidelberg
N19871	NY	Ground Turkey	09/08	Heidelberg
N18399	GA	Ground Turkey	01/08	Heidelberg
N18415	GA	Ground Turkey	05/08	Heidelberg
N18484	NM	Ground Turkey	03/08	Heidelberg
N19753	CO	Ground Turkey	05/08	Heidelberg
N19754	CO	Ground Turkey	05/08	Heidelberg
N18453	MD	Ground Turkey	06/08	Heidelberg
N18393	CT	Ground Turkey	06/08	Heidelberg
N19737	CA	Chicken Breast	12/08	Heidelberg
N18463	NM	Chicken Breast	01/08	Heidelberg
N18464	NM	Chicken Breast	01/08	Heidelberg
N19740	CO	Chicken Breast	01/08	Heidelberg
N19880	NY	Ground Turkey	10/08	Heidelberg
N18411	GA	Ground Turkey	04/08	Heidelberg
N16443	TN	Ground Turkey	02/08	Heidelberg
N19873	NY	Ground Turkey	09/08	Heidelberg
N19746	CO	Ground Turkey	02/08	Heidelberg
N18443	MD	Ground Turkey	05/08	Heidelberg
N19748	CO	Ground Turkey	03/08	Heidelberg
N19755	CO	Ground Turkey	05/08	Heidelberg
N18442	MD	Ground Turkey	05/08	Heidelberg
N18430	MD	Ground Turkey	03/08	Heidelberg

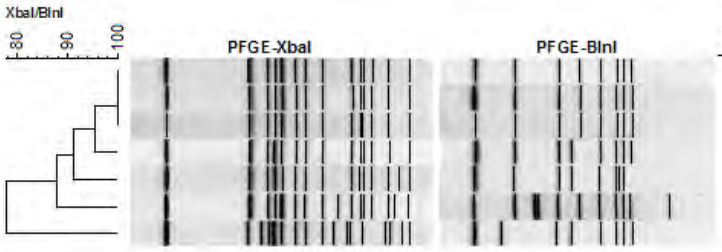
A-1j. PFGE Profiles for *Salmonella* IIIa 18: z4,z23:-





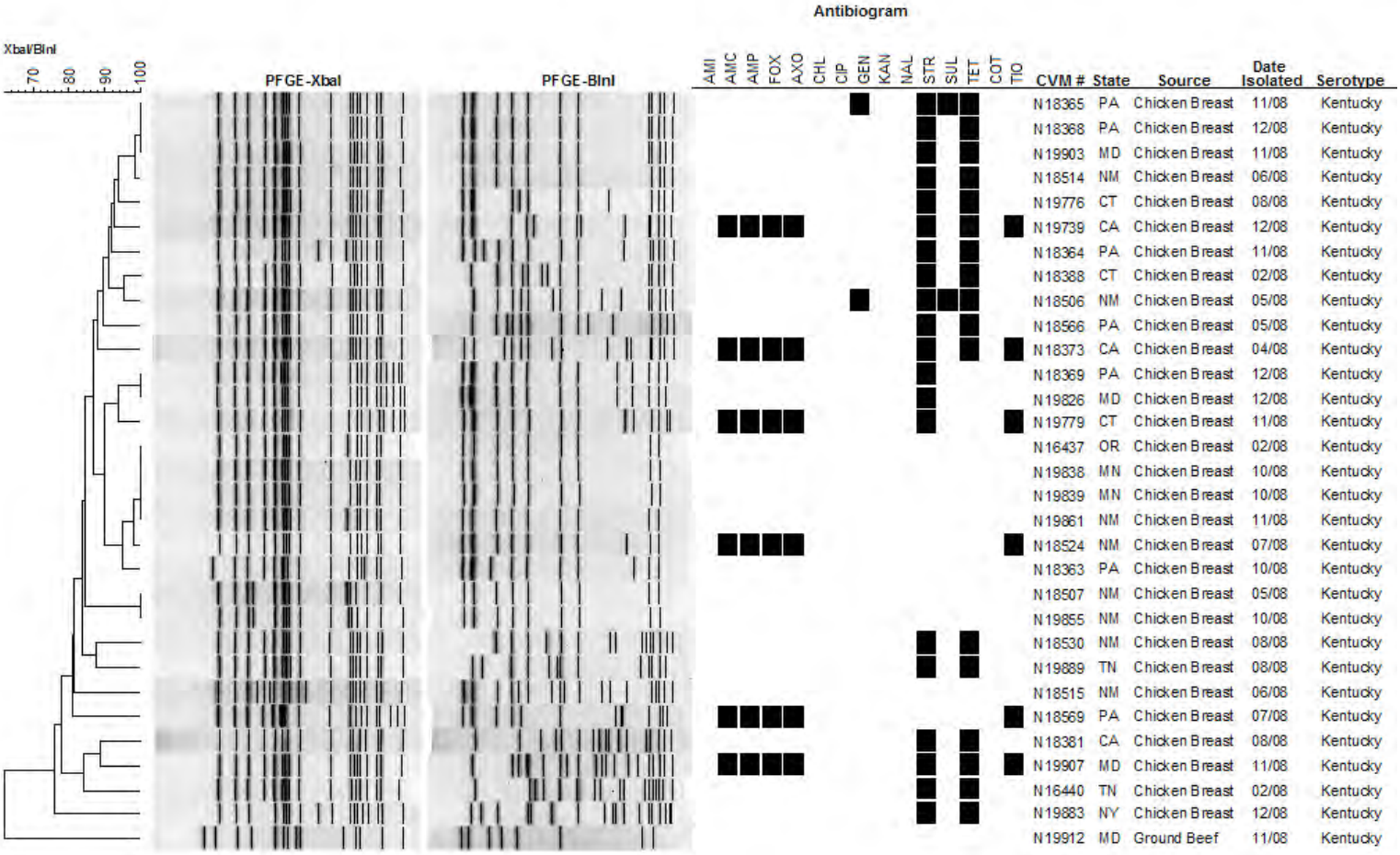
CVM #	State	Source	Date Isolated	Serotype
N16403	CA	Ground Turkey	01/08	IIIa 18:z4,z23:-
N18377	CA	Ground Turkey	06/08	IIIa 18:z4,z23:-
N18383	CA	Ground Turkey	08/08	IIIa 18:z4,z23:-
N18384	CA	Ground Turkey	09/08	IIIa 18:z4,z23:-
N18503	NM	Ground Turkey	04/08	IIIa 18:z4,z23:-
N19745	CO	Ground Turkey	02/08	IIIa 18:z4,z23:-
N19761	CO	Ground Turkey	07/08	IIIa 18:z4,z23:-
N19762	CO	Ground Turkey	08/08	IIIa 18:z4,z23:-
N19764	CO	Ground Turkey	10/08	IIIa 18:z4,z23:-
N19765	CO	Ground Turkey	10/08	IIIa 18:z4,z23:-
N19772	CO	Ground Turkey	12/08	IIIa 18:z4,z23:-
N19865	NM	Ground Turkey	12/08	IIIa 18:z4,z23:-
N19866	NM	Ground Turkey	12/08	IIIa 18:z4,z23:-
N19773	CO	Ground Turkey	12/08	IIIa 18:z4,z23:-
N18554	OR	Ground Turkey	08/08	IIIa 18:z4,z23:-
N19757	CO	Ground Turkey	06/08	IIIa 18:z4,z23:-

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

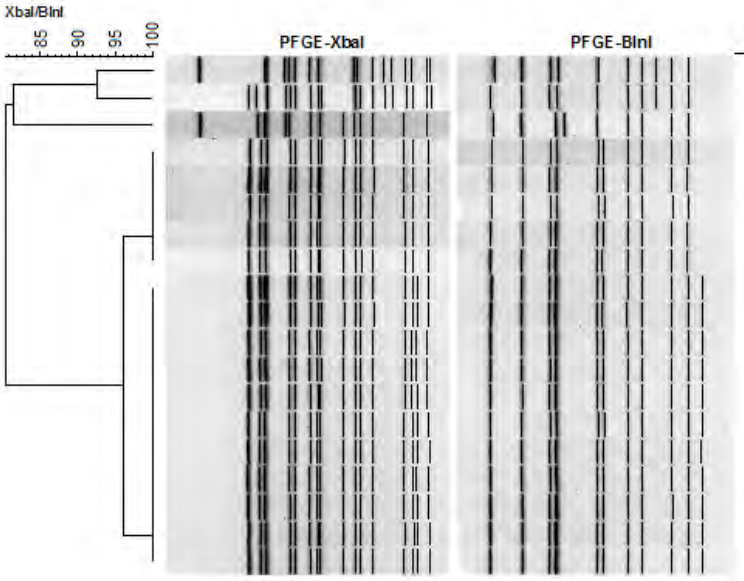


Antibiogram																			
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
															N18462	NM	Chicken Breast	01/08	Infantis
															N19783	GA	Chicken Breast	08/08	Infantis
															N19784	GA	Chicken Breast	08/08	Infantis
															N19870	NY	Chicken Breast	09/08	Infantis
															N19738	CA	Chicken Breast	12/08	Infantis
															N19911	MD	Ground Turkey	11/08	Infantis
															N19836	MN	Pork Chop	07/08	Infantis

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

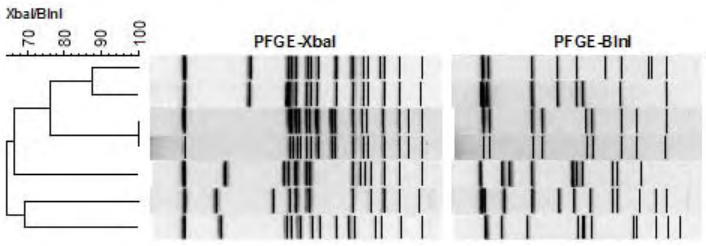


A-1m. PFGE Profiles for *Salmonella* Mbandaka



Antibiogram																			
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
															N16425	NY	Chicken Breast	03/08	Mbandaka
															N19906	MD	Chicken Breast	11/08	Mbandaka
															N18427	MD	Chicken Breast	03/08	Mbandaka
															N18579	TN	Chicken Breast	07/08	Mbandaka
															N18582	TN	Chicken Breast	07/08	Mbandaka
															N18595	TN	Ground Beef	07/08	Mbandaka
															N18597	TN	Ground Beef	07/08	Mbandaka
															N18599	TN	Ground Beef	07/08	Mbandaka
															N18575	TN	Chicken Breast	07/08	Mbandaka
															N18576	TN	Chicken Breast	07/08	Mbandaka
															N18602	TN	Ground Beef	07/08	Mbandaka
															N18603	TN	Ground Beef	07/08	Mbandaka
															N18604	TN	Ground Beef	07/08	Mbandaka
															N18607	TN	Pork Chop	07/08	Mbandaka
															N18608	TN	Pork Chop	07/08	Mbandaka
															N18609	TN	Pork Chop	07/08	Mbandaka
															N18610	TN	Pork Chop	07/08	Mbandaka
															N18612	TN	Pork Chop	07/08	Mbandaka
															N18614	TN	Pork Chop	07/08	Mbandaka

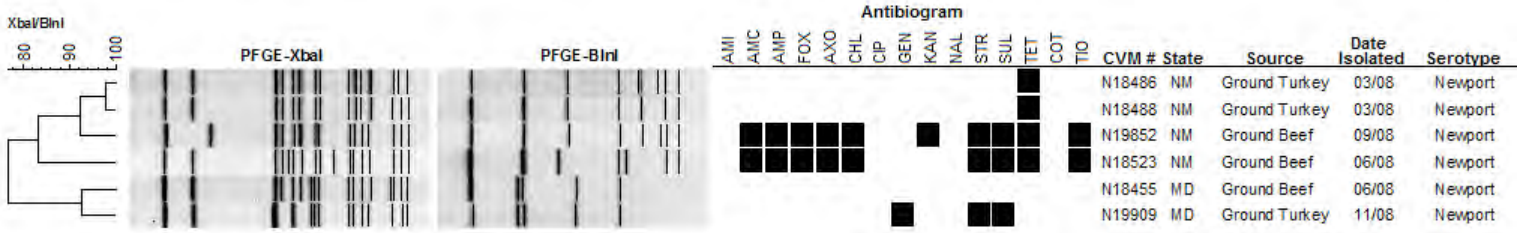
A-1n. PFGE Profiles for *Salmonella* Montevideo



Antibiogram

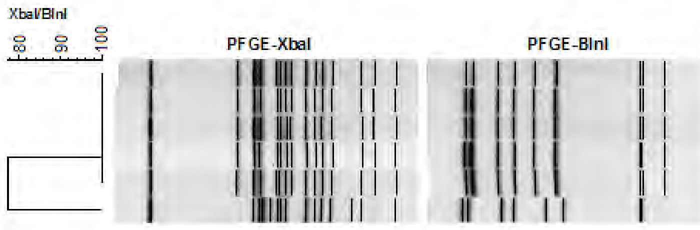
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
															N19892	TN	Ground Beef	11/08	Montevideo
															N19913	MD	Ground Beef	11/08	Montevideo
															N18374	CA	Chicken Breast	06/08	Montevideo
															N18375	CA	Chicken Breast	06/08	Montevideo
															N19841	MN	Ground Turkey	11/08	Montevideo
															N16406	CA	Chicken Breast	02/08	Montevideo
															N19856	NM	Chicken Breast	10/08	Montevideo

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



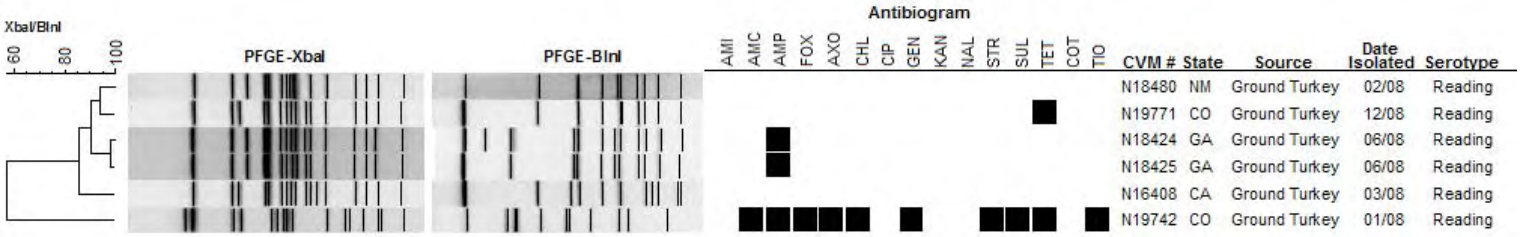
CVM #	State	Source	Date Isolated	Serotype
N18486	NM	Ground Turkey	03/08	Newport
N18488	NM	Ground Turkey	03/08	Newport
N19852	NM	Ground Beef	09/08	Newport
N18523	NM	Ground Beef	06/08	Newport
N18455	MD	Ground Beef	06/08	Newport
N19909	MD	Ground Turkey	11/08	Newport

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



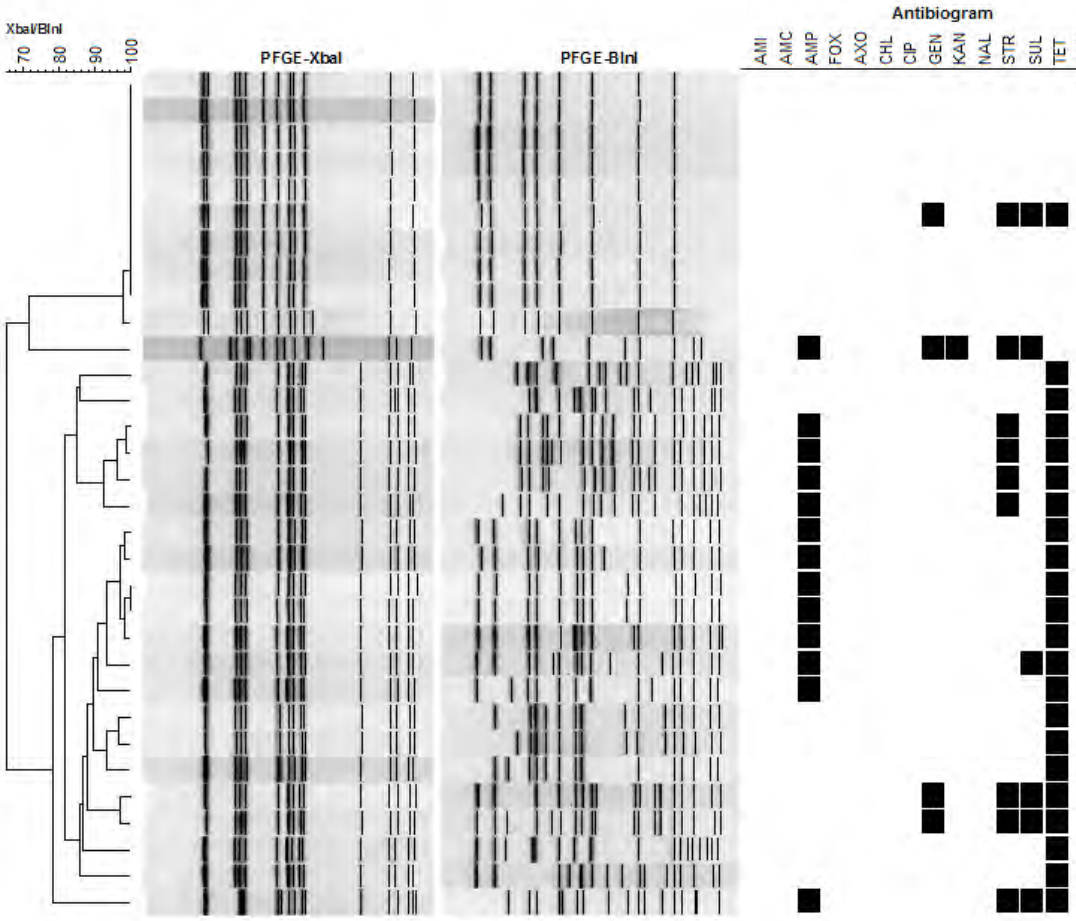
Antibiogram																			
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
															N18588	TN	Ground Turkey	07/08	Norwich
															N18590	TN	Ground Turkey	07/08	Norwich
															N18592	TN	Ground Turkey	07/08	Norwich
															N18600	TN	Ground Beef	07/08	Norwich
															N18613	TN	Pork Chop	07/08	Norwich
															N18598	TN	Ground Beef	07/08	Norwich

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



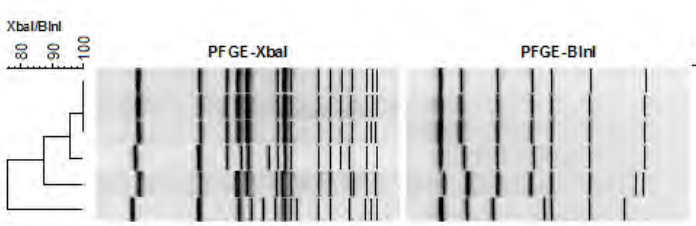
CVM #	State	Source	Date Isolated	Serotype
N18480	NM	Ground Turkey	02/08	Reading
N19771	CO	Ground Turkey	12/08	Reading
N18424	GA	Ground Turkey	06/08	Reading
N18425	GA	Ground Turkey	06/08	Reading
N16408	CA	Ground Turkey	03/08	Reading
N19742	CO	Ground Turkey	01/08	Reading

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



CVM #	State	Source	Date Isolated	Serotype
N18371	PA	Ground Turkey	12/08	Saintpaul
N18441	MD	Ground Turkey	05/08	Saintpaul
N18501	NM	Ground Turkey	04/08	Saintpaul
N18502	NM	Ground Turkey	04/08	Saintpaul
N18540	NY	Ground Turkey	05/08	Saintpaul
N18573	TN	Ground Beef	05/08	Saintpaul
N19810	MD	Ground Turkey	07/08	Saintpaul
N19811	MD	Ground Turkey	07/08	Saintpaul
N19833	MD	Ground Turkey	12/08	Saintpaul
N18478	NM	Ground Turkey	02/08	Saintpaul
N18406	GA	Ground Turkey	03/08	Saintpaul
N18490	NM	Ground Turkey	03/08	Saintpaul
N19802	GA	Ground Turkey	12/08	Saintpaul
N19842	MN	Ground Turkey	11/08	Saintpaul
N19901	MD	Ground Turkey	10/08	Saintpaul
N19900	MD	Ground Turkey	10/08	Saintpaul
N19788	GA	Ground Turkey	09/08	Saintpaul
N19777	CT	Ground Turkey	08/08	Saintpaul
N19879	NY	Ground Turkey	10/08	Saintpaul
N19768	CO	Ground Turkey	11/08	Saintpaul
N19769	CO	Ground Turkey	11/08	Saintpaul
N19908	MD	Ground Turkey	11/08	Saintpaul
N16446	TN	Ground Turkey	04/08	Saintpaul
N19850	NM	Ground Turkey	09/08	Saintpaul
N19803	GA	Ground Turkey	12/08	Saintpaul
N19804	GA	Ground Turkey	12/08	Saintpaul
N19741	CO	Ground Turkey	01/08	Saintpaul
N18397	GA	Ground Turkey	01/08	Saintpaul
N18467	NM	Ground Turkey	01/08	Saintpaul
N18543	NY	Ground Turkey	05/08	Saintpaul
N18567	PA	Ground Turkey	05/08	Saintpaul
N19800	GA	Ground Turkey	11/08	Saintpaul

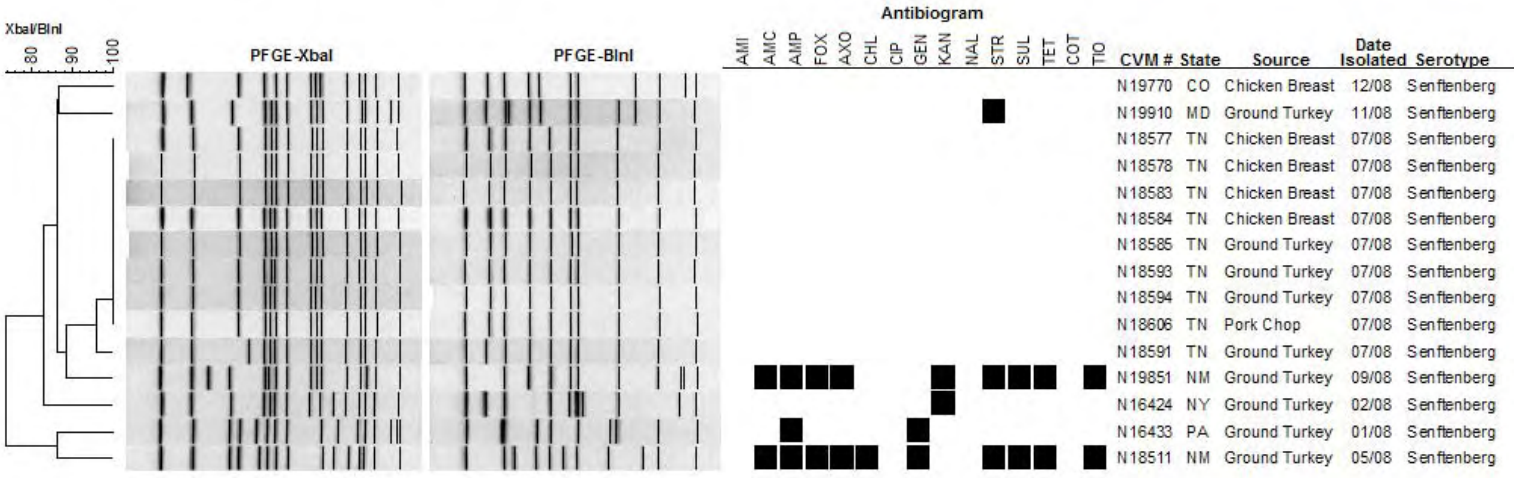
A-1s. PFGE Profiles for *Salmonella* Schwarzengrund



Antibiogram

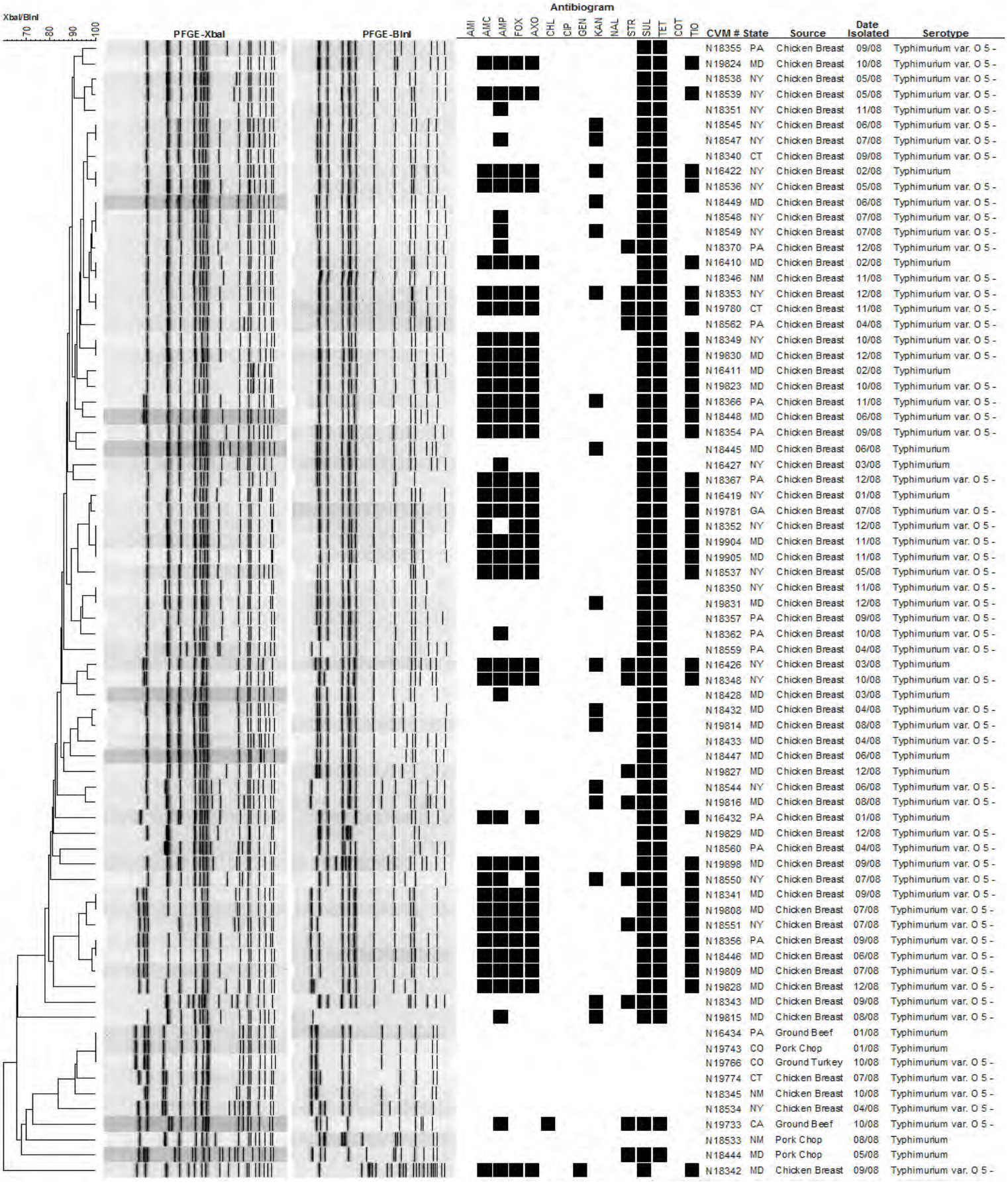
AMI	AMC	AMP	FOX	AXO	CHL	CIP	GEN	KAN	NAL	STR	SUL	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
															N18508	NM	Ground Turkey	05/08	Schwarzengrund
															N18520	NM	Ground Turkey	06/08	Schwarzengrund
															N18522	NM	Ground Turkey	06/08	Schwarzengrund
															N18395	GA	Ground Turkey	01/08	Schwarzengrund
															N18459	MN	Ground Turkey	05/08	Schwarzengrund
		■									■	■			N19794	GA	Ground Turkey	10/08	Schwarzengrund

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



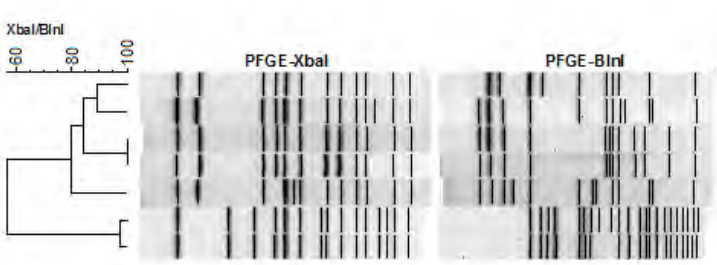
CVM #	State	Source	Date Isolated	Serotype
N19770	CO	Chicken Breast	12/08	Senftenberg
N19910	MD	Ground Turkey	11/08	Senftenberg
N18577	TN	Chicken Breast	07/08	Senftenberg
N18578	TN	Chicken Breast	07/08	Senftenberg
N18583	TN	Chicken Breast	07/08	Senftenberg
N18584	TN	Chicken Breast	07/08	Senftenberg
N18585	TN	Ground Turkey	07/08	Senftenberg
N18593	TN	Ground Turkey	07/08	Senftenberg
N18594	TN	Ground Turkey	07/08	Senftenberg
N18606	TN	Pork Chop	07/08	Senftenberg
N18591	TN	Ground Turkey	07/08	Senftenberg
N19851	NM	Ground Turkey	09/08	Senftenberg
N16424	NY	Ground Turkey	02/08	Senftenberg
N16433	PA	Ground Turkey	01/08	Senftenberg
N18511	NM	Ground Turkey	05/08	Senftenberg

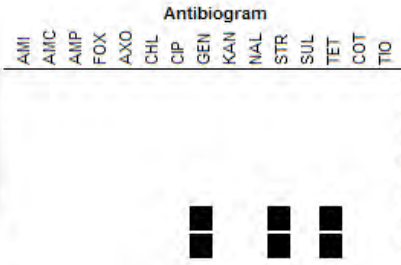
A-1u. PFGE Profiles for *Salmonella* Typhimurium



CVM #	State	Source	Date Isolated	Serotype
N18355	PA	Chicken Breast	09/08	Typhimurium var. O 5 -
N19824	MD	Chicken Breast	10/08	Typhimurium var. O 5 -
N18538	NY	Chicken Breast	05/08	Typhimurium var. O 5 -
N18539	NY	Chicken Breast	05/08	Typhimurium var. O 5 -
N18351	NY	Chicken Breast	11/08	Typhimurium var. O 5 -
N18545	NY	Chicken Breast	06/08	Typhimurium var. O 5 -
N18547	NY	Chicken Breast	07/08	Typhimurium var. O 5 -
N18340	CT	Chicken Breast	09/08	Typhimurium var. O 5 -
N16422	NY	Chicken Breast	02/08	Typhimurium
N18536	NY	Chicken Breast	05/08	Typhimurium var. O 5 -
N18449	MD	Chicken Breast	06/08	Typhimurium var. O 5 -
N18548	NY	Chicken Breast	07/08	Typhimurium var. O 5 -
N18549	NY	Chicken Breast	07/08	Typhimurium var. O 5 -
N18370	PA	Chicken Breast	12/08	Typhimurium var. O 5 -
N16410	MD	Chicken Breast	02/08	Typhimurium
N18346	NM	Chicken Breast	11/08	Typhimurium var. O 5 -
N18353	NY	Chicken Breast	12/08	Typhimurium var. O 5 -
N19780	CT	Chicken Breast	11/08	Typhimurium var. O 5 -
N18562	PA	Chicken Breast	04/08	Typhimurium var. O 5 -
N18349	NY	Chicken Breast	10/08	Typhimurium var. O 5 -
N19830	MD	Chicken Breast	12/08	Typhimurium var. O 5 -
N16411	MD	Chicken Breast	02/08	Typhimurium
N19823	MD	Chicken Breast	10/08	Typhimurium var. O 5 -
N18366	PA	Chicken Breast	11/08	Typhimurium var. O 5 -
N18448	MD	Chicken Breast	06/08	Typhimurium var. O 5 -
N18354	PA	Chicken Breast	09/08	Typhimurium var. O 5 -
N18445	MD	Chicken Breast	06/08	Typhimurium
N16427	NY	Chicken Breast	03/08	Typhimurium
N18367	PA	Chicken Breast	12/08	Typhimurium var. O 5 -
N16419	NY	Chicken Breast	01/08	Typhimurium
N19781	GA	Chicken Breast	07/08	Typhimurium var. O 5 -
N18352	NY	Chicken Breast	12/08	Typhimurium var. O 5 -
N19904	MD	Chicken Breast	11/08	Typhimurium var. O 5 -
N19905	MD	Chicken Breast	11/08	Typhimurium var. O 5 -
N18537	NY	Chicken Breast	05/08	Typhimurium var. O 5 -
N18350	NY	Chicken Breast	11/08	Typhimurium var. O 5 -
N19831	MD	Chicken Breast	12/08	Typhimurium var. O 5 -
N18357	PA	Chicken Breast	09/08	Typhimurium var. O 5 -
N18362	PA	Chicken Breast	10/08	Typhimurium var. O 5 -
N18559	PA	Chicken Breast	04/08	Typhimurium var. O 5 -
N16426	NY	Chicken Breast	03/08	Typhimurium
N18348	NY	Chicken Breast	10/08	Typhimurium var. O 5 -
N18428	MD	Chicken Breast	03/08	Typhimurium
N18432	MD	Chicken Breast	04/08	Typhimurium var. O 5 -
N19814	MD	Chicken Breast	08/08	Typhimurium var. O 5 -
N18433	MD	Chicken Breast	04/08	Typhimurium var. O 5 -
N18447	MD	Chicken Breast	06/08	Typhimurium
N19827	MD	Chicken Breast	12/08	Typhimurium
N18544	NY	Chicken Breast	06/08	Typhimurium var. O 5 -
N19816	MD	Chicken Breast	08/08	Typhimurium var. O 5 -
N16432	PA	Chicken Breast	01/08	Typhimurium
N19829	MD	Chicken Breast	12/08	Typhimurium var. O 5 -
N18560	PA	Chicken Breast	04/08	Typhimurium var. O 5 -
N19898	MD	Chicken Breast	09/08	Typhimurium var. O 5 -
N18550	NY	Chicken Breast	07/08	Typhimurium var. O 5 -
N18341	MD	Chicken Breast	09/08	Typhimurium var. O 5 -
N19808	MD	Chicken Breast	07/08	Typhimurium var. O 5 -
N18551	NY	Chicken Breast	07/08	Typhimurium var. O 5 -
N18356	PA	Chicken Breast	09/08	Typhimurium var. O 5 -
N18446	MD	Chicken Breast	06/08	Typhimurium var. O 5 -
N19809	MD	Chicken Breast	07/08	Typhimurium var. O 5 -
N19828	MD	Chicken Breast	12/08	Typhimurium var. O 5 -
N18343	MD	Chicken Breast	09/08	Typhimurium var. O 5 -
N19815	MD	Chicken Breast	08/08	Typhimurium var. O 5 -
N16434	PA	Ground Beef	01/08	Typhimurium
N19743	CO	Pork Chop	01/08	Typhimurium
N19766	CO	Ground Turkey	10/08	Typhimurium var. O 5 -
N19774	CT	Chicken Breast	07/08	Typhimurium var. O 5 -
N18345	NM	Chicken Breast	10/08	Typhimurium var. O 5 -
N18534	NY	Chicken Breast	04/08	Typhimurium var. O 5 -
N19733	CA	Ground Beef	10/08	Typhimurium var. O 5 -
N18533	NM	Pork Chop	08/08	Typhimurium
N18444	MD	Pork Chop	05/08	Typhimurium
N18342	MD	Chicken Breast	09/08	Typhimurium var. O 5 -

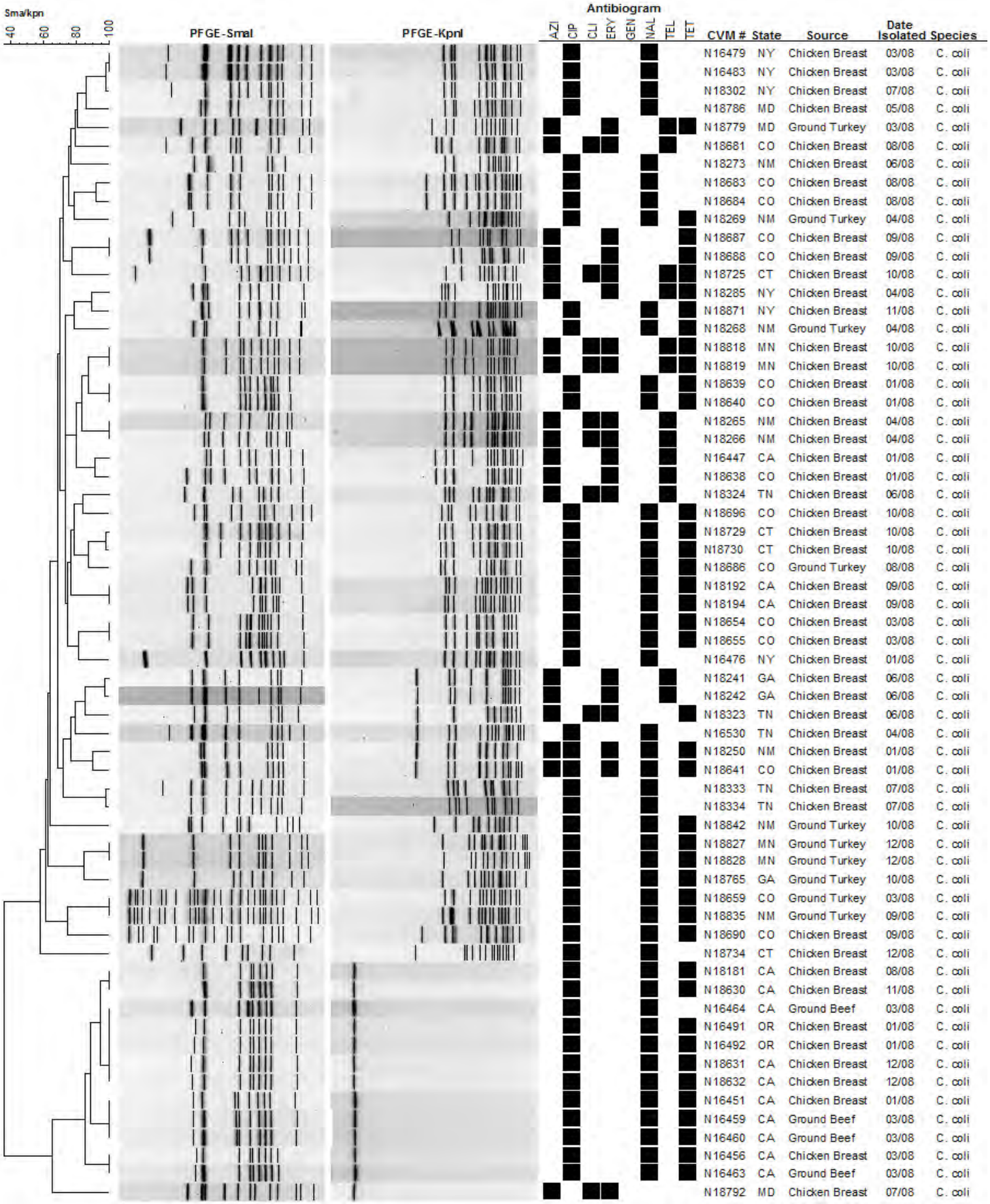
A-1v. PFGE Profiles for *Salmonella* Uganda





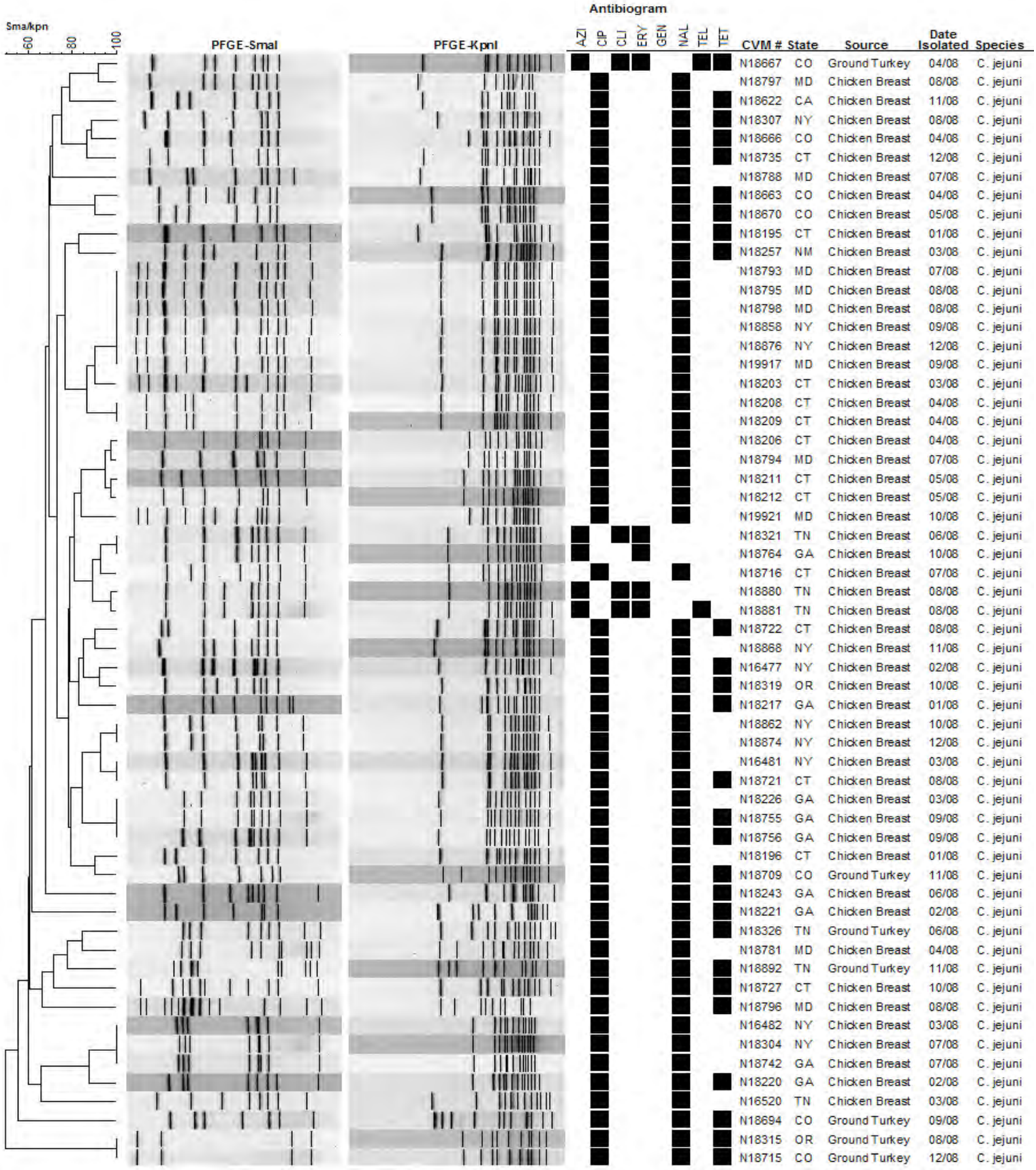
CVM #	State	Source	Date Isolated	Serotype
N16409	MD	Chicken Breast	02/08	Uganda
N19835	MN	Pork Chop	07/08	Uganda
N18587	TN	Ground Turkey	07/08	Uganda
N18589	TN	Ground Turkey	07/08	Uganda
N18378	CA	Ground Beef	06/08	Uganda
N16438	OR	Ground Turkey	04/08	Uganda
N16439	OR	Ground Turkey	04/08	Uganda

A-1w. PFGE Profiles for *Campylobacter coli*



CVM #	State	Source	Date Isolated	Species
N16479	NY	Chicken Breast	03/08	C. coli
N16483	NY	Chicken Breast	03/08	C. coli
N18302	NY	Chicken Breast	07/08	C. coli
N18786	MD	Chicken Breast	05/08	C. coli
N18779	MD	Ground Turkey	03/08	C. coli
N18681	CO	Chicken Breast	08/08	C. coli
N18273	NM	Chicken Breast	06/08	C. coli
N18683	CO	Chicken Breast	08/08	C. coli
N18684	CO	Chicken Breast	08/08	C. coli
N18269	NM	Ground Turkey	04/08	C. coli
N18687	CO	Chicken Breast	09/08	C. coli
N18688	CO	Chicken Breast	09/08	C. coli
N18725	CT	Chicken Breast	10/08	C. coli
N18285	NY	Chicken Breast	04/08	C. coli
N18871	NY	Chicken Breast	11/08	C. coli
N18268	NM	Ground Turkey	04/08	C. coli
N18818	MN	Chicken Breast	10/08	C. coli
N18819	MN	Chicken Breast	10/08	C. coli
N18639	CO	Chicken Breast	01/08	C. coli
N18640	CO	Chicken Breast	01/08	C. coli
N18265	NM	Chicken Breast	04/08	C. coli
N18266	NM	Chicken Breast	04/08	C. coli
N16447	CA	Chicken Breast	01/08	C. coli
N18638	CO	Chicken Breast	01/08	C. coli
N18324	TN	Chicken Breast	06/08	C. coli
N18696	CO	Chicken Breast	10/08	C. coli
N18729	CT	Chicken Breast	10/08	C. coli
N18730	CT	Chicken Breast	10/08	C. coli
N18686	CO	Ground Turkey	08/08	C. coli
N18192	CA	Chicken Breast	09/08	C. coli
N18194	CA	Chicken Breast	09/08	C. coli
N18654	CO	Chicken Breast	03/08	C. coli
N18655	CO	Chicken Breast	03/08	C. coli
N16476	NY	Chicken Breast	01/08	C. coli
N18241	GA	Chicken Breast	06/08	C. coli
N18242	GA	Chicken Breast	06/08	C. coli
N18323	TN	Chicken Breast	06/08	C. coli
N16530	TN	Chicken Breast	04/08	C. coli
N18250	NM	Chicken Breast	01/08	C. coli
N18641	CO	Chicken Breast	01/08	C. coli
N18333	TN	Chicken Breast	07/08	C. coli
N18334	TN	Chicken Breast	07/08	C. coli
N18842	NM	Ground Turkey	10/08	C. coli
N18827	MN	Ground Turkey	12/08	C. coli
N18828	MN	Ground Turkey	12/08	C. coli
N18765	GA	Ground Turkey	10/08	C. coli
N18659	CO	Ground Turkey	03/08	C. coli
N18835	NM	Ground Turkey	09/08	C. coli
N18690	CO	Chicken Breast	09/08	C. coli
N18734	CT	Chicken Breast	12/08	C. coli
N18181	CA	Chicken Breast	08/08	C. coli
N18630	CA	Chicken Breast	11/08	C. coli
N16464	CA	Ground Beef	03/08	C. coli
N16491	OR	Chicken Breast	01/08	C. coli
N16492	OR	Chicken Breast	01/08	C. coli
N18631	CA	Chicken Breast	12/08	C. coli
N18632	CA	Chicken Breast	12/08	C. coli
N16451	CA	Chicken Breast	01/08	C. coli
N16459	CA	Ground Beef	03/08	C. coli
N16460	CA	Ground Beef	03/08	C. coli
N16456	CA	Chicken Breast	03/08	C. coli
N16463	CA	Ground Beef	03/08	C. coli
N18792	MD	Chicken Breast	07/08	C. coli

A-1x. PFGE Profiles for *Campylobacter jejuni*



CVM #	State	Source	Date Isolated	Species
N18667	CO	Ground Turkey	04/08	C. jejuni
N18797	MD	Chicken Breast	08/08	C. jejuni
N18622	CA	Chicken Breast	11/08	C. jejuni
N18307	NY	Chicken Breast	08/08	C. jejuni
N18666	CO	Chicken Breast	04/08	C. jejuni
N18735	CT	Chicken Breast	12/08	C. jejuni
N18788	MD	Chicken Breast	07/08	C. jejuni
N18663	CO	Chicken Breast	04/08	C. jejuni
N18670	CO	Chicken Breast	05/08	C. jejuni
N18195	CT	Chicken Breast	01/08	C. jejuni
N18257	NM	Chicken Breast	03/08	C. jejuni
N18793	MD	Chicken Breast	07/08	C. jejuni
N18795	MD	Chicken Breast	08/08	C. jejuni
N18798	MD	Chicken Breast	08/08	C. jejuni
N18858	NY	Chicken Breast	09/08	C. jejuni
N18876	NY	Chicken Breast	12/08	C. jejuni
N19917	MD	Chicken Breast	09/08	C. jejuni
N18203	CT	Chicken Breast	03/08	C. jejuni
N18208	CT	Chicken Breast	04/08	C. jejuni
N18209	CT	Chicken Breast	04/08	C. jejuni
N18206	CT	Chicken Breast	04/08	C. jejuni
N18794	MD	Chicken Breast	07/08	C. jejuni
N18211	CT	Chicken Breast	05/08	C. jejuni
N18212	CT	Chicken Breast	05/08	C. jejuni
N19921	MD	Chicken Breast	10/08	C. jejuni
N18321	TN	Chicken Breast	06/08	C. jejuni
N18764	GA	Chicken Breast	10/08	C. jejuni
N18716	CT	Chicken Breast	07/08	C. jejuni
N18880	TN	Chicken Breast	08/08	C. jejuni
N18881	TN	Chicken Breast	08/08	C. jejuni
N18722	CT	Chicken Breast	08/08	C. jejuni
N18868	NY	Chicken Breast	11/08	C. jejuni
N16477	NY	Chicken Breast	02/08	C. jejuni
N18319	OR	Chicken Breast	10/08	C. jejuni
N18217	GA	Chicken Breast	01/08	C. jejuni
N18862	NY	Chicken Breast	10/08	C. jejuni
N18874	NY	Chicken Breast	12/08	C. jejuni
N16481	NY	Chicken Breast	03/08	C. jejuni
N18721	CT	Chicken Breast	08/08	C. jejuni
N18226	GA	Chicken Breast	03/08	C. jejuni
N18755	GA	Chicken Breast	09/08	C. jejuni
N18756	GA	Chicken Breast	09/08	C. jejuni
N18196	CT	Chicken Breast	01/08	C. jejuni
N18709	CO	Ground Turkey	11/08	C. jejuni
N18243	GA	Chicken Breast	06/08	C. jejuni
N18221	GA	Chicken Breast	02/08	C. jejuni
N18326	TN	Ground Turkey	06/08	C. jejuni
N18781	MD	Chicken Breast	04/08	C. jejuni
N18892	TN	Ground Turkey	11/08	C. jejuni
N18727	CT	Chicken Breast	10/08	C. jejuni
N18796	MD	Chicken Breast	08/08	C. jejuni
N16482	NY	Chicken Breast	03/08	C. jejuni
N18304	NY	Chicken Breast	07/08	C. jejuni
N18742	GA	Chicken Breast	07/08	C. jejuni
N18220	GA	Chicken Breast	02/08	C. jejuni
N16520	TN	Chicken Breast	03/08	C. jejuni
N18694	CO	Ground Turkey	09/08	C. jejuni
N18315	OR	Ground Turkey	08/08	C. jejuni
N18715	CO	Ground Turkey	12/08	C. jejuni

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 _____