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2005 Retail Meat Report

National Antimicrobial Resistance Monitoring System

NARMS

ABBREVIATIONS USED IN THE REPORT, 2005

AR	Antimicrobial Resistance
BAP	Blood Agar Plate
CCA	Campy-Cefex Agar Plate
CDC	Centers for Disease Control and Prevention
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
CLSI	Clinical and Laboratory Standards Institute
PCR	Polymerase Chain Reaction
PFGE	Pulsed Field Gel Electrophoresis
PulseNet	National Molecular Subtyping Network for Foodborne Disease Surveillance
QC	Quality Control
RVR10	Rappaport-Vassiliadis
USDA	United States Department of Agriculture
XLD	Xylose Lysine Deoxycholate

Antimicrobial Abbreviations:

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

Meat Types

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

State Abbreviations:

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

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NARMS Retail Meat Annual Report 2005

The primary purpose of the NARMS retail meat surveillance program is to monitor the prevalence of antimicrobial resistance among foodborne pathogenic and commensal organisms, in particular, *Salmonella, Campylobacter, Enterococcus* and *E. coli* The results generated by the NARMS retail meat program will establish a reference point for analyzing trends of antimicrobial resistance among these foodborne bacteria. NARMS retail meat surveillance is an ongoing collaboration between the U.S. Food and Drug Administration (Center for Veterinary Medicine), the Centers for Disease Control and Prevention, and in 2005, all 10 of the current FoodNet laboratories: California, Colorado, Connecticut, Georgia, Maryland, Minnesota, New Mexico, New York, Oregon, and Tennessee. Bacterial isolates are sent to FDA/CVM for confirmation of species, antimicrobial susceptibility testing, and genetic analysis.

For calendar year 2005, all test sites began retail meat sampling in January. A total of 40 food samples were purchased per month comprised of 10 samples each of chicken breast, ground turkey, ground beef, and pork chops. Samples were kept cold during transport from the grocery store(s) to the laboratory. All ten FoodNet sites cultured the meats and poultry rinsates for the presence of *Salmonella* and *Campylobacter*. Four of the ten FoodNet laboratories (Georgia, Maryland, Oregon, and Tennessee) also cultured meat and poultry rinsates for the presence of *E. coli* and *Enterococcus*.

Changes in 2005

In 2005, bacitracin was replaced with tigecycline on the panel of agents tested against *Enterococcus.* A total of 4781 meats samples were collected, compared with 4699 in 2004. Breakpoints were changed for bacitracin, kanamycin and lincomycin (see Table 1).

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Acknowledgements

Much thanks to Deborah Brooks, Michelle Talley and Hung Dang for providing outstanding web support to the NARMS program.

Table 1. Antimicrobial Susceptibility Test Methods and Interpretive Criteria: NARMS Retail Meat, 2005

Genus: *Campylobacter*

Susceptibility Testing Method: Broth microdilution   Sensititre™ Plate: CAMPY

QC Organism: *Campylobacter jejuni* ATCC 33560

Drug	Range (µg/ml)	Susceptible (µg/ml)	Intermediate (µg/ml)	Resistant (µg/ml)
Azithromycin*	0.015-64	≤ 2	4	≥ 8
Ciprofloxacin	0.015-64	≤ 1	2	≥ 4
Clindamycin*	0.03-16	≤ 2	4	≥ 8
Erythromycin	0.03-64	≤ 8	16	≥ 32
Florfenicol*^	0.03-64	≤ 4		
Gentamicin*	0.12-32	≤ 2	4	≥ 8
Nalidixic Acid*	4-64	≤ 16	32	≥ 64
Telithromycin*	0.015-8	≤ 4	8	≥ 16
Tetracycline	0.06-64	≤ 4	8	≥ 16

Genus: *Enterococcus*

Susceptibility Testing Method: Broth microdilution   Sensititre™ Plate: CMV2AGPF

QC Organisms: *Enterococcus faecalis* ATCC 29212 and *Enterococcus faecalis* ATCC 51299

Drug	Range (µg/ml)	Susceptible (µg/ml)	Intermediate (µg/ml)	Resistant (µg/ml)
Chloramphenicol	2-32	≤ 8	16	≥ 32
Ciprofloxacin	0.12-4	≤ 1	2	≥ 4
Daptomycin*^	0.5-16	≤ 4		
Erythromycin	0.5-8	≤ 0.5	1,2,4	≥ 8
Flavomycin*	1-16	≤ 8	16	≥ 32
Gentamicin	128-1024	≤ 500		> 500
Kanamycin*	128-1024	≤ 512	256	≥ 1024
Lincomycin*	1-32	≤ 2	4	≥ 8
Linezolid	0.5-8	≤ 2	4	≥ 8
Nitrofurantoin	2-64	≤ 32	64	≥ 128
Penicillin	0.5-16	≤ 8		≥ 16
Quinupristin/Dalfopristin	1-32	≤ 1	2	≥ 4
Streptomycin	512-2048	≤ 1000		> 1000
Tetracycline	4-32	≤ 4	8	≥ 16
Tigecycline*^	0.015-0.5	≤ 0.25		
Tylosin*	0.25-32	≤ 8	16	≥ 32
Vancomycin	0.25-32	≤ 4	8,16	≥ 32

*No CLSI interpretative criteria for this bacterium / antimicrobial combination currently available.
^ Absence of resistant strains precludes defining any results category other than “susceptible.”

Genus: *Escherichia coli* and *Salmonella*

Susceptibility Testing Method: Broth microdilution Sensititre™ Plate: CMV1AGNF

QC Organisms: *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 29213,
Pseudomonas aeruginosa ATCC 27853, and *Enterococcus faecalis* ATCC 29212

Drug	**Range** (µg/ml)	**Susceptible** (µg/ml)	**Intermediate** (µg/ml)	**Resistant** (µg/ml)
Amikacin	0.5-64	≤ 16	32	≥ 64
Amoxicillin/Clavulanic acid	1/0.5-32/16	≤ 8/4	16/8	≥ 32/16
Ampicillin	1-32	≤ 8	16	≥ 32
Cefoxitin	0.5-32	≤ 8	16	≥ 32
Ceftiofur	0.12-8	≤ 2	4	≥ 8
Ceftriaxone	0.25-64	≤ 8	16,32	≥ 64
Chloramphenicol	2-32	≤ 8	16	≥ 32
Ciprofloxacin	0.015-4	≤ 1	2	≥ 4
Gentamicin	0.25-16	≤ 4	8	≥ 16
Kanamycin	8-64	≤ 16	32	≥ 64
Nalidixic acid	0.5-32	≤ 16		≥ 32
Streptomycin*	32-64	≤ 32		≥ 64
Sulfisoxazole	16-256	≤ 256		≥ 512
Tetracycline	4-32	≤ 4	8	≥ 16
Trimethoprim/ Sulfamethoxazole	0.12/2.38-4/76	≤ 2/38		≥ 4/76

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

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Tables & Figures

PREVALENCE

PERCENT POSITIVE SAMPLES FOR

Table 2. Number of Retail Meat Samples Tested by Site and Meat Type, 2002-2005

Site	Type Meat	2002	2003	2004	2005	Total
CA	Chicken Breast		120	120	118	358
	Ground Turkey		120	120	119	359
	Ground Beef		120	120	120	360
	Pork Chop		120	120	120	360
	Total		480	480	477	1437
CO	Chicken Breast			97	116	213
	Ground Turkey			101	116	217
	Ground Beef			106	116	222
	Pork Chop			99	116	215
	Total			403	464	867
CT	Chicken Breast	120	60	120	120	420
	Ground Turkey	120	60	120	120	420
	Ground Beef	120	60	120	120	420
	Pork Chop	120	60	120	120	420
	Total	480	240	480	480	1680
GA	Chicken Breast	120	120	120	120	480
	Ground Turkey	120	120	120	120	480
	Ground Beef	120	120	120	120	480
	Pork Chop	120	120	120	120	480
	Total	480	480	480	480	1920
MD	Chicken Breast	120	120	120	120	480
	Ground Beef	120	120	120	120	480
	Ground Turkey	120	120	120	120	480
	Pork Chop	120	120	120	120	480
	Total	480	480	480	480	1920
MN	Chicken Breast	106	120	120	120	466
	Ground Turkey	127	110	120	120	477
	Ground Beef	123	110	120	120	473
	Pork Chop	103	120	120	120	463
	Total	459	460	480	480	1879
NM	Chicken Breast			119	120	239
	Ground Turkey			118	120	238
	Ground Beef			120	120	240
	Pork Chop			119	120	239
	Total			476	480	956
NY	Chicken Breast		120	120	120	360
	Ground Turkey		120	120	120	360
	Ground Beef		120	120	120	360
	Pork Chop		120	120	120	360
	Total		480	480	480	1440
OR	Chicken Breast	40	120	120	120	400
	Ground Turkey	40	120	120	120	400
	Ground Beef	40	120	120	120	400
	Pork Chop	40	120	120	120	400
	Total	160	480	480	480	1600
TN	Chicken Breast	110	117	116	120	463
	Ground Turkey	115	87	106	120	428
	Ground Beef	119	110	120	120	469
	Pork Chop	110	119	118	120	467
	Total	454	433	460	480	1827
Total		**2513**	**3533**	**4699**	**4781**	**15526**

Grey areas indicate site was not participating in surveillance.

Table 3. Percent Positive Samples by Bacterium and Meat Type, 2002-2005

2002	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
Bacterium	n	(%)	n	(%)	n	(%)	n	(%)
Campylobacter	288*	(46.8)	4	(1.0)	0	(0.0)	5	(0.8)
Salmonella	60	(9.7)	74	(11.5)	9	(1.4)	10	(1.6)
Enterococcus	381	(97.7)	387	(98.0)	383	(96.0)	369	(94.6)
Escherichia coli	282	(72.3)	304	(77.0)	295	(73.9)	184	(47.2)

2513 = Total number of retail meats tested for *Salmonella* and *Campylobacter*

616 = Chicken Breast, 642 = Ground Turkey, 642 = Ground Beef, 613 = Pork Chop

1574 = Total number of retail meats tested for *Enterococcus* and *Escherichia coli*

390 = Chicken Breast, 395 = Ground Turkey, 399 = Ground Beef, 390 = Pork Chop

2003	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
Bacterium	n	(%)	n	(%)	n	(%)	n	(%)
Campylobacter	469	(52.3)	5	(0.6)	1	(0.1)	4	(0.4)
Salmonella	83	(9.3)	114	(13.3)	10	(1.1)	5	(0.6)
Enterococcus	466	(97.7)	418	(93.5)	432	(91.9)	426	(88.9)
Escherichia coli	396	(83.0)	333	(74.5)	311	(66.2)	218	(45.5)

3533 = Total number of retail meats tested for *Salmonella* and *Campylobacter*

897 = Chicken Breast, 857 = Ground Turkey, 880 = Ground Beef, 899 = Pork Chop

1873 = Total number of retail meats tested for *Enterococcus* and *Escherichia coli*

477 = Chicken Breast, 447 = Ground Turkey, 470 = Ground Beef, 479 = Pork Chop

2004	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
Bacterium	n	(%)	n	(%)	n	(%)	n	(%)
Campylobacter	706	(60.2)	12	(1.0)	0	(0.0)	3	(0.3)
Salmonella	157	(13.4)	142	(12.2)	14	(1.2)	11	(0.9)
Enterococcus	466	(97.9)	437	(93.8)	448	(93.3)	404	(84.5)
Escherichia coli	400	(84.0)	376	(80.7)	338	(70.4)	232	(48.5)

4699 = Total number of retail meats tested for *Salmonella* and *Campylobacter*

1172 = Chicken Breast, 1165 = Ground Turkey, 1186 = Ground Beef, 1176 = Pork Chop

1900 = Total number of retail meats tested for *Enterococcus* and *Escherichia coli*

476 = Chicken Breast, 466 = Ground Turkey, 480 = Ground Beef, 478 = Pork Chop

2005	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
Bacterium	n	(%)	n	(%)	n	(%)	n	(%)
Campylobacter	554	(46.6)	20	(1.7)	0	(0.0)	2	(0.2)
Salmonella	153	(12.8)	183	(15.3)	8	(0.7)	9	(0.8)
Enterococcus	457	(97.2)	452	(96.2)	447	(95.1)	409	(87.0)
Escherichia coli	393	(84.0)	396	(84.3)	316	(67.5)	205	(44.1)

4777 = Total number of retail meats tested for *Campylobacter*

1190 = Chicken Breast, 1195 = Ground Turkey, 1196 = Ground Beef, 1196 = Pork Chop

4781 = Total number of retail meats tested for Salmonella

1194 = Chicken Breast, 1195 = Ground Turkey, 1196 = Ground Beef, 1196 = Pork Chop

1880 = Total number of retail meats tested for *Enterococcus*

470 = Chicken Breast, 470 = Ground Turkey, 470 = Ground Beef, 470 = Pork Chop

1871 = Total number of retail meats tested *Escherichia coli*

468 = Chicken Breast, 470 = Ground Turkey, 468 = Ground Beef, 465 = Pork Chop

n= # of isolates

Figure 1. Percent Positive Samples for *Campylobacter* & *Salmonella* by Meat Type, All Sites, 2002-2005

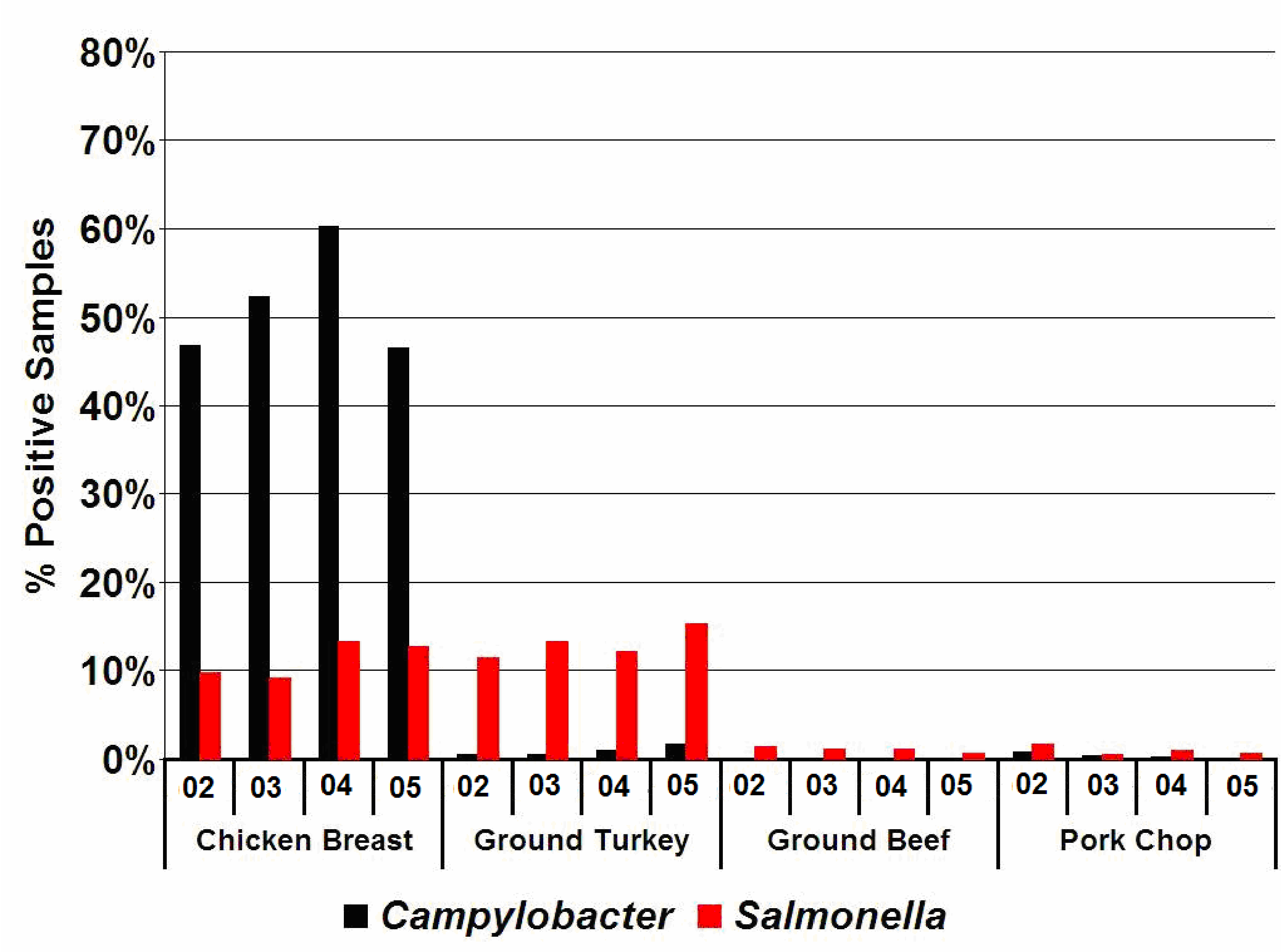


Figure 2. Percent Positive Samples for *Enterococcus* & *E. coli* by Meat Type for All Sites, 2002-2005

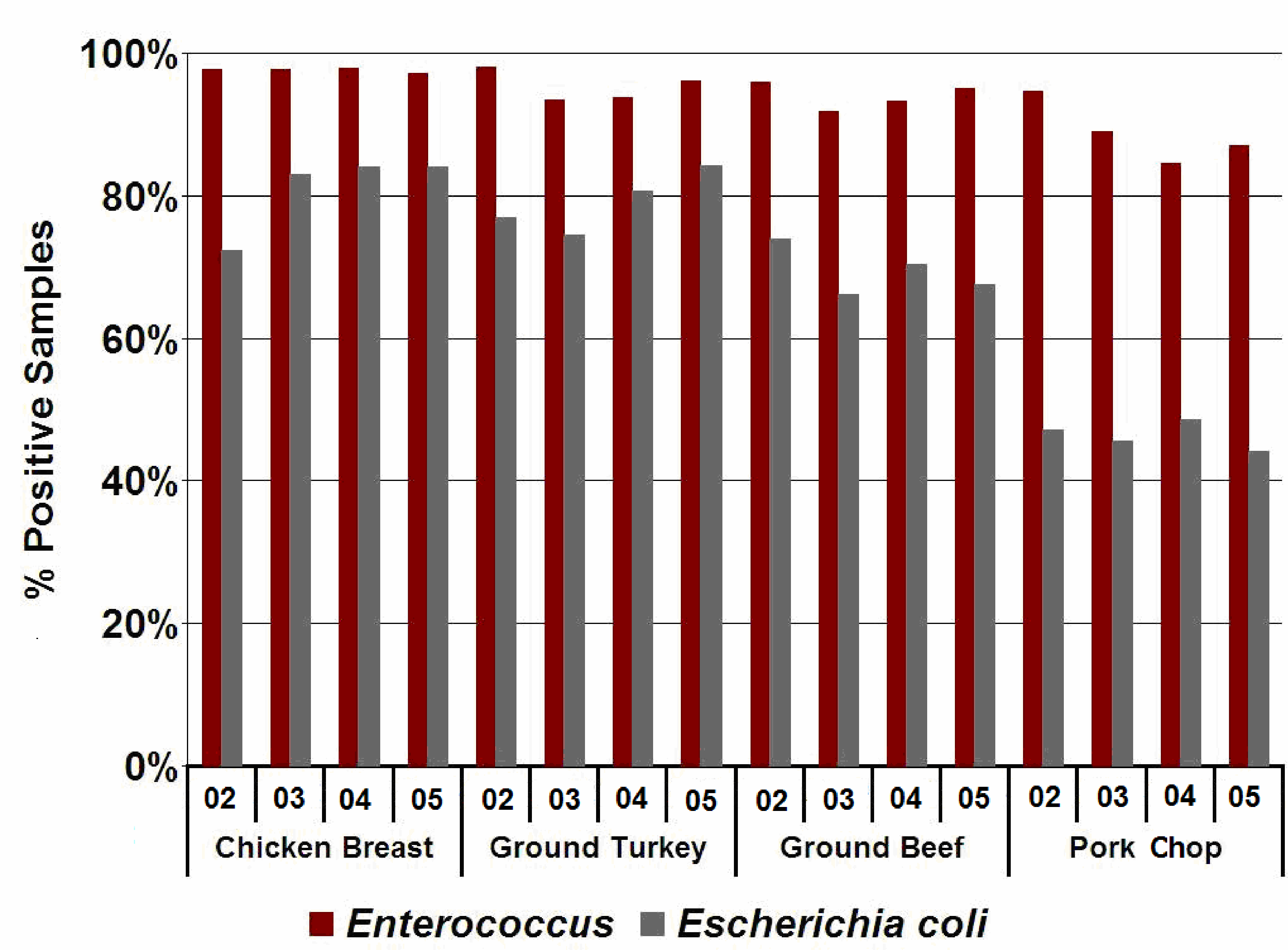


Figure 3. Percent Positive Samples for *Campylobacter* & *Salmonella* and *Enterococcus* & *E. coli* by Month and Meat Type for All Sites, 2005

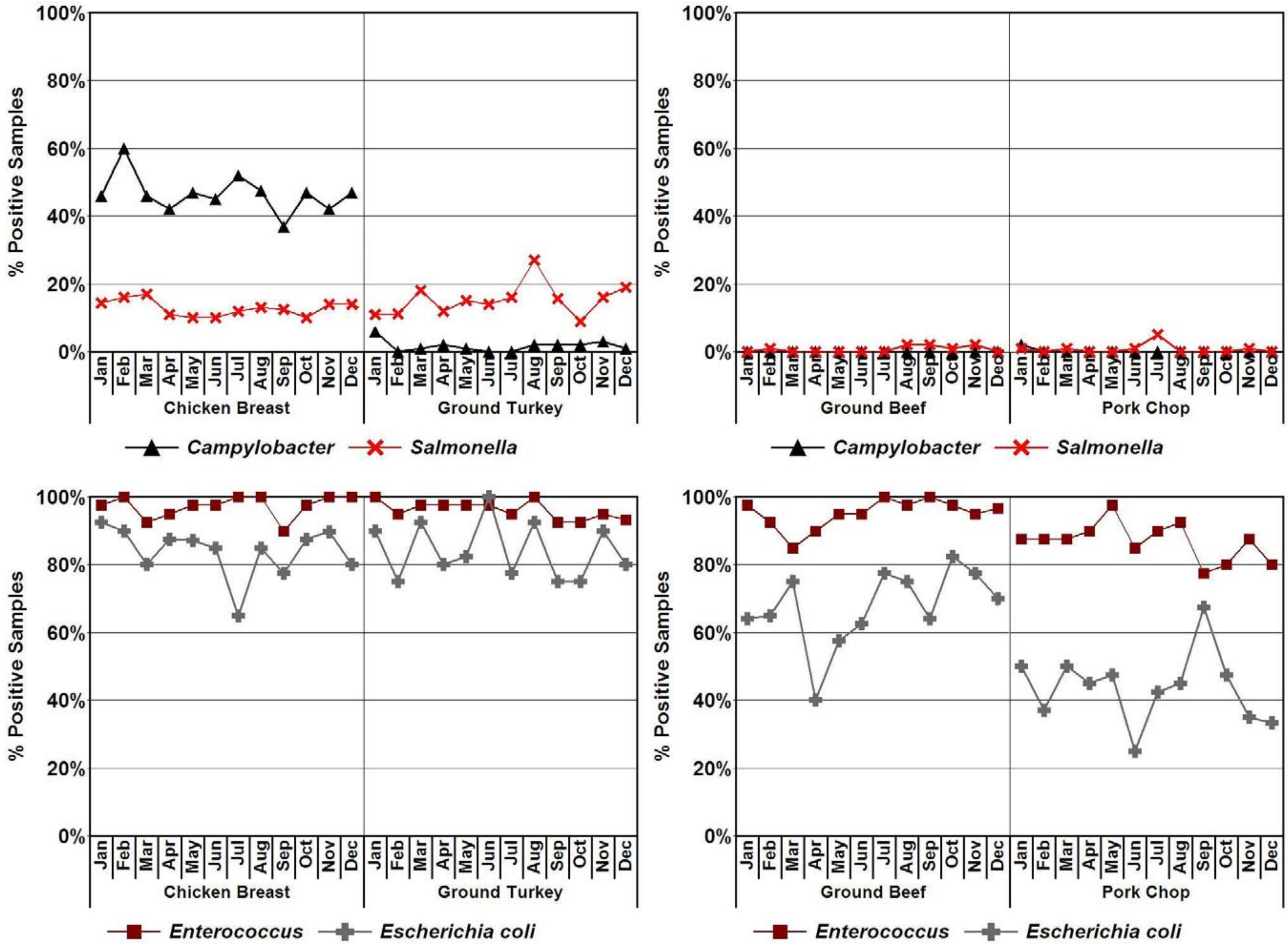


Table 4. Number of Isolates by Site, Bacterium and Meat Type, 2002-2005						
Site	**Year**	**Bacterium**	**Chicken Breast**	**Ground Turkey**	**Ground Beef**	**Pork Chop**
CA	2003	*Campylobacter*	64	0	0	2
		Salmonella	4	6	1	1
	2004	*Campylobacter*	96	0	0	1
		Salmonella	17	9	1	1
	2005	*Campylobacter*	83	1	0	0
		Salmonella	21	15	1	2
CO	2004	*Campylobacter*	21	0	0	0
		Salmonella	1	8	0	0
	2005	*Campylobacter*	38	0	0	0
		Salmonella	12	17	0	0
CT	2002	*Campylobacter*	74	2	0	1
		Salmonella	17	21	5	1
	2003	*Campylobacter*	50	0	0	0
		Salmonella	9	8	0	0
	2004	*Campylobacter*	86	2	0	1
		Salmonella	30	26	5	5
	2005	*Campylobacter*	85	3	0	1
		Salmonella	19	12	3	1
GA	2002	*Campylobacter*	84	0	0	0
		Salmonella	14	19	2	2
		Enterococcus	120	120	118	119
		Escherichia	104	103	93	55
	2003	*Campylobacter*	76	2	0	0
		Salmonella	8	27	2	0
		Enterococcus	119	120	119	116
		Escherichia	120	117	90	68
	2004	*Campylobacter*	61	1	0	0
		Salmonella	6	38	1	0
		Enterococcus	120	120	117	116
		Escherichia	115	119	91	64
	2005	*Campylobacter*	62	5	0	0
		Salmonella	10	32	0	2
		Enterococcus	120	120	118	117
		Escherichia	119	117	102	71
MD	2002	*Campylobacter*	30	0	0	1
		Salmonella	8	9	2	6
		Enterococcus	117	113	107	101
		Escherichia	107	110	105	66
	2003	*Campylobacter*	38	0	1	0
		Salmonella	18	25	3	1
		Enterococcus	113	103	92	90
		Escherichia	113	103	87	71
	2004	*Campylobacter*	76	2	0	0
		Salmonella	24	13	1	0
		Enterococcus	114	106	100	77
		Escherichia	110	109	83	62
	2005	*Campylobacter*	85	3	0	1
		Salmonella	22	12	0	3
		Enterococcus	110	111	113	86
		Escherichia	100	105	78	58

Table 4 cont'd. Number of Isolates by Site, Bacterium and Meat Type, 2002-2005						
Site	**Year**	**Bacterium**	**Chicken Breast**	**Ground Turkey**	**Ground Beef**	**Pork Chop**
MN	2002	*Campylobacter*	33	1	0	0
		Salmonella	4	7	0	0
	2003	*Campylobacter*	62	3	0	1
		Salmonella	13	11	1	0
	2004	*Campylobacter*	73	6	0	0
		Salmonella	20	14	0	0
	2005	*Campylobacter*	24	4	0	0
		Salmonella	24	28	1	0
NM	2004	*Campylobacter*	53	0	0	1
		Salmonella	3	9	0	0
	2005	*Campylobacter*	31	2	0	0
		Salmonella	5	20	1	0
OR	2002	*Campylobacter*	1	0	0	0
		Salmonella	4	2	0	0
		Enterococcus	40	40	40	39
		Escherichia	9	17	22	9
	2003	*Campylobacter*	45	0	0	1
		Salmonella	17	5	2	1
		Enterococcus	119	108	112	103
		Escherichia	78	49	57	28
	2004	*Campylobacter*	73	0	0	0
		Salmonella	25	6	6	2
		Enterococcus	118	105	115	108
		Escherichia	73	53	99	51
	2005	*Campylobacter*	37	0	0	0
		Salmonella	16	16	1	0
		Enterococcus	109	103	98	95
		Escherichia	76	72	61	31
TN	2002	*Campylobacter*	66	1	0	3
		Salmonella	13	16	0	1
		Enterococcus	104	114	118	110
		Escherichia	62	74	75	54
	2003	*Campylobacter*	59	0	0	0
		Salmonella	3	12	1	0
		Enterococcus	115	87	109	117
		Escherichia	85	64	77	51
	2004	*Campylobacter*	71	1	0	0
		Salmonella	15	8	0	0
		Enterococcus	114	106	116	103
		Escherichia	102	95	65	55
	2005	*Campylobacter*	59	1	0	0
		Salmonella	7	19	1	0
		Enterococcus	118	118	118	111
		Escherichia	98	102	75	45

SALMONELLA

MIC DISTRIBUTIONS AMONG *SALMONELLA*

MIC DISTRIBUTIONS AMONG *SALMONELLA* BY MEAT TYPE

Table 5. Overall *Salmonella* Serotypes Identified, 2005

Serotype	n
1. *S.* Heidelberg	75
2. *S.* Kentucky	62
3. *S.* Saintpaul	25
4. *S.* Hadar	22
5. *S.* Typhimurium	18
6. *S.* IIIa 18: z4, z23: -	17
7. *S.* Typhimurium var. 5-	14
8. *S.* Enteritidis	12
9. *S.* Reading	10
10. *S.* I 4,5,12:i:-	9
11. *S.* Senftenberg	9
12. *S.* Brandenburg	8
13. *S.* Schwarzengrund	8
14. *S.* Montevideo	7
15. *S.* Agona	6
16. *S.* Muenster	6
17. *S.* Anatum	4
18. *S.* Bredeney	4
19. *S.* I 4,12:d:-	4
20. *S.* Berta	3
21. *S.* Newport	3
22. *S.* Chester	2
23. *S.* I 4,5,12:d:-	2
24. *S.* IIIa 35:z4,z23:-	2
25. *S.* Mbandaka	2
26. *S.* Muenchen	2
27. *S.* Panama	2
28. *S.* Thompson	2
29. *S.* Albany	1
30. *S.* Derby	1
31. *S.* Dublin	1
32. *S.* I 3,10:nonmotile	1
33. *S.* I 4, 12:r:-	1
34. S. I 4,5,12:-:1,2	1
35. *S.* I 4, 5, 12: nonmotile	1
36. *S.* IIIa 18:z4,z32:-	1
37. *S.* Infantis	1
38. *S.* Johannesburg	1
39. *S.* Minnesota	1
40. *S.* Ohio	1
41. *S.* Oranienburg	1
Total	**353**

Table 6. *Salmonella* by Serotype and Meat Type, 2005

Serotype	Chicken Breast		Ground Turkey		Ground Beef		Pork Chop	
	n	%*	n	%	n	%	n	%
1. *S.* Heidelberg (n=75)	22	29.3%	53	70.7%		-†		-
2. *S.* Kentucky (n=62)	60	96.8%	2	3.2%		-		-
3. *S.* Typhimurium (n=32)‡	29	90.6%	1	3.1%		-	2	6.3%
4. *S.* Saintpaul (n=25)		-	24	96.0%	1	4.0%		-
5. *S.* Hadar (n=22)	9	40.9%	13	59.1%		-		-
6. *S.* IIIa 18:z4,z23:- (n=17)		-	17	100.0%		-		-
7. *S.* Enteritidis (n=12)	12	100.0%		-		-		-
8. *S.* Reading (n=10)		-	10	100.0%		-		-
9. *S.* I 4,5,12:i:- (n=9)	9	100.0%		-		-		-
10. *S.* Senftenberg (n=9)		-	8	88.9%		-	1	11.1%
11. *S.* Brandenburg (n=8)		-	8	100.0%		-		-
12. *S.* Schwarzengrund (n=8)		-	8	100.0%		-		-
13. *S.* Montevideo (n=7)	1	14.3%	4	57.1%	2	28.6%		-
14. *S.* Agona (n=6)		-	5	83.3%		-	1	16.7%
15. *S.* Muenster (n=6)		-	3	50.0%	3	50.0%		-
16. *S.* Anatum (n=4)	1	25.0%	1	25.0%		-	2	50.0%
17. *S.* Bredeney (n=4)	2	50.0%	2	50.0%		-		-
18. *S.* I 4,12:d:- (n=4)	1	25.0%	3	75.0%		-		-
19. *S.* Berta (n=3)		-	3	100.0%		-		-
20. *S.* Newport (n=3)		-	3	100.0%		-		-
21. *S.* Chester (n=2)		-	2	100.0%		-		-
22. *S.* I 4,5,12:d:- (n=2)		-	2	100.0%		-		-
23. *S.* IIIa 35:z4,z23:- (n=2)		-	2	100.0%		-		-
24. *S.* Mbandaka (n=2)	2	100.0%		-		-		-
25. *S.* Muenchen (n=2)		-		-		-	2	100.0%
26. *S.* Panama (n=2)	1	50.0%	1	50.0%		-		-
27. *S.* Thompson (n=2)	1	50.0%	1	50.0%		-		-
28. *S.* Albany (n=1)		-	1	100.0%		-		-
29. *S.* Derby (n=1)		-	1	100.0%		-		-
30. *S.* Dublin (n=1)		-		-	1	100.0%		-
31. *S.* I 3,10:nonmotile (n=1)		-	1	100.0%		-		-
32. *S.* I 4,12:r:- (n=1)		-	1	100.0%		-		-
33. *S.* I 4,5,12:-:1,2 (n=1)		-	1	100.0%		-		-
34. *S.* I 4,5,12:nonmotile (n=1)	1	100.0%		-		-		-
35. *S.* IIIa 18:z4,z32:- (n=1)		-	1	100.0%		-		-
36. *S.* Infantis (n=1)		-		-		-	1	100.0%
37. *S.* Johannesburg (n=1)		-	1	100.0%		-		-
38. *S.* Minnesota (n=1)		-		-	1	100.0%		-
39. *S.* Ohio (n=1)	1	100.0%		-		-		-
40. *S.* Oranienburg (n=1)	1	100.0%		-		-		-
Total (n=353)	153	43.3%	183	51.8%	8	2.3%	9	2.5%

* Where % = (# isolates per serotype per meat) / (total # isolates per serotype).
† Dashes indicate that no isolates from that serotype were isolated from that meat type.
‡ Includes *S.* Typhimurium var. 5-.

Table 7. Antimicrobial Resistance among *Salmonella* Isolates 2002- 2005

		2002		2003		2004		2005		Cochran-Armitage‡ Trend Test	
Class	**Antimicrobial/Resistance Breakpoint (µg/ml)**	**n**	**%R**	**n**	**%R**	**n**	**%R**	**n**	**%R**	**Z Statistic (two-sided)**	**P-value**
Aminoglycosides	**Amikacin (MIC≥ 64)**	0	0.0%	0	0.0%	0	0.0%	0	0.0%		
	Gentamicin (MIC≥ 16)	20	13.1%	31	14.6%	35	10.8%	56	15.9%	0.6432	0.5201
	Kanamycin (MIC≥ 64)	19	12.4%	35	16.5%	45	13.9%	46	13.0%	-0.0344	0.7308
	Streptomycin (MIC≥ 64)	54	35.3%	80	37.7%	98	30.2%	132	37.4%	0.1013	0.9193
Aminopenicillins	**Ampicillin (MIC≥ 32)**	28	18.3%	67	31.6%	81	25.0%	94	26.6%	0.9253	0.3548
Beta-lactamase inhibitor Combinations	**Amoxicillin-Clavulanic (MIC≥ 32)**	19	12.4%	39	18.4%	52	16.0%	49	13.9%	-0.2314	0.817
Cephems	**Cephalothin§ (MIC≥ 32)**	23	15.0%	63	29.7%						
	Ceftiofur (MIC≥8)	16	10.5%	29	13.7%	48	14.8%	45	12.7%	0.5089	0.6108
	Ceftriaxone (MIC≥ 64)	0	0.0%	1	0.5%	1	0.3%	5	1.4%	1.8434	0.0653
	Cefoxitin (MIC≥ 32)	16	10.5%	29	13.7%	48	14.8%	45	12.7%	0.5089	0.6108
Folate pathway inhibitors	**Sulfisoxazole** (MIC≥ 512)**	34	22.2%	56	26.4%	89	27.5%	94	26.6%	0.8868	0.3752
	Trimethoprim-sulfamethoxazole (MIC≥ 4)	3	2.0%	0	0.0%	1	0.3%	2	0.6%	-1.1882	0.2348
Phenicols	**Chloramphenicol (MIC≥ 32)**	7	4.6%	9	4.3%	11	3.4%	5	1.4%	-2.2096	0.0271
Quinolones	**Ciprofloxacin (MIC≥ 4)**	0	0.0%	0	0.0%	0	0.0%	0	0.0%		
	Nalidixic Acid (MIC≥ 32)	6	3.9%	6	2.8%	0	0.0%	3	0.8%	-3.1243	0.0018
Tetracycline	**Tetracycline (MIC≥ 16)**	70	45.8%	76	35.8%	161	49.7%	146	41.4%	0.103	0.918

‡ P-value for percent resistant for trend was calculated using the Cochran-Armitage Trend Test method. Gray areas indicate that no z-statistic could be calculated.
§ Cephalothin was removed from the gram negative antimicrobial susceptiblity panel in 2003.
** Sulfisoxazole replaced Sulfamethoxazole in 2004 and 2005.

Figure 4. Antimicrobial Resistance among *Salmonella* isolates, 2002-2005

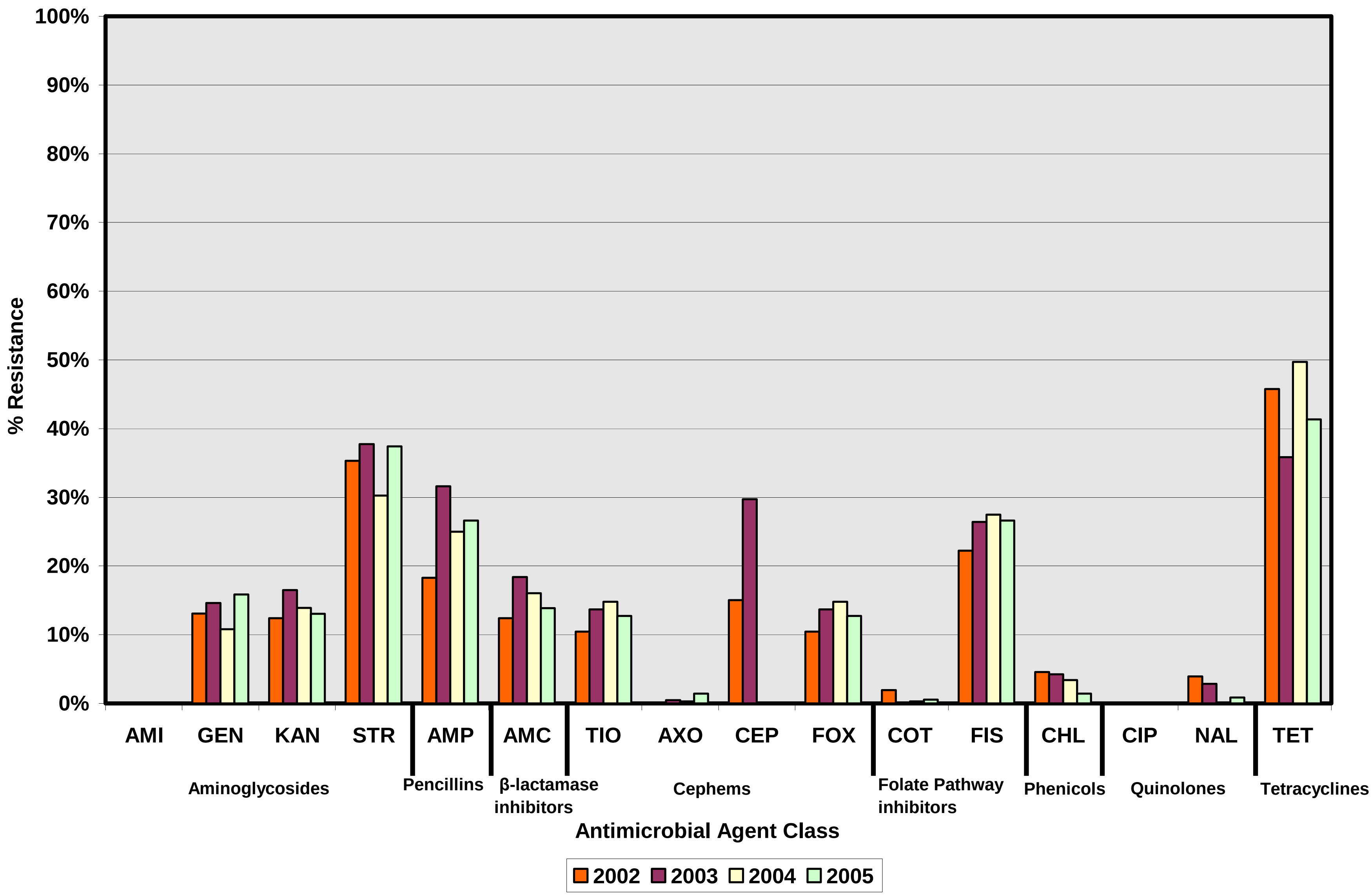


Figure 5. MIC Distribution among all Antimicrobial Agents

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
					Distribution (%) of MICs (µg/ml)[4]																
Aminoglycosides																					
Amikacin	2002 (n=153)	0.0%	0.0%	[0.0 - 2.4]						6.5	58.8	30.1	4.6								
	2003 (n=212)	0.0%	0.0%	[0.0 - 1.7]						3.3	51.9	42.0	2.8								
	2004 (n=324)	0.0%	0.0%	[0.0 - 1.1]						4.6	49.4	41.0	4.9								
	2005 (n=353)	0.0%	0.0%	[0.0 - 1.0]						3.4	65.4	28.3	2.5	0.3							
Gentamicin	2002 (n=153)	1.3%	13.1%	[8.2 - 19.5]					39.2	43.1	3.3			1.3	**3.3**	**9.8**					
	2003 (n=212)	3.8%	14.6%	[10.2 - 20.1]					29.2	44.3	6.1	1.9		3.8	**9.0**	**5.7**					
	2004 (n=324)	1.5%	10.8%	[7.6 - 14.7]					42.0	41.4	4.0	0.3		1.5	**4.9**	**5.9**					
	2005 (n=353)	2.8%	15.9%	[12.2 - 20.1]					49.3	29.7	1.4	0.3	0.6	2.8	**8.2**	**7.6**					
Kanamycin	2002 (n=153)	1.3%	12.4%	[7.6 - 18.7]										82.4	3.9	1.3	**1.3**	**11.1**			
	2003 (n=212)	2.4%	16.5%	[11.8 - 22.2]										81.1		2.4	**7.5**	**9.0**			
	2004 (n=324)	0.9%	13.9%	[10.3 - 18.1]										82.7	2.5	0.9	**3.1**	**10.8**			
	2005 (n=353)	0.0%	13.0%	[9.7 - 17.0]										85.8	1.1		**1.7**	**11.3**			
Streptomycin*	2002 (n=153)	N/A	35.3%	[27.7 - 43.4]												64.7	**8.5**	**26.8**			
	2003 (n=212)	N/A	37.7%	[31.2 - 44.6]												62.3	**17.0**	**20.8**			
	2004 (n=324)	N/A	30.2%	[25.3 - 35.6]												69.8	**17.3**	**13.0**			
	2005 (n=353)	N/A	37.4%	[32.3 - 42.7]												62.6	**22.4**	**15.0**			
Aminopenicillins																					
Ampicillin	2002 (n=153)	0.0%	18.3%	[12.5 - 25.4]							46.4	32.0	2.6	0.7			**18.3**				
	2003 (n=212)	0.0%	31.6%	[25.4 - 38.3]							38.2	28.8	0.9	0.5			**31.6**				
	2004 (n=324)	0.0%	25.0%	[20.4 - 30.1]							63.6	10.5	0.9				**25.0**				
	2005 (n=353)	0.0%	26.6%	[22.1 - 31.6]							66.6	5.9	0.8				**26.6**				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=153)	2.6%	12.4%	[7.6 - 18.7]						72.6	8.5	1.3	2.6	2.6	2.6	9.8					
	2003 (n=212)	11.3%	18.4%	[13.4 - 24.3]							60.4	7.5	0.5	1.9	11.3	**4.7**	**13.7**				
	2004 (n=324)	4.9%	16.0%	[12.2 - 20.5]							67.0	8.0		4.0	4.9	**1.2**	**14.8**				
	2005 (n=353)	8.2%	13.9%	[10.4 - 17.9]							70.0	3.1		4.8	8.2	**2.3**	**11.6**				
Cephalosporins																					
Ceftiofur	2002 (n=153)	0.0%	10.5%	[6.1 - 16.4]					0.7	58.8	27.5	2.6		**0.7**	**9.8**						
	2003 (n=212)	0.0%	13.7%	[9.4 - 19.1]						45.3	39.2	1.9			**13.7**						
	2004 (n=324)	0.0%	14.8%	[11.1 - 19.2]					0.3	46.3	36.7	1.9			**14.8**						
	2005 (n=353)	0.0%	12.7%	[9.5 - 16.7]					1.1	51.3	33.7	1.1			**12.7**						
Ceftriaxone	2002 (n=153)	5.2%	0.0%	[0.0 - 2.4]					89.5				0.7	4.6	3.9	1.3					
	2003 (n=212)	12.3%	0.5%	[0.0 - 2.6]					85.8				0.5	0.9	8.0	4.2	**0.5**				
	2004 (n=324)	13.9%	0.3%	[0.0 - 1.7]					84.9					0.9	9.9	4.0	**0.3**				
	2005 (n=353)	10.8%	1.4%	[0.5 - 3.3]					86.7	0.3				0.8	9.1	1.7	**0.8**	**0.6**			
Cephalothin	2002 (n=153)	0.0%	15.0%	[9.8 - 21.7]								17.7	56.9	10.5		**2.0**	**13.1**				
	2003 (n=212)	1.9%	29.7%	[23.7 - 36.4]								11.3	46.7	10.4	1.9	**2.4**	**27.4**				
Cephamycins																					
Cefoxitin	2002 (n=153)	1.3%	10.5%	[6.1 - 16.4]							2.0	51.6	26.8	7.8	1.3	**10.5**					
	2003 (n=212)	0.9%	13.7%	[9.4 - 19.1]							0.9	55.7	23.6	5.2	0.9	**13.7**					
	2004 (n=324)	0.6%	14.8%	[11.1 - 19.2]							1.9	59.0	20.7	3.1	0.6	**3.1**	**11.7**				
	2005 (n=353)	0.6%	12.7%	[9.5 - 16.7]							23.5	46.7	15.0	1.4	**0.6**	**6.8**	**5.9**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=153)	N/A	22.2%	[15.9 - 29.6]											26.8	39.9	10.5	0.7			**22.22**
	2003 (n=212)	N/A	26.4%	[20.6 - 32.9]											24.1	33.5	13.7	2.4		**0.5**	**25.9**
Sulfisoxazole	2004 (n=324)	N/A	27.5%	[22.7 - 32.7]											8.3	15.4	48.1	0.6		**27.5**	
	2005 (n=353)	N/A	26.6%	[22.1 - 31.6]											6.8	24.9	40.8	0.8		**26.6**	
Trimethoprim-Sulfamethoxazole	2002 (n=153)	N/A	2.0%	[0.4 - 5.6]				92.2	5.2	0.7				**2.0**							
	2003 (n=212)	N/A	0.0%	[0.0 - 1.7]				88.7	10.8	0.5											
	2004 (n=324)	N/A	0.3%	[0.0 - 1.7]				93.2	4.3	1.9				**0.3**							
	2005 (n=353)	N/A	0.6%	[0.1 - 2.0]				96.6	2.5	0.3				**0.6**							
Phenicols																					
Chloramphenicol	2002 (n=153)	3.3%	4.6%	[1.9 - 9.2]								0.7	48.4	43.1	3.3		**4.6**				
	2003 (n=212)	1.4%	4.2%	[2.0 - 7.9]									20.3	74.1	1.4		**4.2**				
	2004 (n=324)	2.2%	3.4%	[1.7 - 6.0]								1.2	13.0	80.2	2.2		**3.4**				
	2005 (n=353)	1.7%	1.4%	[0.5 - 3.3]								0.8	50.4	45.6	1.7		**1.4**				
Quinolones																					
Ciprofloxacin	2002 (n=153)	0.0%	0.0%	[0.0 - 2.4]	79.1	15.0	2.0	0.7	0.7	1.3	1.3										
	2003 (n=212)	0.0%	0.0%	[0.0 - 1.7]	83.5	12.3	1.4		2.4	0.5											
	2004 (n=324)	0.0%	0.0%	[0.0 - 1.1]	95.4	4.0	0.6														
	2005 (n=353)	0.0%	0.0%	[0.0 - 1.0]	83.9	14.4	0.8	0.6	0.3												
Nalidixic Acid	2002 (n=153)	N/A	3.9%	[1.5 - 8.3]							0.7	0.0	66.0	28.1	1.3		**3.9**				
	2003 (n=212)	N/A	2.8%	[1.0 - 6.1]							0.5	1.4	82.5	11.8	0.9		**2.8**				
	2004 (n=324)	N/A	0.0%	[0.0 - 1.1]								8.0	84.9	6.8	0.3						
	2005 (n=353)	N/A	0.8%	[0.2 - 2.5]							0.3	19.5	76.2	2.8	0.3	**0.3**	**0.6**				
Tetracyclines																					
Tetracycline	2002 (n=153)	0.7%	45.8%	[37.7 - 54.0]									53.6	0.7	**0.7**	**2.0**	**43.1**				
	2003 (n=212)	1.4%	35.8%	[29.4 - 42.7]									62.7	1.4		**0.5**	**35.4**				
	2004 (n=324)	3.7%	49.7%	[44.1 - 55.3]									46.6	3.7	**1.9**	**0.9**	**46.9**				
	2005 (n=353)	0.0%	41.4%	[36.2 - 46.7]									58.6			**0.8**	**40.5**				

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

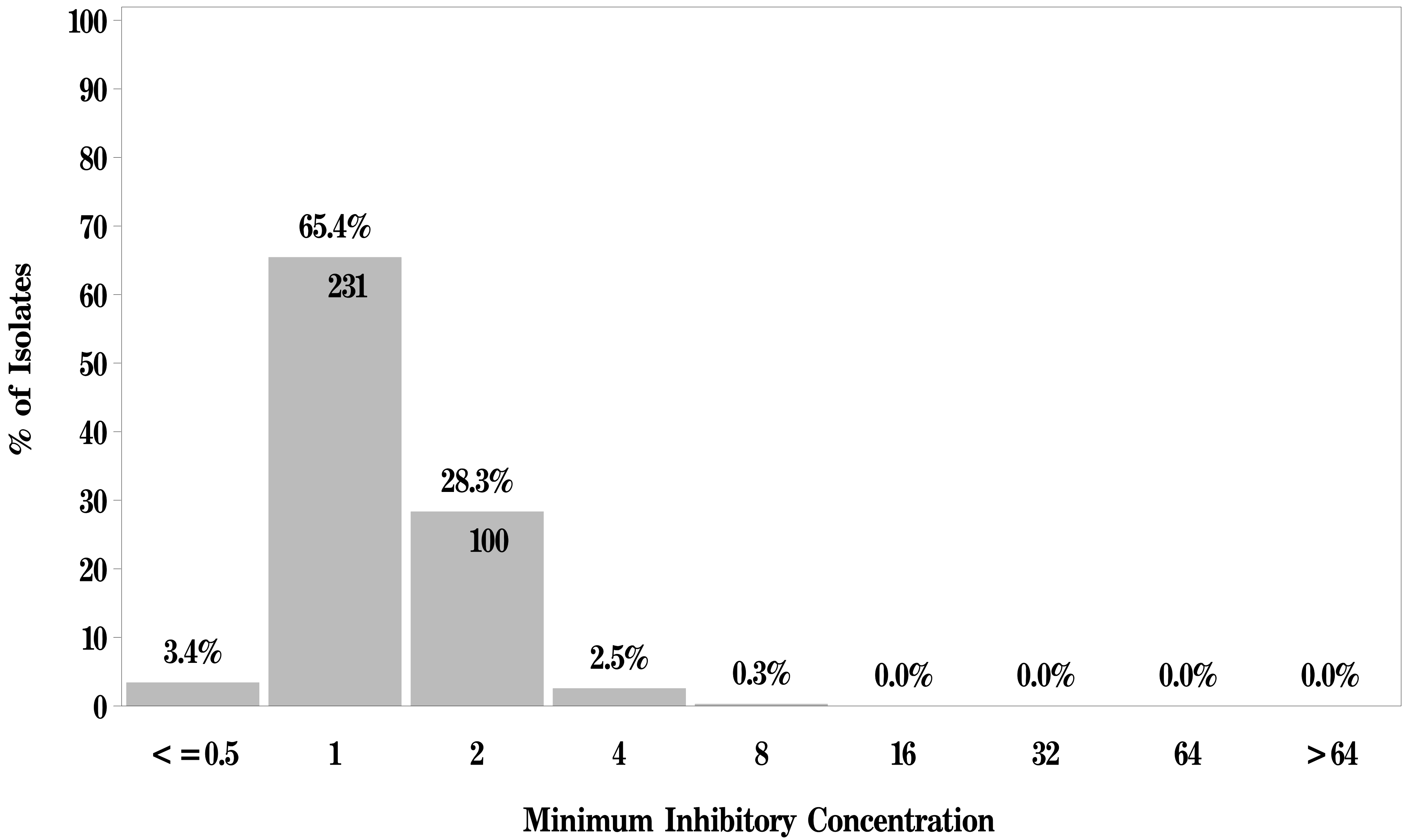
[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Black vertical bars indicate the breakpoints for susceptibility, while 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 percentages of 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.

NARMS

Figure 5a: Minimum Inhibitory Concentration of Amikacin for *Salmonella* (N=353 Isolates)

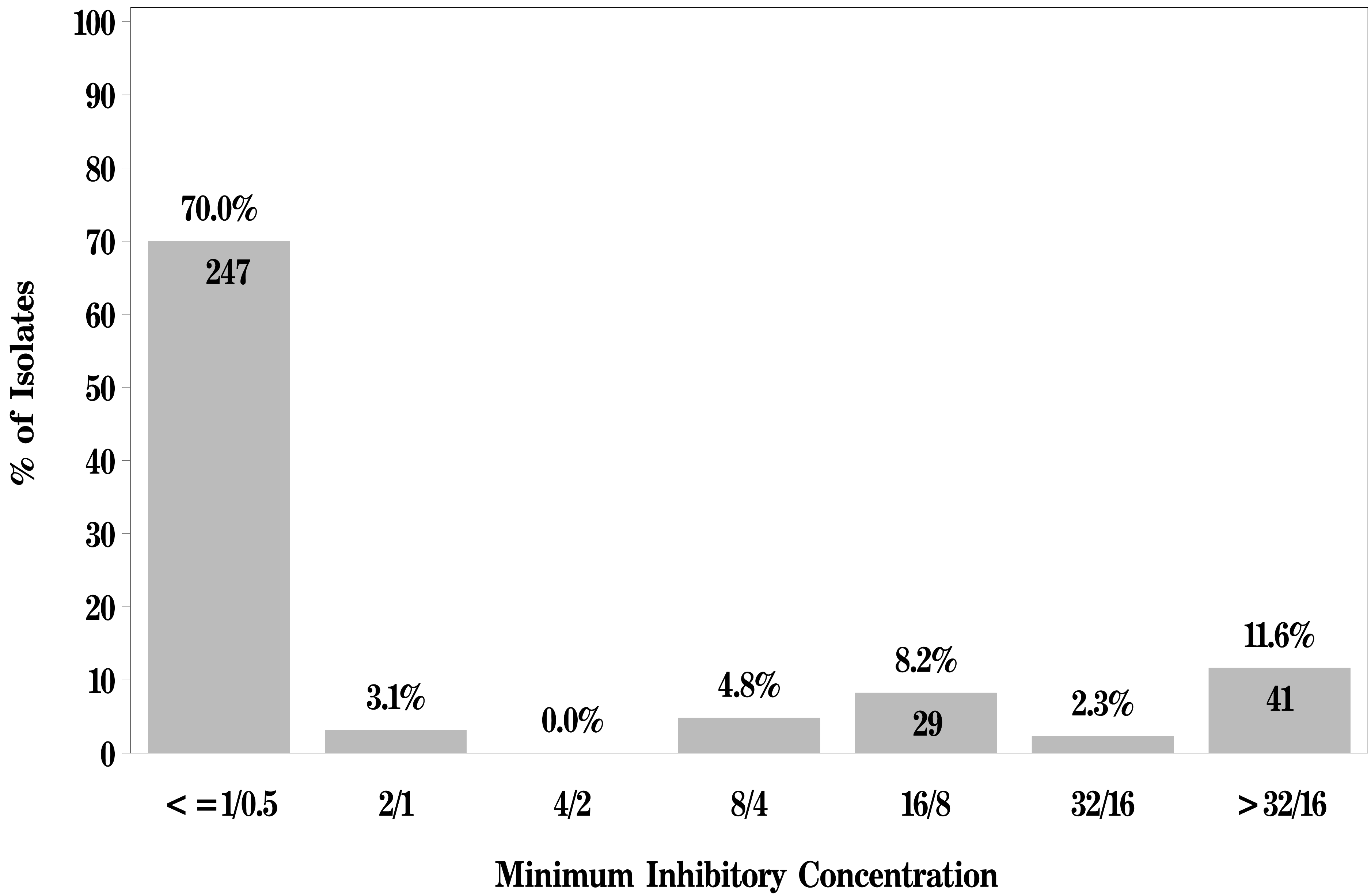
Breakpoints: Susceptible <=16 μg/mL Resistant >=64 μg/mL



NARMS

Figure 5b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Salmonella* (N=353 Isolates)

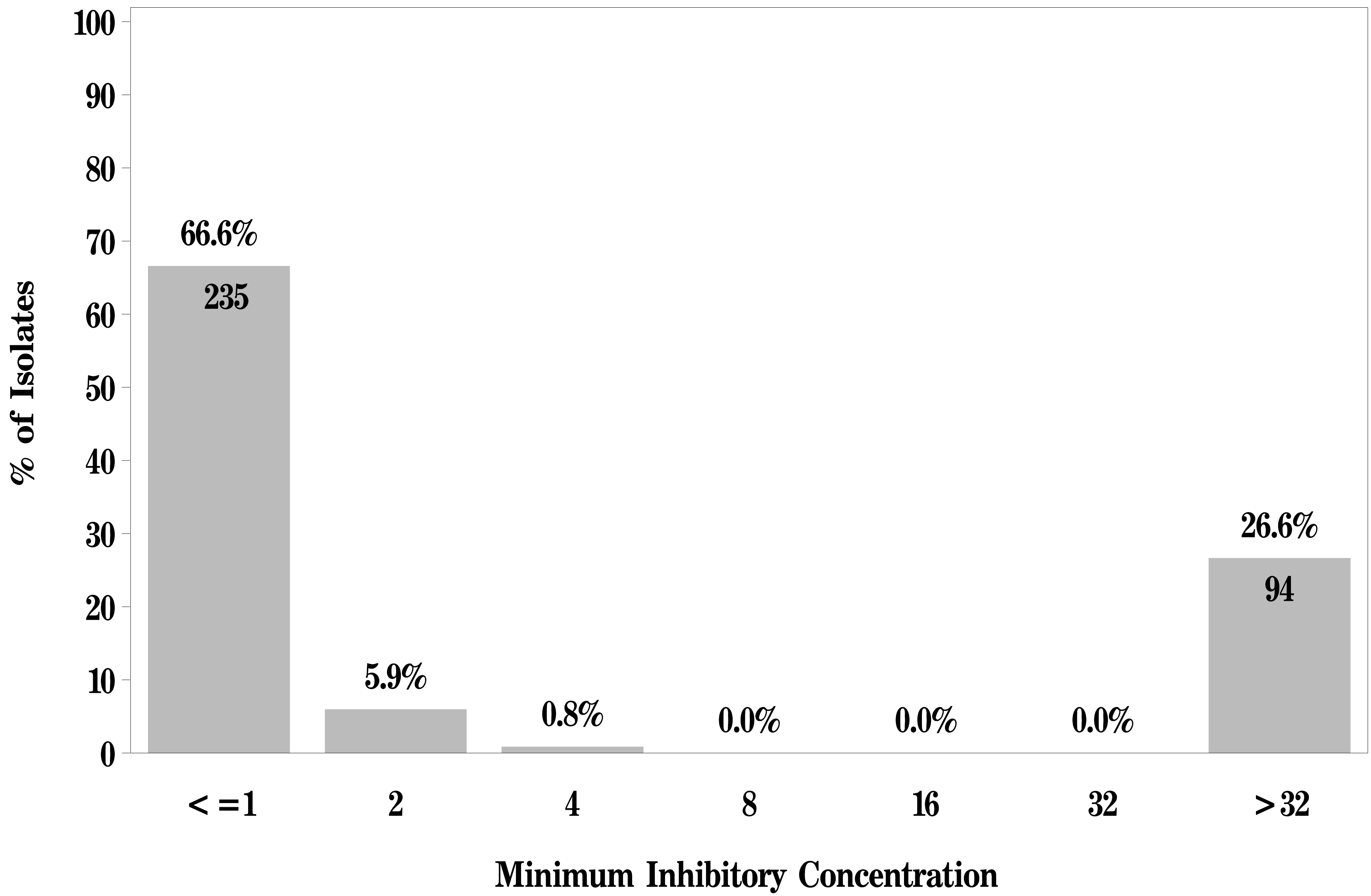
Breakpoints: Susceptible <=8 μg/mL Resistant >=32 μg/mL



NARMS

Figure 5c: Minimum Inhibitory Concentration of Ampicillin for *Salmonella* (N=353 Isolates)

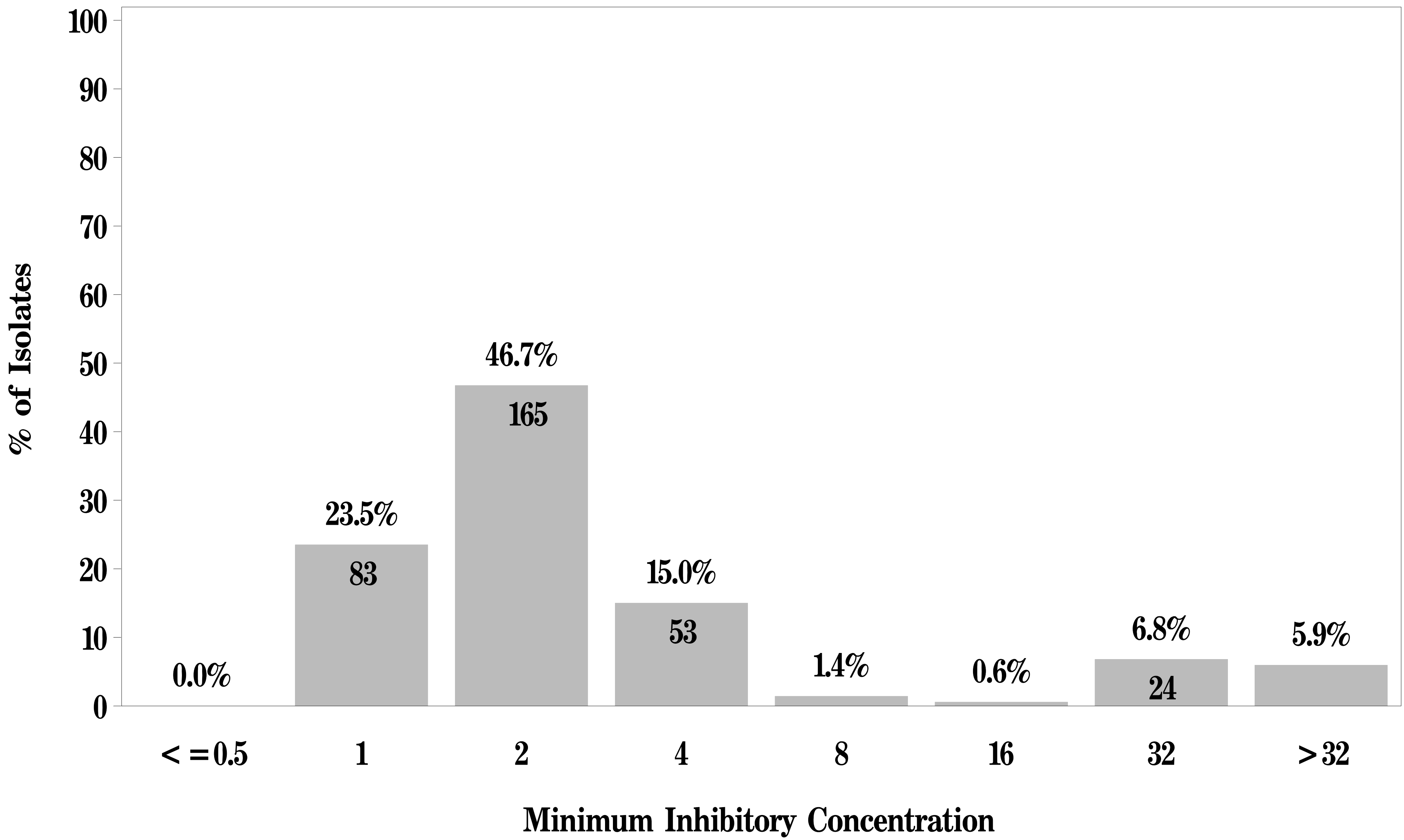
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 5d: Minimum Inhibitory Concentration of Cefoxitin for *Salmonella* (N=353 Isolates)

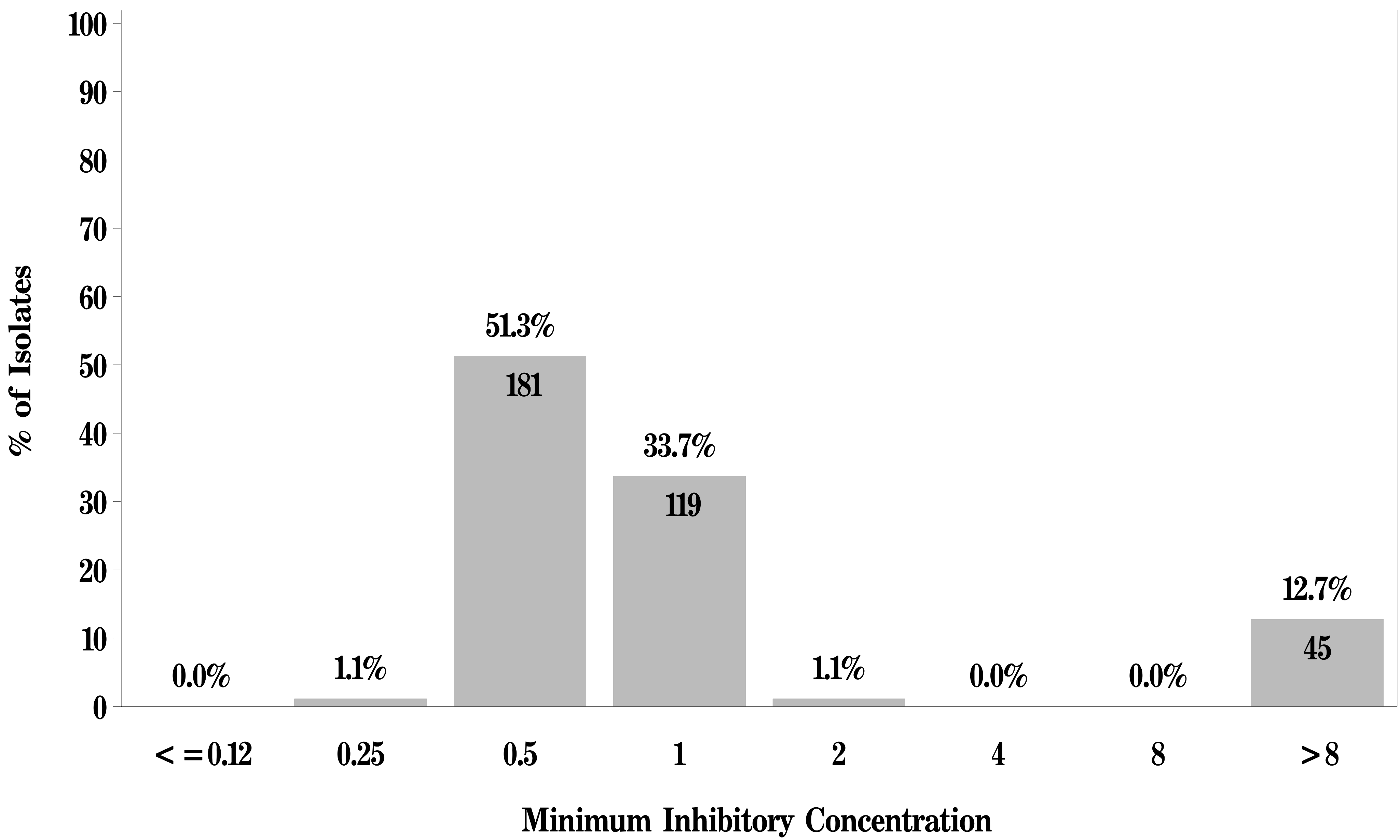
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 5e: Minimum Inhibitory Concentration of Ceftiofur for *Salmonella* (N=353 Isolates)

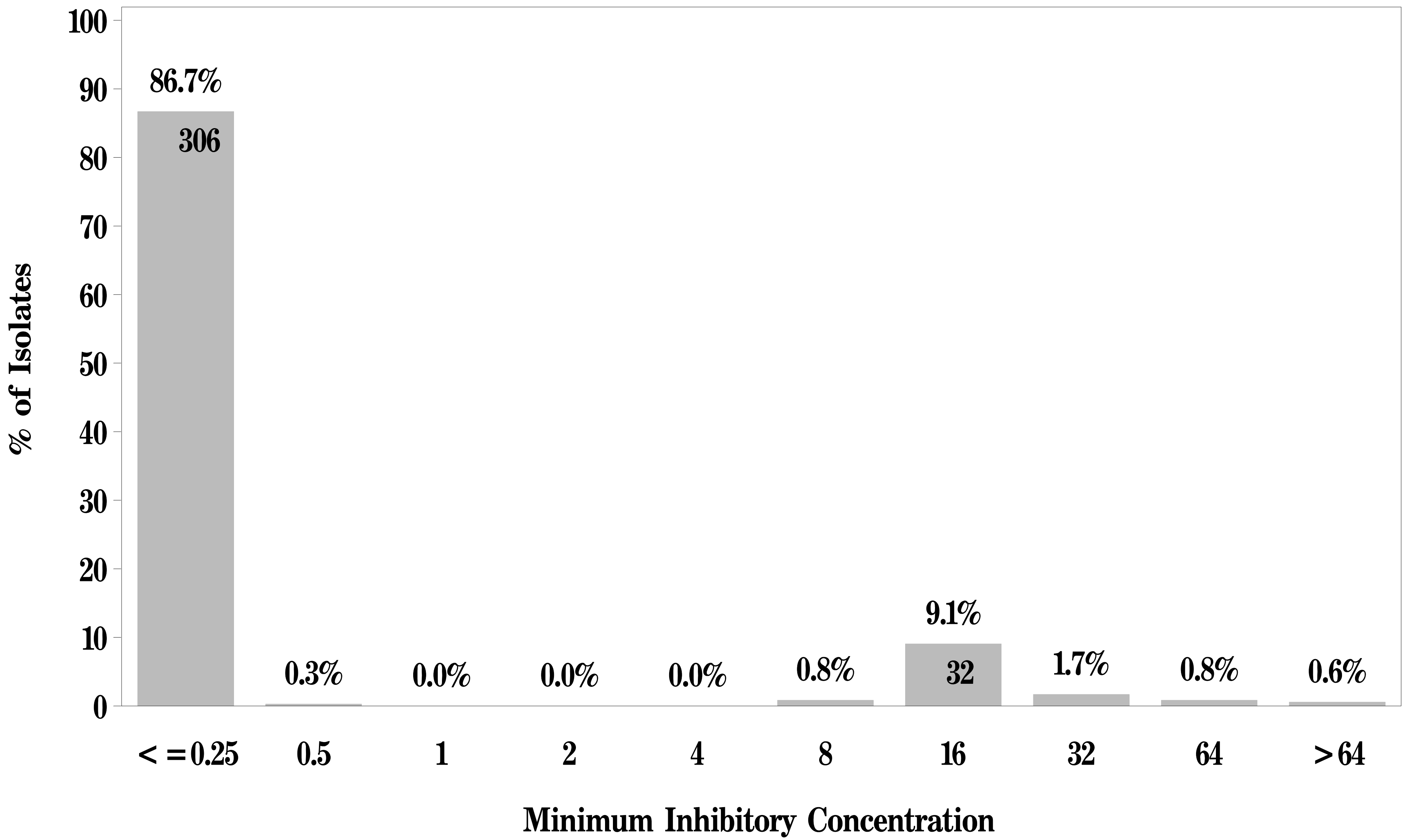
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 5f: Minimum Inhibitory Concentration of Ceftriaxone for *Salmonella* (N=353 Isolates)

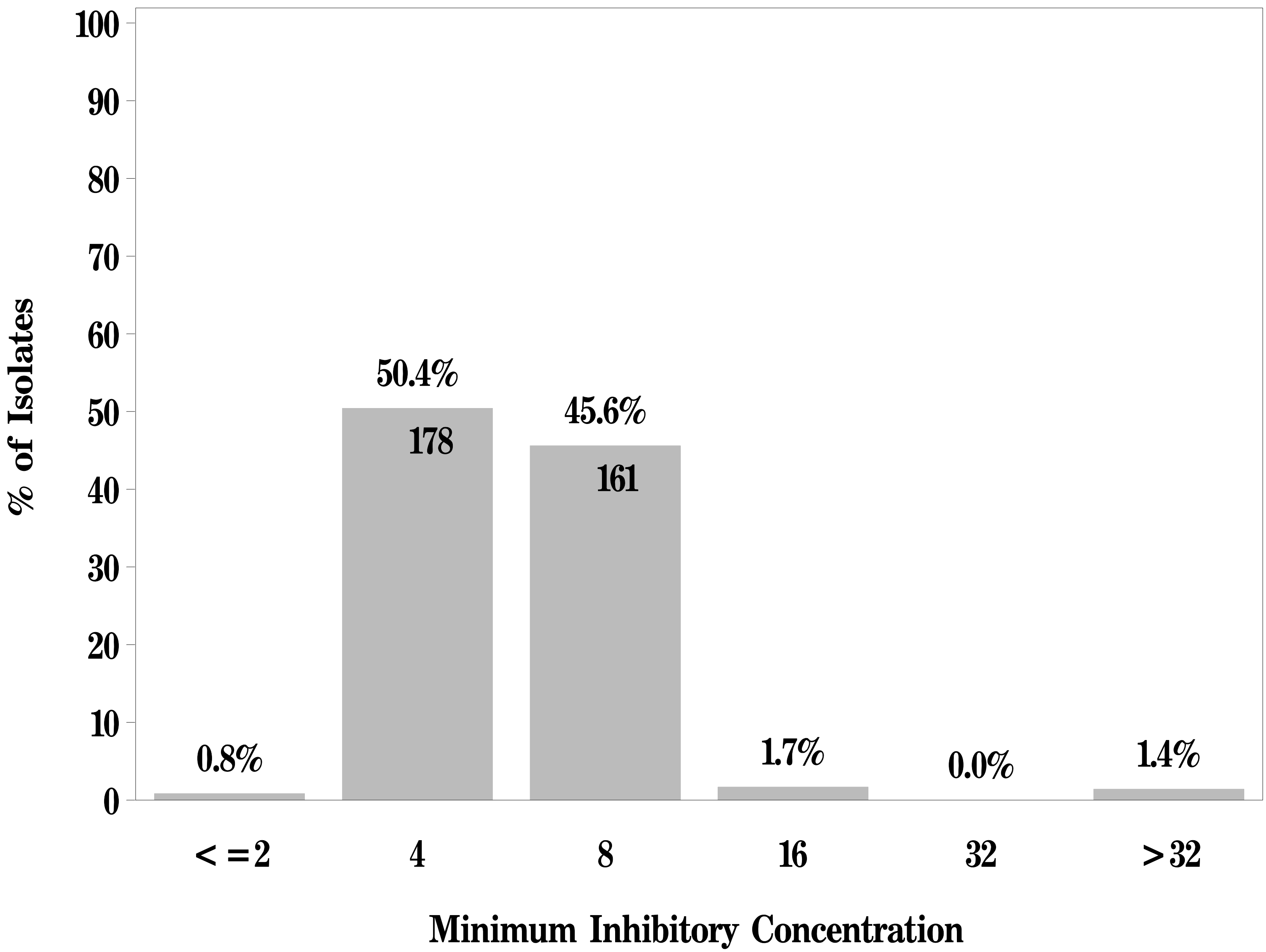
Breakpoints: Susceptible<=8 μg/mL Resistant>=64 μg/mL



NARMS

Figure 5g: Minimum Inhibitory Concentration of Chloramphenicol for *Salmonella* (N=353 Isolates)

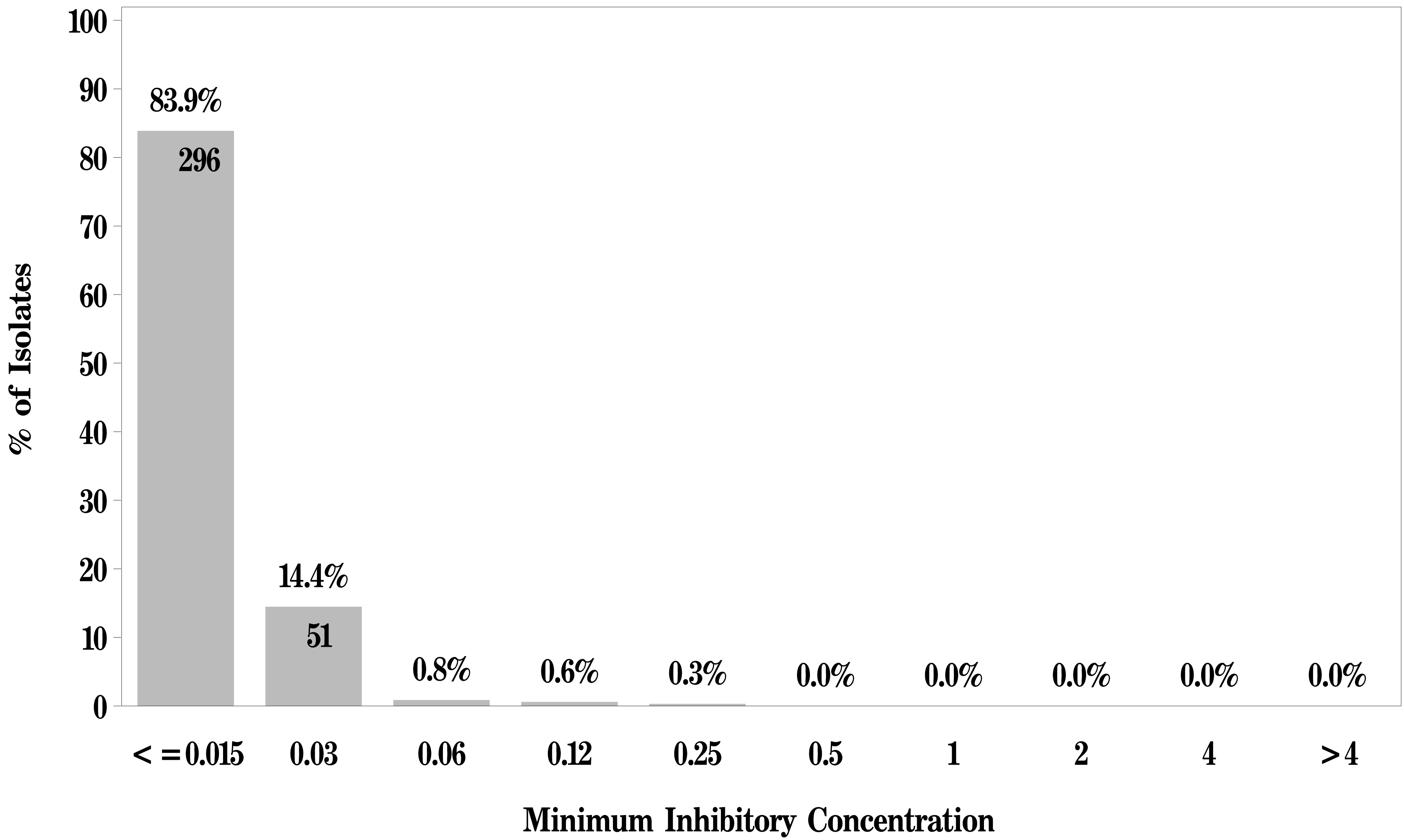
Breakpoints: Susceptible <=8 μg/mL Resistant >=32 μg/mL



NARMS

Figure 5h: Minimum Inhibitory Concentration of Ciprofloxacin for *Salmonella* (N=353 Isolates)

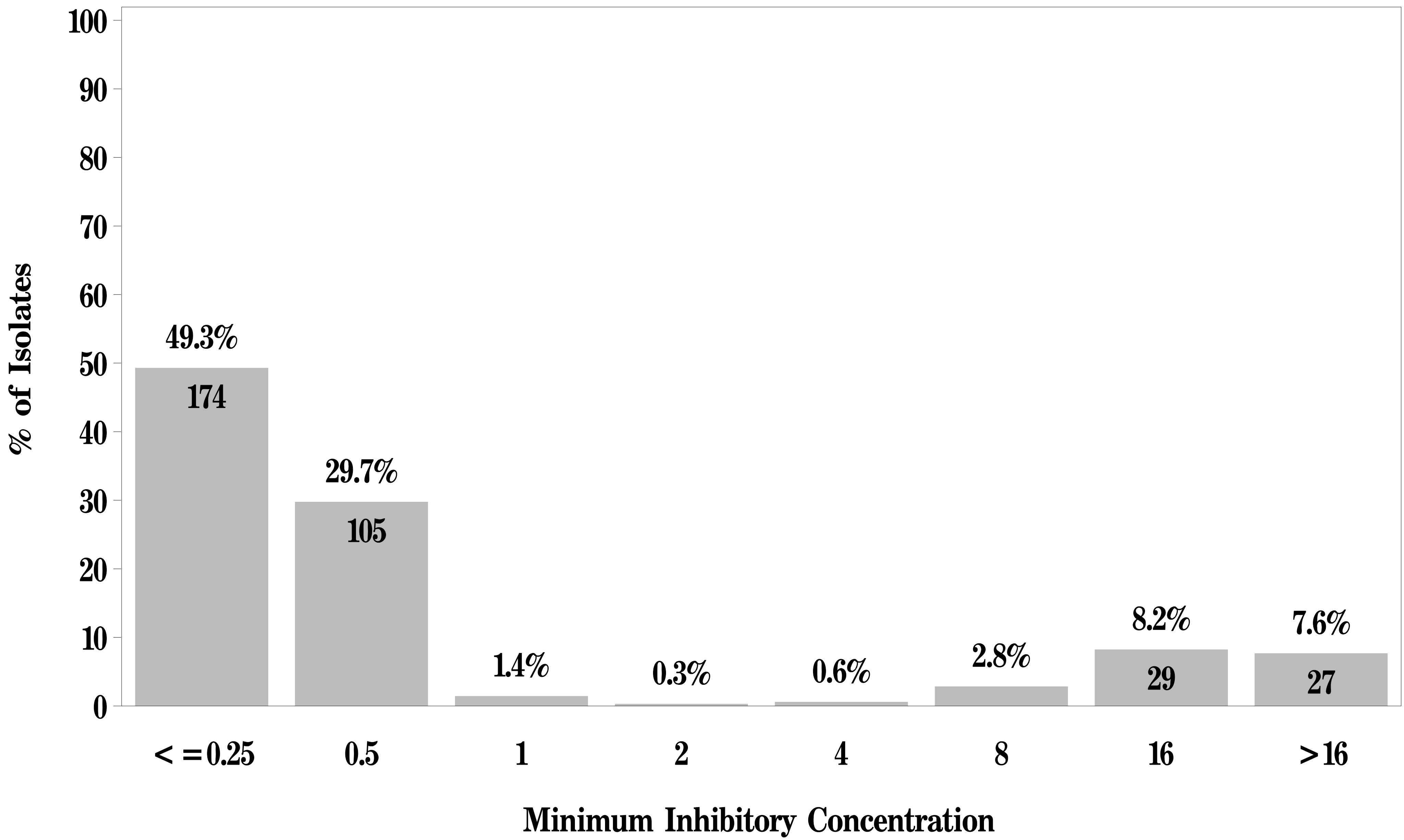
Breakpoints: Susceptible <=1 μg/mL Resistant >=4 μg/mL



NARMS

Figure 5i: Minimum Inhibitory Concentration of Gentamicin for *Salmonella* (N=353 Isolates)

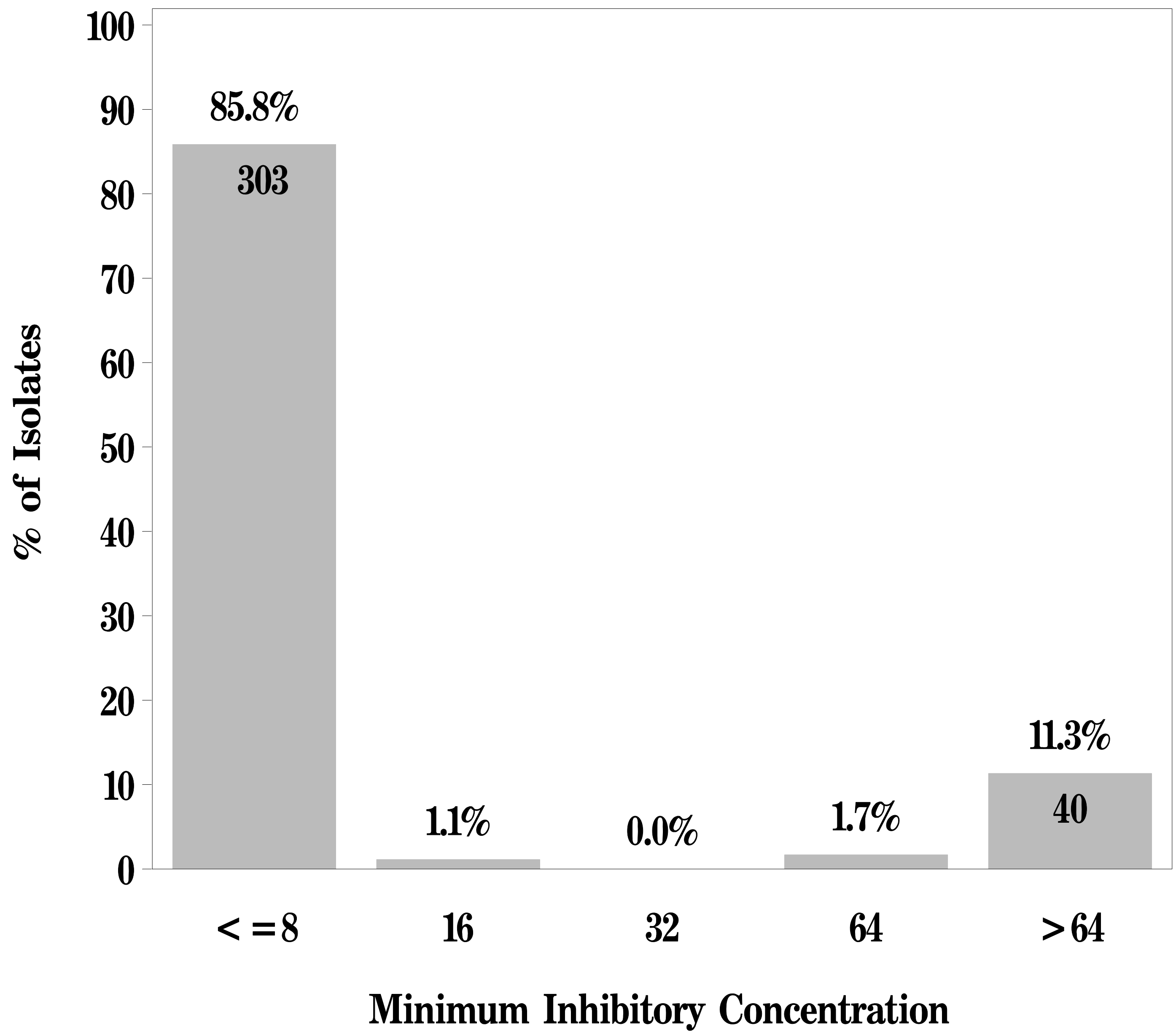
Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL



NARMS

Figure 5j: Minimum Inhibitory Concentration of Kanamycin for *Salmonella* (N=353 Isolates)

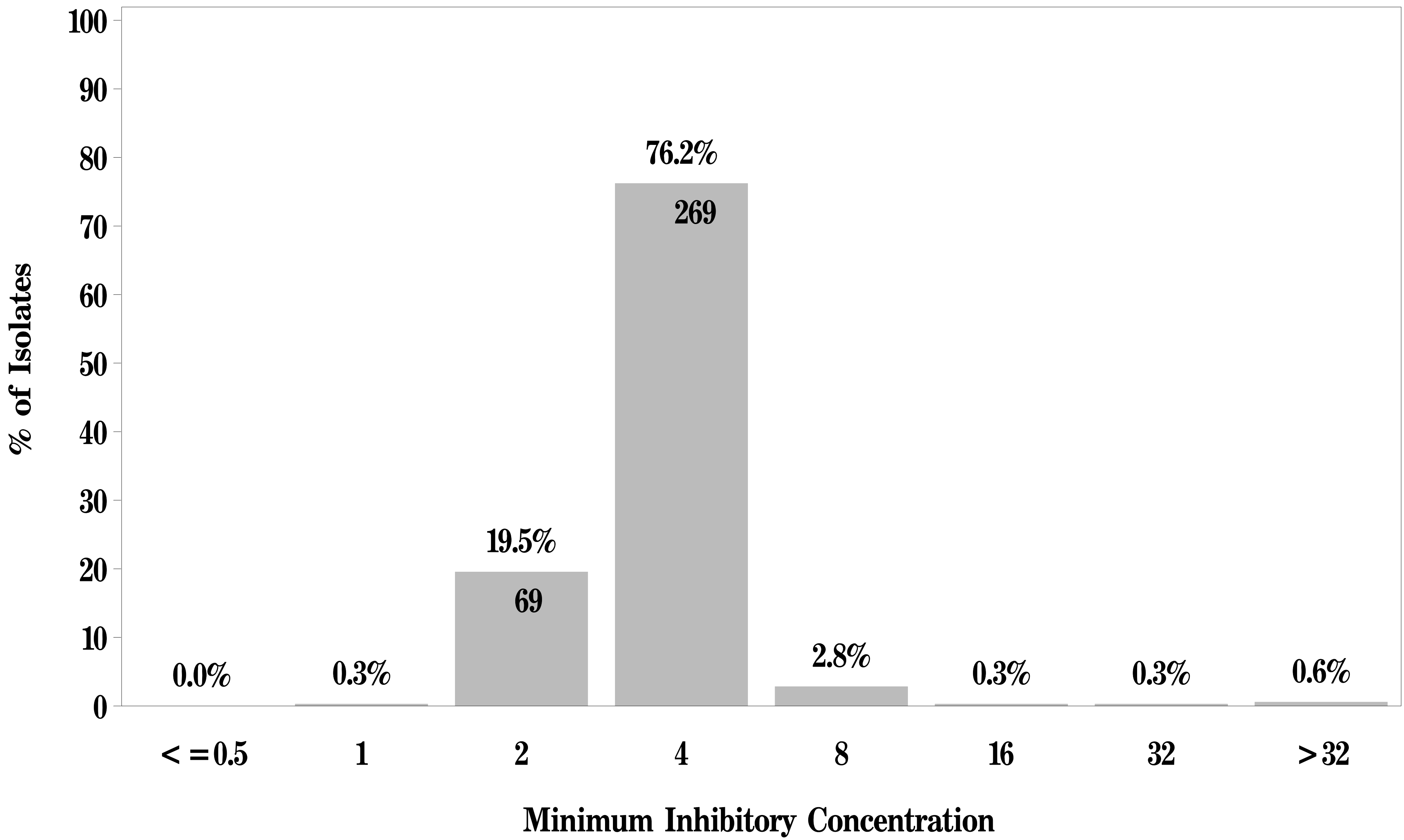
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 5k: Minimum Inhibitory Concentration of Nalidixic acid for *Salmonella* (N=353 Isolates)

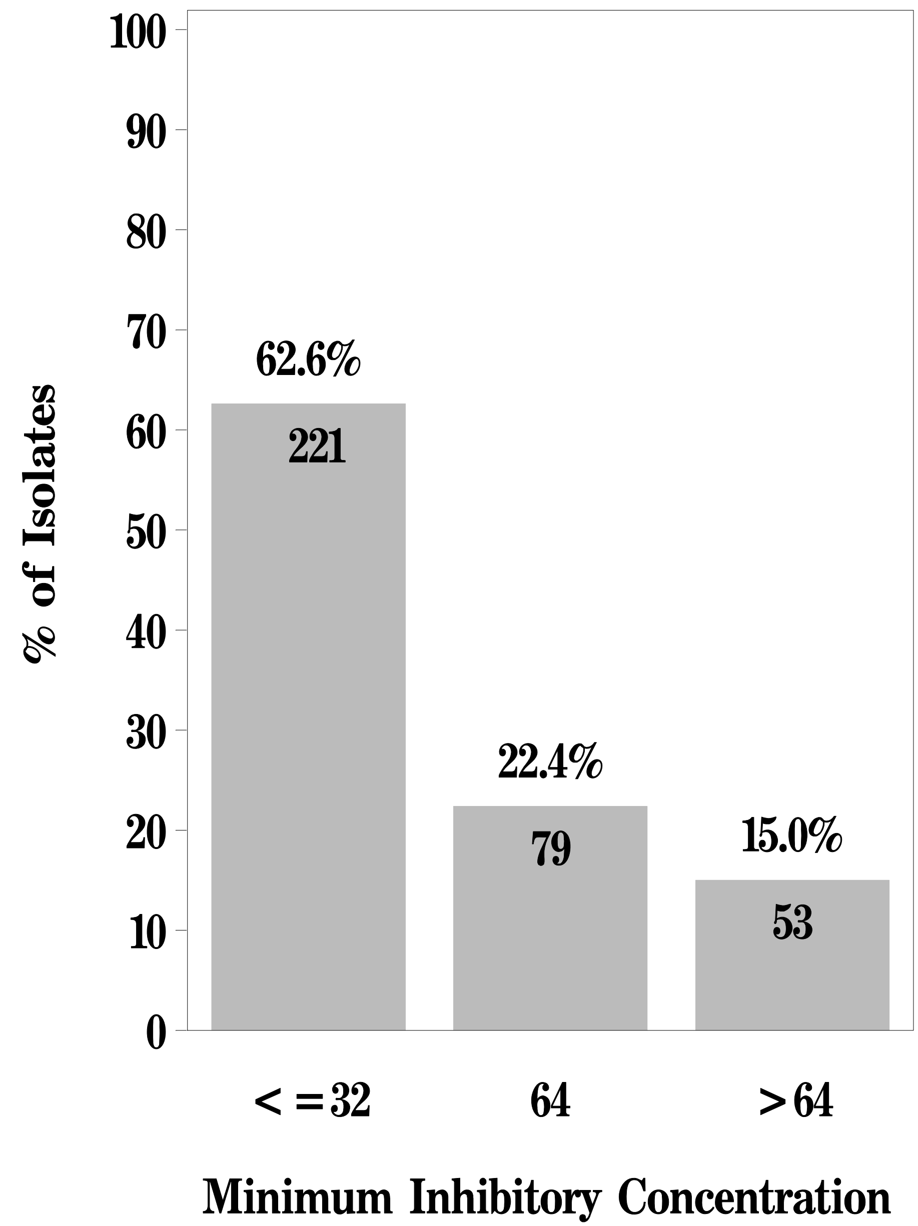
Breakpoints: Susceptible<=16 μg/mL Resistant>=32 μg/mL



NARMS

Figure 5l: Minimum Inhibitory Concentration of Streptomycin for *Salmonella* (N=353 Isolates)

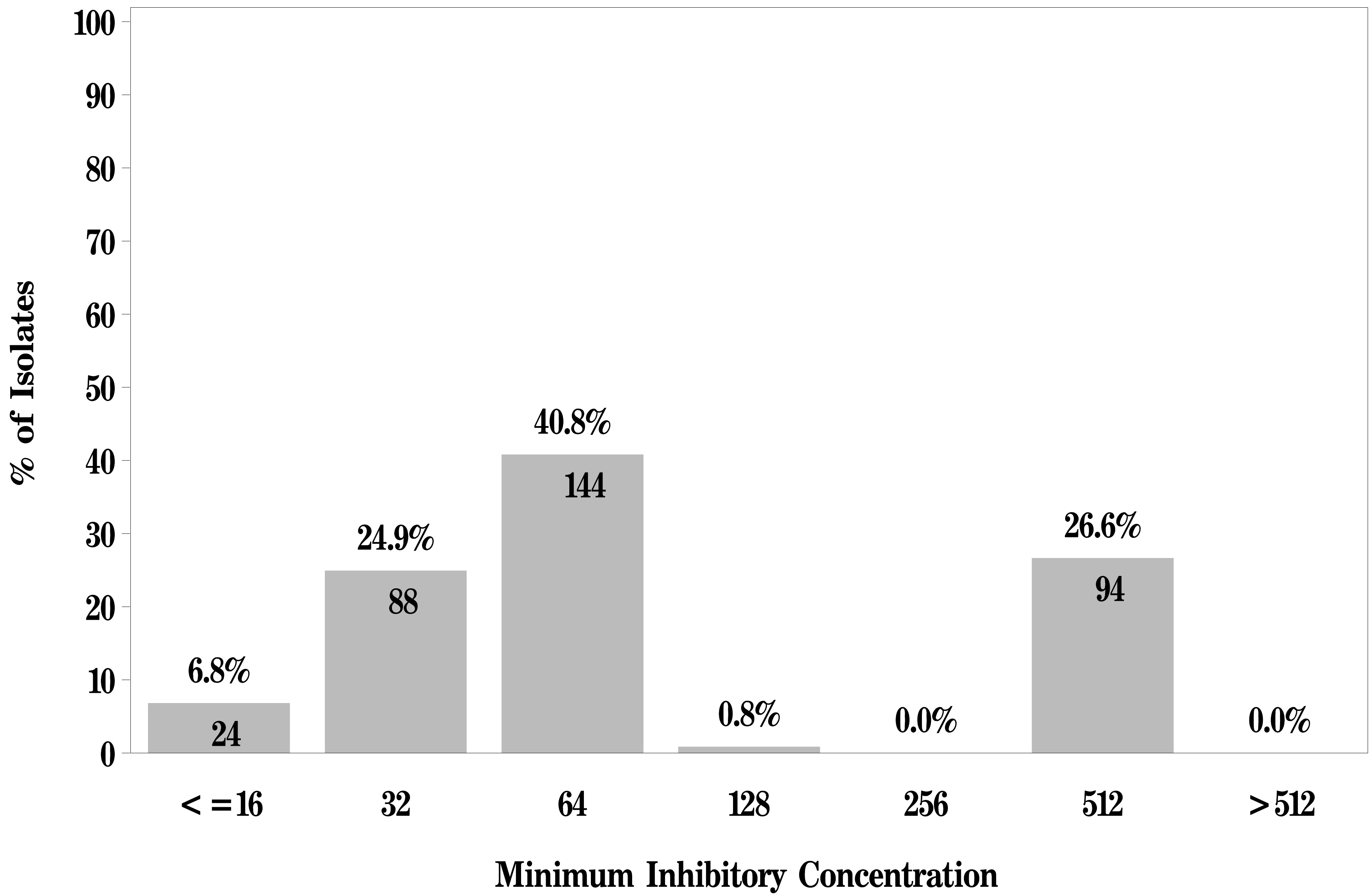
Breakpoints: Susceptible <=32 μg/mL Resistant >=64 μg/mL



NARMS

Figure 5m: Minimum Inhibitory Concentration of Sulfisoxazole for *Salmonella* (N=353 Isolates)

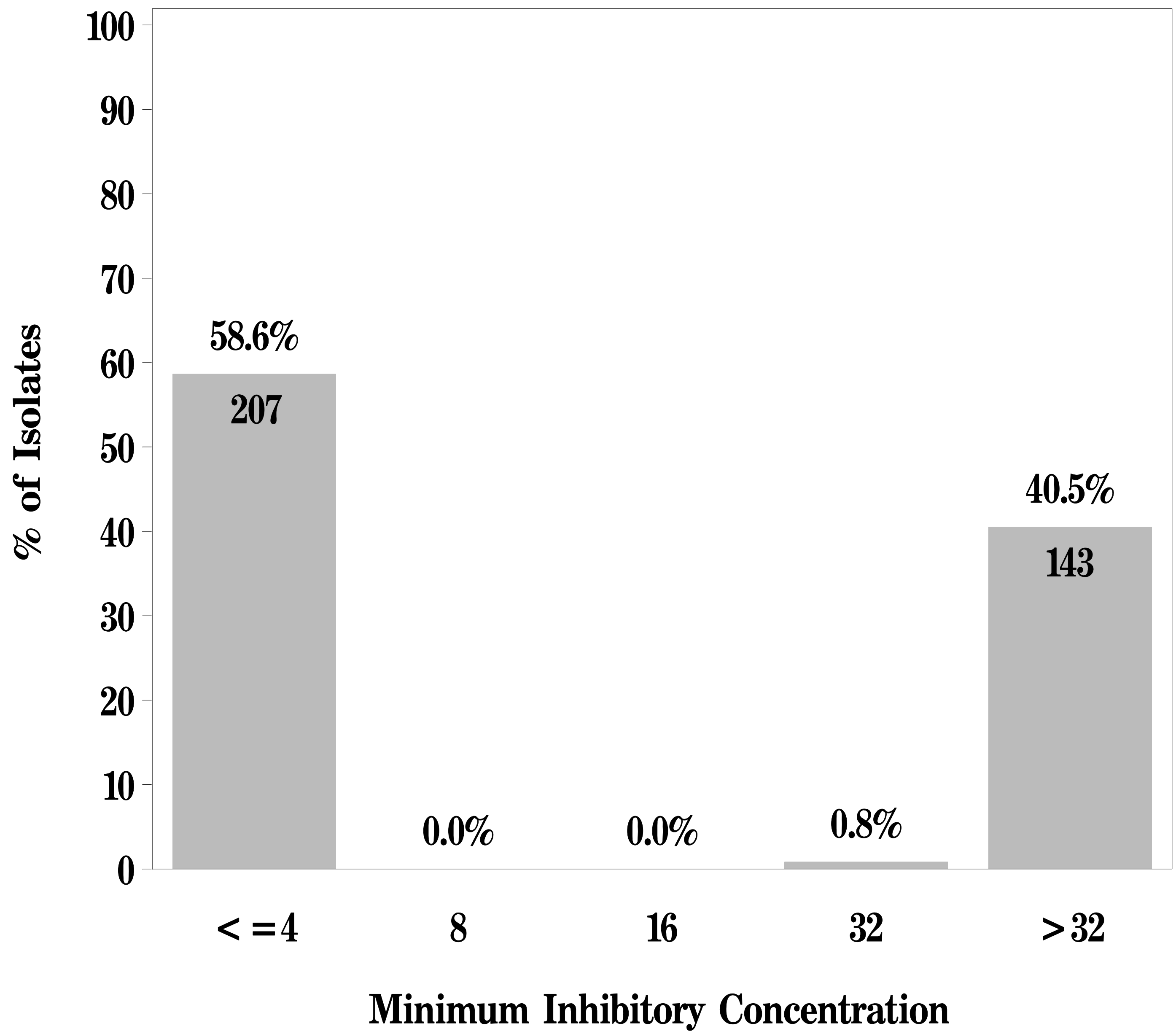
Breakpoints: Susceptible<=256 μg/mL Resistant>=512 μg/mL



NARMS

Figure 5n: Minimum Inhibitory Concentration of Tetracycline for *Salmonella* (N=353 Isolates)

Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL



NARMS

Figure 5o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Salmonella* (N=353 Isolates)

Breakpoints: Susceptible <=2 µg/mL Resistant >=4 µg/mL

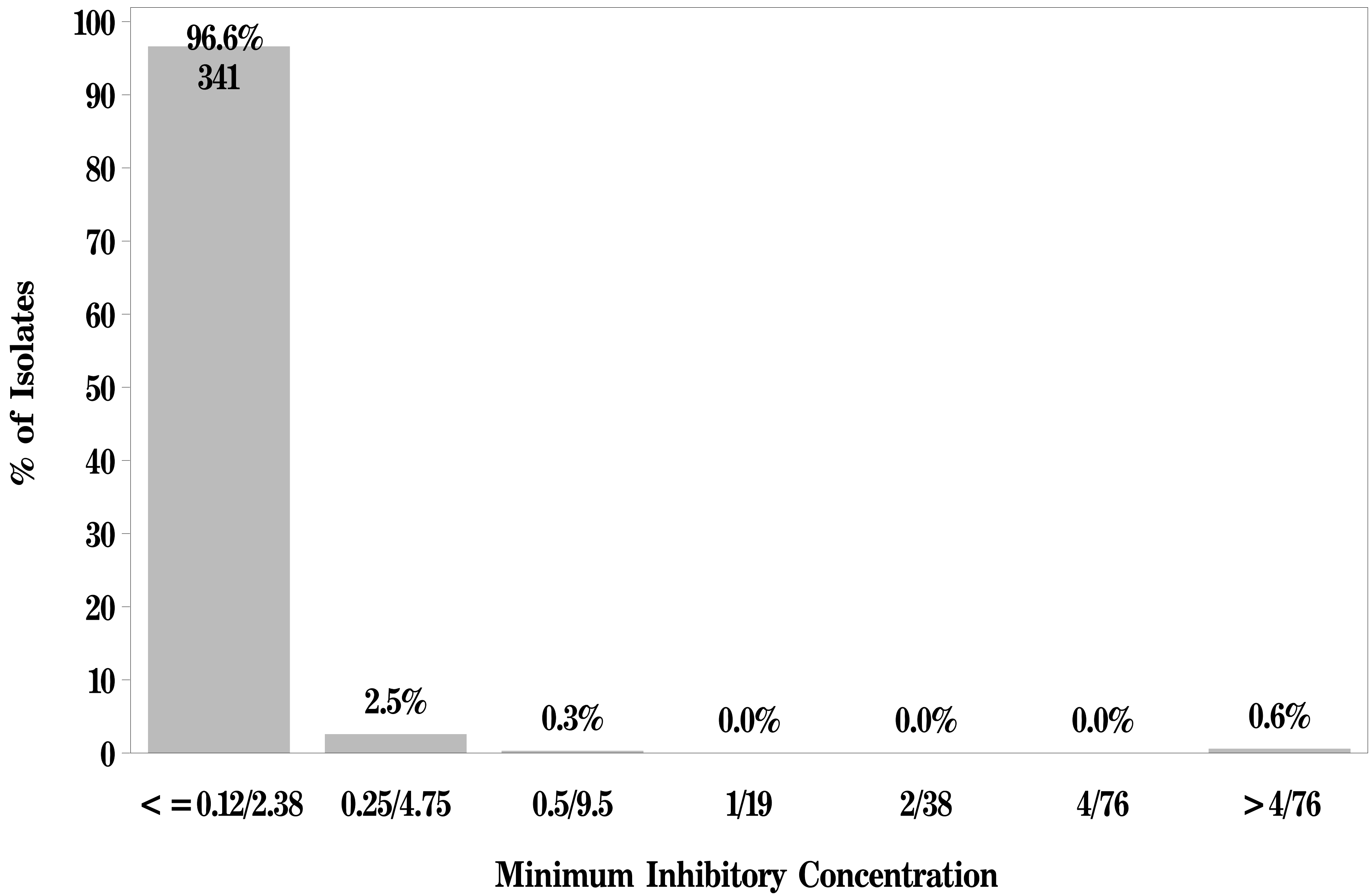


Figure 6a. MIC Distribution among *Salmonella* from Chicken Breast

Antimicrobial	Year (# of Isolates)	%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 (n=60)	0.0%	0.0%	[0.0 - 6.0]						6.7	58.3	30.0	5.0								
	2003 (n=83)	0.0%	0.0%	[0.0 - 4.3]						8.4	47.0	41.0	3.6								
	2004 (n=157)	0.0%	0.0%	[0.0 - 2.3]						7.6	46.5	40.1	5.7								
	2005 (n=153)	0.0%	0.0%	[0.0 - 2.4]						7.2	69.3	20.3	3.3								
Gentamicin	2002 (n=60)	0.0%	10.0%	[3.8 - 20.5]					36.7	48.3	5.0				1.7	8.3					
	2003 (n=83)	1.2%	6.0%	[2.0 - 13.5]					33.7	54.2	4.8			1.2	2.4	3.6					
	2004 (n=157)	0.6%	3.8%	[1.4 - 8.1]					46.5	45.2	3.8			0.6	1.9	1.9					
	2005 (n=153)	0.0%	3.3%	[1.1 - 7.5]					64.7	30.1	2.0				0.7	2.6					
Kanamycin	2002 (n=60)	0.0%	6.7%	[1.8 - 16.2]										91.7	1.7			6.7			
	2003 (n=83)	1.2%	4.8%	[1.3 - 11.9]										94.0		1.2		4.8			
	2004 (n=157)	0.6%	11.5%	[6.9 - 17.5]										84.7	3.2	0.6		11.5			
	2005 (n=153)	0.0%	4.6%	[1.9 - 9.2]										95.4				4.6			
Streptomycin	2002 (n=60)	N/A	28.3%	[17.5 - 41.4]												71.7	10.0	18.3			
	2003 (n=83)	N/A	26.5%	[17.4 - 37.3]												73.5	14.5	12.0			
	2004 (n=157)	N/A	28.0%	[21.2 - 35.7]												72.0	16.6	11.5			
	2005 (n=153)	N/A	30.1%	[22.9 - 38.0]												69.9	21.6	8.5			
Aminopenicillins																					
Ampicillin	2002 (n=60)	0.0%	16.7%	[8.3 - 28.5]							53.3	30.0					16.7				
	2003 (n=83)	0.0%	33.7%	[23.7 - 44.9]							43.4	22.9					33.7				
	2004 (n=157)	0.0%	30.6%	[23.5 - 38.4]							60.5	8.9					30.6				
	2005 (n=153)	0.0%	26.8%	[20.0 - 34.5]							69.3	3.3	0.7				26.8				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=60)	1.7%	10.0%	[3.8 - 20.5]							76.7	6.7		5.0	1.7		10.0				
	2003 (n=83)	6.0%	25.3%	[16.4 - 36.0]							65.1	1.2		2.4	6.0		25.3				
	2004 (n=157)	1.3%	24.8%	[18.3 - 32.4]							61.8	7.6		4.5	1.3		24.8				
	2005 (n=153)	3.9%	21.6%	[15.3 - 28.9]							70.6	2.0		2.0	3.9	2.0	19.6				
Cephalosporins																					
Ceftiofur	2002 (n=60)	0.0%	10.0%	[3.8 - 20.5]					1.7	71.7	16.7	0.0			10.0						
	2003 (n=83)	0.0%	25.3%	[16.4 - 36.0]						51.8	21.7	1.2			25.3						
	2004 (n=157)	0.0%	24.8%	[18.3 - 32.4]					0.6	47.1	27.4				24.8						
	2005 (n=153)	0.0%	20.9%	[14.8 - 28.2]					2.6	61.4	15.0	0.0			20.9						
Ceftriaxone	2002 (n=60)	5.0%	0.0%	[0.0 - 6.0]					90.0					5.0	3.3	1.7					
	2003 (n=83)	24.1%	0.0%	[0.0 - 4.3]					73.5				1.2	1.2	16.9	7.2					
	2004 (n=157)	22.9%	0.0%	[0.0 - 2.3]					75.2					1.9	18.5	4.5					
	2005 (n=153)	19.6%	0.0%	[0.0 - 2.4]					77.8	0.7				2.0	17.0	2.6					
Cephalothin	2002 (n=60)	0.0%	13.3%	[5.9 - 24.6]								23.3	60.0	3.3		3.3	10.0				
	2003 (n=83)	2.4%	28.9%	[19.5 - 39.9]								21.7	42.2	4.8	2.4	1.2	27.7				
Cephamycins																					
Cefoxitin	2002 (n=60)	0.0%	10.0%	[3.8 - 20.5]								60.2	13.3	1.2		25.3					
	2003 (n=83)	0.0%	25.3%	[16.4 - 36.0]								60.2	13.3	1.2		25.3					
	2004 (n=157)	0.0%	24.8%	[18.3 - 32.4]							2.5	56.7	14.6	1.3		5.7	19.1				
	2005 (n=153)	0.7%	20.9%	[14.8 - 28.2]							25.5	48.4	4.6		0.7	11.1	9.8				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=60)	N/A	16.7%	[8.3 - 28.5]											38.3	31.67	13.3				16.7
	2003 (n=83)	N/A	14.5%	[7.7 - 23.9]											32.5	33.7	15.7	3.6			14.5
Sulfisoxazole	2004 (n=157)	N/A	28.7%	[21.7 - 36.4]											12.1	14.6	43.3	1.3		28.7	
	2005 (n=153)	N/A	17.0%	[11.4 - 23.9]											11.1	28.1	41.8	2.0		17.0	
Trimethoprim-Sulfamethoxazole	2002 (n=60)	N/A	0.0%	[0.0 - 6.0]				98.3	1.7												
	2003 (n=83)	N/A	0.0%	[0.0 - 4.3]				97.6	2.4												
	2004 (n=157)	N/A	0.0%	[0.0 - 2.3]				96.8	3.2												
	2005 (n=153)	N/A	0.0%	[0.0 - 2.4]				98.7	1.3												
Phenicols																					
Chloramphenicol	2002 (n=60)	0.0%	0.0%	[0.0 - 6.0]								1.7	68.3	30.0							
	2003 (n=83)	0.0%	2.4%	[0.3 - 8.4]									32.5	65.1			2.4				
	2004 (n=157)	0.6%	1.9%	[0.4 - 5.5]								2.5	14.6	80.3	0.6		1.9				
	2005 (n=153)	0.0%	0.7%	[0.0 - 3.6]								1.3	65.4	32.7			0.7				
Quinolones																					
Ciprofloxacin	2002 (n=60)	0.0%	0.0%	[0.0 - 6.0]	90.0	10.0															
	2003 (n=83)	0.0%	0.0%	[0.0 - 4.3]	83.1	14.5	1.2		1.2												
	2004 (n=157)	0.0%	0.0%	[0.0 - 2.3]	96.2	3.8															
	2005 (n=153)	0.0%	0.0%	[0.0 - 2.4]	88.2	11.1		0.7													
Nalidixic Acid	2002 (n=60)	N/A	0.0%	[0.0 - 6.0]									68.3	31.7							
	2003 (n=83)	N/A	1.2%	[0.0 - 6.5]							1.2	1.2	84.3	12.0			1.2				
	2004 (n=157)	N/A	0.0%	[0.0 - 2.3]								12.1	82.8	5.1							
	2005 (n=153)	N/A	0.7%	[0.0 - 3.6]							0.7	27.5	69.3	1.3	0.7	0.7					
Tetracyclines																					
Tetracycline	2002 (n=60)	1.7%	33.3%	[21.7 - 46.7]									65.0	1.7			33.3				
	2003 (n=83)	0.0%	27.7%	[18.4 - 38.6]									72.3			1.2	26.5				
	2004 (n=157)	0.6%	46.5%	[38.5 - 54.6]									52.9	0.6			46.5				
	2005 (n=153)	0.0%	43.8%	[35.8 - 52.0]									56.2			0.7	43.1				

[1] Percent of isolates with intermediate susceptibility.
[2] Percent of isolates that were resistant.
[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. Black vertical bars indicate the breakpoints for susceptibility, while 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 percentages of 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.

Figure 6b. MIC Distribution among *Salmonella* from Ground Turkey

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
					Distribution (%) of MICs (µg/ml)[4]																
Aminoglycosides																					
Amikacin	2002 (n=74)	0.0%	0.0%	[0.0 - 4.9]						6.8	55.4	32.4	5.4								
	2003 (n=114)	0.0%	0.0%	[0.0 - 3.2]							52.6	44.7	2.6								
	2004 (n=157)	0.0%	0.0%	[0.0 - 2.6]						2.1	50.0	44.4	3.5								
	2005 (n=183)	0.0%	0.0%	[0.0 - 2.0]						0.0	62.3	35.5	1.6	0.5							
Gentamicin	2002 (n=74)	2.7%	14.9%	[7.7 - 25.0]					40.5	39.2	2.7			2.7	**5.4**	**9.5**					
	2003 (n=114)	5.3%	22.8%	[15.5 - 31.6]					25.4	37.7	5.3	3.5		5.3	**14.9**	**7.9**					
	2004 (n=157)	2.8%	20.4%	[14.1 - 28.0]					33.8	37.3	4.9	0.7		2.8	**9.2**	**11.3**					
	2005 (n=183)	5.5%	26.8%	[20.5 - 33.8]					36.6	29.0	1.1		1.1	5.5	**14.2**	**12.6**					
Kanamycin	2002 (n=74)	2.7%	18.9%	[10.7 - 29.7]										74.3	4.1	2.7	**2.7**	**16.2**			
	2003 (n=114)	2.6%	27.2%	[19.3 - 36.3]										70.2		2.6	**14.0**	**13.2**			
	2004 (n=157)	1.4%	18.3%	[12.3 - 25.7]										78.9	1.4	1.4	**7.0**	**11.3**			
	2005 (n=183)	0.0%	20.2%	[14.7 - 26.8]										77.6	2.2		**3.3**	**16.9**			
Streptomycin	2002 (n=74)	N/A	37.8%	[26.8 - 49.9]												62.2	**8.1**	**29.7**			
	2003 (n=114)	N/A	45.6%	[36.3 - 55.2]												54.4	**20.2**	**25.4**			
	2004 (n=157)	N/A	34.5%	[26.7 - 42.9]												65.5	**21.1**	**13.4**			
	2005 (n=183)	N/A	44.3%	[36.9 - 51.8]												55.7	**23.5**	**20.8**			
Aminopenicillins																					
Ampicillin	2002 (n=74)	0.0%	16.2%	[8.7 - 26.6]							41.9	36.5	4.1	1.4			**16.2**				
	2003 (n=114)	0.0%	28.9%	[20.8 - 38.2]							36.8	31.6	1.8	0.9			**28.9**				
	2004 (n=157)	0.0%	20.4%	[14.1 - 28.0]							64.1	14.1	1.4				**20.4**				
	2005 (n=183)	0.0%	26.8%	[20.5 - 33.8]							63.9	8.7	0.5				**26.8**				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=74)	1.4%	12.2%	[5.7 - 21.8]							73.0	9.5	2.7	1.4	1.4	**5.4**	**6.8**				
	2003 (n=114)	15.8%	11.4%	[6.2 - 18.7]							58.8	11.4	0.9	10.8	15.8	**8.8**	**2.6**				
	2004 (n=157)	8.5%	7.7%	[3.9 - 13.4]							71.8	8.5		3.5	8.5	**2.8**	**4.9**				
	2005 (n=183)	10.4%	8.7%	[5.1 - 13.8]							69.4	3.8		7.7	10.4	**2.7**	**6.0**				
Cephalosporins																					
Ceftiofur	2002 (n=74)	0.0%	8.1%	[3.0 - 16.8]						51.4	35.1	5.4		**1.4**	**6.8**						
	2003 (n=114)	0.0%	2.6%	[0.5 - 7.5]						41.2	54.4	1.8			**2.6**						
	2004 (n=157)	0.0%	4.9%	[2.0 - 9.9]						43.0	47.9	4.2			**4.9**						
	2005 (n=183)	0.0%	7.1%	[3.8 - 11.8]						44.8	46.4	1.6			**7.1**						
Ceftriaxone	2002 (n=74)	1.4%	0.0%	[0.0 - 4.9]					91.9	0.5			1.4	5.4	1.4						
	2003 (n=114)	1.8%	0.0%	[0.0 - 3.2]					97.4					0.9		1.8					
	2004 (n=157)	5.6%	0.0%	[0.0 - 2.6]					94.4						2.1	3.5					
	2005 (n=183)	4.4%	2.7%	[0.9 - 6.3]					92.9						3.3	1.1	**1.6**	**1.1**			
Cephalothin	2002 (n=74)	0.0%	14.9%	[7.7 - 25.0]								14.9	55.4	14.9		**1.4**	**13.5**				
	2003 (n=114)	1.8%	28.9%	[20.8 - 38.2]								5.3	49.1	14.9	1.8	**2.6**	**26.3**				
Cephamycins																					
Cefoxitin	2002 (n=74)	1.4%	8.1%	[3.0 - 16.8]							1.8	55.3	31.6	7.0	1.8	**2.6**					
	2003 (n=114)	1.8%	2.6%	[0.5 - 7.5]							1.8	55.3	31.6	7.0	1.8	**2.6**					
	2004 (n=157)	1.4%	4.9%	[2.0 - 9.9]							1.4	60.6	28.2	3.5	1.4	**0.7**	**4.2**				
	2005 (n=183)	0.0%	7.1%	[3.8 - 11.8]							23.5	46.4	20.8	2.2		**3.8**	**3.3**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=74)	N/A	20.3%	[11.8 - 31.2]											20.3	51.4	6.8	1.4			**20.3**
	2003 (n=114)	N/A	33.3%	[24.8 - 42.8]											18.4	33.3	13.2	1.8		**0.9**	**32.5**
Sulfisoxazole	2004 (n=157)	N/A	28.2%	[20.9 - 36.3]											4.9	17.6	49.3			**28.2**	
	2005 (n=183)	N/A	34.4%	[27.6 - 41.8]											3.3	23.0	39.3			**34.4**	
Trimethoprim-Sulfamethoxazole	2002 (n=74)	N/A	1.4%	[0.0 - 7.3]				89.2	8.1	1.4				**1.4**							
	2003 (n=114)	N/A	0.0%	[0.0 - 3.2]				86.0	13.2	0.9											
	2004 (n=157)	N/A	0.0%	[0.0 - 2.6]				89.4	6.3	4.2											
	2005 (n=183)	N/A	0.5%	[0.0 - 3.0]				96.2	2.7	0.5				**0.5**							
Phenicols																					
Chloramphenicol	2002 (n=74)	6.8%	1.4%	[0.0 - 7.3]									39.2	52.7	6.8		**1.4**				
	2003 (n=114)	2.6%	0.9%	[0.0 - 4.8]									13.2	83.3	2.6		**0.9**				
	2004 (n=157)	4.2%	2.8%	[0.8 - 7.1]									12.7	80.3	4.2		**2.8**				
	2005 (n=183)	2.7%	0.5%	[0.0 - 3.0]									41.0	55.7	2.7		**0.5**				
Quinolones																					
Ciprofloxacin	2002 (n=74)	0.0%	0.0%	[0.0 - 4.9]	71.6	17.6	2.7	1.4	1.4	2.7	2.7										
	2003 (n=114)	0.0%	0.0%	[0.0 - 3.2]	86.0	8.8	0.9		3.5	0.9											
	2004 (n=157)	0.0%	0.0%	[0.0 - 2.6]	93.7	4.9	1.4														
	2005 (n=183)	0.0%	0.0%	[0.0 - 2.0]	80.9	16.4	1.6	0.5	0.5												
Nalidixic Acid	2002 (n=74)	N/A	8.1%	[3.0 - 16.8]							1.4		64.9	24.3	1.4		**8.1**				
	2003 (n=114)	N/A	4.4%	[1.4 - 9.9]								0.9	82.5	11.4	0.9		**4.4**				
	2004 (n=157)	N/A	0.0%	[0.0 - 2.6]								4.2	85.2	9.9	0.7						
	2005 (n=183)	N/A	1.1%	[0.1 - 3.9]								14.2	80.9	3.8			**1.1**				
Tetracyclines																					
Tetracycline	2002 (n=74)	0.0%	55.4%	[43.4 - 67.0]									44.6		**1.4**	**2.7**	**51.4**				
	2003 (n=114)	2.6%	39.5%	[30.4 - 49.1]									57.9	2.6			**39.5**				
	2004 (n=157)	7.7%	56.3%	[47.8 - 64.6]									35.9	7.7	**4.2**	**0.7**	**51.4**				
	2005 (n=183)	0.0%	39.9%	[32.7 - 47.4]									60.1			**0.5**	**39.3**				

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while 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 percentages of 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.

Figure 6c. MIC Distribution among *Salmonella* from Ground Beef

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
					Distribution (%) of MICs (µg/ml)[4]																
Aminoglycosides																					
Amikacin	2002 (n=9)	0.0%	0.0%	[0.0 - 4.9]						1.1	66.7	22.2									
	2003 (n=10)	0.0%	0.0%	[0.0 - 3.2]							60.0	40.0									
	2004 (n=14)	0.0%	0.0%	[0.0 - 2.6]							64.3	28.6	7.1								
	2005 (n=8)	0.0%	0.0%	[0.0 - 2.0]						12.5	75.0	12.5									
Gentamicin	2002 (n=9)	0.0%	0.0%	[0.0 - 4.9]					55.6	44.4											
	2003 (n=10)	0.0%	0.0%	[0.0 - 3.2]					30.0	40.0	30.0										
	2004 (n=14)	0.0%	0.0%	[0.0 - 2.6]					57.1	42.9											
	2005 (n=8)	0.0%	25.0%	[0.1 - 3.9]					37.5	37.5					**25.0**						
Kanamycin	2002 (n=9)	0.0%	0.0%	[0.0 - 4.9]										100.0							
	2003 (n=10)	0.0%	0.0%	[0.0 - 3.2]										100.0							
	2004 (n=14)	0.0%	0.0%	[0.0 - 2.6]										100.0							
	2005 (n=8)	0.0%	25.0%	[0.1 - 3.9]										75.0				**25.0**			
Streptomycin	2002 (n=9)	N/A	22.2%	[0.3 - 9.4]												77.8		**22.2**			
	2003 (n=10)	N/A	40.0%	[1.0 - 8.7]												60.0		**40.0**			
	2004 (n=14)	N/A	14.3%	[0.2 - 5.0]												85.7		**14.3**			
	2005 (n=8)	N/A	25.0%	[0.1 - 3.9]												75.0	**12.5**	**12.5**			
Aminopenicillins																					
Ampicillin	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]							33.3	33.3	11.1				**22.2**				
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]							10.0	50.0						**40.0**			
	2004 (n=14)	0.0%	21.4%	[0.4 - 6.0]							78.6						**21.4**				
	2005 (n=8)	0.0%	25.0%	[0.1 - 3.9]							75.0						**25.0**				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]							55.6	22.2					**22.2**				
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]							50.0	10.0					**40.0**				
	2004 (n=14)	0.0%	14.3%	[0.2 - 5.0]							71.4	7.1		7.1			**14.3**				
	2005 (n=8)	25.0%	0.0%	[0.0 - 2.0]							75.0				25.0						
Cephalosporins																					
Ceftiofur	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]						44.4	33.3				**22.2**						
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]				30.0	30.0						**40.0**						
	2004 (n=14)	0.0%	14.3%	[0.2 - 5.0]						50.0	35.7				**14.3**						
	2005 (n=8)	0.0%	0.0%	[0.0 - 2.0]						37.5	62.5										
Ceftriaxone	2002 (n=9)	22.2%	0.0%	[0.0 - 4.9]					77.8						11.1	11.1					
	2003 (n=10)	30.0%	10.0%	[0.0 - 4.8]					60.0						30.0		**10.0**				
	2004 (n=14)	7.1%	7.1%	[0.0 - 3.9]					85.7							7.1	**7.1**				
	2005 (n=8)	0.0%	0.0%	[0.0 - 2.0]					100.0												
Cephalothin	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]									5.6	22.2			**22.2**				
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]									50.0	10.0			**40.0**				
Cephamycins																					
Cefoxitin	2002 (n=9)	11.1%	22.2%	[0.3 - 9.4]								40.0	20.0			**40.0**					
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]								40.0	20.0			**40.0**					
	2004 (n=14)	0.0%	14.3%	[0.2 - 5.0]								50.0	14.3	21.4			**14.3**				
	2005 (n=8)	0.0%	0.0%	[0.0 - 2.0]								50.0	37.5	12.5							
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=9)	N/A	22.2%	[0.3 - 9.4]											22.2	44.44	11.1				**22.2**
	2003 (n=10)	N/A	40.0%	[1.0 - 8.7]											20.0	30	10.0				**40.0**
Sulfisoxazole	2004 (n=14)	N/A	14.3%	[0.2 - 5.0]											7.1	7.1	71.4			**14.3**	
	2005 (n=8)	N/A	25.0%	[0.1 - 3.9]											0.0	12.5	62.5			**25.0**	
Trimethoprim-Sulfamethoxazole	2002 (n=9)	N/A	0.0%	[0.0 - 4.9]				100.0													
	2003 (n=10)	N/A	0.0%	[0.0 - 3.2]				60.0	40.0												
	2004 (n=14)	N/A	7.1%	[0.0 - 3.9]				92.9						**7.1**							
	2005 (n=8)	N/A	0.0%	[0.0 - 2.0]				87.5	12.5												
Phenicols																					
Chloramphenicol	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]									11.1	66.7			**22.2**				
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]									10.0	50.0			**40.0**				
	2004 (n=14)	0.0%	14.3%	[0.2 - 5.0]									7.1	78.6			**14.3**				
	2005 (n=8)	0.0%	12.5%	[0.0 - 3.0]									12.5	75.0			**12.5**				
Quinolones																					
Ciprofloxacin	2002 (n=9)	0.0%	0.0%	[0.0 - 4.9]	66.7	22.2	11.1														
	2003 (n=10)	0.0%	0.0%	[0.0 - 3.2]	70.0	30.0															
	2004 (n=14)	0.0%	0.0%	[0.0 - 2.6]	100.0																
	2005 (n=8)	0.0%	0.0%	[0.0 - 2.0]	75.0	25.0															
Nalidixic Acid	2002 (n=9)	N/A	0.0%	[0.0 - 4.9]									66.7	2.2	11.1						
	2003 (n=10)	N/A	0.0%	[0.0 - 3.2]								10.0	70.0	20.0							
	2004 (n=14)	N/A	0.0%	[0.0 - 2.6]								7.1	92.9								
	2005 (n=8)	N/A	0.0%	[0.0 - 2.0]									100.0								
Tetracyclines																					
Tetracycline	2002 (n=9)	0.0%	22.2%	[0.3 - 9.4]									77.8				**22.2**				
	2003 (n=10)	0.0%	40.0%	[1.0 - 8.7]									60.0				**40.0**				
	2004 (n=14)	0.0%	14.3%	[0.2 - 5.0]									85.7				**14.3**				
	2005 (n=8)	0.0%	12.5%	[0.0 - 3.0]									87.5				**12.5**				

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while 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 percentages of 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.

Figure 6d. MIC Distribution among *Salmonella* from Pork Chop

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	Distribution (%) of MICs (µg/ml)[4]																
					0.015	0.03	0.060	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
Aminoglycosides																					
Amikacin	2002 (n=10)	0.0%	0.0%	[0.0 - 30.8]							80.0	20.0									
	2003 (n=5)	0.0%	0.0%	[0.0 - 52.2]							100.0										
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]							63.6	27.3	9.1								
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]							55.6	33.3	11.1								
Gentamicin	2002 (n=10)	0.0%	30.0%	[6.7 - 65.2]					30.0	40.0						**30.0**					
	2003 (n=5)	20.0%	0.0%	[0.0 - 52.2]					40.0	40.0				20.0							
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]					63.6	36.4											
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]					55.6	33.3		11.1									
Kanamycin	2002 (n=10)	0.0%	10.0%	[0.3 - 44.5]										70.0	20.0			**10.0**			
	2003 (n=5)	20.0%	0.0%	[0.0 - 52.2]										80.0		20.0					
	2004 (n=11)	0.0%	9.1%	[0.2 - 41.3]										81.8	9.1			**9.1**			
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]										100.0							
Streptomycin	2002 (n=10)	N/A	70.0%	[34.8 - 93.3]												30.0	**10.0**	**60.0**			
	2003 (n=5)	N/A	40.0%	[5.3 - 85.3]												60.0	**20.0**	**20.0**			
	2004 (n=11)	N/A	27.3%	[6.0 - 61.0]												72.7		**27.3**			
	2005 (n=9)	N/A	33.3%	[7.5 - 70.1]												66.7	**22.2**	**11.1**			
Aminopenicillins																					
Ampicillin	2002 (n=10)	0.0%	40.0%	[12.2 - 73.8]							50.0	10.0					**40.0**				
	2003 (n=5)	0.0%	40.0%	[5.3 - 85.3]							40.0	20.0					**40.0**				
	2004 (n=11)	0.0%	9.1%	[0.2 - 41.3]							81.8		9.1				**9.1**				
	2005 (n=9)	0.0%	22.2%	[2.8 - 60.0]							66.7		11.1				**22.2**				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=10)	20.0%	20.0%	[2.5 - 55.6]							60.0				20.0		**20.0**				
	2003 (n=5)	20.0%	20.0%	[0.5 - 71.6]							40.0	20.0			20.0		**20.0**				
	2004 (n=11)	18.2%	0.0%	[0.0 - 28.5]							72.7	9.1			18.2						
	2005 (n=9)	22.2%	0.0%	[0.0 - 33.6]							66.7	11.1		22.2							
Cephalosporins																					
Ceftiofur	2002 (n=10)	0.0%	20.0%	[2.5 - 55.6]						50.0	30.0				**20.0**						
	2003 (n=5)	0.0%	20.0%	[0.5 - 71.6]						60.0		20.0			**20.0**						
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]						72.7	27.3										
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]						22.2	66.7	11.0									
Ceftriaxone	2002 (n=10)	20.0%	0.0%	[0.0 - 30.8]					80.0						20.0						
	2003 (n=5)	20.0%	0.0%	[0.0 - 52.2]					80.0							20.0					
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]					100.0												
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]					100.0												
Cephalothin	2002 (n=10)	0.0%	20.0%	[2.5 - 55.6]								20.0	50.0	10.0			**20.0**				
	2003 (n=5)	0.0%	40.0%	[5.3 - 85.3]									60.0			**20.0**	**20.0**				
Cephamycins																					
Cefoxitin	2002 (n=10)	0.0%	20.0%	[2.5 - 55.6]								20.0	20.0	40.0		**20.0**					
	2003 (n=5)	0.0%	20.0%	[0.5 - 71.6]								20.0	20.0	40.0		**20.0**					
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]								81.8	18.2								
	2005 (n=9)	11.1%	0.0%	[0.0 - 33.6]							11.1	22.2	55.6		11.1						
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=10)	N/A	70.0%	[34.8 - 93.3]											10.0		20.0				**70.0**
	2003 (n=5)	N/A	40.0%	[5.3 - 85.3]											20.0	40.0					**40.0**
Sulfisoxazole	2004 (n=11)	N/A	18.2%	[2.3 - 51.8]												9.1	72.7			**18.2**	
	2005 (n=9)	N/A	33.3%	[7.5 - 70.1]											11.1	22.2	33.3			**33.3**	
Trimethoprim-Sulfamethoxazole	2002 (n=10)	N/A	20.0%	[2.5 - 55.6]				70.0	10.0					**20.0**							
	2003 (n=5)	N/A	0.0%	[0.0 - 52.2]				60.0	40.0												
	2004 (n=11)	N/A	0.0%	[0.0 - 28.5]				100.0													
	2005 (n=9)	N/A	11.1%	[0.3 - 48.2]				77.8	11.1					**11.1**							
Phenicols																					
Chloramphenicol	2002 (n=10)	0.0%	40.0%	[12.2 - 73.8]									30.0	30.0			**40.0**				
	2003 (n=5)	0.0%	40.0%	[5.3 - 85.3]										60.0			**40.0**				
	2004 (n=11)	0.0%	18.2%	[2.3 - 51.8]										81.8			**18.2**				
	2005 (n=9)	11.1%	22.2%	[2.8 - 60.0]								11.1	22.2	33.3	11.1		**22.2**				
Quinolones																					
Ciprofloxacin	2002 (n=10)	0.0%	0.0%	[0.0 - 30.8]	80.0	20.0															
	2003 (n=5)	0.0%	0.0%	[0.0 - 52.2]	60.0	20.0	20.0														
	2004 (n=11)	0.0%	0.0%	[0.0 - 28.5]	100.0																
	2005 (n=9)	0.0%	0.0%	[0.0 - 33.6]	77.8	22.2															
Nalidixic Acid	2002 (n=10)	N/A	0.0%	[0.0 - 30.8]									60.0	40.0							
	2003 (n=5)	N/A	0.0%	[0.0 - 52.2]									80.0		20.0						
	2004 (n=11)	N/A	0.0%	[0.0 - 28.5]									100.0								
	2005 (n=9)	N/A	0.0%	[0.0 - 33.6]								11.1	77.8	11.1							
Tetracyclines																					
Tetracycline	2002 (n=10)	0.0%	70.0%	[34.8 - 93.3]									30.0			**10.0**	**60.0**				
	2003 (n=5)	0.0%	80.0%	[28.4 - 99.5]									20.0				**80.0**				
	2004 (n=11)	0.0%	54.5%	[23.4 - 83.3]									45.5			**18.2**	**36.4**				
	2005 (n=9)	0.0%	55.6%	[21.2 - 86.3]									44.4			**11.1**	**44.4**				

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

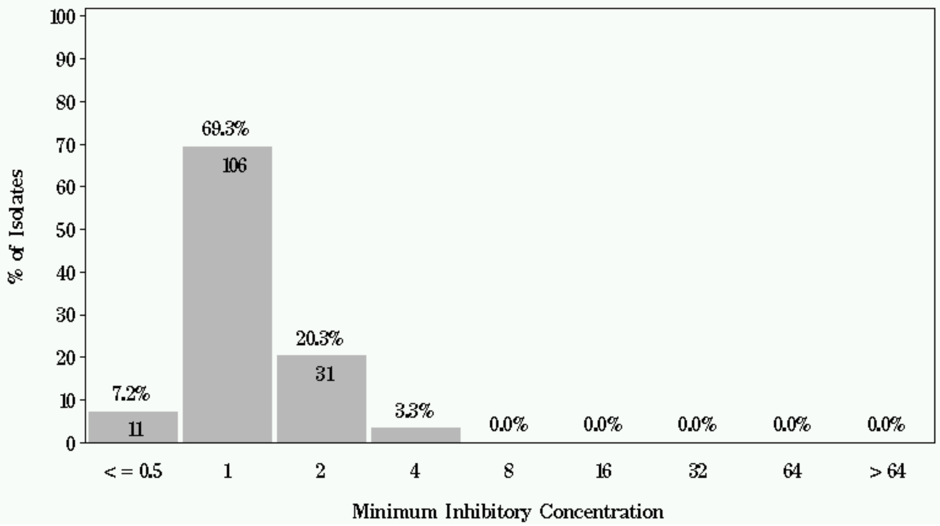
[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method.

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Black vertical bars indicate the breakpoints for susceptibility, while 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 percentages of 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.

NARMS

Figure 7a: Minimum Inhibitory Concentration of Amikacin for *Salmonella* in Chicken Breast (N=153 Isolates)

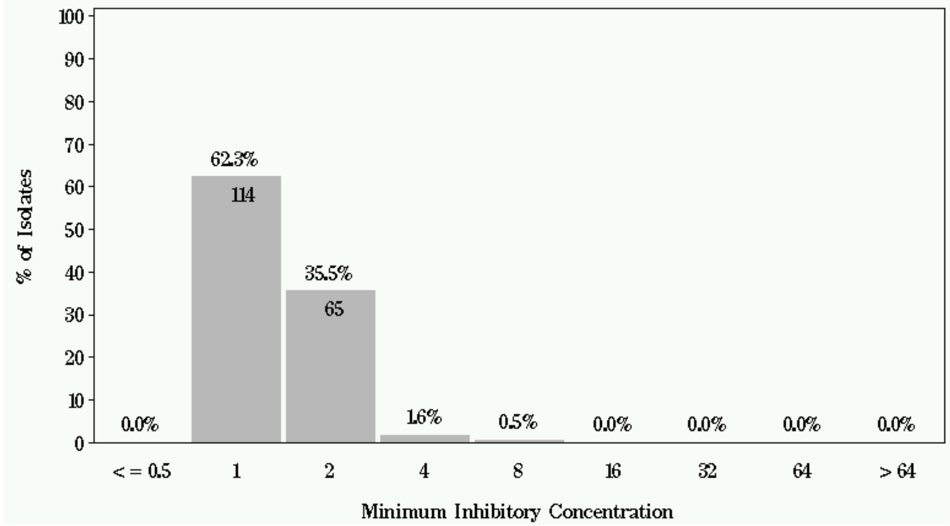
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7a: Minimum Inhibitory Concentration of Amikacin for *Salmonella* in Ground Turkey (N=183 Isolates)

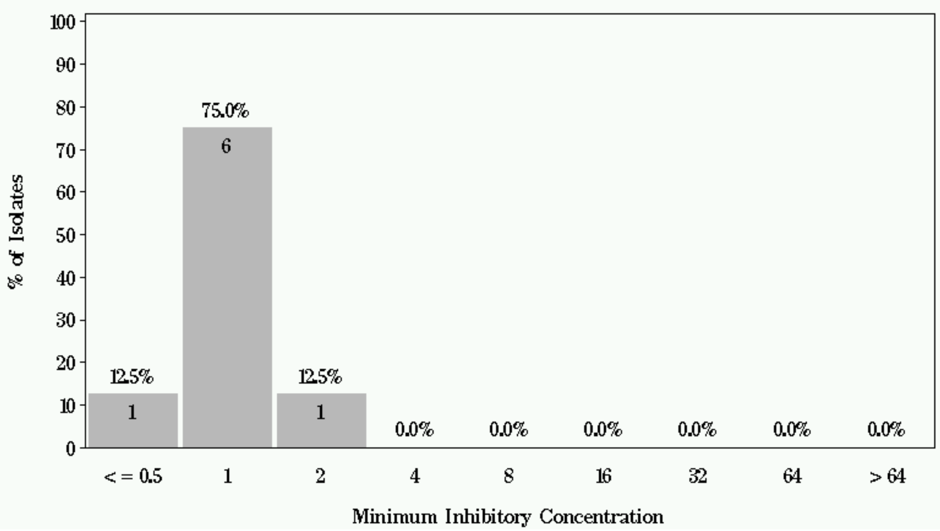
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7a: Minimum Inhibitory Concentration of Amikacin for *Salmonella* in Ground Beef (N=8 Isolates)

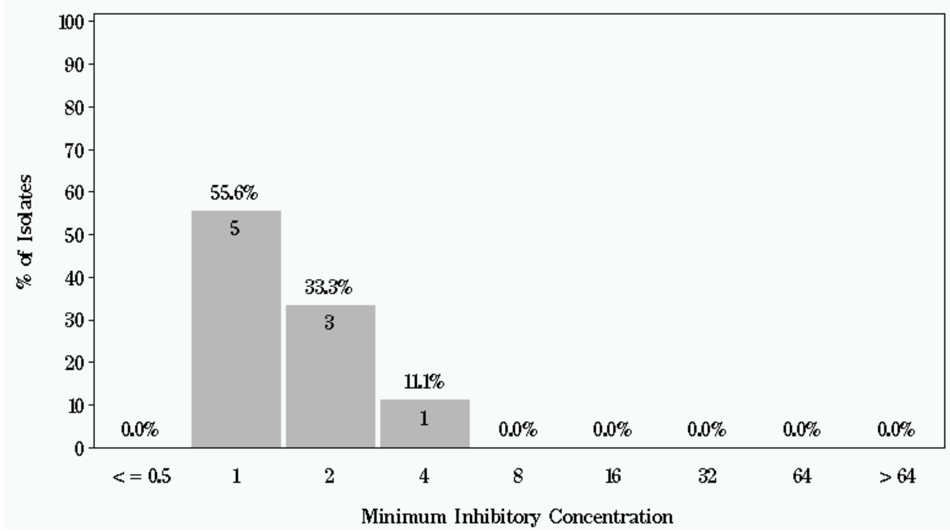
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7a: Minimum Inhibitory Concentration of Amikacin for *Salmonella* in Pork Chop (N=9 Isolates)

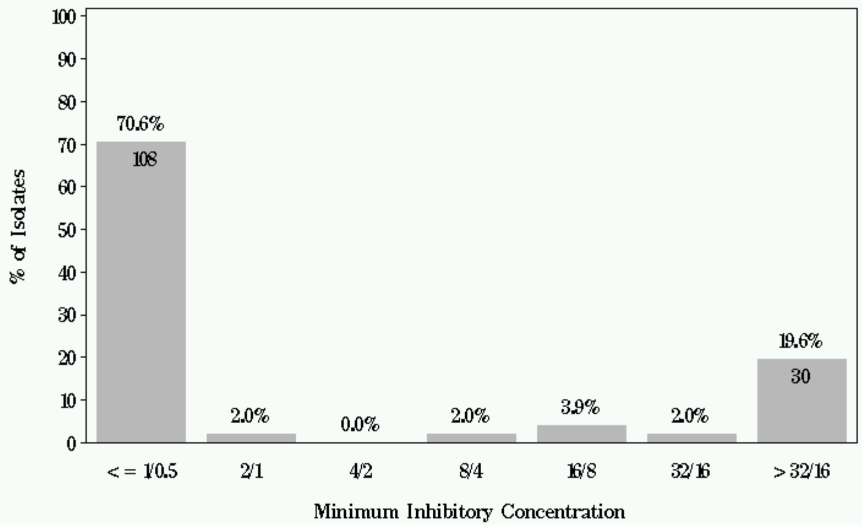
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Salmonella* in Chicken Breast (N=153 Isolates)

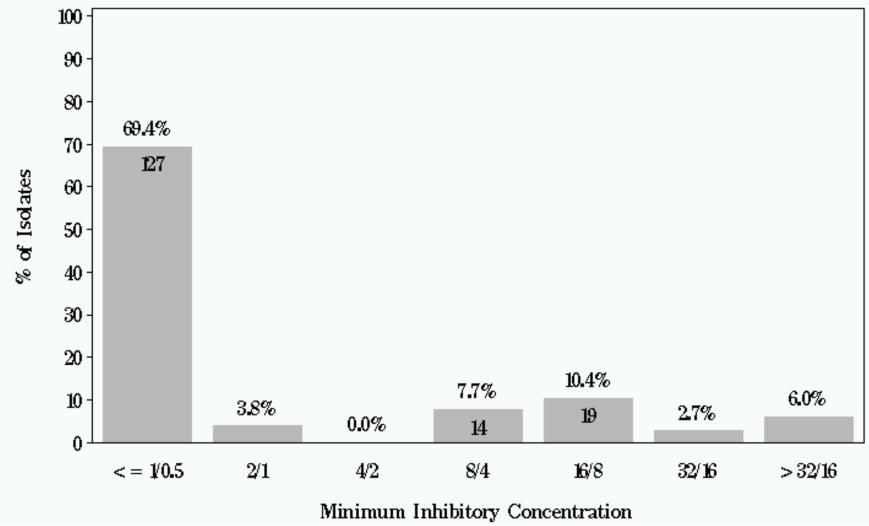
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL



NARMS

Figure 7b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Salmonella* in Ground Turkey (N=183 Isolates)

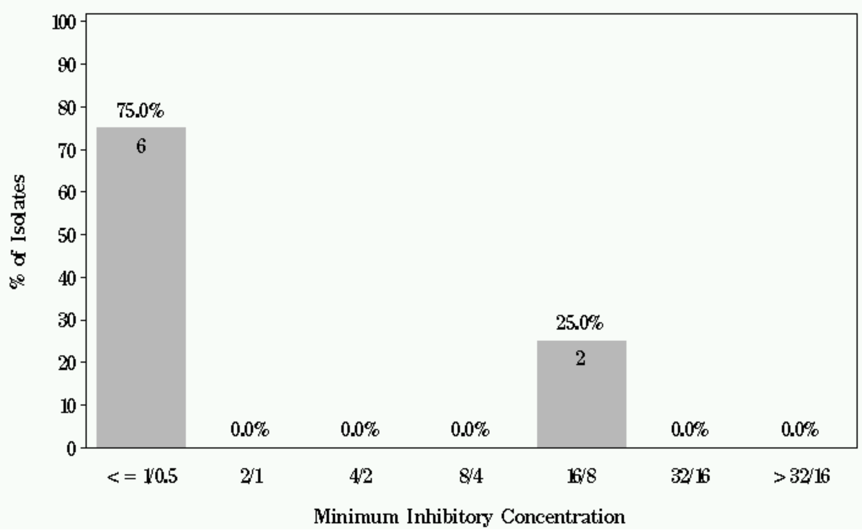
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL



NARMS

Figure 7b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Salmonella* in Ground Beef (N=8 Isolates)

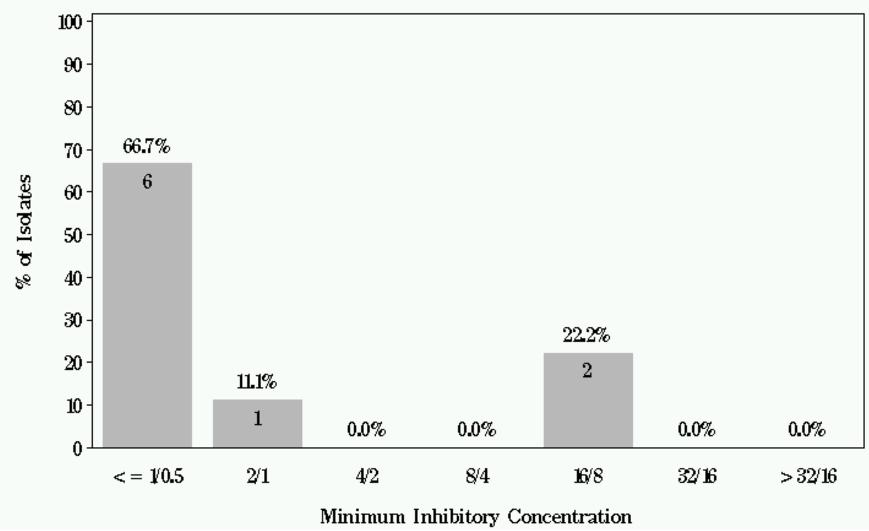
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL



NARMS

Figure 7b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Salmonella* in Pork Chop (N=9 Isolates)

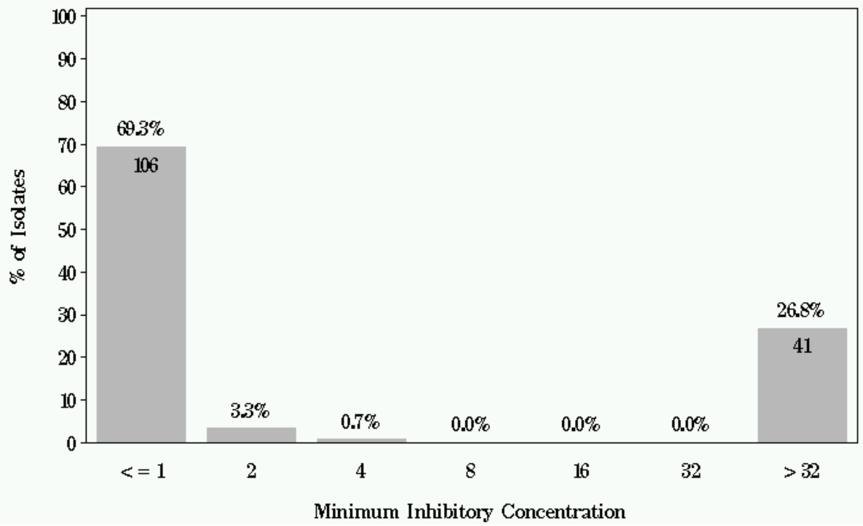
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL



NARMS

Figure 7c: Minimum Inhibitory Concentration of Ampicillin for *Salmonella* in Chicken Breast (N=153 Isolates)

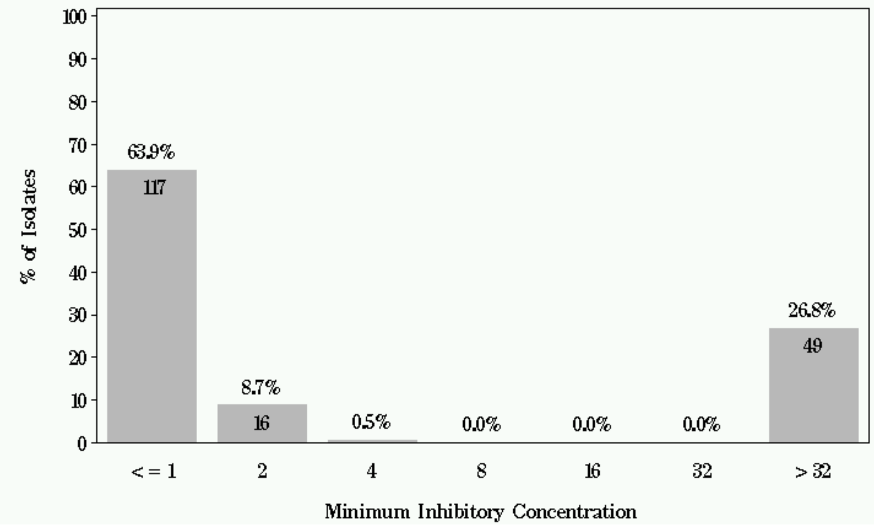
Breakpoints: Susceptible<=8 $\mu g/mL$ Resistant>=32 $\mu g/mL$



NARMS

Figure 7c: Minimum Inhibitory Concentration of Ampicillin for *Salmonella* in Ground Turkey (N=183 Isolates)

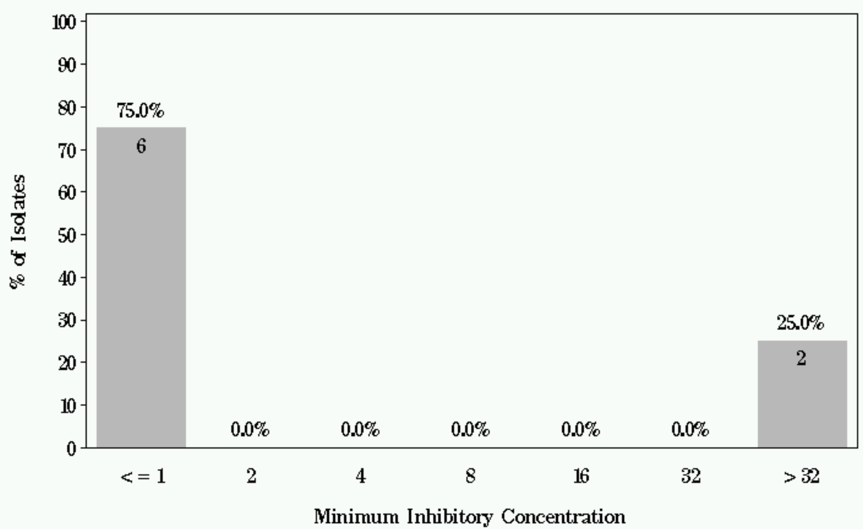
Breakpoints: Susceptible<=8 $\mu g/mL$ Resistant>=32 $\mu g/mL$



NARMS

Figure 7c: Minimum Inhibitory Concentration of Ampicillin for *Salmonella* in Ground Beef (N=8 Isolates)

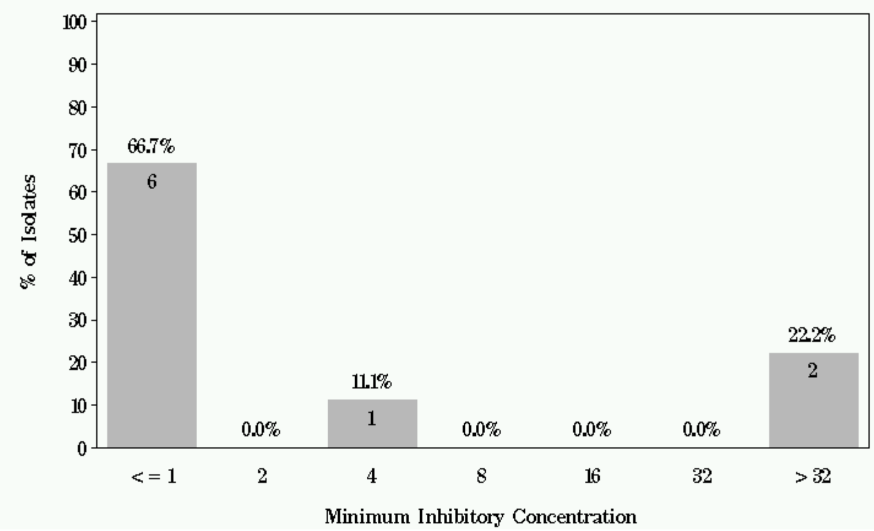
Breakpoints: Susceptible<=8 $\mu g/mL$ Resistant>=32 $\mu g/mL$

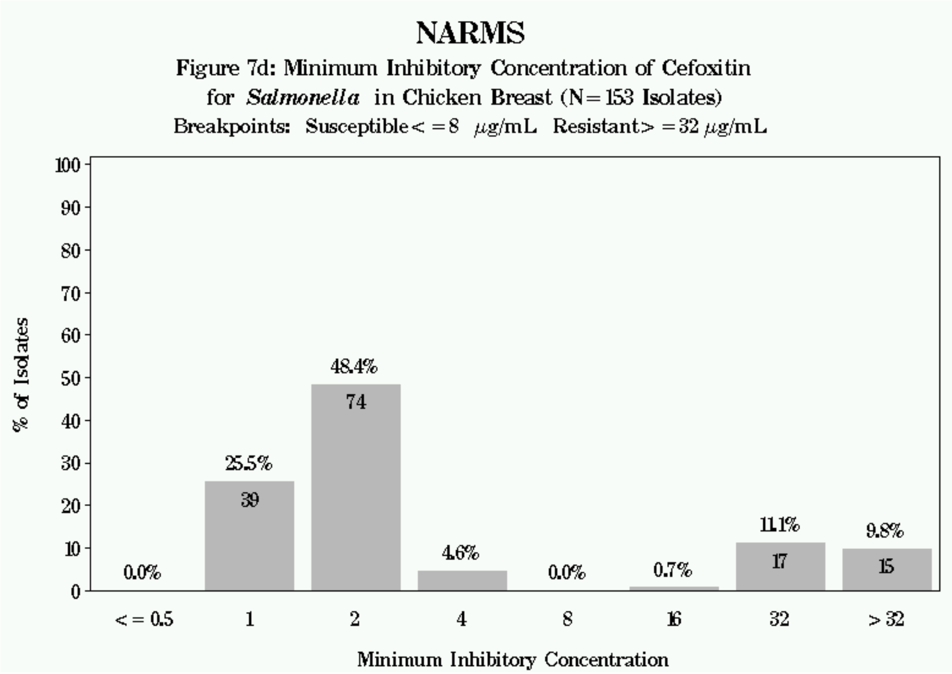


NARMS

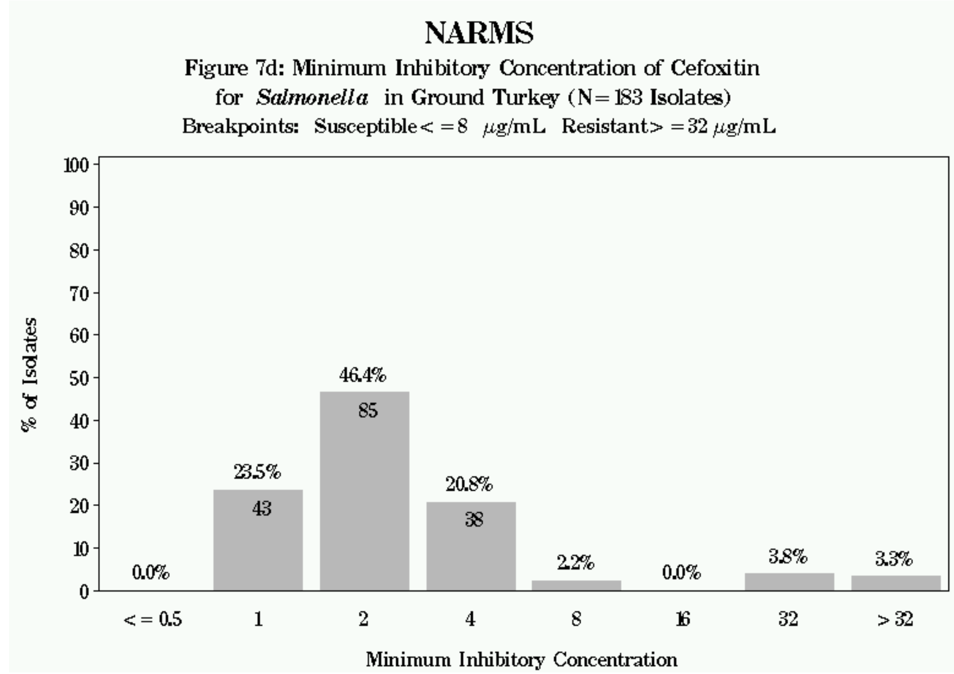
Figure 7c: Minimum Inhibitory Concentration of Ampicillin for *Salmonella* in Pork Chop (N=9 Isolates)

Breakpoints: Susceptible<=8 $\mu g/mL$ Resistant>=32 $\mu g/mL$

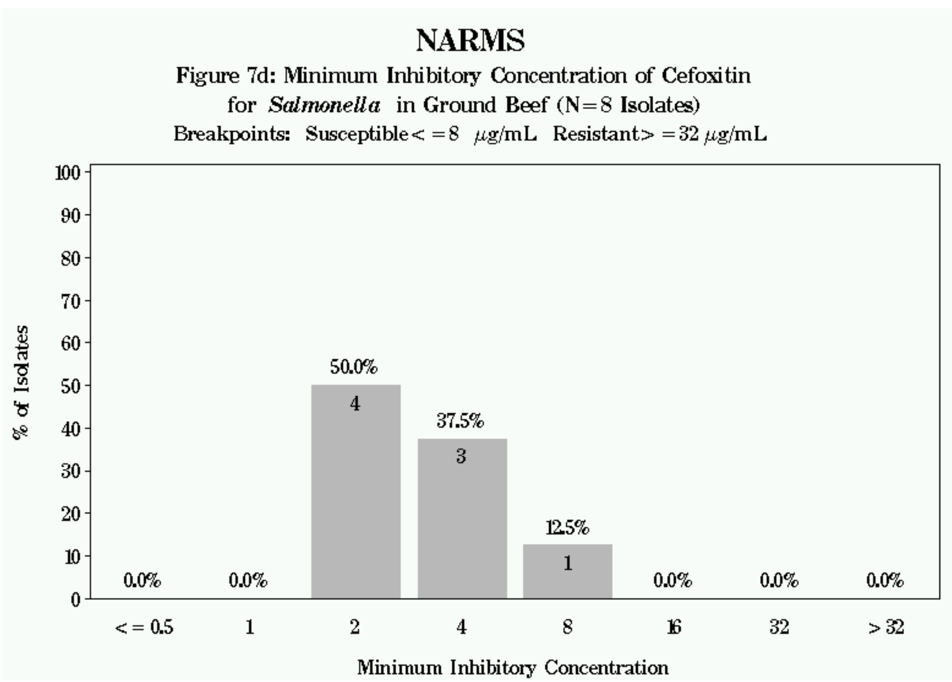




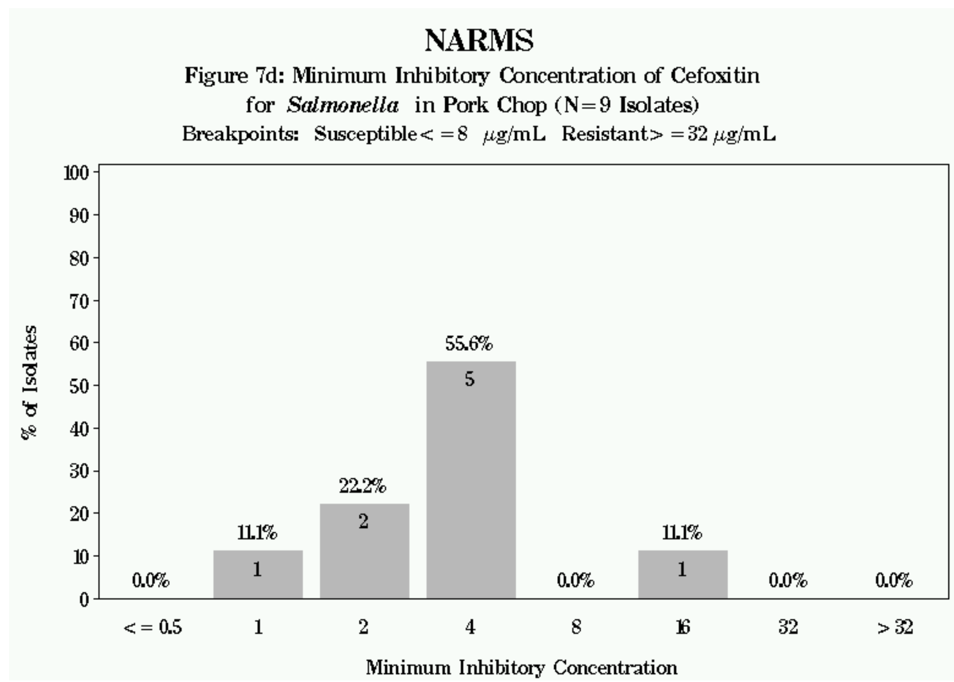
NARMS
Figure 7d: Minimum Inhibitory Concentration of Cefoxitin
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5 1 2 4 8 16 32 >32
0.0% 25.5% 48.4% 4.6% 0.0% 0.7% 11.1% 9.8%
39 74 17 15



NARMS
Figure 7d: Minimum Inhibitory Concentration of Cefoxitin
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5 1 2 4 8 16 32 >32
0.0% 23.5% 46.4% 20.8% 2.2% 0.0% 3.8% 3.3%
43 85 38



NARMS
Figure 7d: Minimum Inhibitory Concentration of Cefoxitin
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5 1 2 4 8 16 32 >32
0.0% 0.0% 50.0% 37.5% 12.5% 0.0% 0.0% 0.0%
4 3 1

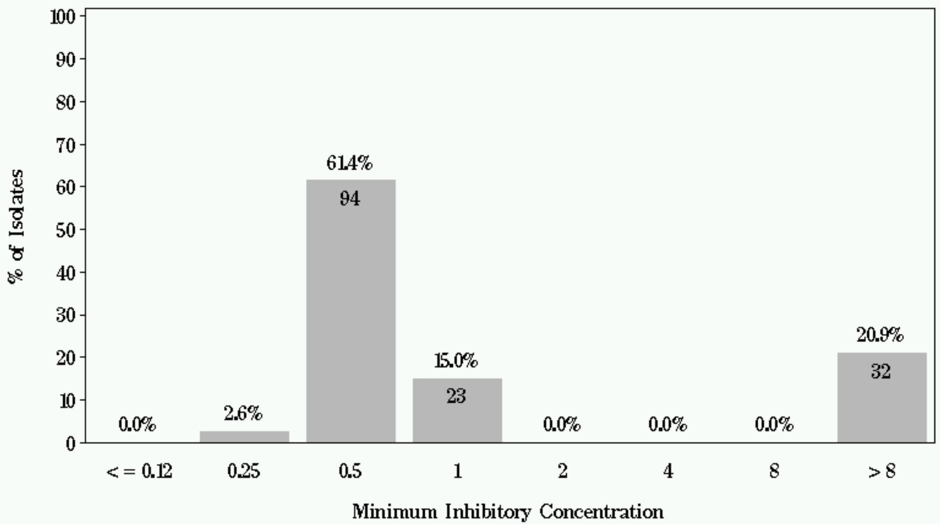


NARMS
Figure 7d: Minimum Inhibitory Concentration of Cefoxitin
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5 1 2 4 8 16 32 >32
0.0% 11.1% 22.2% 55.6% 0.0% 11.1% 0.0% 0.0%
1 2 5 1

NARMS

Figure 7e: Minimum Inhibitory Concentration of Ceftiofur for *Salmonella* in Chicken Breast (N=153 Isolates)

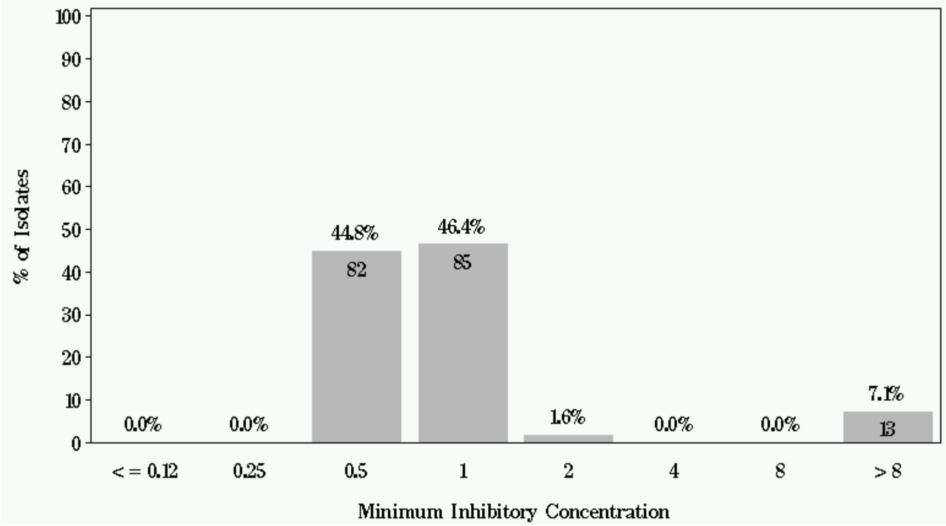
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 7e: Minimum Inhibitory Concentration of Ceftiofur for *Salmonella* in Ground Turkey (N=183 Isolates)

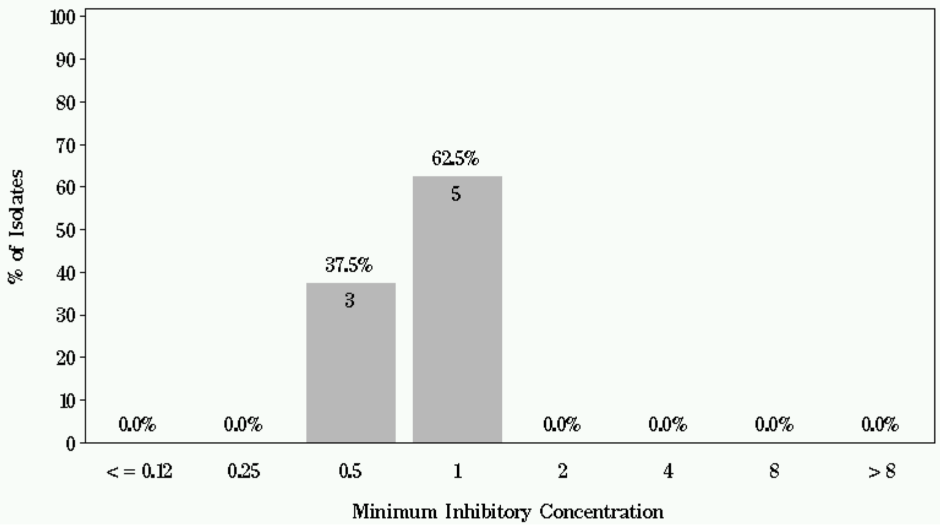
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 7e: Minimum Inhibitory Concentration of Ceftiofur for *Salmonella* in Ground Beef (N=8 Isolates)

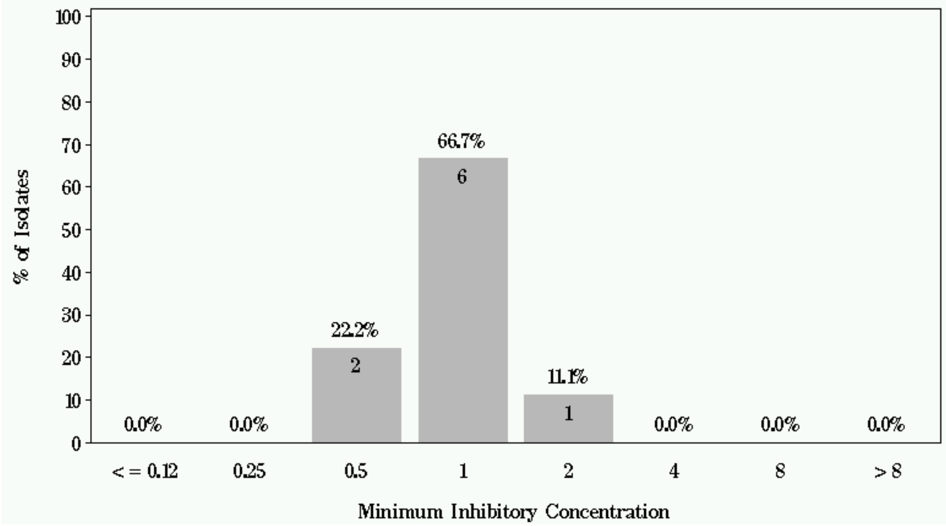
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 7e: Minimum Inhibitory Concentration of Ceftiofur for *Salmonella* in Pork Chop (N=9 Isolates)

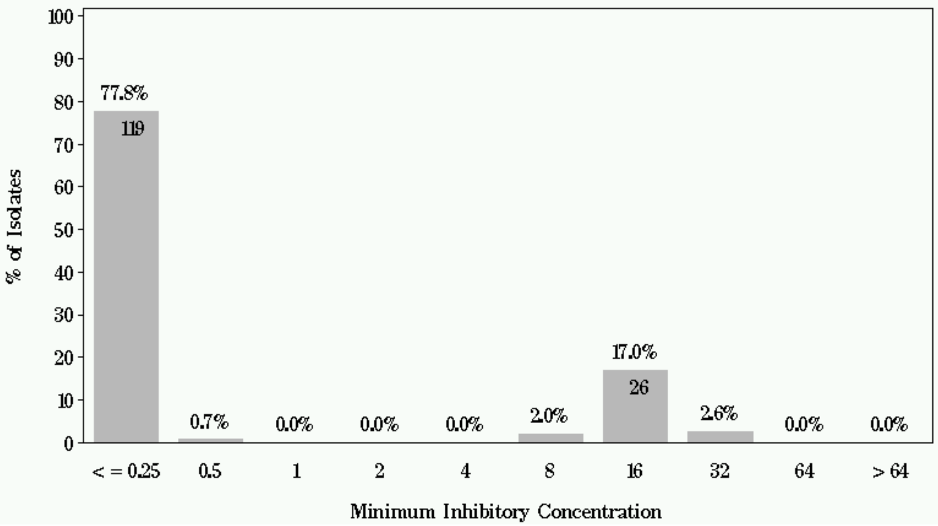
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 7f: Minimum Inhibitory Concentration of Ceftriaxone for *Salmonella* in Chicken Breast (N=153 Isolates)

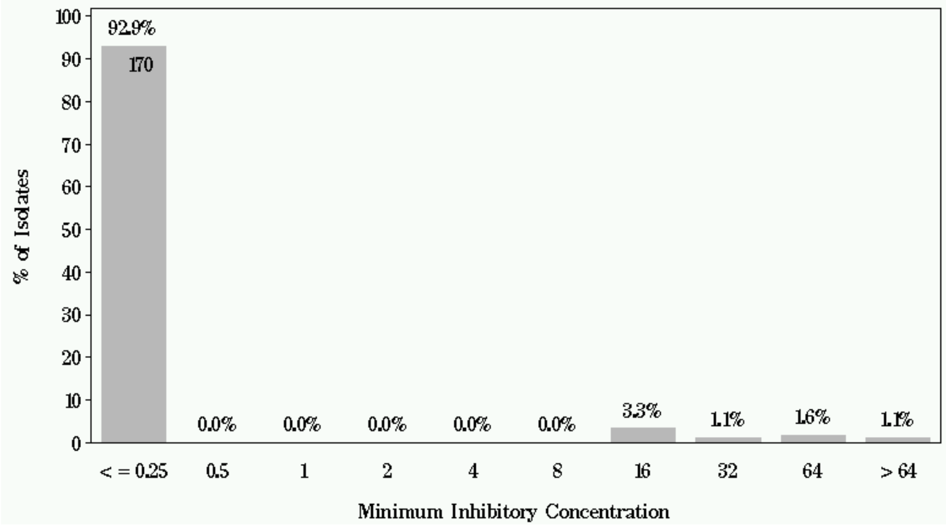
Breakpoints: Susceptible<=8 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7f: Minimum Inhibitory Concentration of Ceftriaxone for *Salmonella* in Ground Turkey (N=183 Isolates)

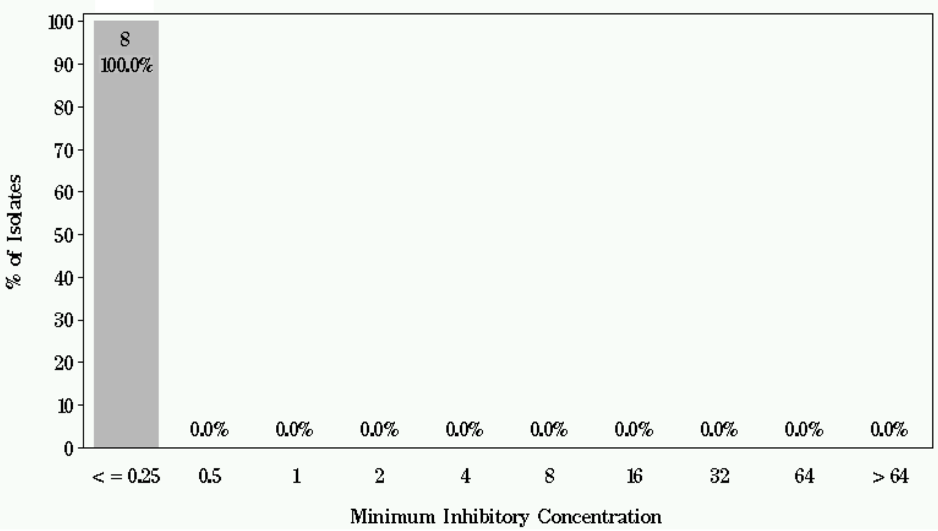
Breakpoints: Susceptible<=8 μg/mL Resistant>=64 μg/mL



NARMS

Figure 7f: Minimum Inhibitory Concentration of Ceftriaxone for *Salmonella* in Ground Beef (N=8 Isolates)

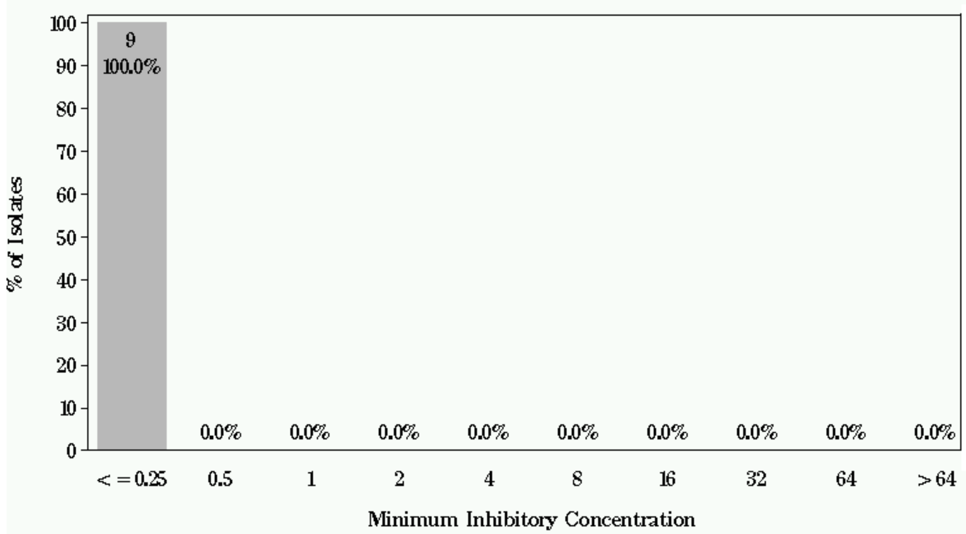
Breakpoints: Susceptible<=8 μg/mL Resistant>=64 μg/mL

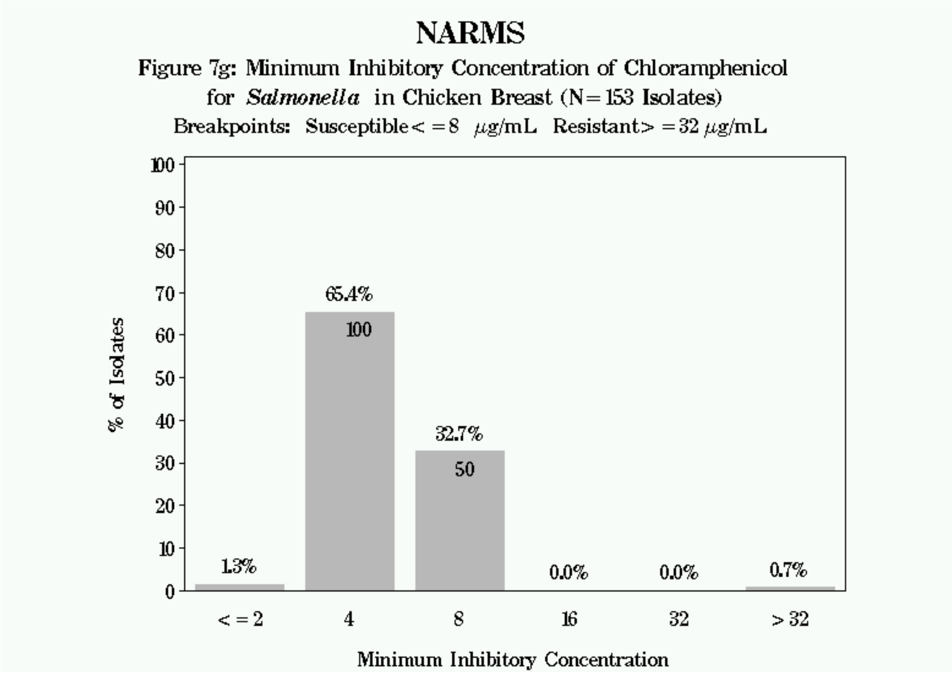


NARMS

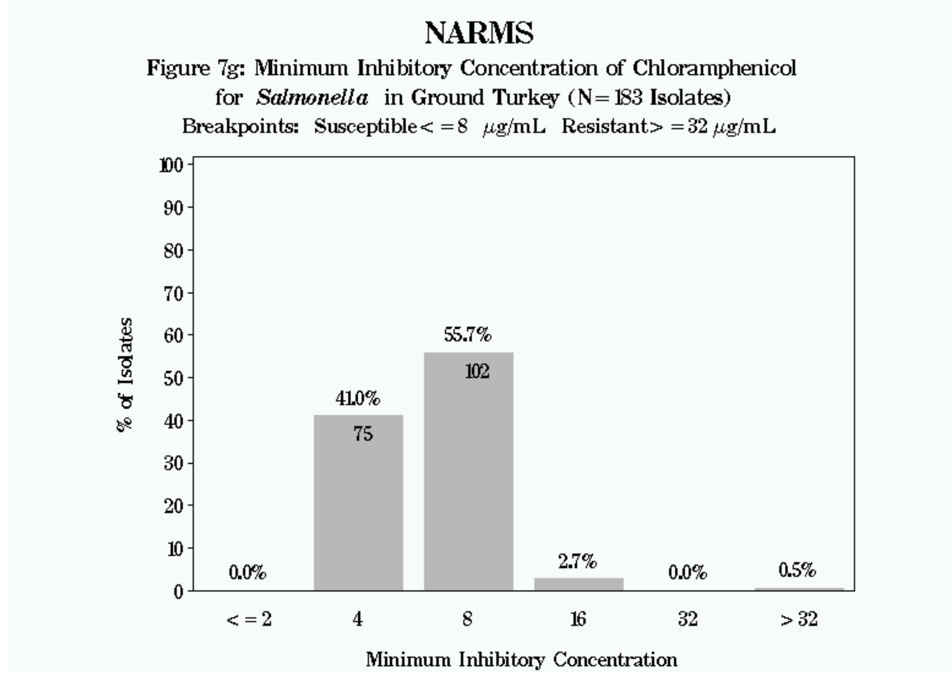
Figure 7f: Minimum Inhibitory Concentration of Ceftriaxone for *Salmonella* in Pork Chop (N=9 Isolates)

Breakpoints: Susceptible<=8 μg/mL Resistant>=64 μg/mL

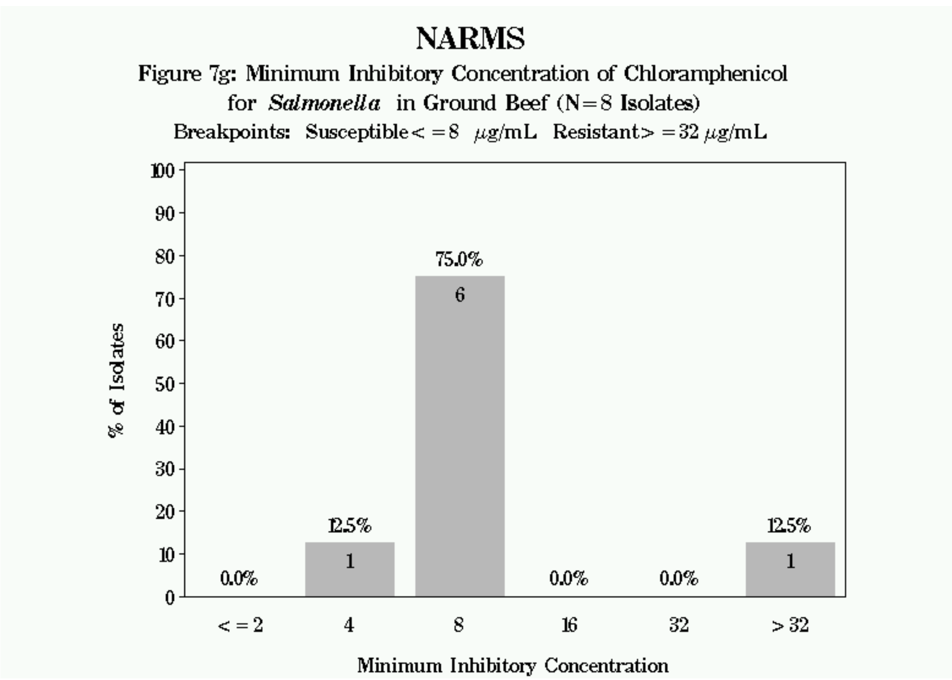




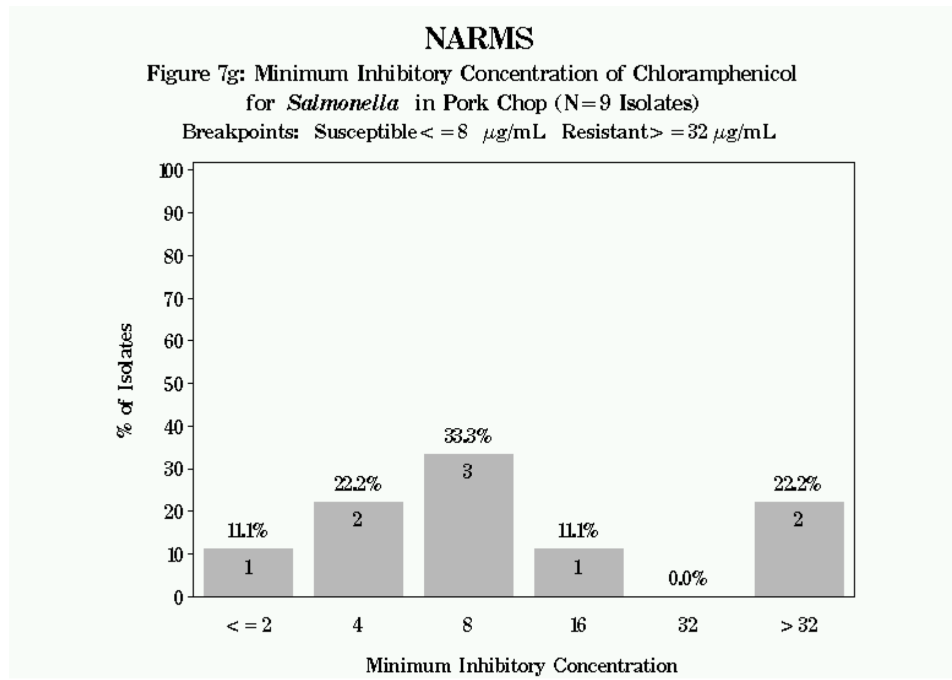
NARMS
Figure 7g: Minimum Inhibitory Concentration of Chloramphenicol for *Salmonella* in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=2
4
8
16
32
>32
1.3%
65.4%
100
32.7%
50
0.0%
0.0%
0.7%



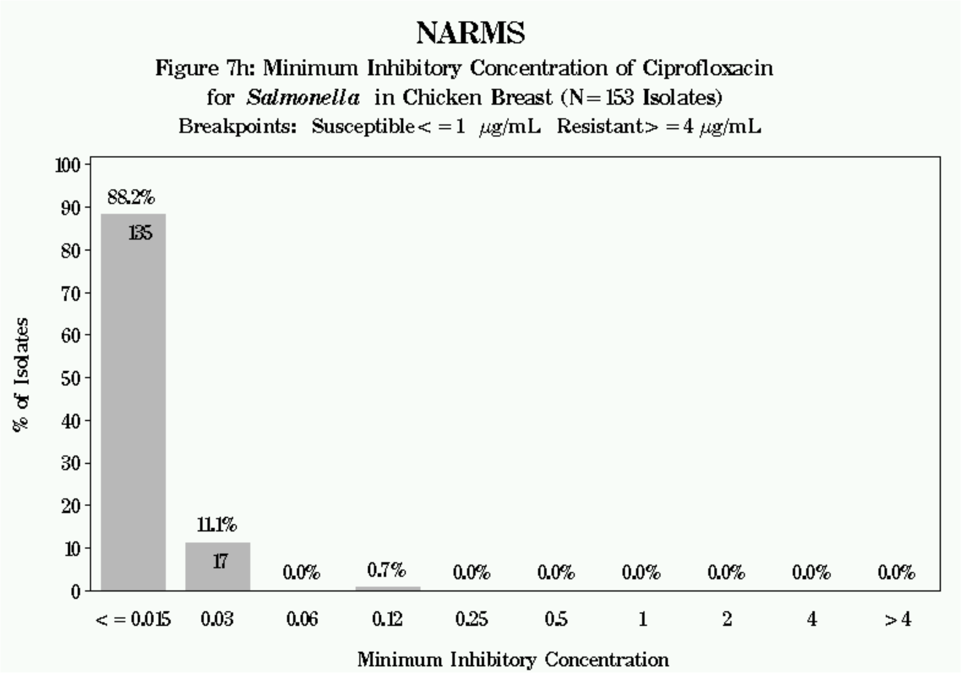
NARMS
Figure 7g: Minimum Inhibitory Concentration of Chloramphenicol for *Salmonella* in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
0.0%
41.0%
75
55.7%
102
2.7%
0.0%
0.5%

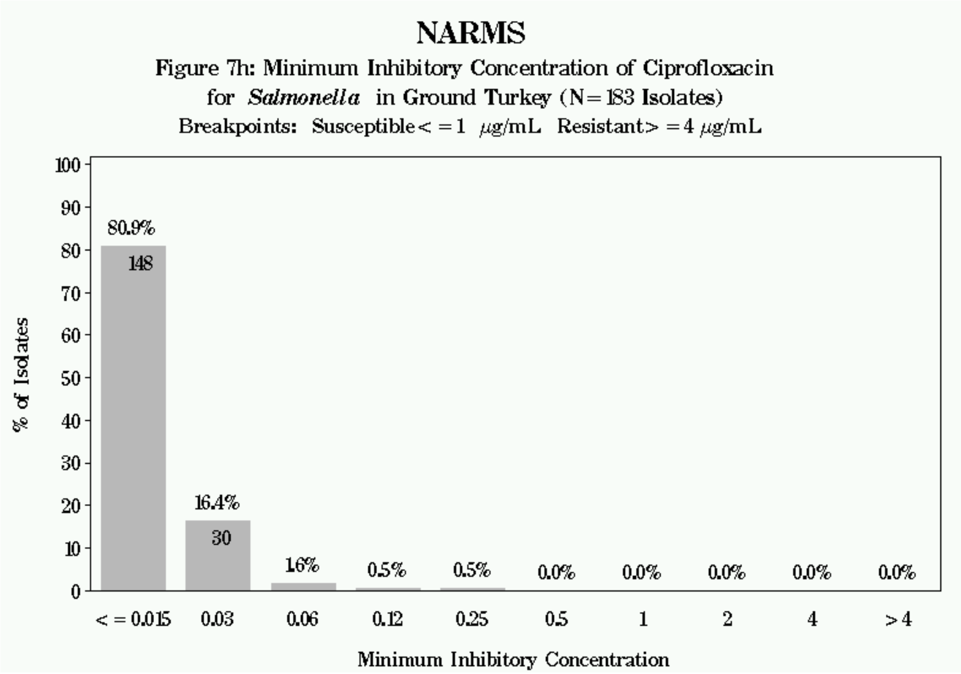


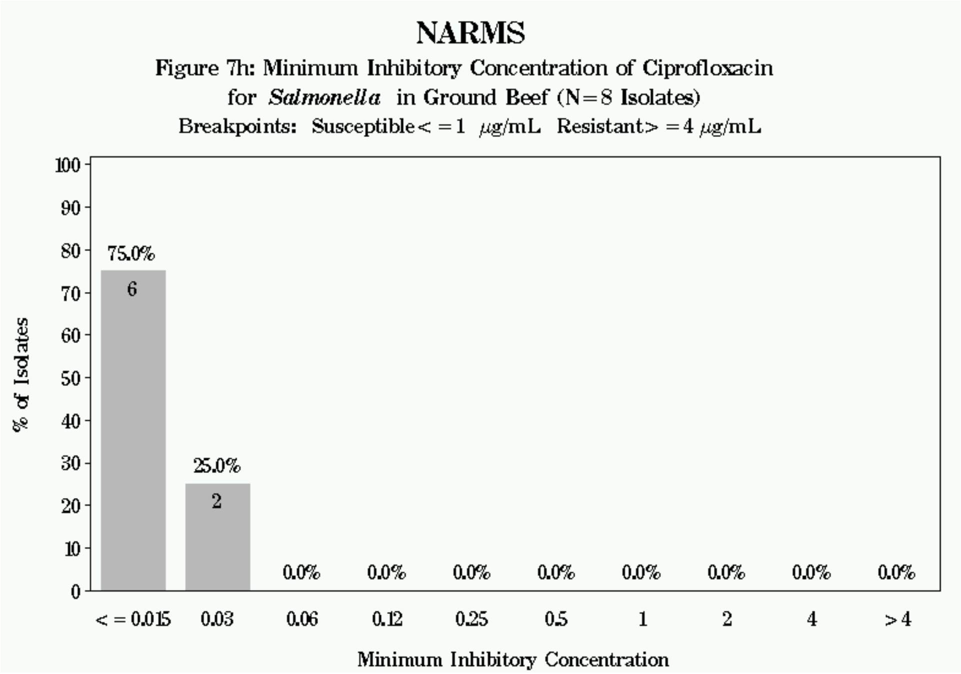
NARMS
Figure 7g: Minimum Inhibitory Concentration of Chloramphenicol for *Salmonella* in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
0.0%
12.5%
1
75.0%
6
0.0%
0.0%
12.5%
1

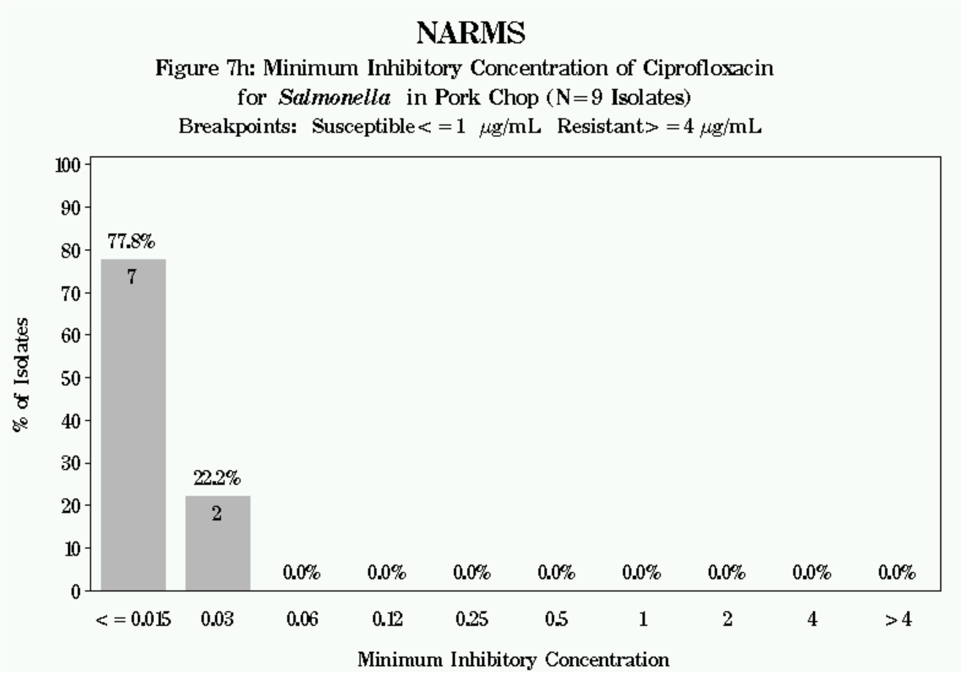


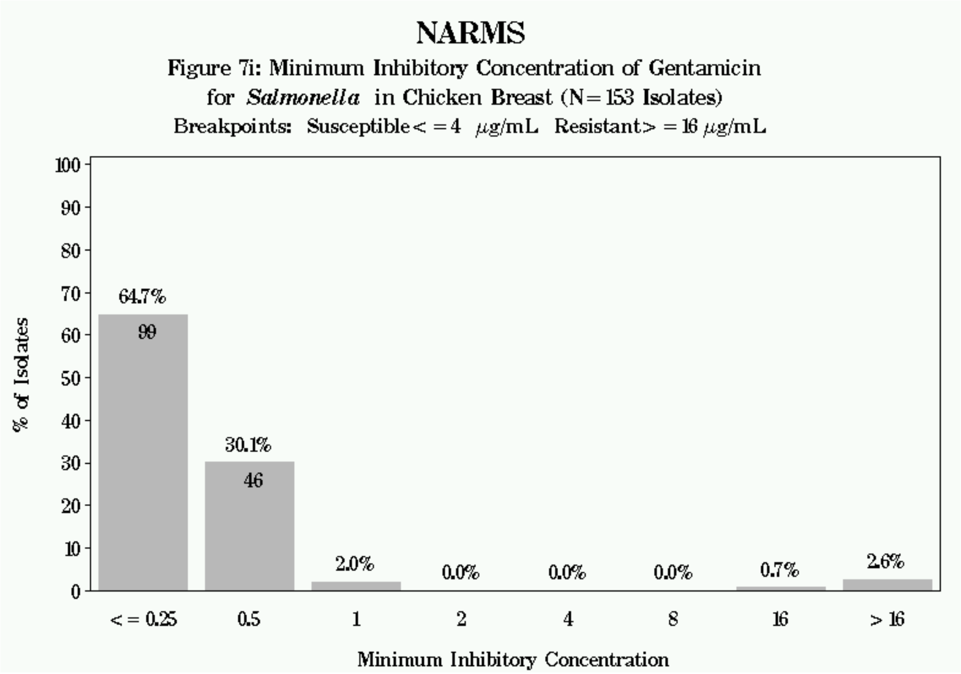
NARMS
Figure 7g: Minimum Inhibitory Concentration of Chloramphenicol for *Salmonella* in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
11.1%
1
22.2%
2
33.3%
3
11.1%
1
0.0%
22.2%
2


NARMS
Figure 7h: Minimum Inhibitory Concentration of Ciprofloxacin
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
>4
88.2%
135
11.1%
17
0.0%
0.7%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%

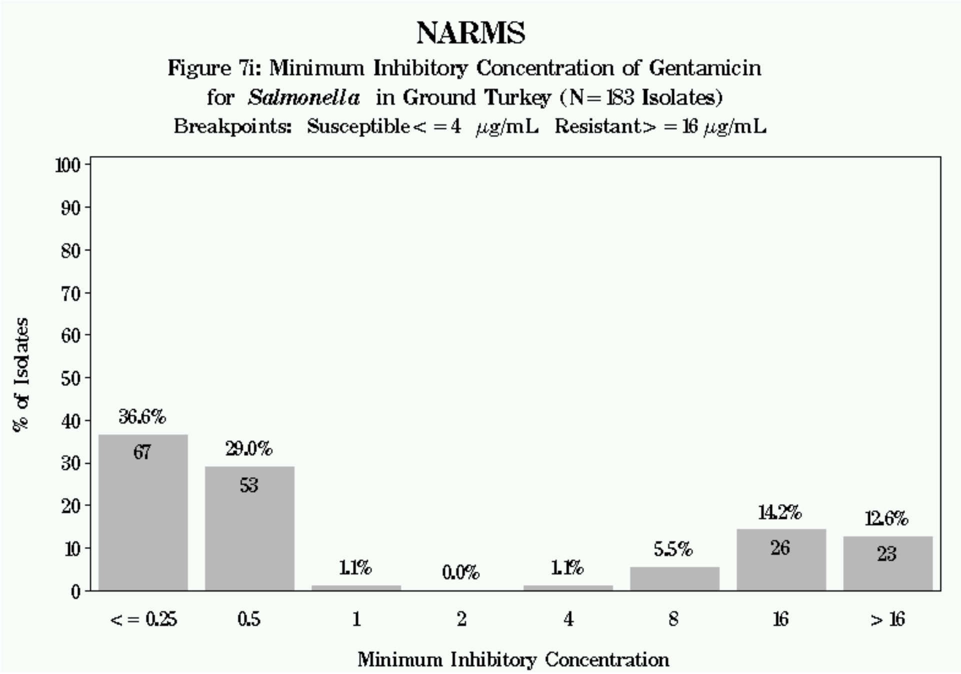

NARMS
Figure 7h: Minimum Inhibitory Concentration of Ciprofloxacin
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
>4
80.9%
148
16.4%
30
1.6%
0.5%
0.5%
0.0%
0.0%
0.0%
0.0%
0.0%


NARMS
Figure 7h: Minimum Inhibitory Concentration of Ciprofloxacin
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
>4
75.0%
6
25.0%
2
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%

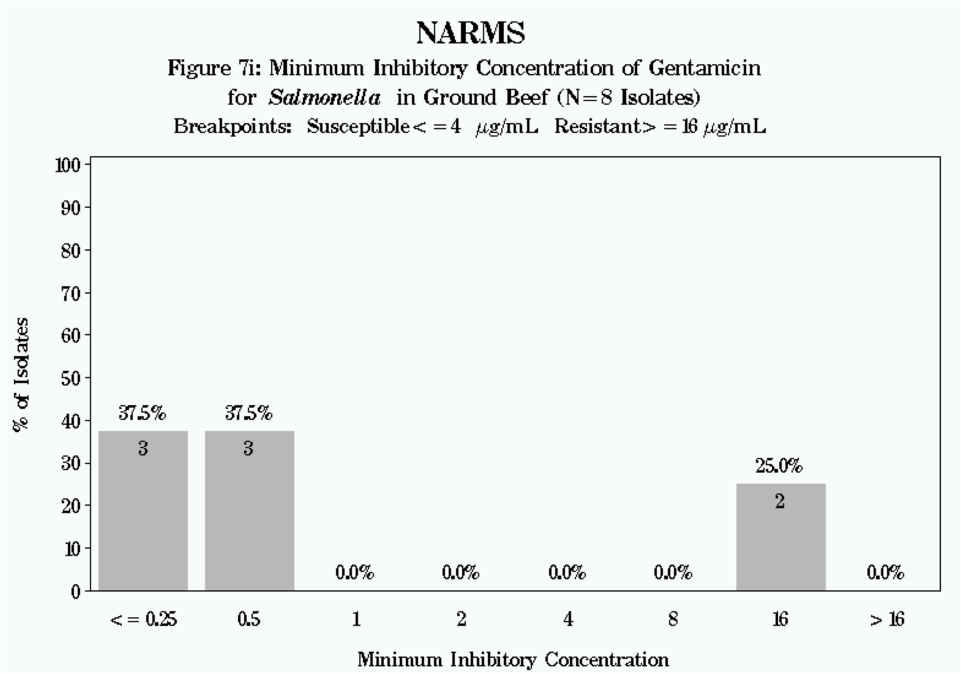

NARMS
Figure 7h: Minimum Inhibitory Concentration of Ciprofloxacin
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
>4
77.8%
7
22.2%
2
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%



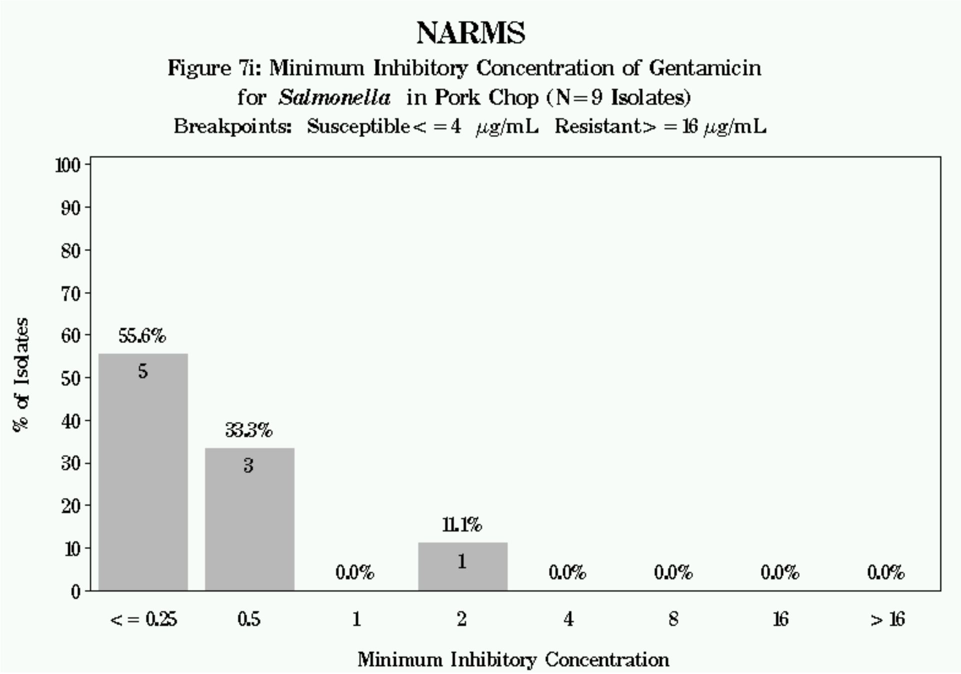
NARMS
Figure 7i: Minimum Inhibitory Concentration of Gentamicin
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=4 µg/mL Resistant>=16 µg/mL
% of Isolates
64.7%
99
30.1%
46
2.0%
0.0%
0.0%
0.0%
0.7%
2.6%
<=0.25
0.5
1
2
4
8
16
>16
Minimum Inhibitory Concentration



NARMS
Figure 7i: Minimum Inhibitory Concentration of Gentamicin
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=4 µg/mL Resistant>=16 µg/mL
% of Isolates
36.6%
67
29.0%
53
1.1%
0.0%
1.1%
5.5%
14.2%
26
12.6%
23
<=0.25
0.5
1
2
4
8
16
>16
Minimum Inhibitory Concentration



NARMS
Figure 7i: Minimum Inhibitory Concentration of Gentamicin
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=4 µg/mL Resistant>=16 µg/mL
% of Isolates
37.5%
3
37.5%
3
0.0%
0.0%
0.0%
0.0%
25.0%
2
0.0%
<=0.25
0.5
1
2
4
8
16
>16
Minimum Inhibitory Concentration

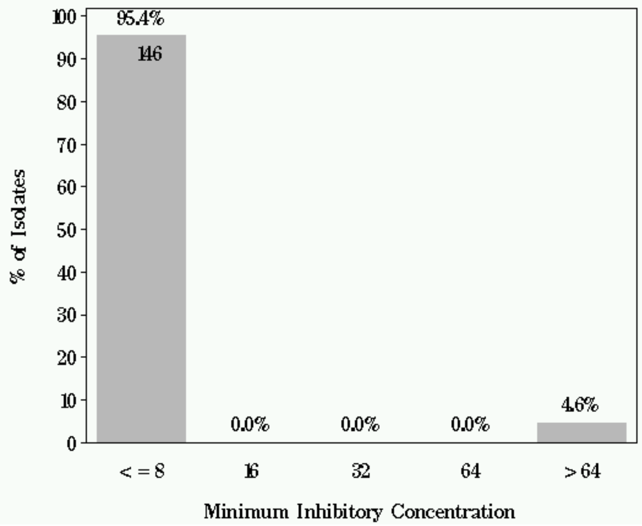


NARMS
Figure 7i: Minimum Inhibitory Concentration of Gentamicin
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=4 µg/mL Resistant>=16 µg/mL
% of Isolates
55.6%
5
33.3%
3
0.0%
11.1%
1
0.0%
0.0%
0.0%
0.0%
<=0.25
0.5
1
2
4
8
16
>16
Minimum Inhibitory Concentration

NARMS

Figure 7j: Minimum Inhibitory Concentration of Kanamycin for *Salmonella* in Chicken Breast (N=153 Isolates)

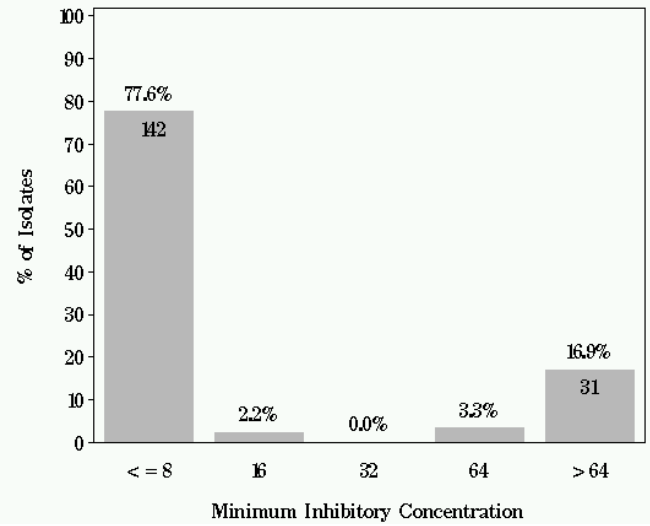
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$



NARMS

Figure 7j: Minimum Inhibitory Concentration of Kanamycin for *Salmonella* in Ground Turkey (N=183 Isolates)

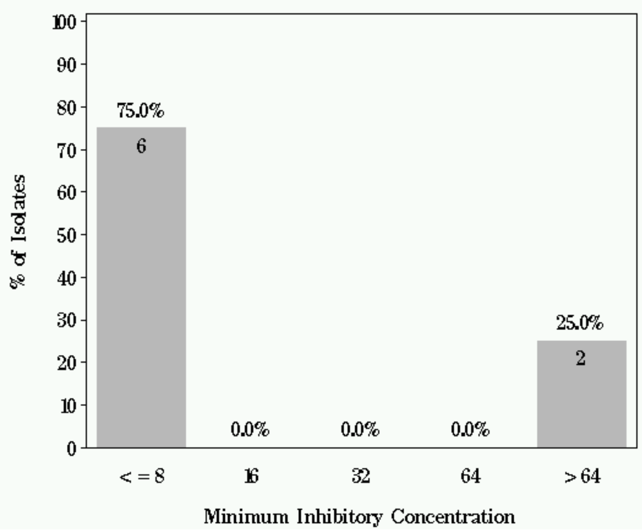
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$



NARMS

Figure 7j: Minimum Inhibitory Concentration of Kanamycin for *Salmonella* in Ground Beef (N=8 Isolates)

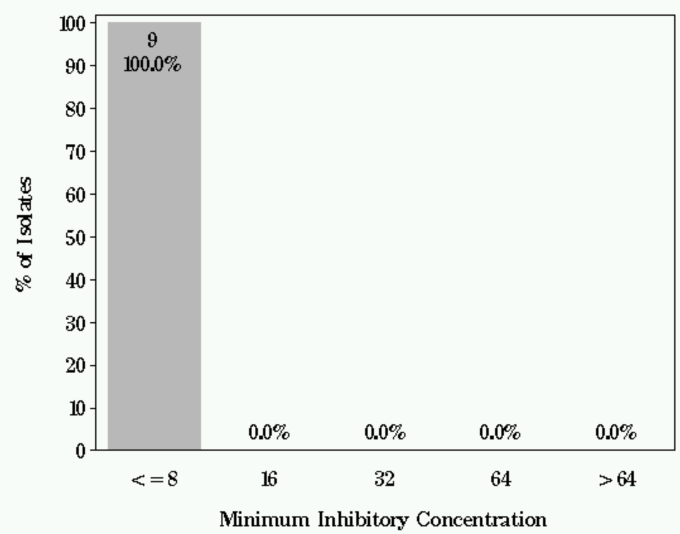
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$

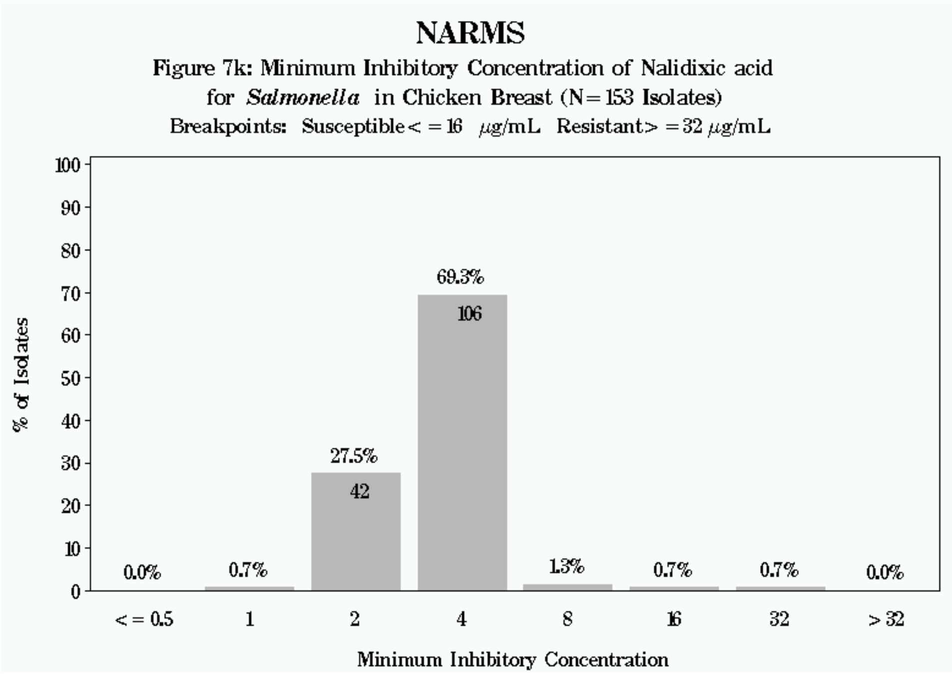


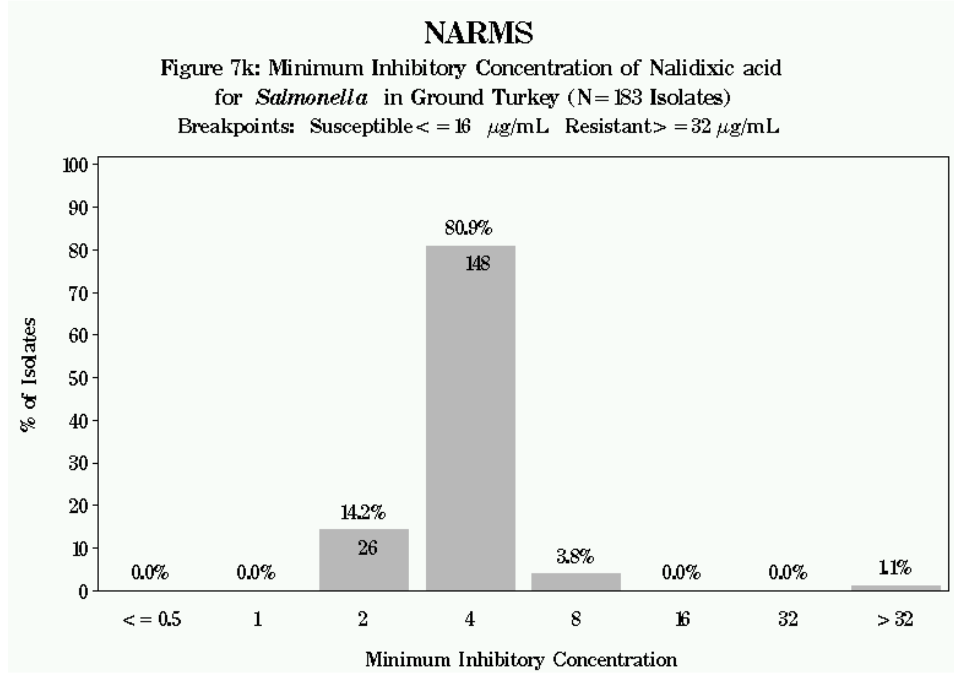
NARMS

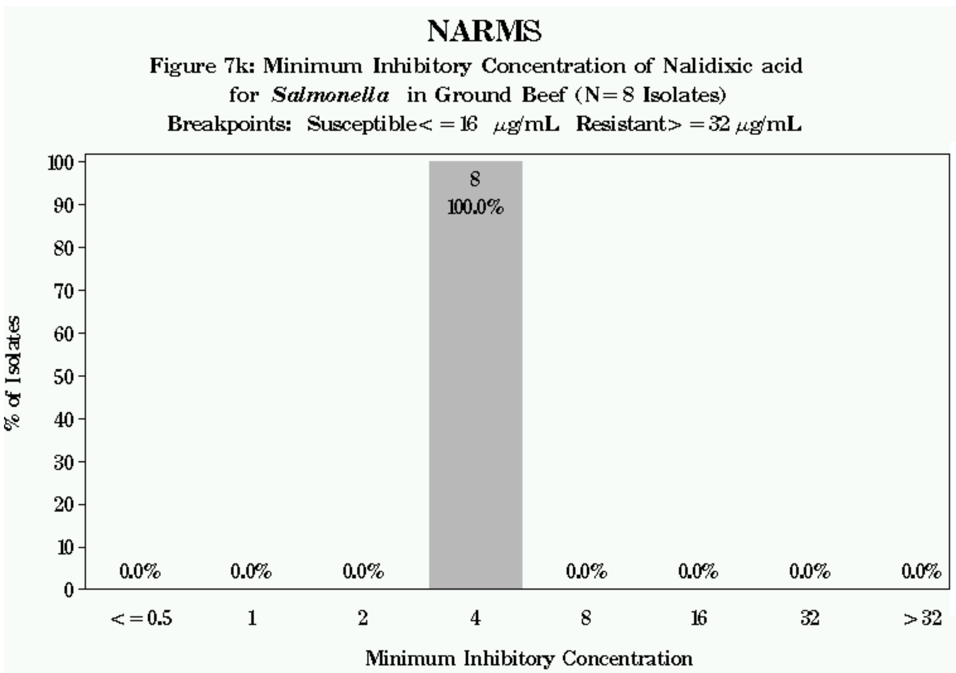
Figure 7j: Minimum Inhibitory Concentration of Kanamycin for *Salmonella* in Pork Chop (N=9 Isolates)

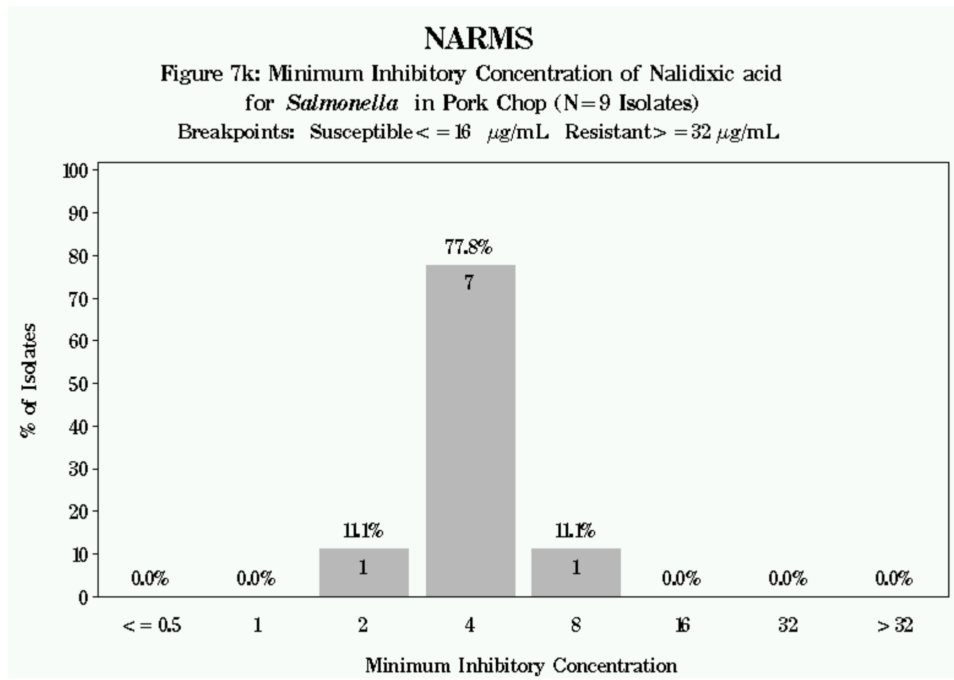
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$




NARMS
Figure 7k: Minimum Inhibitory Concentration of Nalidixic acid
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=16 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 0.7%
2: 27.5% 42
4: 69.3% 106
8: 1.3%
16: 0.7%
32: 0.7%
>32: 0.0%


NARMS
Figure 7k: Minimum Inhibitory Concentration of Nalidixic acid
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=16 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 0.0%
2: 14.2% 26
4: 80.9% 148
8: 3.8%
16: 0.0%
32: 0.0%
>32: 1.1%

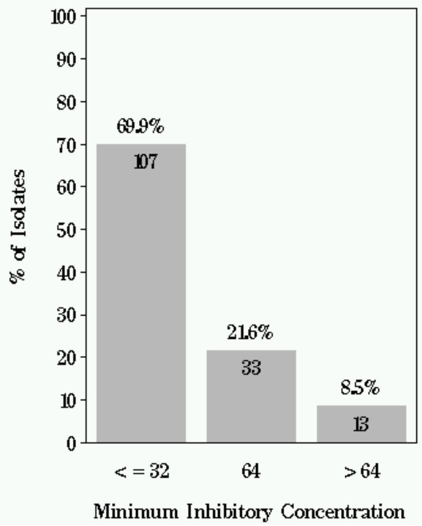

NARMS
Figure 7k: Minimum Inhibitory Concentration of Nalidixic acid
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=16 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 0.0%
2: 0.0%
4: 8 100.0%
8: 0.0%
16: 0.0%
32: 0.0%
>32: 0.0%


NARMS
Figure 7k: Minimum Inhibitory Concentration of Nalidixic acid
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=16 µg/mL Resistant>=32 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 0.0%
2: 11.1% 1
4: 77.8% 7
8: 11.1% 1
16: 0.0%
32: 0.0%
>32: 0.0%

NARMS

Figure 71: Minimum Inhibitory Concentration of Streptomycin for *Salmonella* in Chicken Breast (N=153 Isolates)

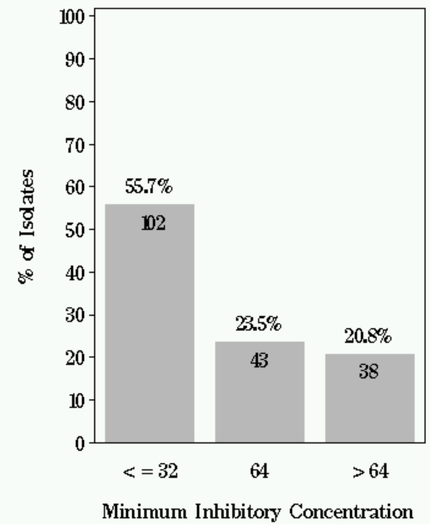
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 71: Minimum Inhibitory Concentration of Streptomycin for *Salmonella* in Ground Turkey (N=183 Isolates)

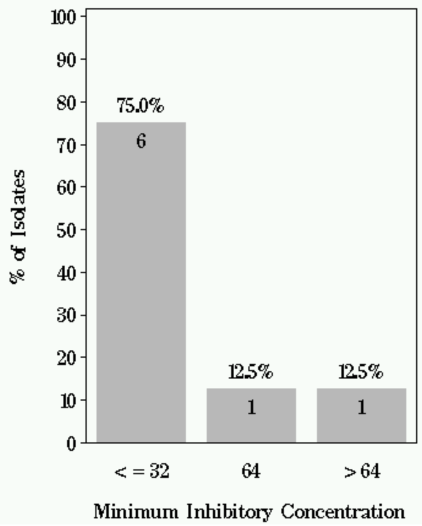
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 71: Minimum Inhibitory Concentration of Streptomycin for *Salmonella* in Ground Beef (N=8 Isolates)

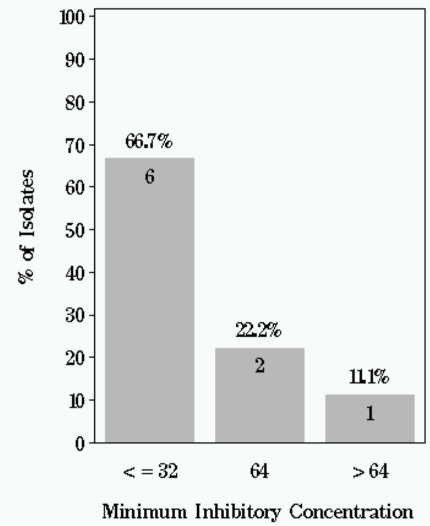
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL

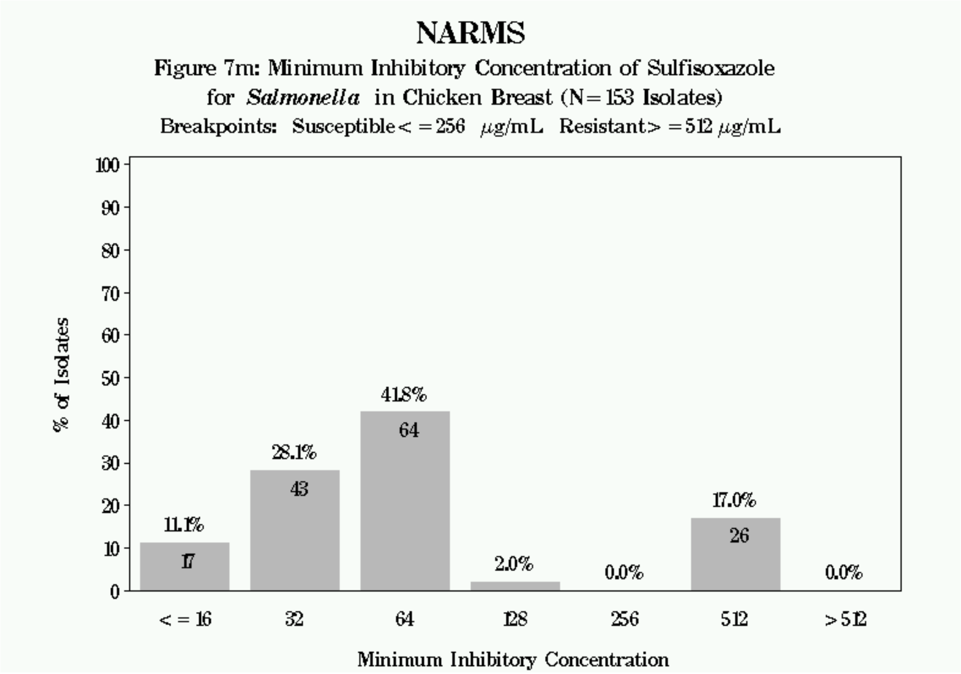


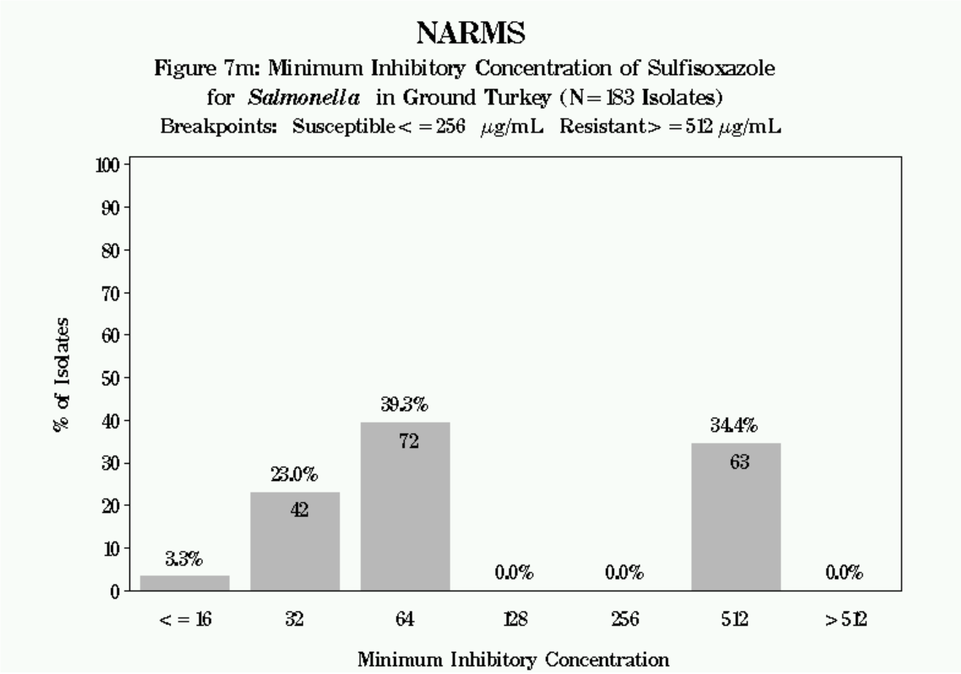
NARMS

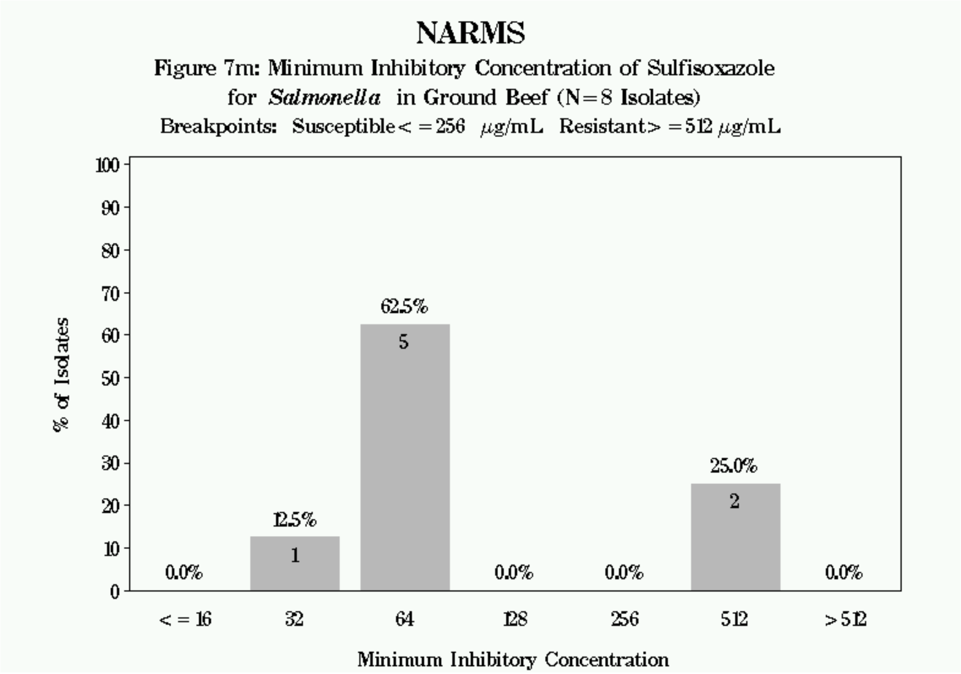
Figure 71: Minimum Inhibitory Concentration of Streptomycin for *Salmonella* in Pork Chop (N=9 Isolates)

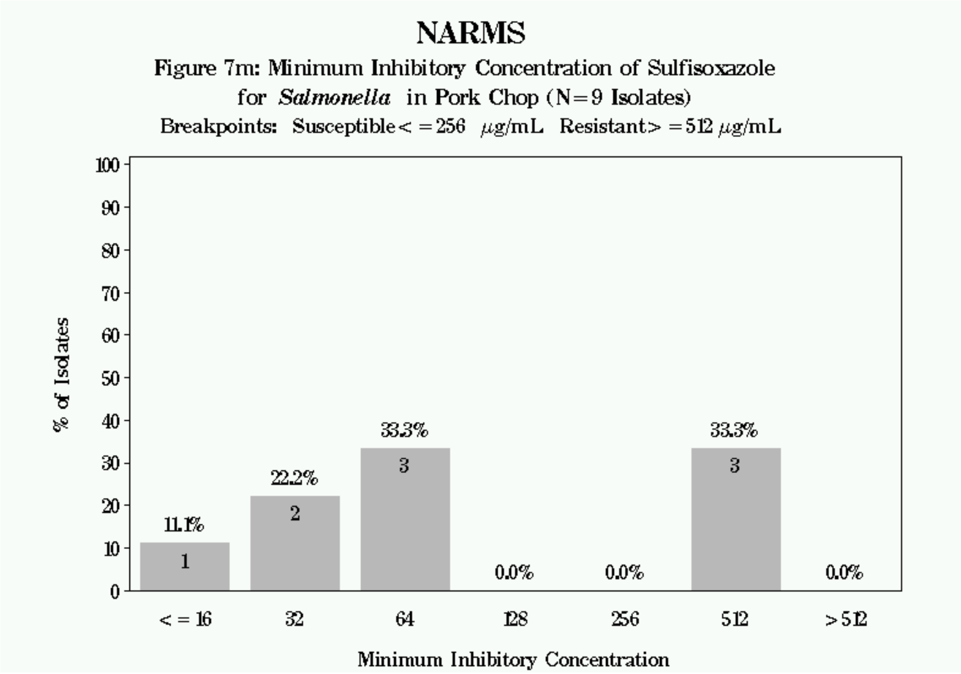
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL

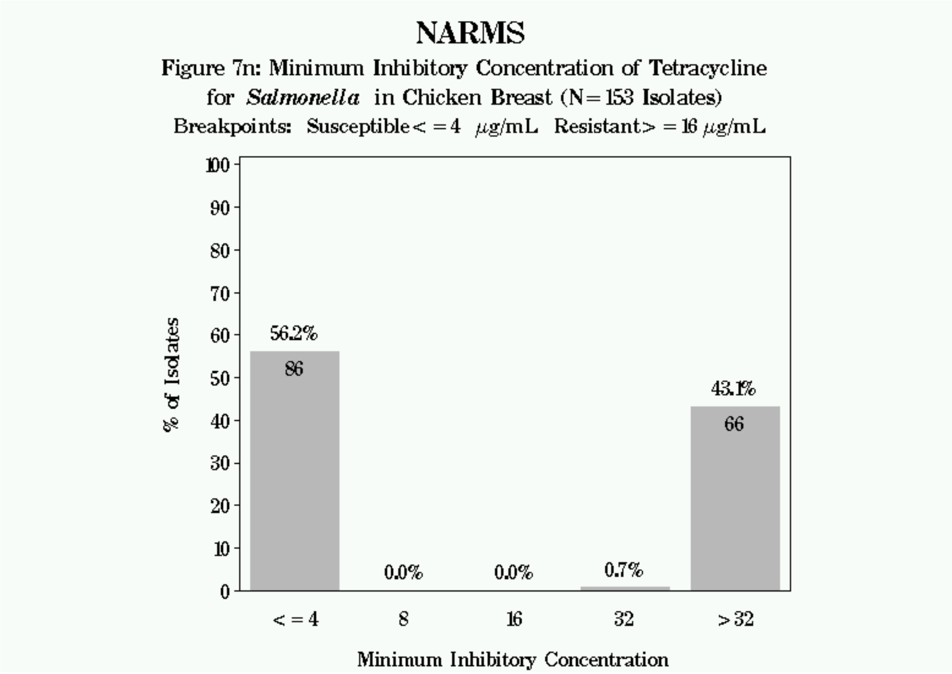



NARMS
Figure 7m: Minimum Inhibitory Concentration of Sulfisoxazole
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=16 11.1% 17
32 28.1% 43
64 41.8% 64
128 2.0%
256 0.0%
512 17.0% 26
>512 0.0%

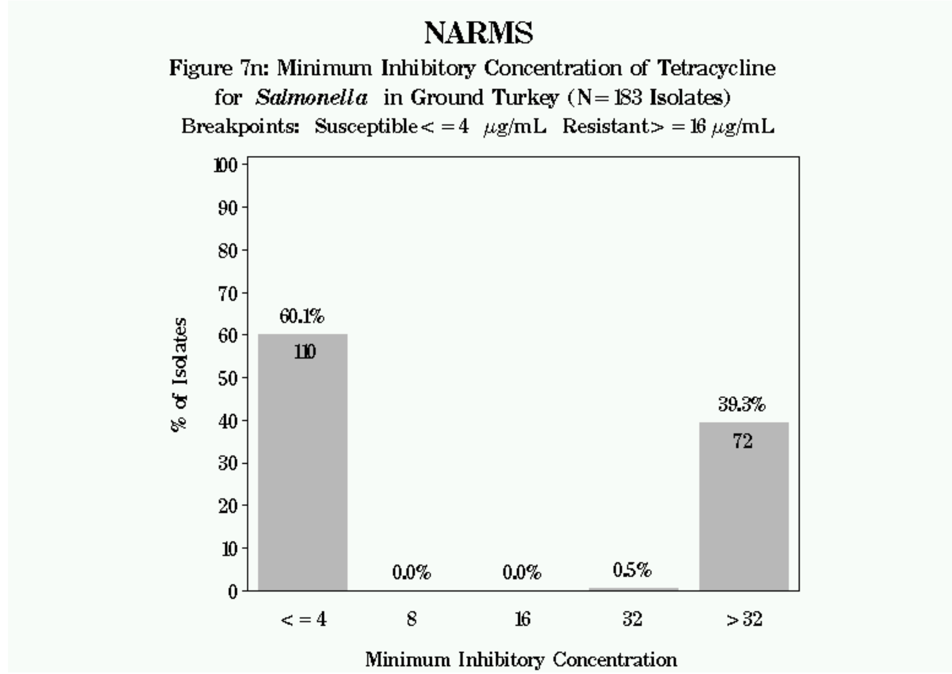

NARMS
Figure 7m: Minimum Inhibitory Concentration of Sulfisoxazole
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=16 3.3%
32 23.0% 42
64 39.3% 72
128 0.0%
256 0.0%
512 34.4% 63
>512 0.0%


NARMS
Figure 7m: Minimum Inhibitory Concentration of Sulfisoxazole
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=16 0.0%
32 12.5% 1
64 62.5% 5
128 0.0%
256 0.0%
512 25.0% 2
>512 0.0%

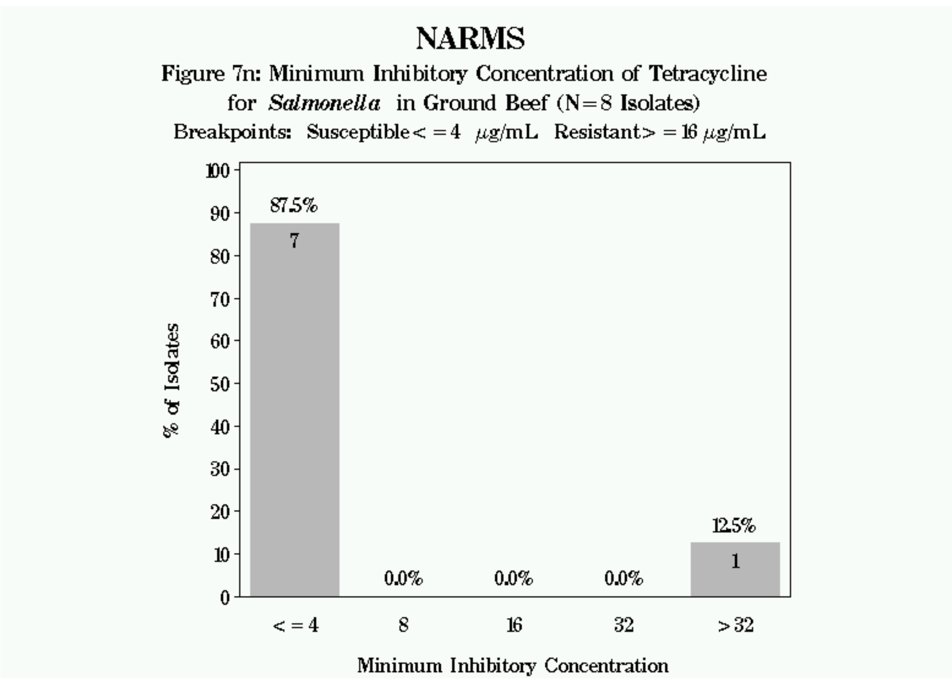

NARMS
Figure 7m: Minimum Inhibitory Concentration of Sulfisoxazole
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL
% of Isolates
Minimum Inhibitory Concentration
<=16 11.1% 1
32 22.2% 2
64 33.3% 3
128 0.0%
256 0.0%
512 33.3% 3
>512 0.0%



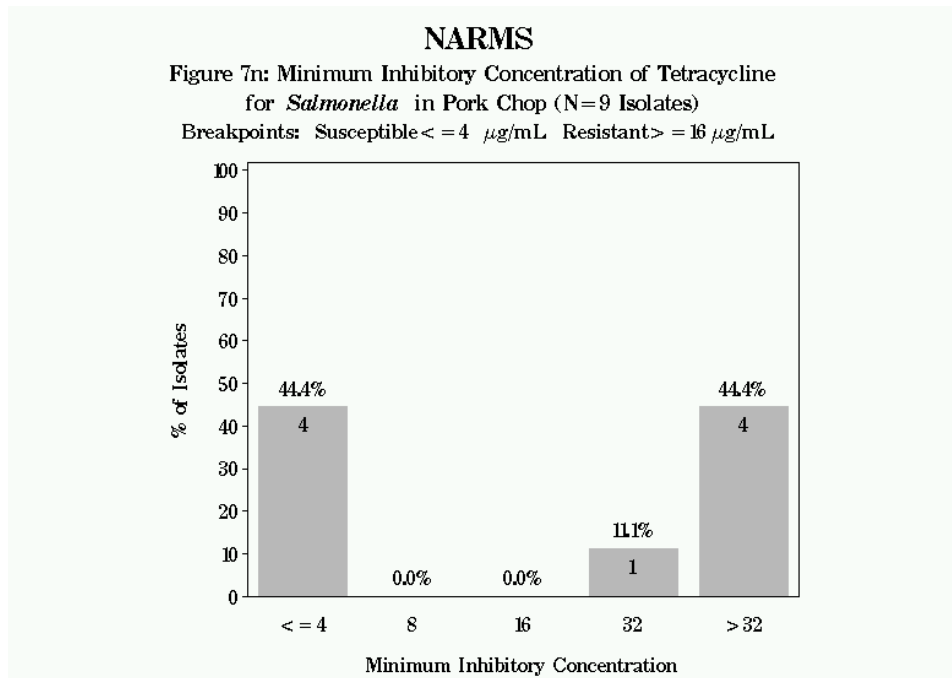
NARMS
Figure 7n: Minimum Inhibitory Concentration of Tetracycline
for Salmonella in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible< =4 µg/mL Resistant> =16 µg/mL
% of Isolates
56.2%
86
0.0%
0.0%
0.7%
43.1%
66
< =4
8
16
32
> 32
Minimum Inhibitory Concentration



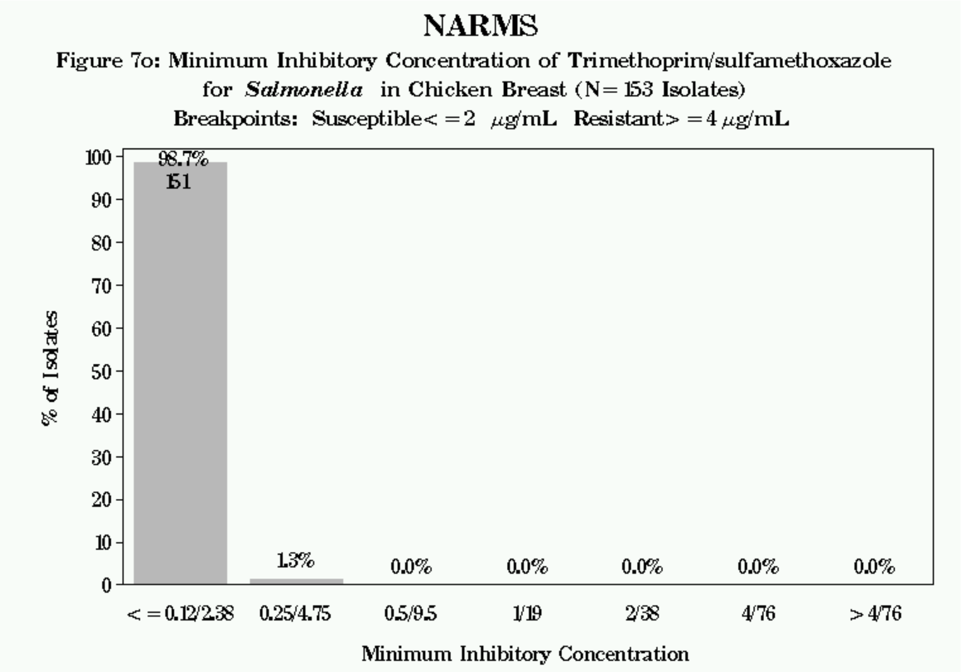
NARMS
Figure 7n: Minimum Inhibitory Concentration of Tetracycline
for Salmonella in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible< =4 µg/mL Resistant> =16 µg/mL
% of Isolates
60.1%
110
0.0%
0.0%
0.5%
39.3%
72
< =4
8
16
32
> 32
Minimum Inhibitory Concentration



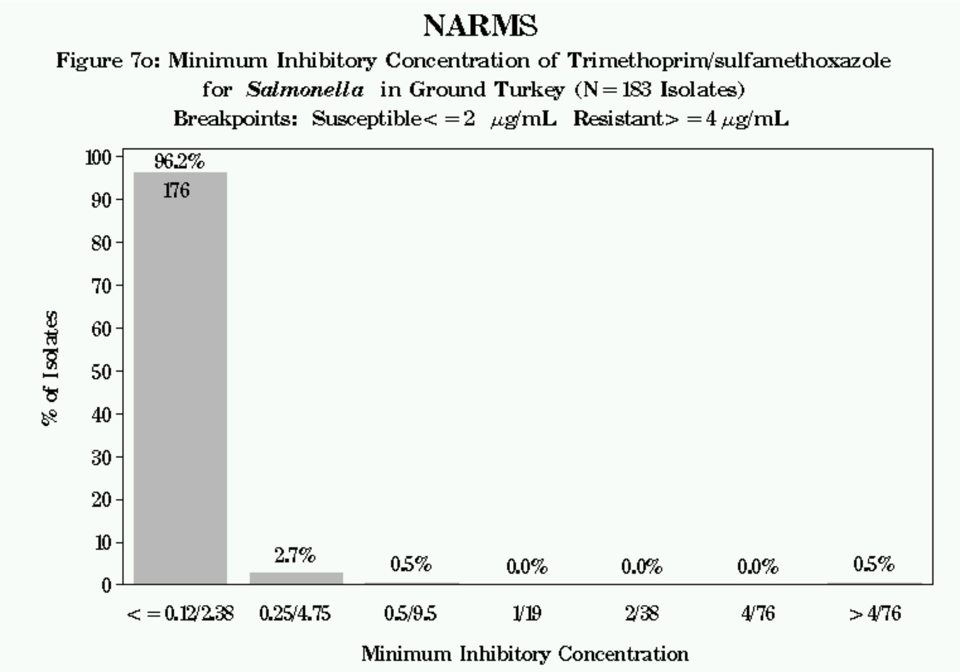
NARMS
Figure 7n: Minimum Inhibitory Concentration of Tetracycline
for Salmonella in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible< =4 µg/mL Resistant> =16 µg/mL
% of Isolates
87.5%
7
0.0%
0.0%
0.0%
12.5%
1
< =4
8
16
32
> 32
Minimum Inhibitory Concentration



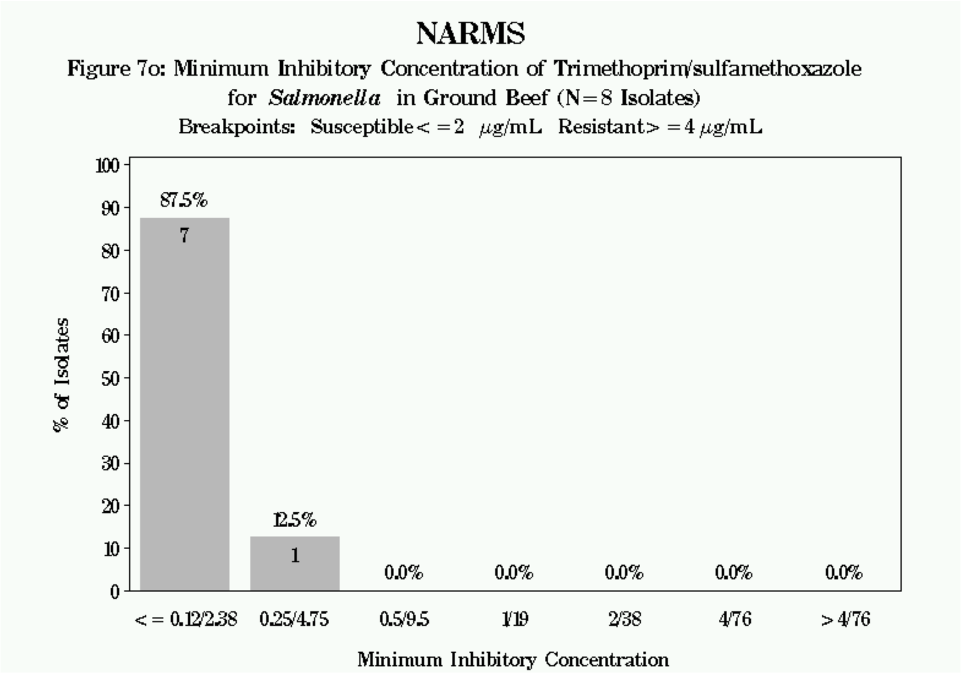
NARMS
Figure 7n: Minimum Inhibitory Concentration of Tetracycline
for Salmonella in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible< =4 µg/mL Resistant> =16 µg/mL
% of Isolates
44.4%
4
0.0%
0.0%
11.1%
1
44.4%
4
< =4
8
16
32
> 32
Minimum Inhibitory Concentration



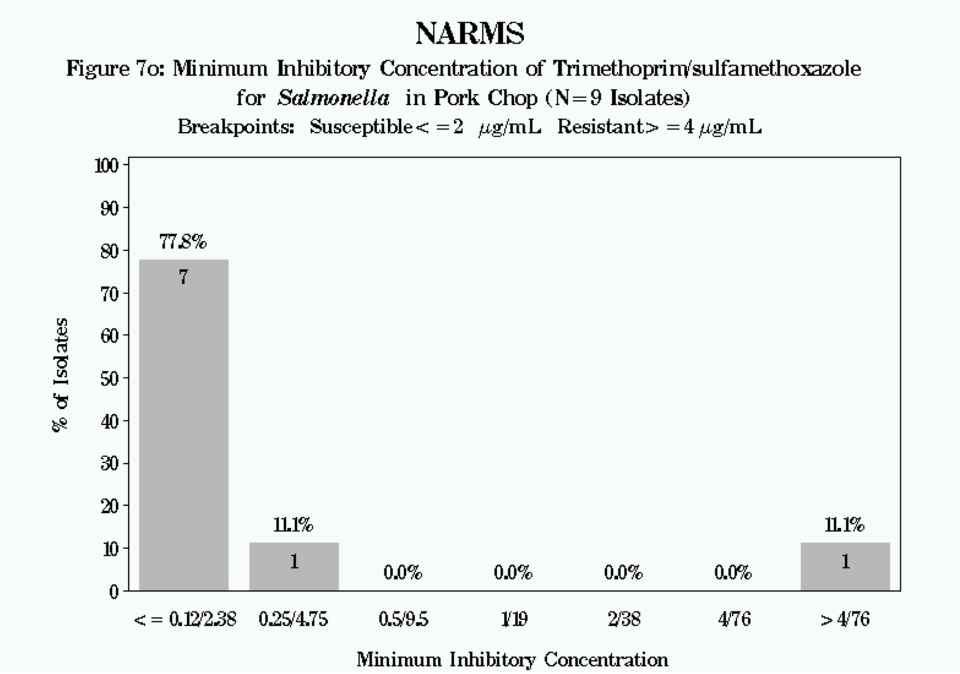
NARMS
Figure 7o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Salmonella* in Chicken Breast (N=153 Isolates)
Breakpoints: Susceptible<=2 µg/mL Resistant>=4 µg/mL
% of Isolates
98.7% 151
1.3%
0.0%
0.0%
0.0%
0.0%
0.0%
<=0.12/2.38
0.25/4.75
0.5/9.5
1/19
2/38
4/76
>4/76
Minimum Inhibitory Concentration



NARMS
Figure 7o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Salmonella* in Ground Turkey (N=183 Isolates)
Breakpoints: Susceptible<=2 µg/mL Resistant>=4 µg/mL
% of Isolates
96.2% 176
2.7%
0.5%
0.0%
0.0%
0.0%
0.5%
<=0.12/2.38
0.25/4.75
0.5/9.5
1/19
2/38
4/76
>4/76
Minimum Inhibitory Concentration



NARMS
Figure 7o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Salmonella* in Ground Beef (N=8 Isolates)
Breakpoints: Susceptible<=2 µg/mL Resistant>=4 µg/mL
% of Isolates
87.5% 7
12.5% 1
0.0%
0.0%
0.0%
0.0%
0.0%
<=0.12/2.38
0.25/4.75
0.5/9.5
1/19
2/38
4/76
>4/76
Minimum Inhibitory Concentration



NARMS
Figure 7o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Salmonella* in Pork Chop (N=9 Isolates)
Breakpoints: Susceptible<=2 µg/mL Resistant>=4 µg/mL
% of Isolates
77.8% 7
11.1% 1
0.0%
0.0%
0.0%
0.0%
11.1% 1
<=0.12/2.38
0.25/4.75
0.5/9.5
1/19
2/38
4/76
>4/76
Minimum Inhibitory Concentration

Table 8. Antimicrobial Resistance[*] among *Salmonella* Isolates by Meat Type, 2002-2005

Class	Antimicrobial/Resistance Breakpoint (µg/ml)	Year	Chicken Breast %R	Ground Turkey %R	Ground Beef %R	Pork Chop %R
Aminoglycosides	Amikacin (MIC≥ 64)	2002	-[†]	-	-	-
		2003	-	-	-	-
		2004	-	-	-	-
		2005	-	-	-	-
	Gentamicin (MIC≥ 16)	2002	10.0%	14.9%	-	30.0%
		2003	6.0%	22.8%	-	-
		2004	3.8%	20.4%	-	-
		2005	3.3%	26.8%	25.0%	-
	Kanamycin (MIC≥ 64)	2002	6.7%	18.9%	-	10.0%
		2003	4.8%	27.2%	-	-
		2004	11.5%	18.3%	-	9.1%
		2005	4.6%	20.2%	25.0%	-
	Streptomycin (MIC≥ 64)	2002	28.3%	37.8%	22.2%	70.0%
		2003	26.5%	45.6%	40.0%	40.0%
		2004	28.0%	34.5%	14.3%	27.3%
		2005	30.1%	44.3%	25.0%	33.3%
Aminopenicillins	Ampicillin (MIC≥ 32)	2002	16.7%	16.2%	22.2%	40.0%
		2003	33.7%	28.9%	40.0%	40.0%
		2004	30.6%	20.4%	21.4%	9.1%
		2005	26.8%	26.8%	25.0%	22.2%
Beta-lactamase inhibitor Combinations	Amoxicillin-Clavulanic Acid (MIC≥ 32)	2002	10.0%	12.2%	22.2%	20.0%
		2003	25.3%	11.4%	40.0%	20.0%
		2004	24.8%	7.7%	14.3%	-
		2005	21.6%	8.7%	-	-
Cephems	Cephalothin (MIC≥ 32)	2002	13.3%	14.9%	22.2%	20.0%
		2003	28.9%	28.9%	40.0%	40.0%
	Ceftiofur (MIC≥8)	2002	10.0%	8.1%	22.2%	20.0%
		2003	25.3%	2.6%	40.0%	20.0%
		2004	24.8%	4.9%	14.3%	-
		2005	20.9%	7.1%	-	-
	Ceftriaxone (MIC≥ 64)	2002	-	-	-	-
		2003	-	-	10.0%	-
		2004	-	-	7.1%	-
		2005	-	2.7%	-	-
	Cefoxitin (MIC≥ 32)	2002	10.0%	8.1%	22.2%	20.0%
		2003	25.3%	2.6%	40.0%	20.0%
		2004	24.8%	4.9%	14.3%	-
		2005	20.9%	7.1%	-	-
Folate Pathway inhibitors	Sulfamethoxazole[‡] (MIC≥ 512) / Sulfisoxazole (MIC≥ 512)	2002	16.7%	20.3%	22.2%	70.0%
		2003	14.5%	33.3%	40.0%	40.0%
		2004	28.7%	28.2%	14.3%	18.2%
		2005	17.0%	34.4%	25.0%	33.3%
	Trimethoprim-Sulfamethoxazole (MIC≥ 4)	2002	-	1.4%	-	20.0%
		2003	-	-	-	-
		2004	-	-	7.1%	-
		2005	-	0.5%	-	11.1%
Phenicols	Chloramphenicol (MIC≥ 32)	2002	-	1.4%	22.2%	40.0%
		2003	2.4%	0.9%	40.0%	40.0%
		2004	1.9%	2.8%	14.3%	18.2%
		2005	0.7%	0.5%	12.5%	22.2%
Quinolones	Ciprofloxacin (MIC≥ 4)	2002	-	-	-	-
		2003	-	-	-	-
		2004	-	-	-	-
		2005	-	-	-	-
	Nalidixic Acid (MIC≥ 32)	2002	-	8.1%	-	-
		2003	1.2%	4.4%	-	-
		2004	-	-	-	-
		2005	0.7%	1.1%	-	-
Tetracycline	Tetracycline (MIC≥ 16)	2002	33.3%	55.4%	22.2%	70.0%
		2003	27.7%	39.5%	40.0%	80.0%
		2004	46.5%	56.3%	14.3%	54.5%
		2005	43.8%	39.9%	12.5%	55.6%

[*] Where % Resistance = (# isolates per meat type resistant to antimicrobial) / (total # isolates per meat type).
[†] Dashes indicate that no isolates were resistant from that meat type.
[‡] Sulfisoxazole replaced Sulfamethoxazole in 2004 and 2005.

Table 9. Antimicrobial Resistance[*] among *Salmonella* Isolates by Serotype, 2005

Antimicrobial Agent by Class															
	Aminoglycosides				Pencillins	β-lactamase inhibitor	Cephems			Folate pathway inhibitors		Phenicols	Quinolones		Tetra-cyclines
Serotype	**AMI**	**GEN**	**KAN**	**STR**	**AMP**	**AMC**	**TIO**	**AXO**	**FOX**	**COT**	**FIS**	**CHL**	**CIP**	**NAL**	**TET**
S. Heidelberg (n=75)	-[†]	30.7%	21.3%	38.7%	21.3%	10.7%	9.3%	-	9.3%	-	29.3%	-	-	1.3%	41.3%
S. Kentucky (n=62)	-	-	-	50.0%	21.0%	21.0%	21.0%	-	21.0%	-	-	-	-	1.6%	54.8%
S. Typhimurium (n=32)[‡]	-	-	21.9%	9.4%	59.4%	50.0%	50.0%	-	50.0%	3.1%	68.8%	9.4%	-	-	68.8%
S. Saintpaul (n=25)	-	24.0%	56.0%	44.0%	60.0%	4.0%	-	-	-	-	64.0%	-	-	-	32.0%
S. Hadar (n=22)	-	-	4.5%	90.9%	27.3%	4.5%	-	-	-	-	4.5%	-	-	-	95.5%
S. IIIa 18:z4,z23:- (n=17)	-	100.0%	-	100.0%	-	-	-	-	-	-	100.0%	-	-	-	-
S. Enteritidis (n=12)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Reading (n=10)	-	-	10.0%	-	50.0%	30.0%	30.0%	30.0%	30.0%	10.0%	10.0%	-	-	-	20.0%
S. I 4,5,12:i:- (n=9)	-	11.1%	-	11.1%	-	-	-	-	-	-	11.1%	-	-	-	11.1%
S. Senftenberg (n=9)	-	44.4%	11.1%	44.4%	44.4%	-	-	-	-	-	22.2%	-	-	-	33.3%
S .Brandenburg (n=8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Schwarzengrund (n=8)	-	-	12.5%	25.0%	25.0%	-	-	-	-	-	12.5%	-	-	-	12.5%
S. Montevideo (n=7)	-	14.3%	28.6%	42.9%	28.6%	-	-	-	-	-	14.3%	-	-	-	28.6%
S. Agona (n=6)	-	33.3%	-	16.7%	-	-	-	-	-	-	50.0%	-	-	-	66.7%
S. Muenster (n=6)	-	-	16.7%	16.7%	16.7%	-	-	-	-	-	-	-	-	16.7%	-
S. Anatum (n=4)	-	-	-	25.0%	25.0%	25.0%	25.0%	-	25.0%	-	-	-	-	-	75.0%
S. Bredeney (n=4)	-	-	-	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	-	50.0%	-	-	-	50.0%
S. I 4,12:d:- (n=4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.0%
S. Berta (n=3)	-	33.3%	-	33.3%	-	-	-	-	-	-	33.3%	-	-	-	-
S. Newport (n=3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*S.*Chester (n=2)	-	-	-	50.0%	50.0%	-	-	-	-	-	-	-	-	-	-
S. I 4,5,12:d:- (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0%
S. IIIa 35:z4,z23:- (n=2)	-	-	-	-	50.0%	50.0%	-	-	-	-	-	-	-	-	50.0%
S. Mbandaka (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0%
S. Muenchen (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Panama (n=2)	-	-	-	50.0%	50.0%	-	-	-	-	-	-	-	-	-	-
S. Thompson (n=2)	-	-	-	-	50.0%	-	-	-	-	-	-	-	-	-	-
S. Albany (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Derby (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0%
S. Dublin (n=1)	-	100.0%	100.0%	100.0%	100.0%	-	-	-	-	-	100.0%	100.0%	-	-	100.0%
S. I 3,10:nonmotile (n=1)	-	-	100.0%	100.0%	100.0%	100.0%	100.0%	-	100.0%	-	100.0%	-	-	-	100.0%
S. I 4,12:r:- (n=1)	-	-	-	100.0%	100.0%	100.0%	100.0%	-	100.0%	-	100.0%	100.0%	-	-	100.0%
S. I 4,5,12:-:1,2 (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. I 4,5,12:nonmotile (n=1)	-	-	-	-	100.0%	100.0%	100.0%	-	100.0%	-	100.0%	-	-	-	100.0%
S. IIIa 18:z4,z32:- (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0%
S. Infantis (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Johannesburg (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Minnesota (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Ohio (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Oranienburg (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total (353)	-	15.9%	13.0%	37.4%	26.6%	13.9%	12.7%	1.4%	12.7%	0.6%	26.6%	1.4%	-	0.8%	41.4%

[*] Where % Resistance = (# isolates per serotype resistant to antimicrobial) / (total # isolates per serotype).
[†] Dashes indicate that 0.0% resistance to antimicrobial.
[‡] Includes *S.* Typhimurium var.5-.

Table 10. Antimicrobial Resistance* among *Salmonella* by Top 6 Serotypes within Meat Type, 2005

Meat Type	Serotype	Antimicrobial Agent Class														
		Aminoglycosides				Pencillins	β-lactamase inhibitor	Cephems			Folate Pathway inhibitors		Phenicols	Quinolones		Tetra-cyclines
		AMI	GEN	KAN	STR	AMP	AMC	TIO	AXO	FOX	COT	FIS	CHL	CIP	NAL	TET
Chicken Breast	*S.* Kentucky (n=60)	-†	-	-	50.0%	21.7%	21.7%	21.7%	-	21.7%	-	-	-	-	1.7%	53.3%
	S. Typhimurium (n=29)‡	-	-	24.1%	3.4%	55.2%	51.7%	51.7%	-	51.7%	-	69.0%	3.4%	-	-	69.0%
	S. Heidelberg (n=22)	-	13.6%	-	18.2%	27.3%	13.6%	9.1%	-	9.1%	-	13.6%	-	-	-	4.5%
	S. Enteritidis (n=12)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Hadar (n=9)	-	-	-	88.9%	33.3%	-	-	-	-	-	-	-	-	-	100.0%
	S. I 4,5,12:i:- (n=9)	-	11.1%	-	11.1%	-	-	-	-	-	-	11.1%	-	-	-	11.1%
Ground Turkey	*S.* Heidelberg (n=53)	-	37.7%	30.2%	47.2%	18.9%	9.4%	9.4%	-	9.4%	-	35.8%	-	-	1.9%	56.6%
	S. Saintpaul (n=24)	-	20.8%	54.2%	41.7%	58.3%	4.2%	-	-	-	-	62.5%	-	-	-	33.3%
	S. IIIa 18:z4,z23:- (n=17)	-	100.0%	-	100.0%	-	-	-	-	-	-	100.0%	-	-	-	-
	S. Hadar (n=13)	-	-	7.7%	92.3%	23.1%	7.7%	-	-	-	-	7.7%	-	-	-	92.3%
	S. Reading (n=10)	-	-	10.0%	-	50.0%	30.0%	30.0%	30.0%	30.0%	10.0%	10.0%	-	-	-	20.0%
	S. Brandenburg (n=8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ground Beef §	*S.* Muenster (n=3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Montevideo (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Dublin (n=1)	-	100.0%	100.0%	100.0%	100.0%	-	-	-	-	-	100.0%	100.0%	-	-	100.0%
	S. Minnesota (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Saintpaul (n=1)	-	100.0%	100.0%	100.0%	100.0%	-	-	-	-	-	100.0%	-	-	-	-
Pork Chop	*S.* Anatum (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0%
	S. Muenchen (n=2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Typhimurium (n=2)	-	-	-	100.0%	100.0%	-	-	-	-	50.0%	100.0%	100.0%	-	-	100.0%
	S. Agona (n=1)	-	-	-	-	-	-	-	-	-	-	100.0%	-	-	-	100.0%
	S. Infantis (n=1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S. Senftenberg (n=1)	-	-	-	100.0%	-	-	-	-	-	-	-	-	-	-	100.0%

* Where % Resistance= (# isolates per serotype resistant to antimicrobial) / (total # isolates per serotype).
† Dashes indicate that no isolates from serotype were isolated from meat type.
‡ Includes *S*. Typhimurium var. 5-.
§ The 6th serotype was not recovered from that meat type.

Table 11. Number of *Salmonella* Resistant to Multiple Antimicrobial Agents, 2002-2005

Meat Type	Number of Antimicrobials	2002 (n=153)	2003 (n=212)	2004 (n=324)	2005 (n=353)	Total
Chicken Breast	**0**	31	39	63	71	204
	1	5	4	16	14	39
	2-4	12	16	42	44	114
	5-7	12	20	33	24	75
	≥8	0	4	3	0	7
	Total	**60**	**83**	**157**	**153**	**453**
Ground Turkey	**0**	28	39	41	54	162
	1	15	12	43	26	96
	2-4	19	37	35	91	182
	5-7	4	22	19	12	57
	≥8	8	4	4	0	16
	Total	**74**	**114**	**142**	**183**	**513**
Ground Beef	**0**	7	6	11	5	29
	1	0	0	1	0	1
	2-4	0	0	0	1	1
	5-7	0	0	0	1	1
	≥8	2	4	2	0	8
	Total	**9**	**10**	**14**	**7**	**40**
Pork Chop	**0**	2	1	5	5	13
	1	1	2	3	2	8
	2-4	3	0	2	2	7
	5-7	2	1	1	1	5
	≥8	2	1	0	0	3
	Total	**10**	**5**	**11**	**10**	**36**

CAMPYLOBACTER

MIC DISTRIBUTIONS AMONG *CAMPYLOBACTER*

MIC DISTRIBUTIONS AMONG *CAMPYLOBACTER* BY MEAT TYPE

Table 12. Overall *Campylobacter* Species Identified, 2002-2005

	2002	2003	2004	2005
Species	**N**	**N**	**N**	**N**
C. jejuni	202	330	517	414
C. coli	95	147	204	160
C. lari	0	2	0	2
Total	**297**	**479**	**721**	**576**

Table 13. *Campylobacter* Species by Meat Type, 2002-2005

Total (N) Isolates in that Year	Species	2002		2003		2004		2005	
	C. jejuni	202		330		517		414	
	C. coli	95		147		204		160	
	C. lari	0		2		0		2	
	Total (N)	297		479		721		576	
Meat Type	**Species**	**n**[†]	**%**[‡]	**n**	**%**	**n**	**%**	**n**	**%**
Chicken Breast	*C. jejuni*	198	98.0%	325	98.5%	510	98.6%	403	97.3%
	C. coli	90	94.7%	142	96.6%	196	96.1%	151	94.4%
	C. lari	0	-[§]	2	100.0%	0	-	0	-
	Total (N)[**]	**288**	97.0%	**469**	97.9%	**706**	97.9%	**554**	96.2%
Ground Turkey	*C. jejuni*	2	1.0%	4	1.2%	7	1.4%	10	2.4%
	C. coli	2	2.1%	1	0.7%	5	2.5%	9	5.6%
	C. lari	0	-	0	-	0	-	1	50.0%
	Total (N)	**4**	**1.3%**	**5**	**1.0%**	**12**	**1.7%**	**20**	**3.5%**
Ground Beef	*C. jejuni*	0	-	1	0.3%	0	-	0	-
	Total	**0**	**-**	**1**	**0.2%**	**0**	**-**	**0**	**-**
Pork Chop	*C. jejuni*	2	1.0%	0	-	0	-	1	0.2%
	C. coli	3	3.2%	4	0.8%	3	1.5%	0	-
	C. lari	0	-	0	-	0	-	1	50.0%
	Total (N)	**5**	**1.7%**	**4**	**0.8%**	**3**	**0.4%**	**2**	**0.3%**

[†] Where n= # of isolates in that species.
[‡] Where % = (# of isolates per species per meat type) / total # of isolates per species).
[§] Dashes indicate no isolates from that species per meat type.
[**] Where % = (total # of isolates in meat type) / total # of isolates in that year).

Table 14. *Campylobacter* Isolates by Month for All Sites in Chicken Breast, 2002-2005

Month	2002 n	2002 %*	2003 n	2003 %	2004 n	2004 %	2005 n	2005 %
January	18	6.3%	32	6.8%	60	8.5%	45	8.1%
February	29	10.1%	31	6.6%	59	8.4%	60	10.8%
March	29	10.1%	27	5.8%	47	6.7%	46	8.3%
April	22	7.6%	30	6.4%	35	5.0%	42	7.6%
May	26	9.0%	40	8.5%	51	7.2%	47	8.5%
June	24	8.3%	41	8.7%	59	8.4%	45	8.1%
July	17	5.9%	53	11.3%	67	9.5%	51	9.2%
August	31	10.8%	29	6.2%	62	8.8%	47	8.5%
September	27	9.4%	50	10.7%	72	10.2%	35	6.3%
October	21	7.3%	58	12.4%	73	10.3%	47	8.5%
November	21	7.3%	26	5.5%	58	8.2%	42	7.6%
December	23	8.0%	52	11.1%	63	8.9%	47	8.5%
Total	288	100.0%	469	100.0%	706	100.0%	554	100.0%

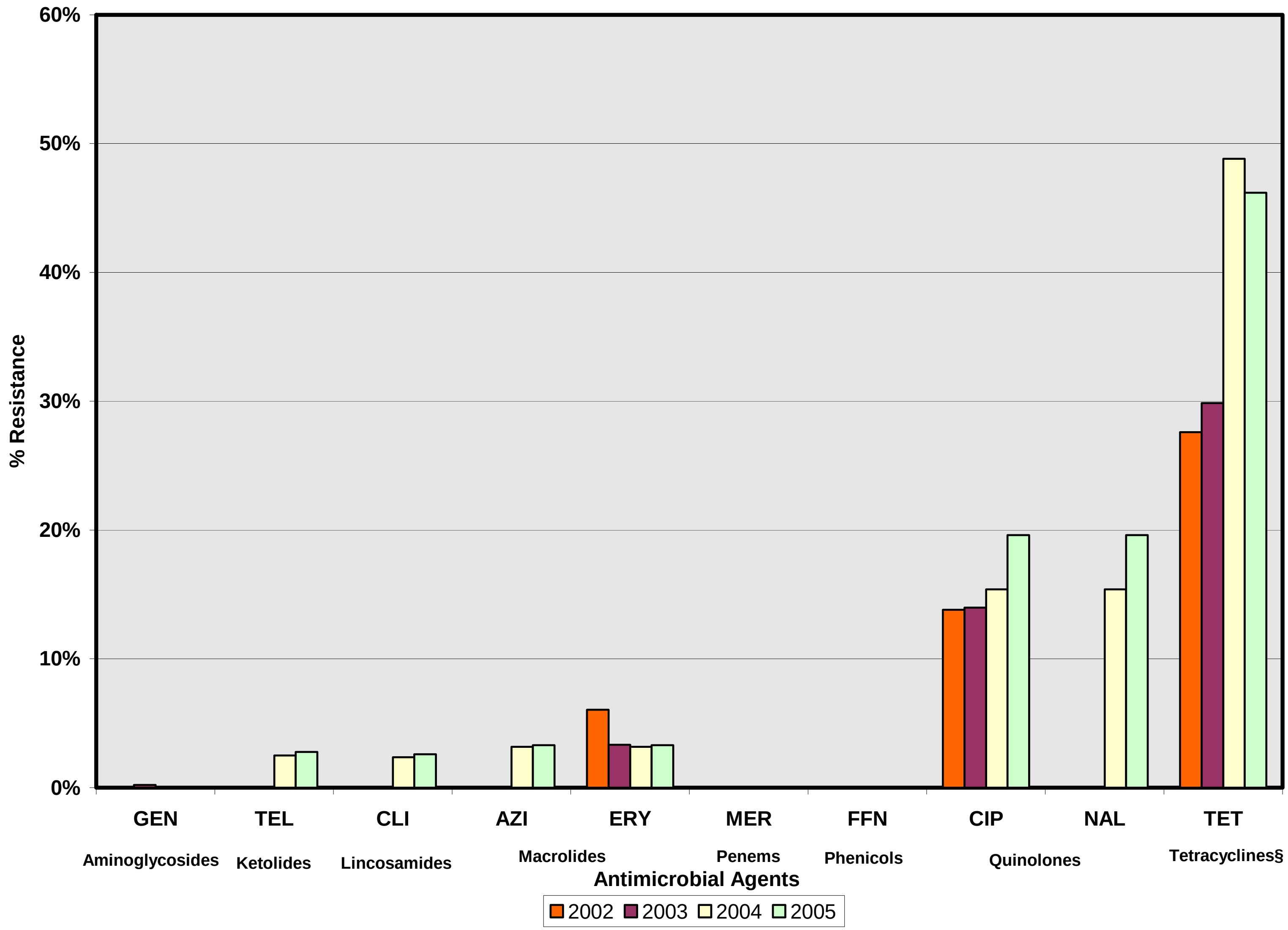
* Where % = (# of isolates that month) / (total # of isolates that year).

Table 15. Antimicrobial Resistance[†] among *Campylobacter* Isolates, 2002-2005

		2002		2003		2004		2005		Cochran-Armitage Trend Test[‡]	
Antimicrobial Class	**Antimicrobial/Resistance Breakpoint (µg/ml)**	**#R**	**%R**	**#R**	**%R:**	**#R**	**%R:**	**#R**	**%R:**	**Z Statistic (two-sided)**	**P-value**
Aminoglycosides	**Gentamicin (MIC ≥ 16)**	0	-[§]	1	0.2%	0	-	0	-	-0.7498	0.4534
Ketolides	**Telithromycin (MIC ≥16)**					0	-	0	-	N/A[**]	N/A
Lincosamides	**Clindamycin (MIC ≥ 4)**					17	2.4%	15	2.6%	0.2991	0.7649
Macrolides	**Azithromycin (MIC ≥ 2)**					23	3.2%	19	3.3%	-0.2304	0.8178
	Erythromycin (MIC ≥ 8)	18	6.1%	16	3.3%	23	3.2%	19	3.3%	-2.0037	0.0451
Penems	**Meropenem (MIC ≥ 16)**					18	2.5%	16	2.8%	-0.0613	0.9511
Phenicols	**Florfenicol[††]**					0	-	0	-	N/A	N/A
Quinolones[‡‡]	**Ciprofloxacin (MIC≥ 4)**	41	13.8%	67	14.0%	111	15.4%	112	19.5%	2.414	0.0158
	Nalidixic Acid (MIC≥ 32)					111	15.4%	111	19.3%	1.8847	0.0595
Tetracycline[§§]	**Tetracycline (MIC≥ 16)**	82	27.6%	143	29.9%	352	48.8%	266	46.2%	7.0293	<.0001

[†] Where % Resistance = # isolated resistant to antimicrobial) / (total # isolates).
Gray areas indicate drug not included in testing that year.
[§] Dashes indicate 0.0% resistance to antimicrobial.
[**] N/A= No Z-statistic or P-value could be calculated.
[††] No resistant breakpoint.
[‡‡] Presented for all species except C. lari, which is considered intrinsically resistant to Quinolones (N=479-2=477 in 2003, N=576-2=574 in 2005).
[§§] Results for 2002 and 2003 are Doxycycline.

Figure 8. Antimicrobial Resistance among *Campylobacter* isolates, 2002-2005*



* In 2002: N=297, 2003: N=479, 2004: N=721 and 2005: N=576

§ In 2002-2003 Antimicrobial Agent was Doxycycline

Figure 9. MIC Distribution among all Antimicrobial Agents

Antimicrobial	Year (# of Isolates)	%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 (n=297)	0.0%	0.0%	[0.0 - 1.2]				0.7	2.7	23.6	68.0	4.0	1.0						
	2003 (n=479)	0.0%	0.2%	[0.0 - 1.2]					1.0	21.5	62.4	14.2	0.6				**0.2**		
	2004 (n=721)	0.0%	0.0%	[0.0 - 0.5]					1.4	4.8	85.3	8.5							
	2005 (n=576)	0.0%	0.0%	[0.0 - 0.6]						5.4	88.2	6.4							
Ketolides																			
Telithromycin	2004 (n=721)	1.1%	2.5%	[1.5 - 3.9]		0.3		0.3	0.4	15.2	42.4	22.4	13.5	2.1	1.02.5				
	2005 (n=576)	0.5%	2.8%	[1.6 - 4.5]		0.2			1.9	12.8	34.0	30.9	13.4	3.5	0.5	**2.8**			
Lincosamides																			
Clindamycin	2004 (n=721)	0.6%	2.4%	[1.4 - 3.7]			0.4	7.8	45.5	35.6	5.4	2.1	0.4	0.6	**0.8**	**1.4**			
	2005 (n=576)	0.7%	2.6%	[1.5 - 4.3]			0.7	6.4	45.8	33.0	10.1	0.5	0.2	0.7	**1.7**	**0.9**			
Macrolides																			
Azithromycin	2004 (n=721)	0.0%	3.2%	[2.0 - 4.7]			39.6	46.0	10.1	1.0									**3.3**
	2005 (n=576)	0.0%	3.3%	[2.0 - 5.1]		3.5	39.8	39.5	12.0	1.0	0.3	0.6	0.1						
Erythromycin	2002 (n=297)	80.5%	6.1%	[3.6 - 9.4]						0.7	12.8	35.7	34.3	10.4	**3.4**				**2.7**
	2003 (n=479)	78.3%	3.3%	[1.9 - 5.4]						2.3	16.1	43.6	**23.0**	11.7	**0.4**	**0.2**		**2.7**	
	2004 (n=721)	0.0%	3.2%	[2.0 - 4.7]				0.3	2.1	44.5	30.3	16.7	**2.4**	0.4	0.1				**3.1**
	2005 (n=576)	0.0%	3.3%	[2.0 - 5.1]				0.3	4.0	31.9	36.6	19.1	**4.5**	0.2					**3.3**
Penems																			
Meropenem	2002 (n=297)	0.0%	0.0%	[0.0 - 1.2]	0.7	20.9	37.4	27.3	10.1	3.4			**0.3**						
	2003 (n=479)	0.0%	0.0%	[0.0 - 0.8]		21.9	50.1	15.9	10.0	0.6	1.0	0.2	0.2						
Phenicols																			
Florfenicol[5]	2004 (n=721)	0.0%	0.0%	[0.0 - 0.5]					0.4		4.1	79.9	15.2	0.4					
	2005 (n=576)	0.0%	0.0%	[0.0 - 0.6]							8.5	71.4	19.4	0.7					
Quinolones[6]																			
Ciprofloxacin	2002 (n=297)	0.0%	13.8%	[10.1 - 18.3]				1.7	37.0	32.0	11.8	3.7				**10.1**	**3.0**	**0.7**	
	2003 (n=477)	0.2%	14.0%	[11.0 - 17.4]				1.9	48.8	26.8	8.2		0.2	**0.4**	**1.9**	**4.6**	**6.7**	**0.4**	
	2004 (n=721)	0.0%	15.4%	[12.8 - 18.2]			0.1	35.1	37.1	12.0		0.1		**0.3**	**7.1**	**6.8**	**1.3**		
	2005 (n=574)	0.2%	19.5%	[16.5 - 23.1]			0.2	21.4	44.1	14.1	0.5	0.2		**0.3**	**6.4**	**9.8**	**3.0**		
Nalidixic acid	2004 (n=721)	0.1%	15.4%	[12.8 - 18.2]										59.6	24.4	0.4	0.1	**1.3**	**14.2**
	2005 (n=574)	0.2%	19.3%	[16.5 - 23.1]										62.0	18.5		0.2	**2.3**	**17.1**
Tetracyclines																			
Doxycycline	2002 (n=297)	12.8%	27.6%	[22.6 - 33.1]				11.8	21.2	8.1	4.0	2.4	5.4	**6.7**	12.8	**10.1**	**14.8**	**2.7**	
	2003 (n=479)	14.2%	29.9%	[25.8 - 34.2]				17.1	23.4	5.4	1.7	1.5	2.5	4.4	14.2	**16.5**	**11.5**	**1.9**	
Tetracycline	2004 (n=721)	0.1%	48.8%	[45.1 - 52.5]				0.4	19.4	17.08.2	4.0	1.6	0.1	0.1	1.6	**3.8**	**19.4**	**24.4**	
	2005 (n=576)	0.0%	46.2%	[42.1 - 50.3]				0.5	14.6	21.0	9.5	5.9	1.7	0.5		**0.7**	**2.8**	**14.1**	**28.6**

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

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

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Black vertical bars indicate the breakpoints for susceptibility, while red vertical bars indicate the breakpoints for resistance. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for Azithromycin, Clindamycin, Gentamicin, Nalidixic Acid and Teltihromycin.

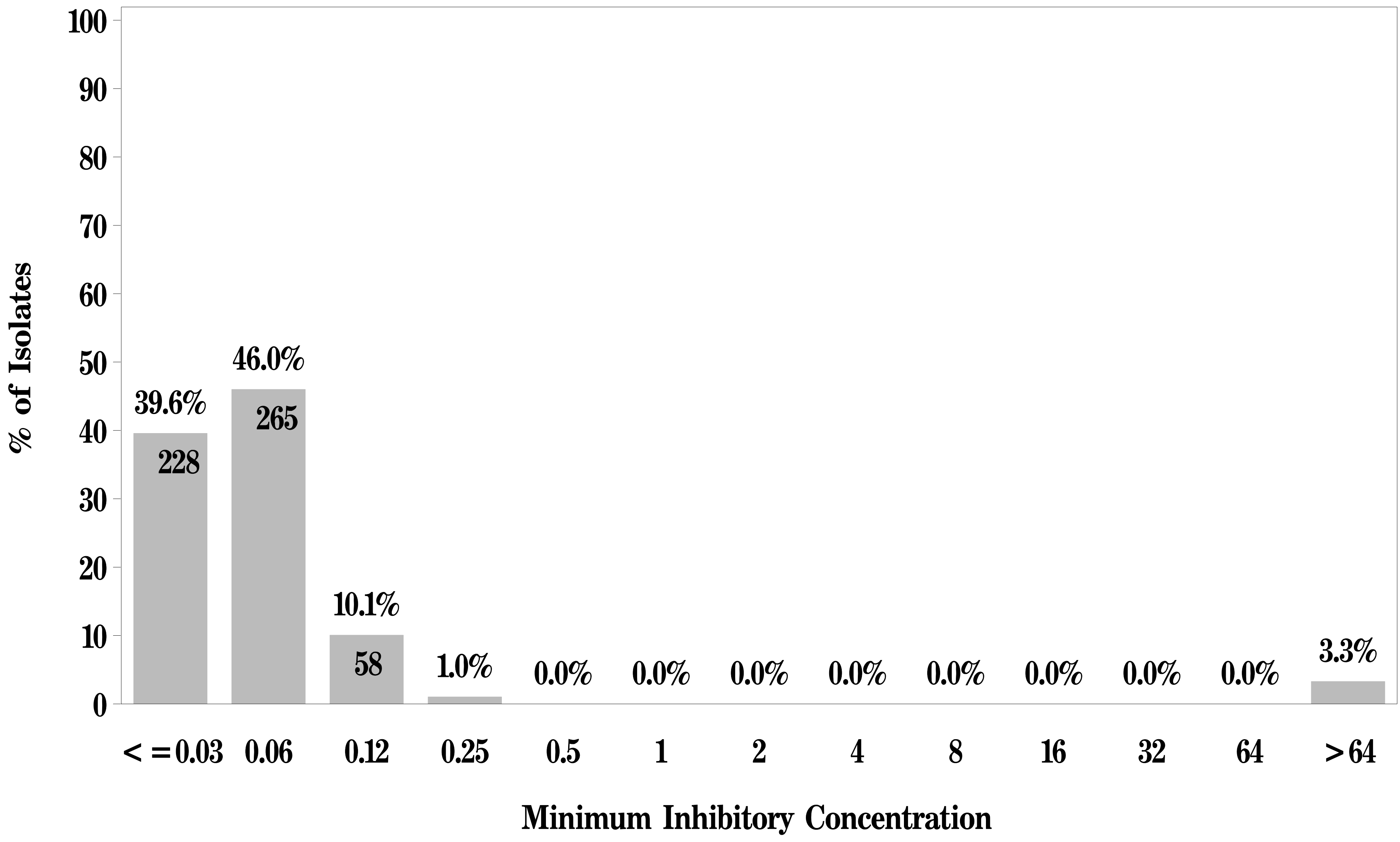
[5] For Florfenicol, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been establishe

[6] Presented for all species except *C. lari* , which is considered intrinsically resistant to Quinolones (N=479-2=477, N=576-2=574).

NARMS

Figure 9a: Minimum Inhibitory Concentration of Azithromycin for *Campylobacter* (N=576 Isolates)

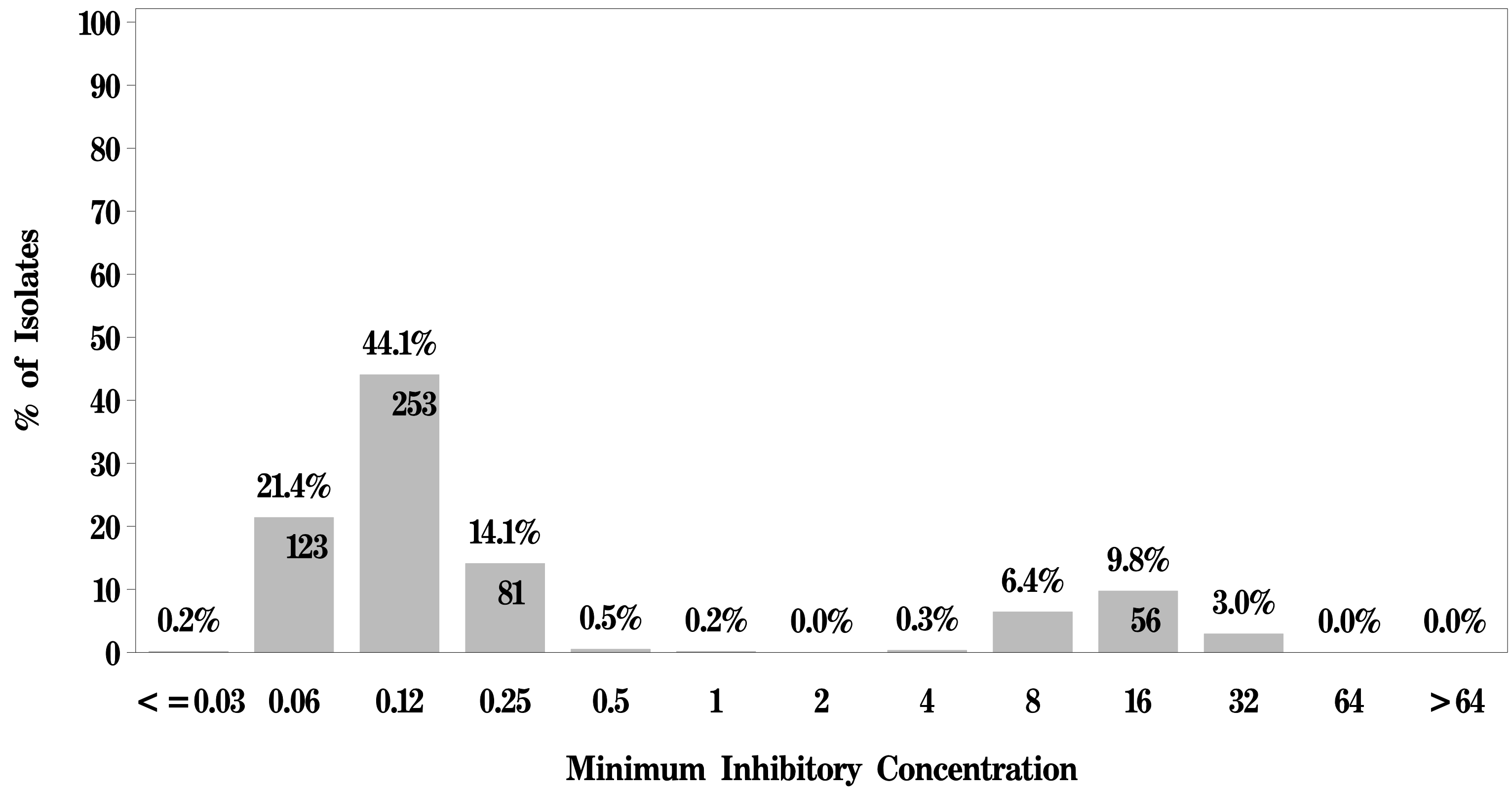
Breakpoints: Susceptible <=2 µg/mL Resistant >=8 µg/mL



NARMS

Figure 9b: Minimum Inhibitory Concentration of Ciprofloxacin* for *Campylobacter* (N=574 Isolates)

Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL

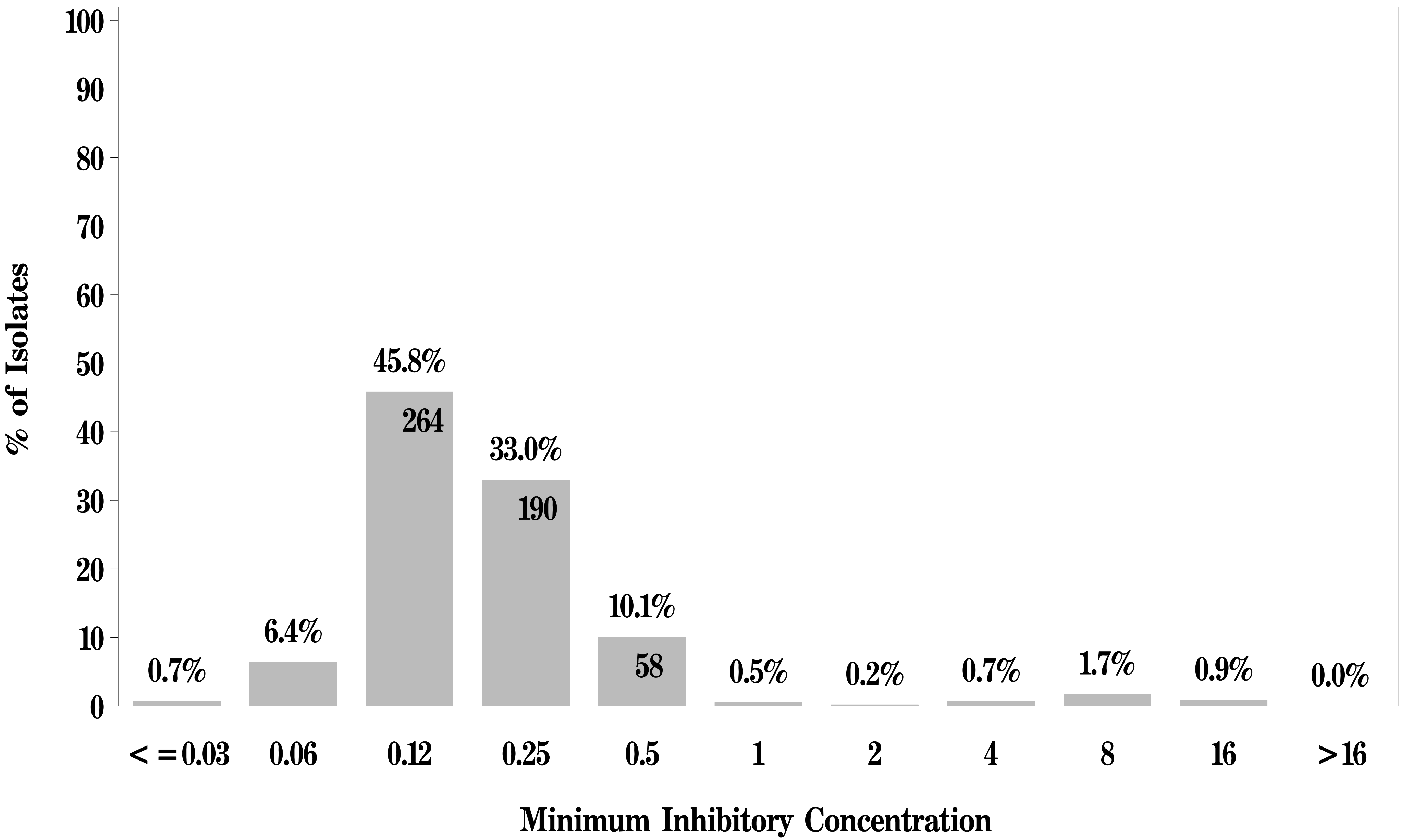


*Presented for all species except *C. lari* (N=576−2=574)

NARMS

Figure 9c: Minimum Inhibitory Concentration of Clindamycin for *Campylobacter* (N=576 Isolates)

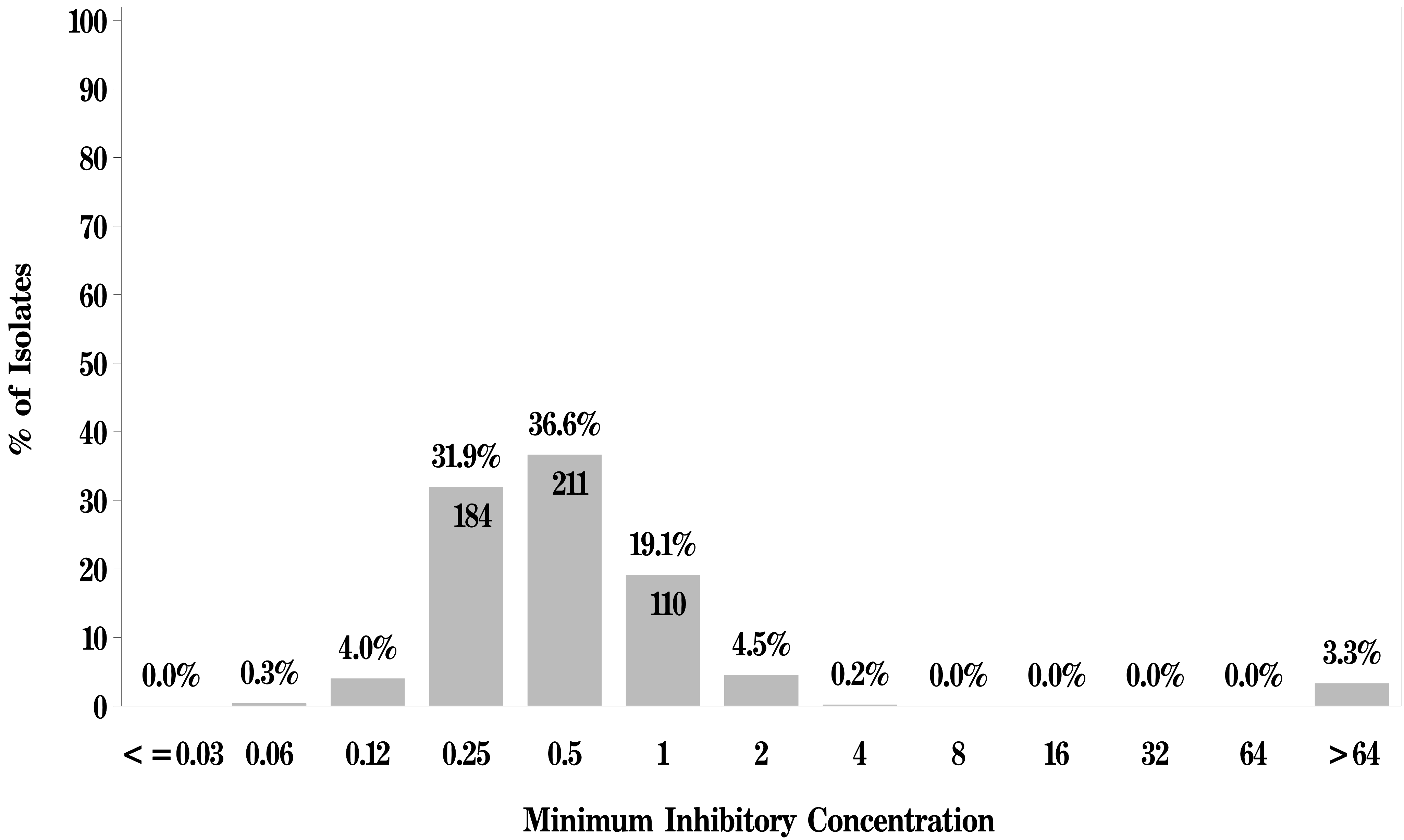
Breakpoints: Susceptible <=2 µg/mL Resistant >=8 µg/mL



NARMS

Figure 9d: Minimum Inhibitory Concentration of Erythromycin for *Campylobacter* (N=576 Isolates)

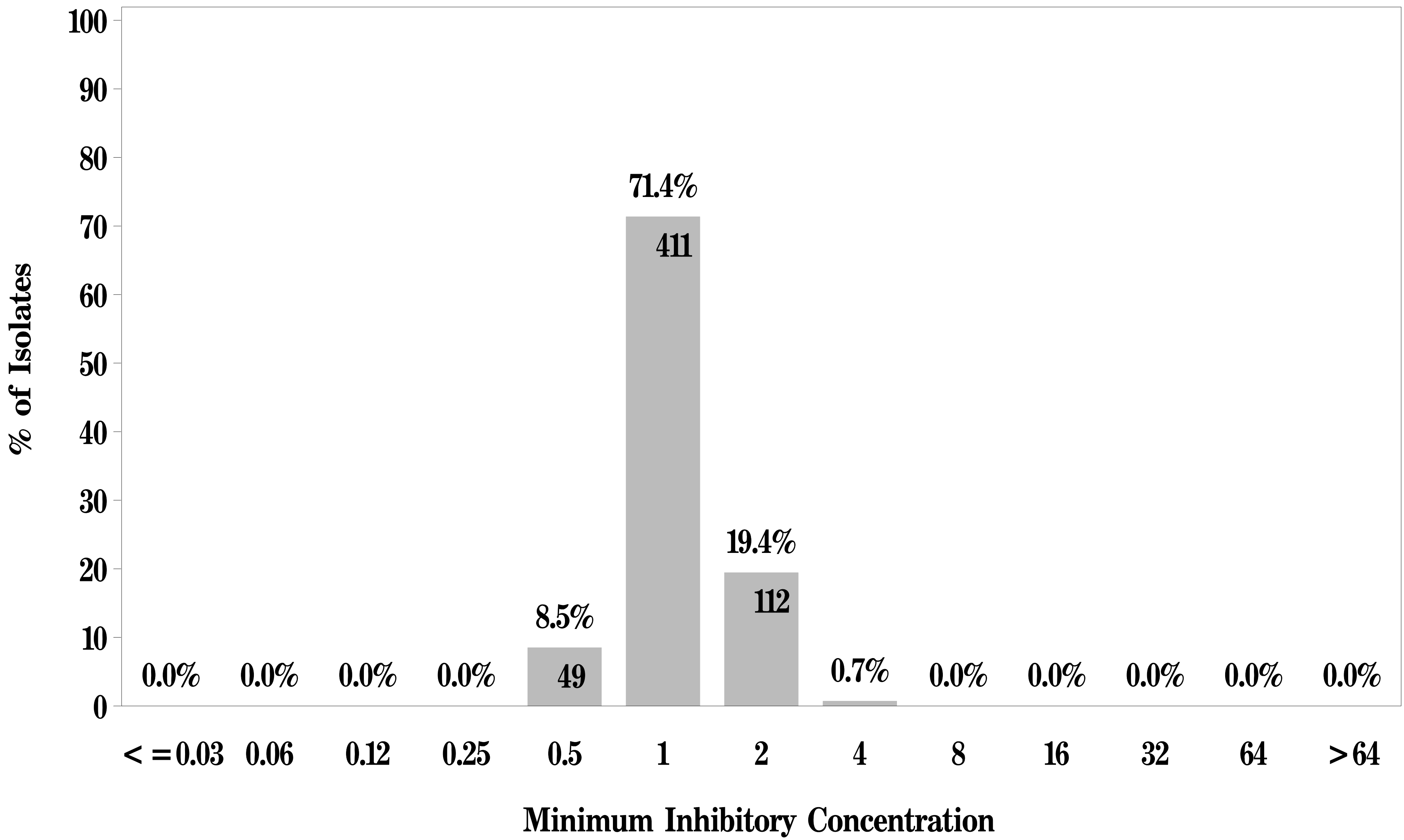
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL



NARMS

Figure 9e: Minimum Inhibitory Concentration of Florfenicol for *Campylobacter* (N=576 Isolates)

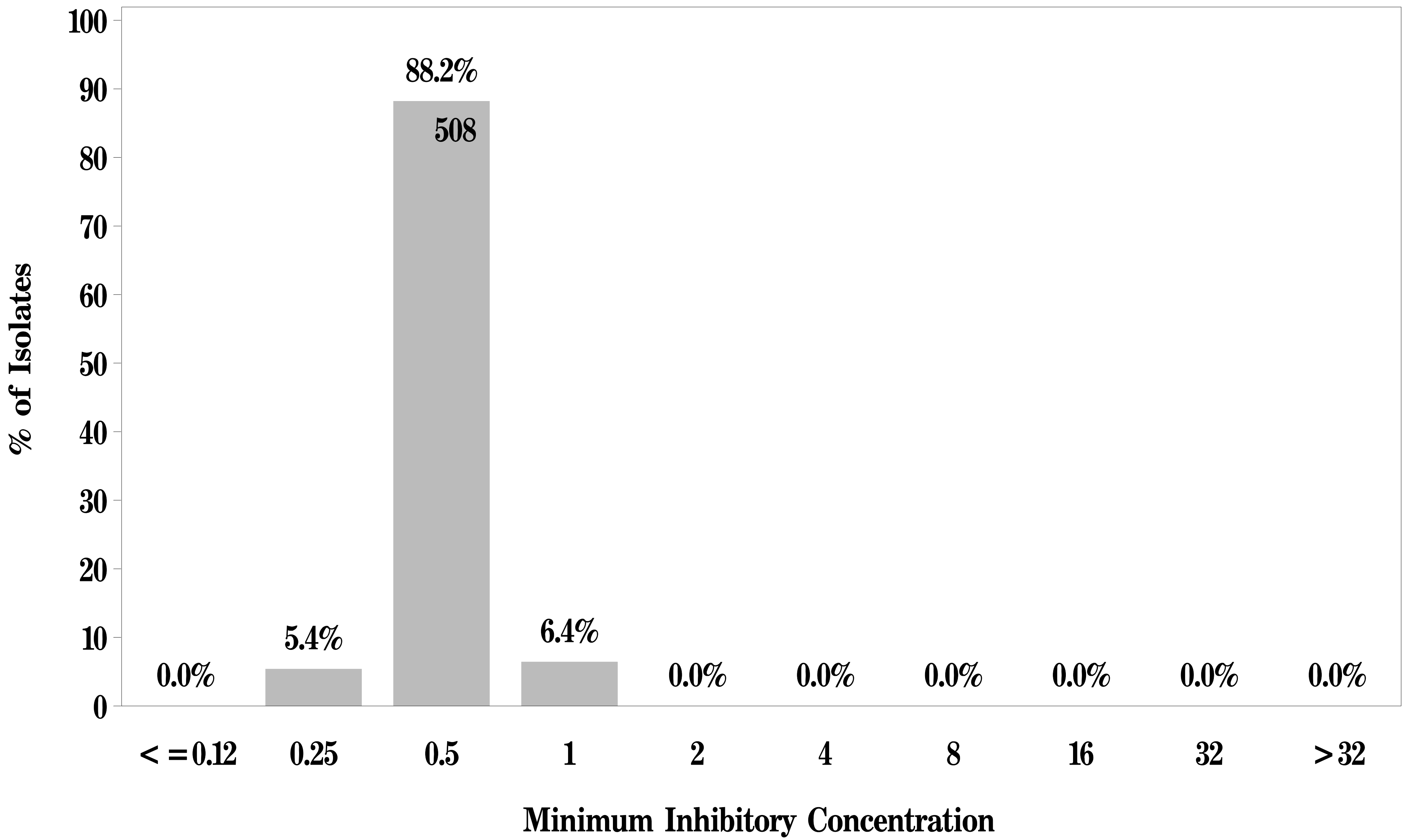
Breakpoints: Susceptible <=4 μg/mL Resistant >= μg/mL



NARMS

Figure 9f: Minimum Inhibitory Concentration of Gentamicin for *Campylobacter* (N=576 Isolates)

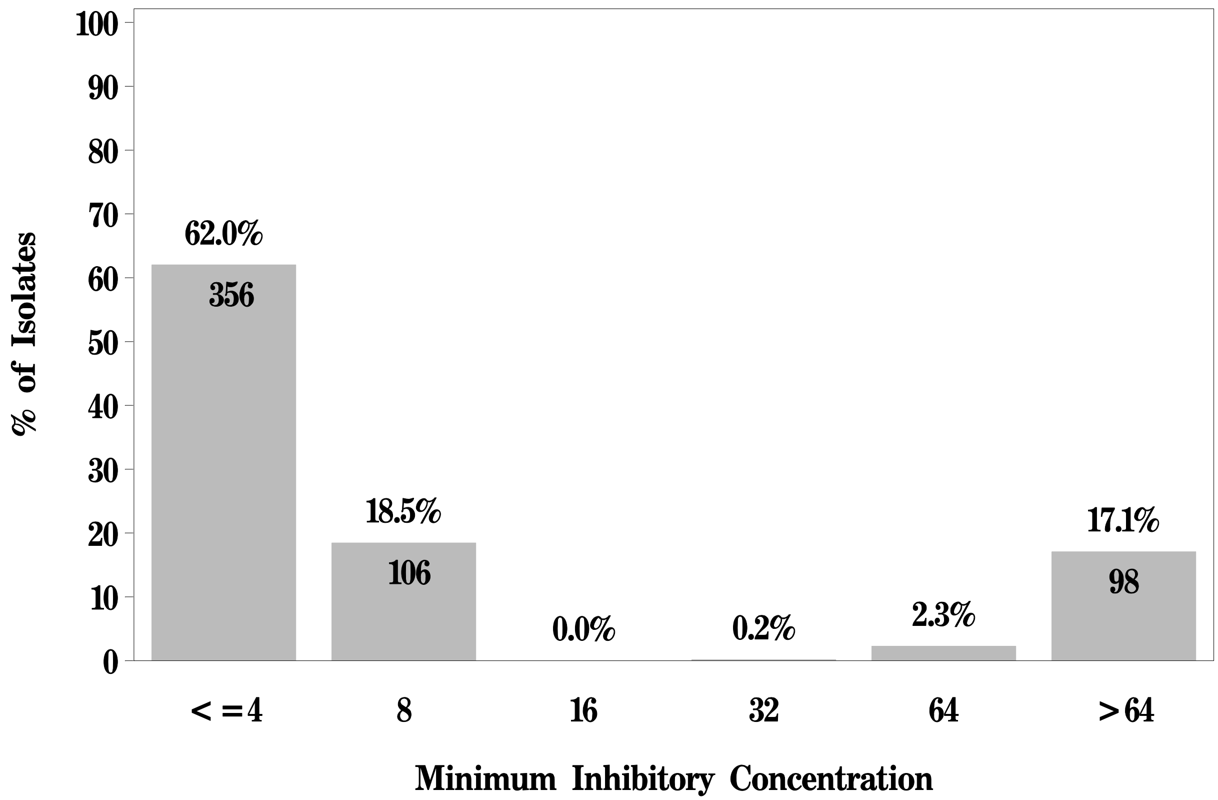
Breakpoints: Susceptible <=2 μg/mL Resistant >=8 μg/mL



NARMS

Figure 9g: Minimum Inhibitory Concentration of Nalidixic acid* for *Campylobacter* (N=574 Isolates)

Breakpoints: Susceptible <=16 μg/mL Resistant >=64 μg/mL

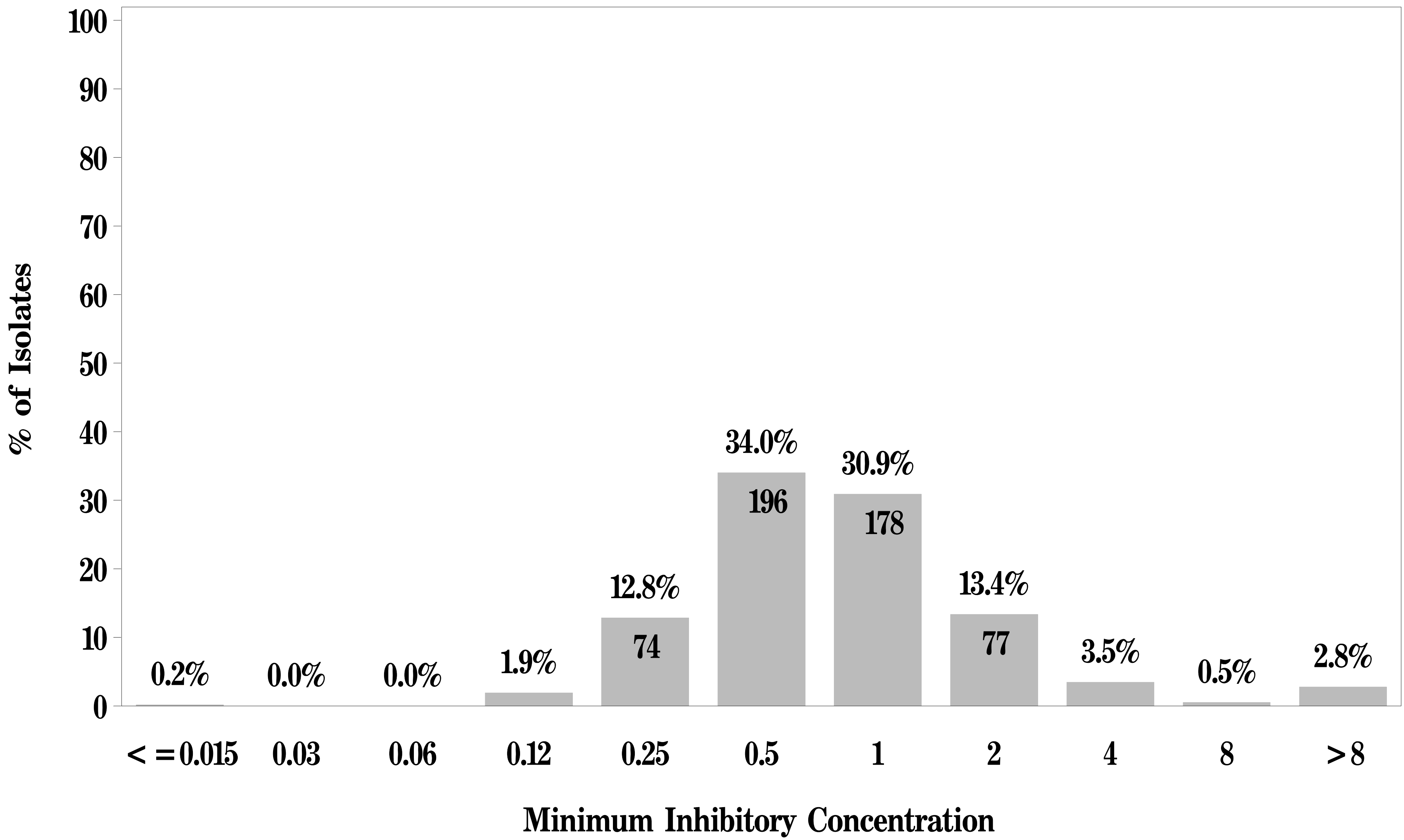


*Presented for all species except *C. lari* (N=576−2=574)

NARMS

Figure 9h: Minimum Inhibitory Concentration of Telithromycin for *Campylobacter* (N=576 Isolates)

Breakpoints: Susceptible <=4 µg/mL Resistant >=16 µg/mL



NARMS

Figure 9i: Minimum Inhibitory Concentration of Tetracycline for *Campylobacter* (N=576 Isolates)

Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL

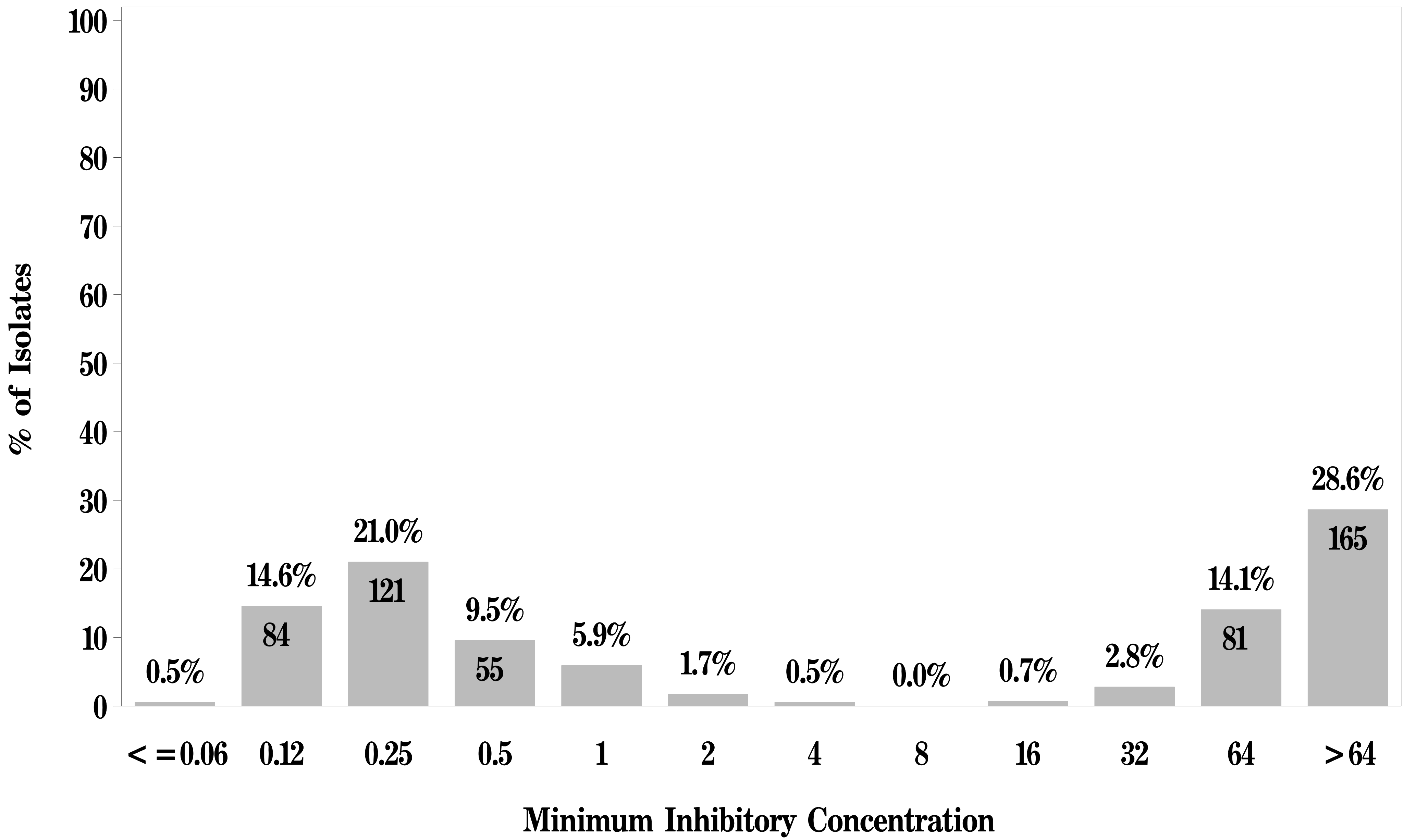


Figure 10a. MIC Distribution among *Campylobacter* from Chicken Breast

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.008	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128
					Distribution (%) of MICs (µg/ml)[4]														
Aminoglycosides																			
Gentamicin	2002 (n=288)	0.0%	0.0%	[0.0 - 1.3]				0.7	2.4	24.3	68.8	3.8							
	2003 (n=469)	0.0%	0.2%	[0.0 - 1.2]					1.1	21.7	62.9	13.6	0.4				**0.2**		
	2004 (n=706)	0.0%	0.0%	[0.0 - 0.5]					1.4	4.8	85.3	8.5							
	2005 (n=554)	0.0%	0.0%	[0.0 - 0.7]						5.1	88.8	6.1							
Ketolides																			
Telithromycin	2004 (n=706)	1.0%	2.5%	[1.5 - 4.0]		0.3		0.3	0.4	15.2	42.4	22.4	13.5	2.1	1.0	**2.5**			
	2005 (n=554)	0.5%	2.5%	[1.4 - 4.2]		0.2			1.8	13.0	34.5	30.7	13.2	3.6	0.5	**2.5**			
Lincosamides																			
Clindamycin	2004 (n=706)	0.6%	2.3%	[1.3 - 3.7]			0.4	7.8	45.5	35.6	5.4	2.1	0.4	0.6	**0.8**	**1.4**			
	2005 (n=554)	0.4%	2.7%	[1.5 - 4.4]			0.5	6.3	45.7	33.6	10.1	0.5	0.2	0.4	**1.8**	**0.9**			
Macrolides																			
Azithromycin	2004 (n=706)	0.0%	3.1%	[2.0 - 4.7]		3.5	39.8	39.5	12.0	1.0	0.3	0.6	0.1						**3.1**
	2005 (n=554)	0.0%	3.1%	[1.8 - 4.9]			39.9	45.8	10.1	1.1									**3.1**
Erythromycin	2002 (n=288)	80.9%	5.9%	[3.5 - 9.3]						0.7	12.5	36.1	35.4	9.4	**3.5**				**2.4**
	2003 (n=469)	78.7%	2.8%	[1.5 - 4.7]						2.3	16.2	43.7	23.0	11.9	**0.4**	**0.2**			**2.1**
	2004 (n=706)	0.0%	3.1%	[2.0 - 4.7]				0.3	2.1	44.5	30.3	16.7	**2.4**	0.4	0.1				**3.1**
	2005 (n=554)	0.0%	3.1%	[1.8 - 4.9]				0.4	32.5	36.5	18.8	4.7	**0.2**						**3.1**
Penems																			
Meropenem	2002 (n=288)	0.0%	0.0%	[0.0 - 1.3]	0.4	20.5	38.5	27.8	9.4	3.5									
	2003 (n=469)	0.0%	0.0%	[0.0 - 0.8]		22.4	50.1	15.6	10.0	0.6	1.1	0.2							
Phenicols																			
Florfenicol[5]	2004 (n=706)	0.0%	0.0%	[0.0 - 0.5]					0.4		4.1	79.9	15.2	0.4					
	2005 (n=554)	0.0%	0.0%	[0.0 - 0.7]							8.5	71.7	19.1	0.7					
Quinolones[6]																			
Ciprofloxacin	2002 (n=288)	0.0%	13.5%	[9.8 - 18.0]				1.7	37.5	31.9	11.5	3.8				**10.1**	**3.1**	**0.4**	
	2003 (n=467)	0.2%	14.1%	[11.1 - 17.6]				1.9	49.0	26.3	8.4		0.2	**0.4**	**1.9**	**4.5**	**6.9**	**0.4**	
	2004 (n=706)	0.0%	15.4%	[12.9 - 18.3]			0.1	35.1	37.1	12.0		0.1		**0.3**	**7.1**	**6.8**	**1.3**		
	2005 (n=554)	0.0%	19.0%	[15.8 - 22.5]				21.1	44.9	14.4	0.4	0.2		**0.3**	**6.4**	**9.0**	**3.1**		
Nalidixic acid	2004 (n=706)	0.1%	15.4%	[12.9 - 18.3]										59.6	24.4	0.4	0.1	**1.3**	**14.2**
	2005 (n=554)	0.2%	18.8%	[15.6 - 22.3]										62.3	18.8		0.2	**1.6**	**17.1**
Tetracyclines																			
Doxycycline	2002 (n=288)	12.8%	27.4%	[22.4 - 33.0]				11.8	21.2	8.3	4.2	2.4	5.6	**6.3**	12.9	**10.1**	**14.9**	**2.4**	
	2003 (n=469)	14.1%	29.4%	[25.3 - 33.8]				17.3	23.7	5.5	1.7	1.3	2.6	4.5	14.1	**16.0**	**11.5**	**1.9**	
Tetracycline	2004 (n=706)	0.1%	49.2%	[45.4 - 52.9]				0.4	19.4	17.0	8.2	4.0	1.6	0.1	0.1	**1.6**	**3.8**	**19.4**	**24.4**
	2005 (n=554)	0.0%	45.3%	[41.1 - 49.6]				0.5	14.6	21.1	9.9	6.1	1.8	0.5		0.7	2.7	14.3	27.6

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while red vertical bars indicate the breakpoints for resistance. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for Azithromycin, Clindamycin, Gentamicin, Nalidixic Acid and Teltihromycin.

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

[6] Presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones (N=479-2=477).

Figure 10b. MIC Distribution among *Campylobacter* from Ground Turkey

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.008	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128
					Distribution (%) of MICs (µg/ml)[4]														
Aminoglycosides																			
Gentamicin	2002 (n=4)	0.0%	0.0%	[0.0 - 60.2]					25.0		75.0								
	2003 (n=5)	0.0%	0.0%	[0.0 - 52.2]						20.0	40.0	40.0							
	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]						8.3	66.7	25.0							
	2005 (n=20)	0.0%	0.0%	[0.0 - 16.8]						15.0	75.0	10.0							
Telithromycin	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]						8.3	16.7	75.0							
	2005 (n=20)	0.0%	10.0%	[1.2 - 31.7]					5.0	5.0	25.0	35.0	20.0			**10.0**			
Clindamycin	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]					25.0	25.0	8.3	41.7							
	2005 (n=20)	10.0%	0.0%	[0.0 - 16.8]			5.0		55.0	20.0	10.0			10.0					
Azithromycin	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]		8.3	8.3	33.3	50.0										
	2005 (n=20)	0.0%	10.0%	[1.2 - 31.7]			30.0	50.0	10.0										**10.0**
Erythromycin	2002 (n=4)	75.0%	0.0%	[0.0 - 60.2]							0.5	25.0		50.0					
	2003 (n=5)	80.0%	0.0%	[0.0 - 52.2]							20.0	60.0	**20.0**						
	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]					8.3	8.3	16.7	66.7							
	2005 (n=20)	0.0%	10.0%	[1.2 - 31.7]					5.0	15.0	40.0	30.0			**10.0**				
Penems																			
Meropenem	2002 (n=12)	0.0%	0.0%	[0.0 - 60.2]		50.0		25.0					25.0						
	2003 (n=20)	0.0%	0.0%	[0.0 - 52.2]			80.0						20.0						
Phenicols																			
Florfenicol[5]	2004 (n=12)	0.0%	0.0%	[0.0 - 26.5]							16.7	16.7	66.7						
	2005 (n=20)	0.0%	0.0%	[0.0 - 16.8]							5.0	65.0	30.0						
Quinolones[6]																			
Ciprofloxacin	2002 (n=4)	0.0%	50.0%	[6.8 - 93.2]						50.0						**25.0**		**25.0**	
	2003 (n=5)	0.0%	20.0%	[0.5 - 71.6]					40.0	40.0						**20.0**			
	2004 (n=12)	0.0%	16.7%	[2.1 - 48.4]				25.0	58.3								**16.7**		
	2005 (n=19)	0.0%	31.6%	[15.4 - 59.2]			5.3	31.6	21.1	5.3	5.3					**31.6**			
Nalidixic acid	2004 (n=12)	0.0%	16.7%	[2.1 - 48.4]										33.3	50.0				**16.7**
	2005 (n=19)	0.0%	31.6%	[15.4 - 59.2]										57.9	10.5			**21.1**	**10.5**
Tetracyclines																			
Doxycycline	2002 (n=4)	25.0%	50.0%	[6.8 - 93.2]					25.0						25.0	**25.0**	**25.0**		
	2003 (n=5)	20.0%	60.0%	[14.7 - 94.7]					20.0						20.0	**40.0**	**20.0**		
Tetracycline	2004 (n=12)	0.0%	25.0%	[5.5 - 57.2]					8.3	16.7	8.3	25.0	16.7					**8.3**	**16.7**
	2005 (n=20)	0.0%	75.0%	[50.9 - 91.3]					5.0	20.0							**5.0**	**10.0**	**60.0**

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while red vertical bars indicate the breakpoints for resistance. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for Azithromycin, Clindamycin, Gentamicin, Nalidixic Acid and Teltihromycin.

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

[6] Presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones (N=20-1=19).

Figure 10c. MIC Distribution among *Campylobacter* from Ground Beef

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	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 (n=0)																		
	2003 (n=1)	0.0%	0.0%	[0.0 - 97.5]							100.0								
	2004 (n=0)																		
	2005 (n=0)																		
Ketolides																			
Telithromycin	2004 (n=0)																		
	2005 (n=0)																		
Lincosamides																			
Clindamycin	2004 (n=0)																		
	2005 (n=0)																		
Macrolides																			
Azithromycin	2004 (n=0)																		
	2005 (n=0)																		
Erythromycin	2002 (n=0)																		
	2003 (n=1)	100.0%	0.0%	[0.0 - 97.5]								100.0							
	2004 (n=0)																		
	2005 (n=0)																		
Penems																			
Meropenem	2002 (n=0)																		
	2003 (n=1)	0.0%	0.0%	[0.0 - 97.5]			100.0												
Phenicols																			
Florfenicol[5]	2004 (n=0)																		
	2005 (n=0)																		
Quinolones																			
Ciprofloxacin	2002 (n=0)																		
	2003 (n=1)	0.0%	0.0%	[0.0 - 97.5]						100.0									
	2004 (n=0)																		
	2005 (n=0)																		
Nalidixic acid	2004 (n=0)																		
	2005 (n=0)																		
Tetracyclines																			
Doxycycline	2002 (n=0)																		
	2003 (n=1)	0.0%	0.0%	[0.0 - 97.5]				100.0											
Tetracycline	2004 (n=0)																		
	2005 (n=0)																		

Distribution (%) of MICs (µg/ml)[4]

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while red vertical bars indicate the breakpoints for resistance. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for Azithromycin, Clindamycin, Gentamicin, Nalidixic Acid and Teltihromycin.

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

Figure 10d. MIC Distribution among *Campylobacter* from Pork Chop

Antimicrobial	Year (# of Isolates)	%I[1]	%R[2]	[95% CI][3]	0.008	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128
										Distribution (%) of MICs (µg/ml)[4]									
Aminoglycosides																			
Gentamicin	2002 (n=5)	0.0%	0.0%	[0.0 - 52.2]							20.0	20.0	60.0						
	2003 (n=4)	0.0%	0.0%	[0.0 - 60.2]							25.0	50.0	25.0						
	2004 (n=3)	0.0%	0.0%	[0.0 - 70.8]								100.0							
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]							50.0	50.0							
Telithromycin	2004 (n=3)	33.3%	0.0%	[0.0 - 70.8]						33.3		33.3			33.3				
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]						50.0		50.0							
Clindamycin	2004 (n=3)	0.0%	33.3%	[0.8 - 90.6]						66.7						**33.3**			
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]				100.0											
Azithromycin	2004 (n=3)	0.0%	33.3%	[0.8 - 90.6]		33.3		33.3											**33.3**
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]			50.0	50.0											
Erythromycin	2002 (n=5)	60.0%	20.0%	[0.5 - 71.6]							20.0	20.0		40.0					**20.0**
	2003 (n=4)	25.0%	75.0%	[19.4 - 99.4]									**25.0**						**75.0**
	2004 (n=3)	0.0%	33.3%	[0.8 - 90.6]						33.3		33.3							**33.3**
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]						50.0	50.0								
Penems																			
Meropenem	2004 (n=3)	0.0%	0.0%	[0.0 - 52.2]	20.0	20.0			60.0										
	2005 (n=2)	0.0%	0.0%	[0.0 - 60.2]				75.0	25.0										
Phenicols																			
Florfenicol[5]	2004 (n=3)	0.0%	0.0%	[0.0 - 70.8]								66.7		33.3					
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]							50.0	50.0							
Quinolones[6]																			
Ciprofloxacin	2002 (n=5)	0.0%	0.0%	[0.0 - 52.2]					40.0	20.0	40.0								
	2003 (n=4)	0.0%	0.0%	[0.0 - 60.2]					50.0	50.0									
	2004 (n=3)	0.0%	0.0%	[0.0 - 70.8]					100.0										
	2005 (n=1)	0.0%	100.0%	[1.3 - 98.7]											**100.0**				
Nalidixic acid	2004 (n=3)	0.0%	0.0%	[0.0 - 70.8]											66.7	33.3			
	2005 (n=1)	0.0%	100.0%	[15.8 - 100.0]															**100.0**
Tetracyclines																			
Doxycycline	2002 (n=5)	0.0%	20.0%	[0.5 - 71.6]				20.0	20.0					**40.0**				**20.0**	
	2003 (n=4)	25.0%	50.0%	[6.8 - 93.2]								25.0			25.0	**50.0**			
Tetracycline	2004 (n=3)	0.0%	66.7%	[9.4 - 99.2]							33.3								**66.7**
	2005 (n=2)	0.0%	0.0%	[0.0 - 84.2]					100.0										

[1] Percent of isolates with intermediate susceptibility.

[2] Percent of isolates that were resistant.

[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. Black vertical bars indicate the breakpoints for susceptibility, while red vertical bars indicate the breakpoints for resistance. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. There are no CLSI breakpoints for Azithromycin, Clindamycin, Gentamicin, Nalidixic Acid and Teltihromycin.

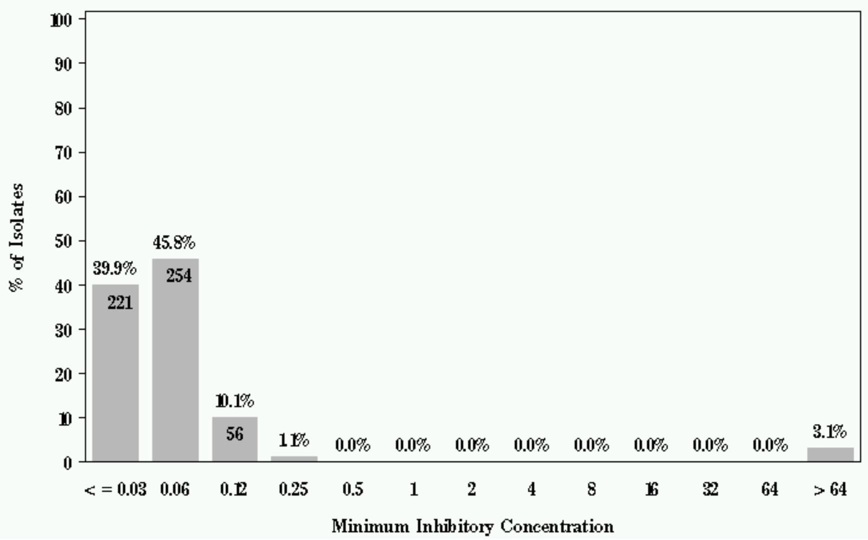
[5] For Florfenicol, percent non-susceptible is reported rather than percent resistant because a resistance breakpoint has not been established.

[6] Presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones (N=2-1=1).

NARMS

Figure 11a: Minimum Inhibitory Concentration of Azithromycin for *Campylobacter* in Chicken Breast (N= 554 Isolates)

Breakpoints: Susceptible< = 2 µg/mL Resistant> = 8 µg/mL

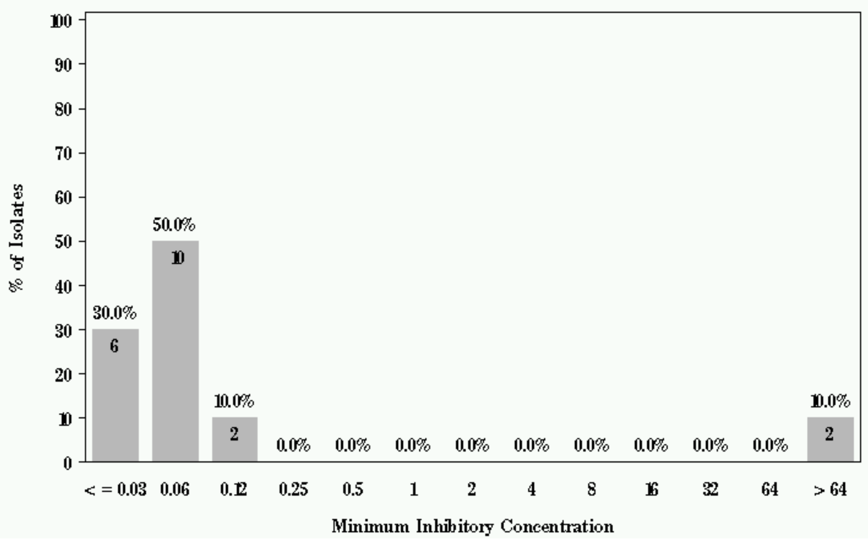


No Isolates found in Ground Beef in 2005

NARMS

Figure 11a: Minimum Inhibitory Concentration of Azithromycin for *Campylobacter* in Ground Turkey (N= 20 Isolates)

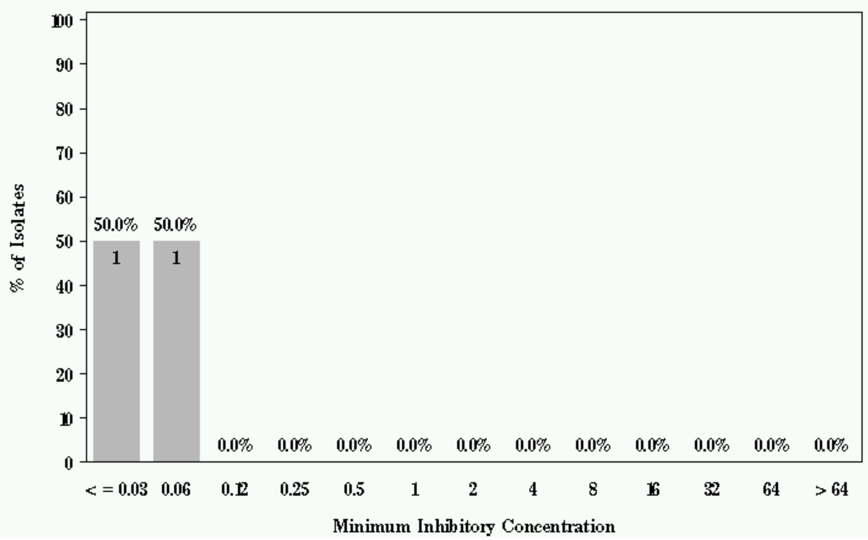
Breakpoints: Susceptible< = 2 µg/mL Resistant> = 8 µg/mL



NARMS

Figure 11a: Minimum Inhibitory Concentration of Azithromycin for *Campylobacter* in Pork Chop (N= 2 Isolates)

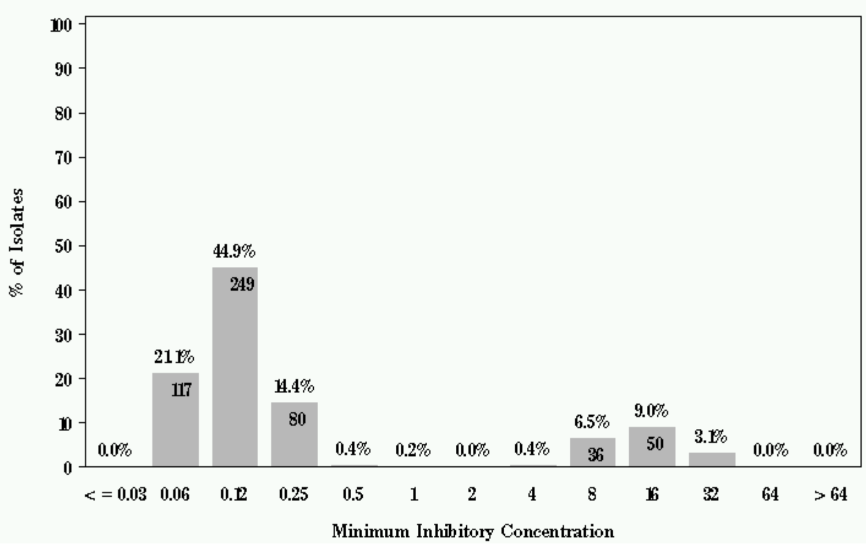
Breakpoints: Susceptible< = 2 µg/mL Resistant> = 8 µg/mL



NARMS

Figure 11b: Minimum Inhibitory Concentration of Ciprofloxacin for *Campylobacter* in Chicken Breast (N=554 Isolates)

Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL

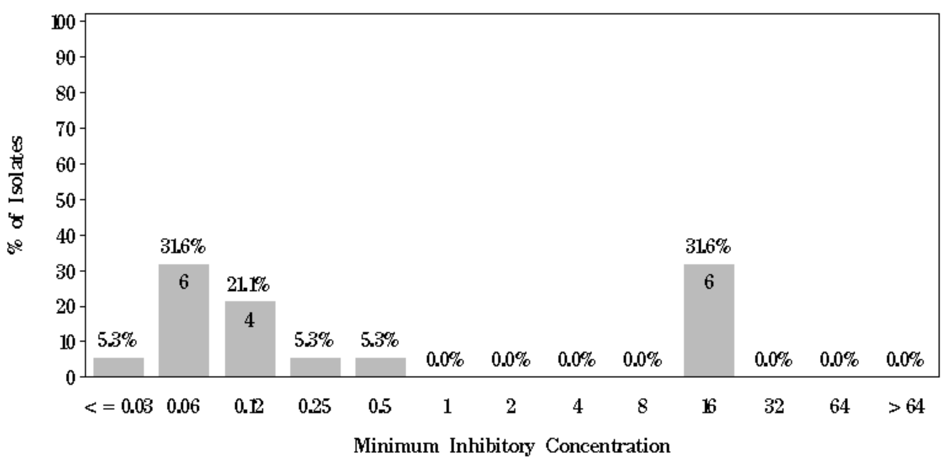


No Isolates found in Ground Beef in 2005

NARMS

Figure 11b: Minimum Inhibitory Concentration of Ciprofloxacin* for *Campylobacter* in Ground Turkey (N=19 Isolates)

Breakpoints: Susceptible<=1 βg/mL Resistant>=4 µg/mL

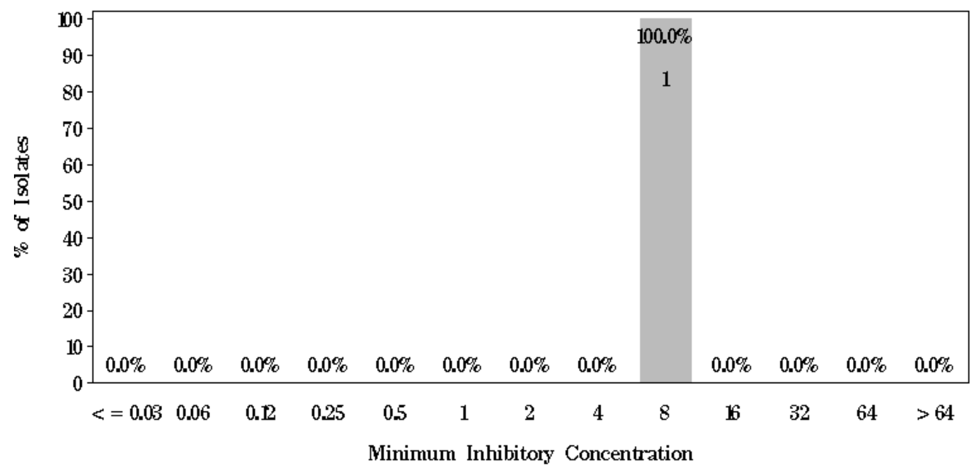


*Presented for all species except *C. lari* (N=20−1=19)

NARMS

Figure 11b: Minimum Inhibitory Concentration of Ciprofloxacin* for *Campylobacter* in Pork Chop (N=1 Isolates)

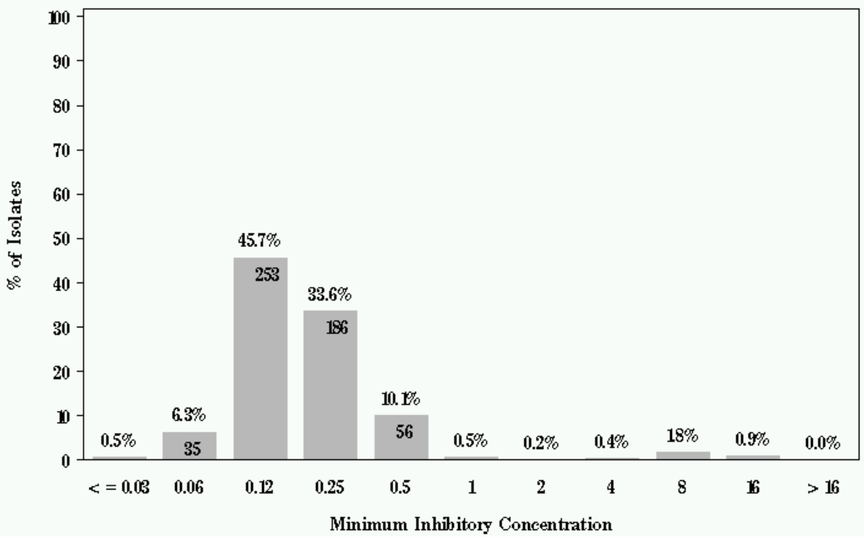
Breakpoints: Susceptible<=1 βg/mL Resistant>=4 µg/mL



*Presented for all species except *C. lari* (N=2−1=1)

NARMS

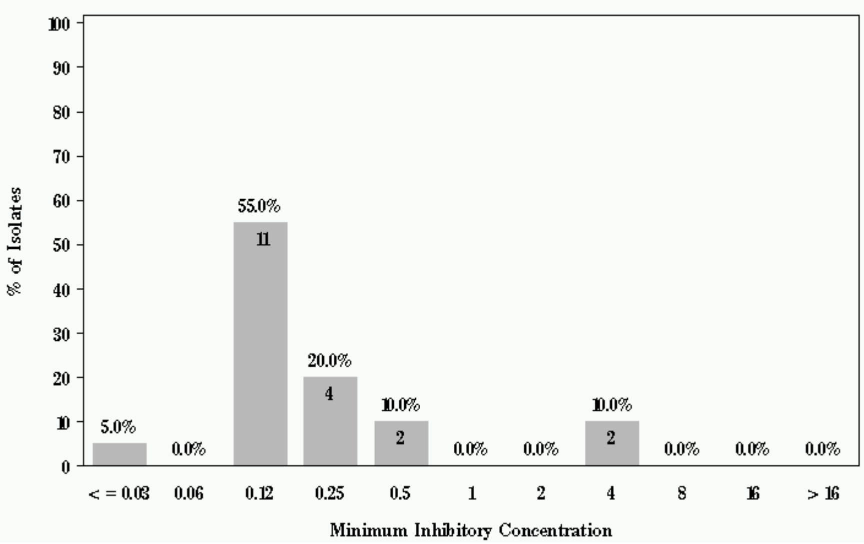
Figure 11c: Minimum Inhibitory Concentration of Clindamycin
for *Campylobacter* in Chicken Breast (N= 554 Isolates)
Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL



No Isolates found in Ground Beef in 2005

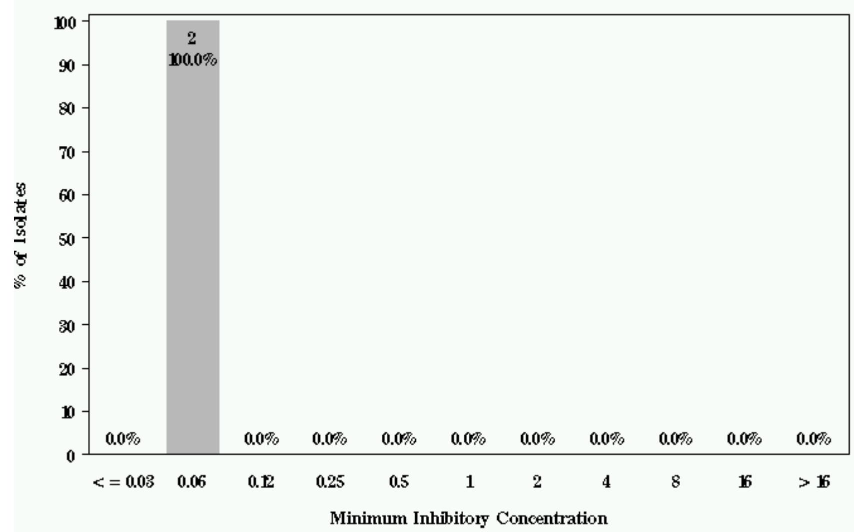
NARMS

Figure 11c: Minimum Inhibitory Concentration of Clindamycin
for *Campylobacter* in Ground Turkey (N= 20 Isolates)
Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL



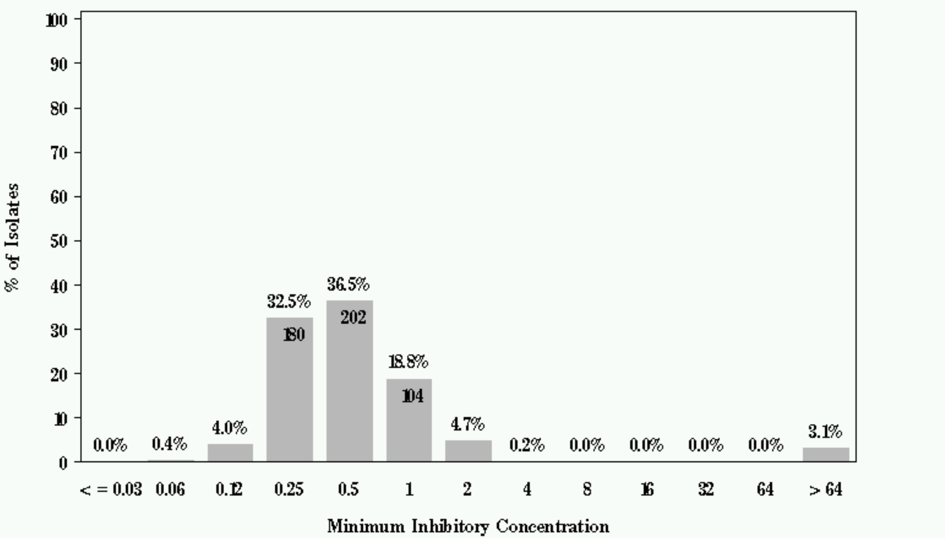
NARMS

Figure 11c: Minimum Inhibitory Concentration of Clindamycin
for *Campylobacter* in Pork Chop (N= 2 Isolates)
Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL



NARMS

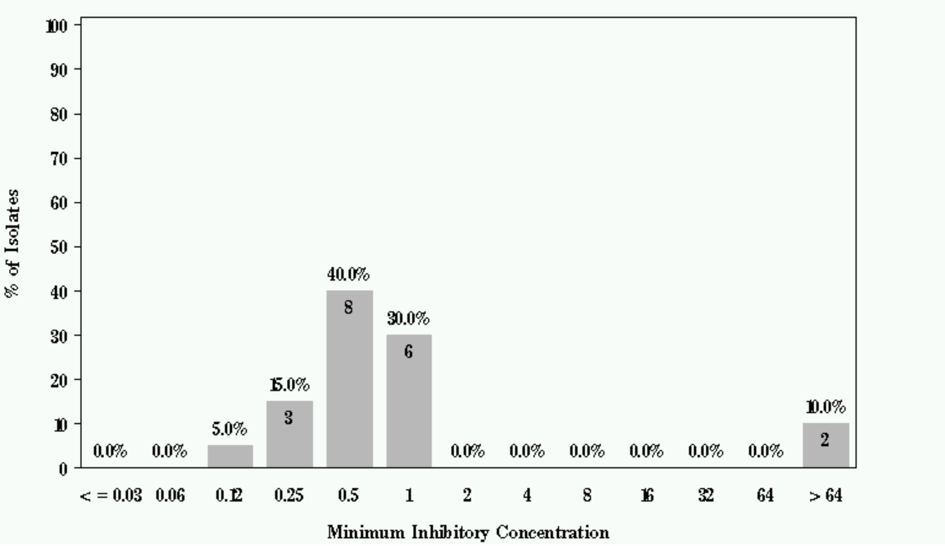
Figure 11d: Minimum Inhibitory Concentration of Erythromycin
for *Campylobacter* in Chicken Breast (N= 554 Isolates)
Breakpoints: Susceptible< =8 μg/mL Resistant> =32 μg/mL



No Isolates found in Ground Beef in 2005

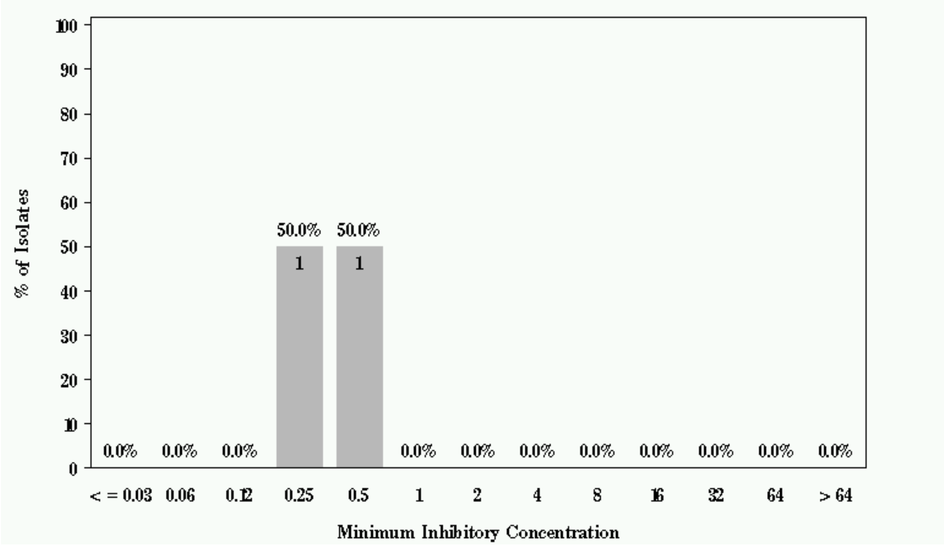
NARMS

Figure 11d: Minimum Inhibitory Concentration of Erythromycin
for *Campylobacter* in Ground Turkey (N= 20 Isolates)
Breakpoints: Susceptible< =8 μg/mL Resistant> =32 μg/mL



NARMS

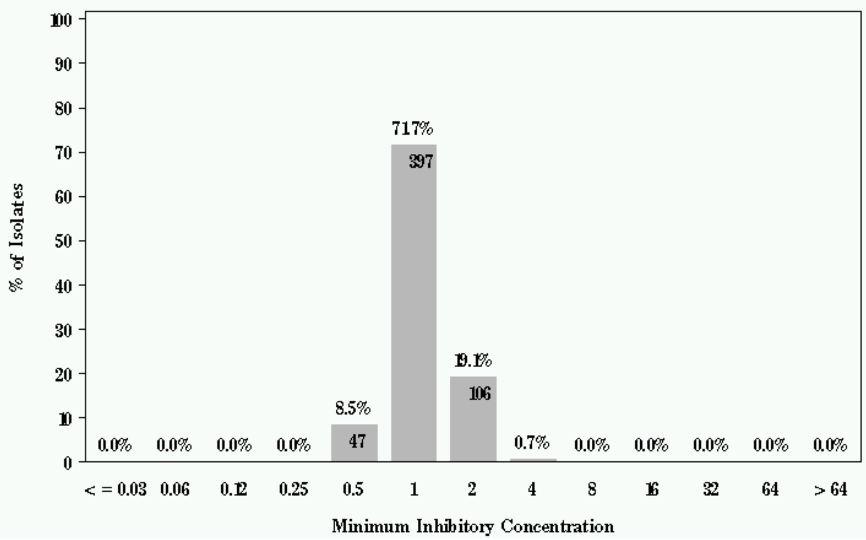
Figure 11d: Minimum Inhibitory Concentration of Erythromycin
for *Campylobacter* in Pork Chop (N= 2 Isolates)
Breakpoints: Susceptible< =8 μg/mL Resistant> =32 μg/mL



NARMS

Figure 11e: Minimum Inhibitory Concentration of Florfenicol for *Campylobacter* in Chicken Breast (N= 554 Isolates)

Breakpoints: Susceptible< = 4 µg/mL Resistant> = µg/mL

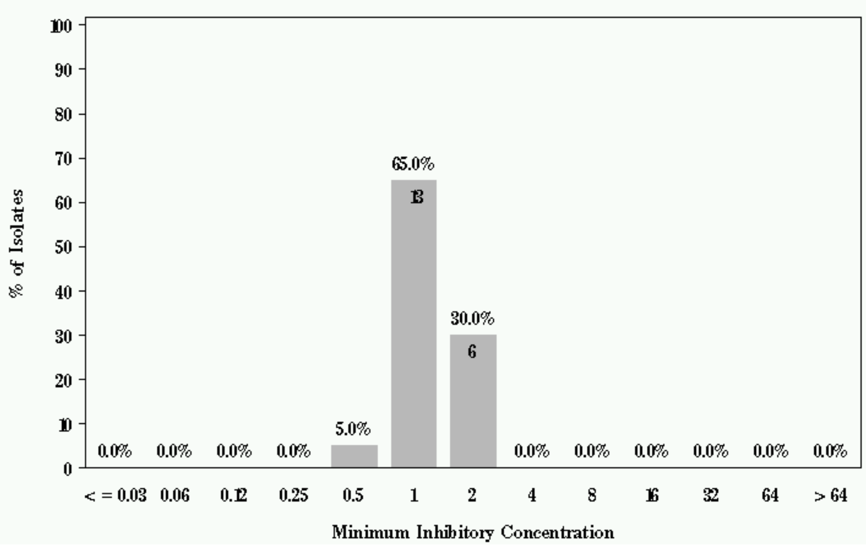


No Isolates found in Ground Beef in 2005

NARMS

Figure 11e: Minimum Inhibitory Concentration of Florfenicol for *Campylobacter* in Ground Turkey (N= 20 Isolates)

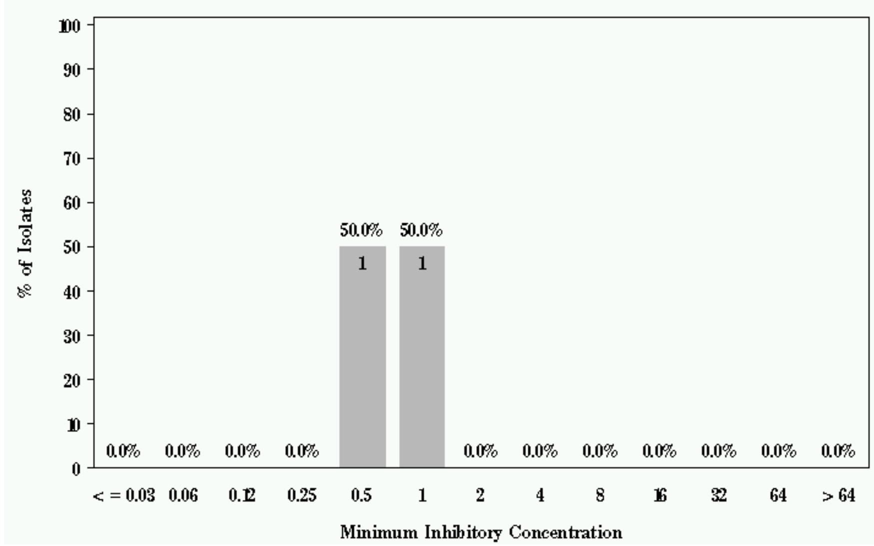
Breakpoints: Susceptible< = 4 µg/mL Resistant> = µg/mL



NARMS

Figure 11e: Minimum Inhibitory Concentration of Florfenicol for *Campylobacter* in Pork Chop (N= 2 Isolates)

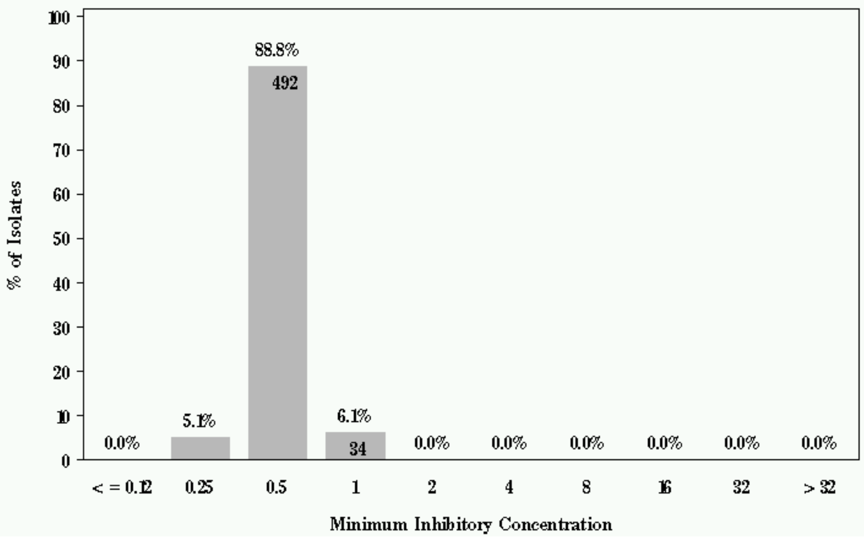
Breakpoints: Susceptible< = 4 µg/mL Resistant> = µg/mL



NARMS

Figure 11f: Minimum Inhibitory Concentration of Gentamicin for *Campylobacter* in Chicken Breast (N= 554 Isolates)

Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL

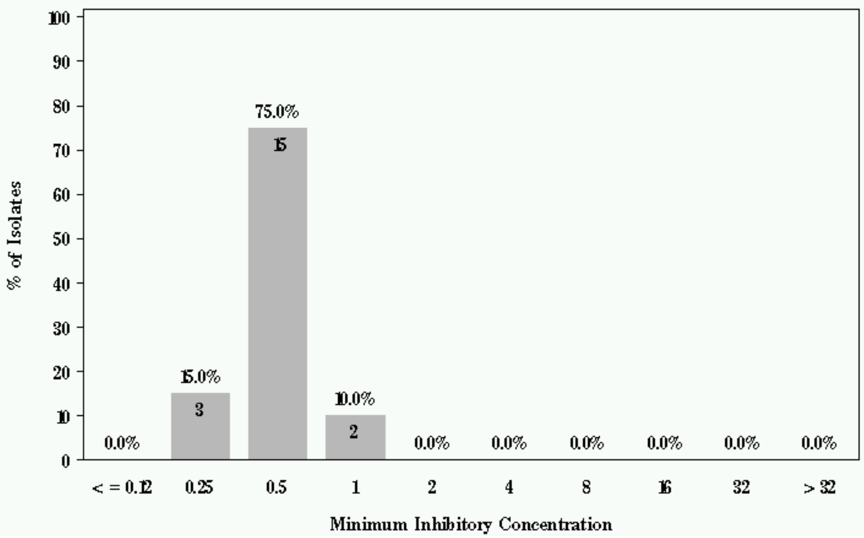


No Isolates found in Ground Beef in 2005

NARMS

Figure 11f: Minimum Inhibitory Concentration of Gentamicin for *Campylobacter* in Ground Turkey (N= 20 Isolates)

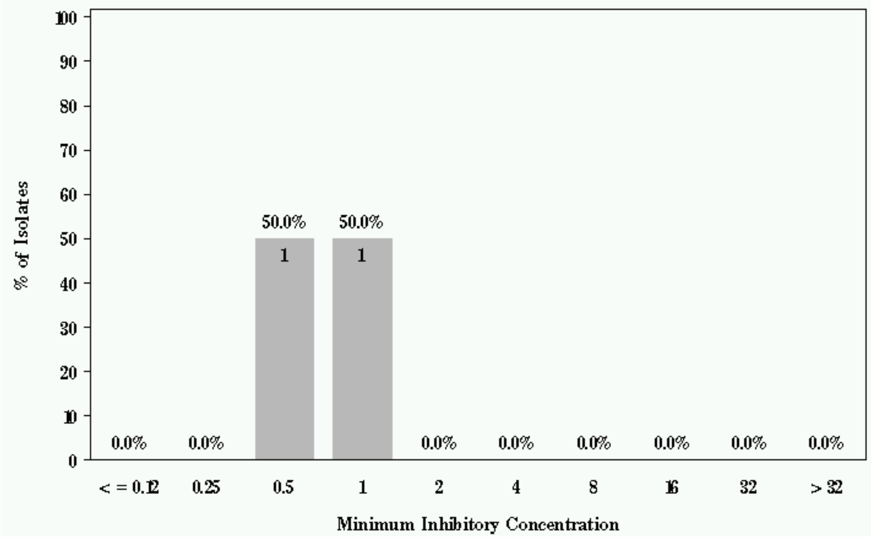
Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL



NARMS

Figure 11f: Minimum Inhibitory Concentration of Gentamicin for *Campylobacter* in Pork Chop (N= 2 Isolates)

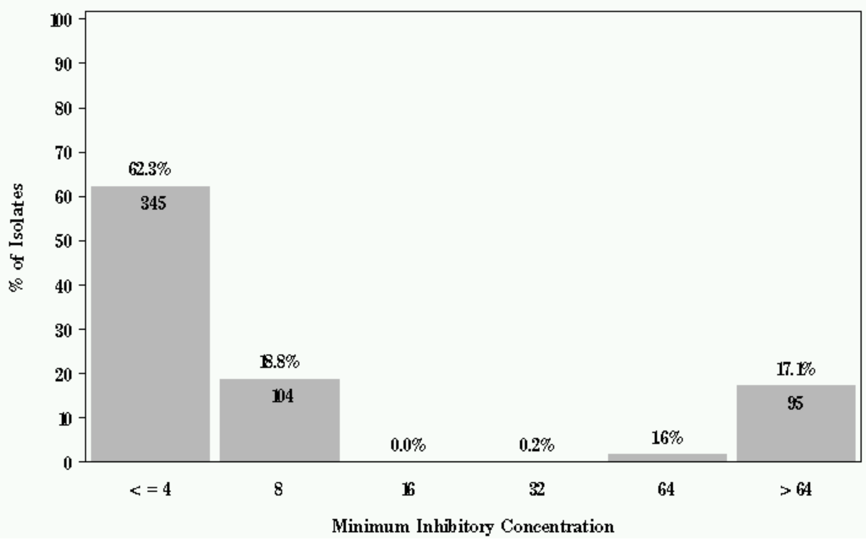
Breakpoints: Susceptible< = 2 μg/mL Resistant> = 8 μg/mL



NARMS

Figure 11g: Minimum Inhibitory Concentration of Nalidixic acid for *Campylobacter* in Chicken Breast (N= 554 Isolates)

Breakpoints: Susceptible< = 16 μg/mL Resistant> = 64 μg/mL

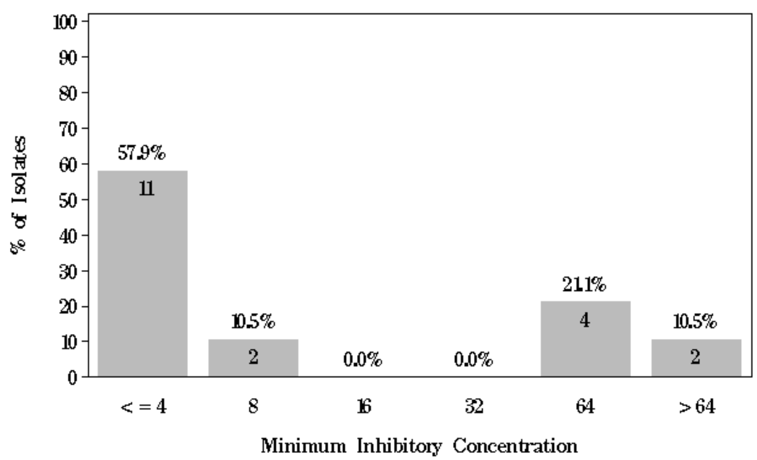


No Isolates found in Ground Beef in 2005

NARMS

Figure 11g: Minimum Inhibitory Concentration of Nalidixic acid*
for *Campylobacter* in Ground Turkey (N= 19 Isolates)

Breakpoints: Susceptible< = 16 γg/mL Resistant> = 64 μg/mL

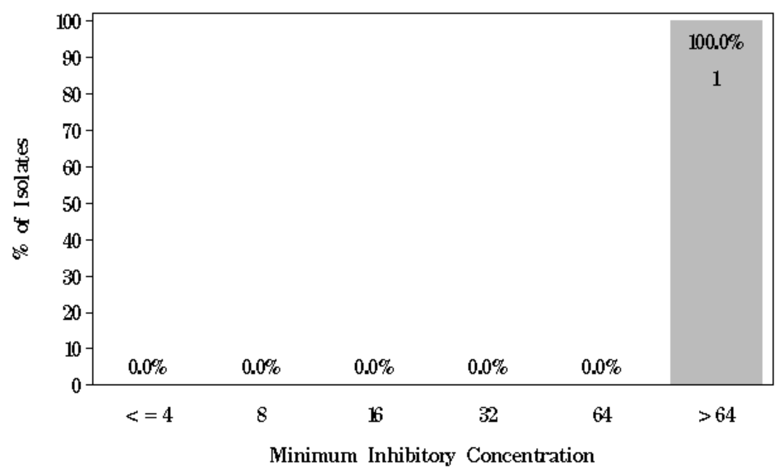


*Presented for all species except *C. lari* (N=20−1=19)

NARMS

Figure 11g: Minimum Inhibitory Concentration of Nalidixic acid*
for *Campylobacter* in Pork Chop (N= 1 Isolates)

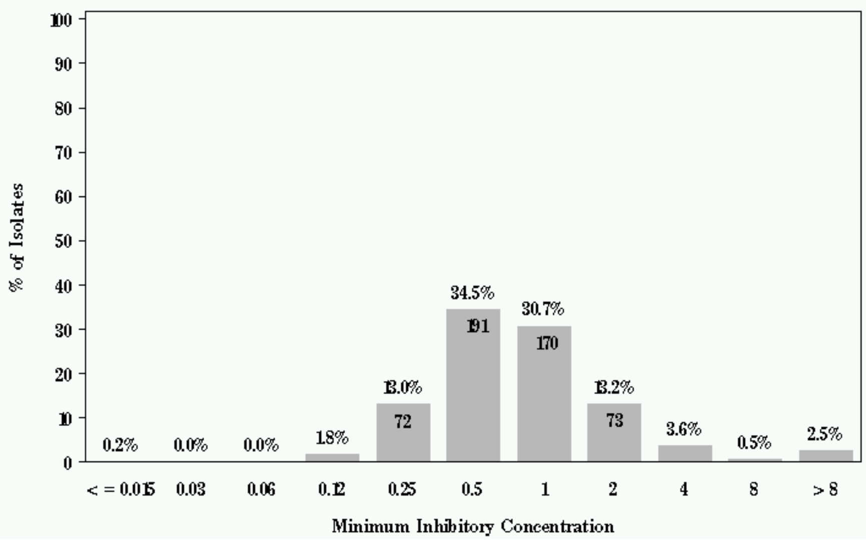
Breakpoints: Susceptible< = 16 γg/mL Resistant> = 64 μg/mL



*Presented for all species except *C. lari* (N=2−1=1)

NARMS

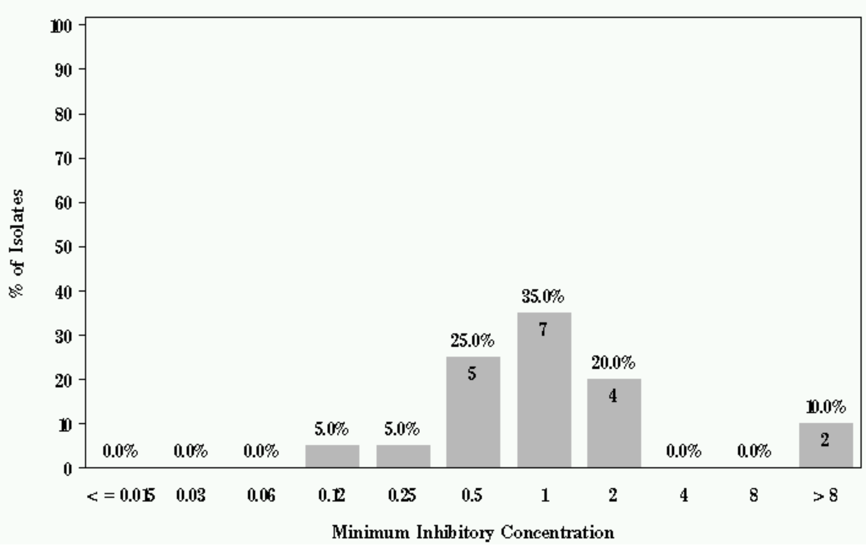
Figure 11h: Minimum Inhibitory Concentration of Telithromycin
for *Campylobacter* in Chicken Breast (N= 554 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16μg/mL



No Isolates found in Ground Beef in 2005

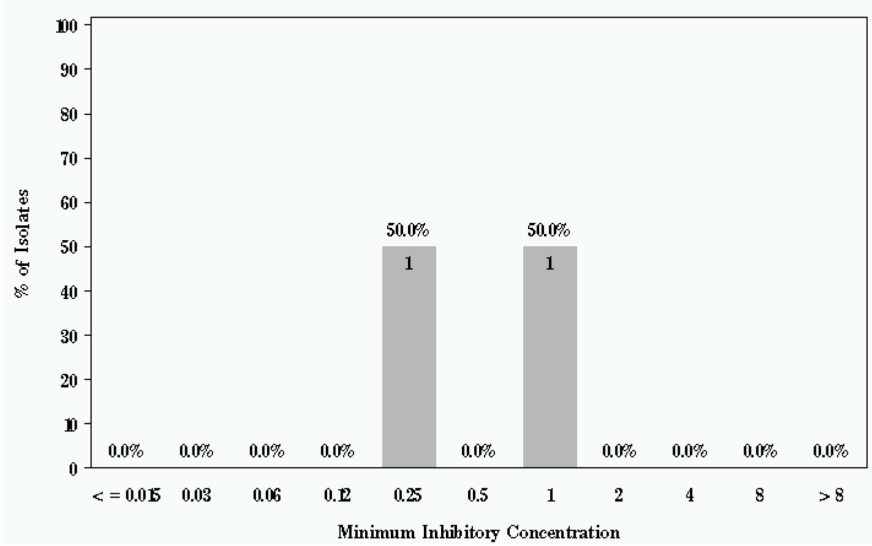
NARMS

Figure 11h: Minimum Inhibitory Concentration of Telithromycin
for *Campylobacter* in Ground Turkey (N= 20 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16μg/mL



NARMS

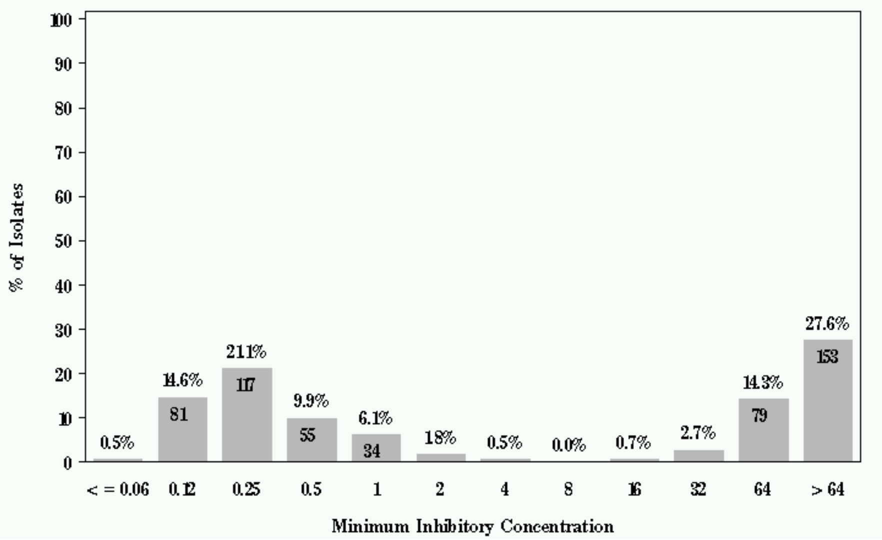
Figure 11h: Minimum Inhibitory Concentration of Telithromycin
for *Campylobacter* in Pork Chop (N= 2 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16μg/mL



NARMS

Figure 11i: Minimum Inhibitory Concentration of Tetracycline for *Campylobacter* in Chicken Breast (N= 554 Isolates)

Breakpoints: Susceptible< = 4 μg/mL Resistant> = 16μg/mL

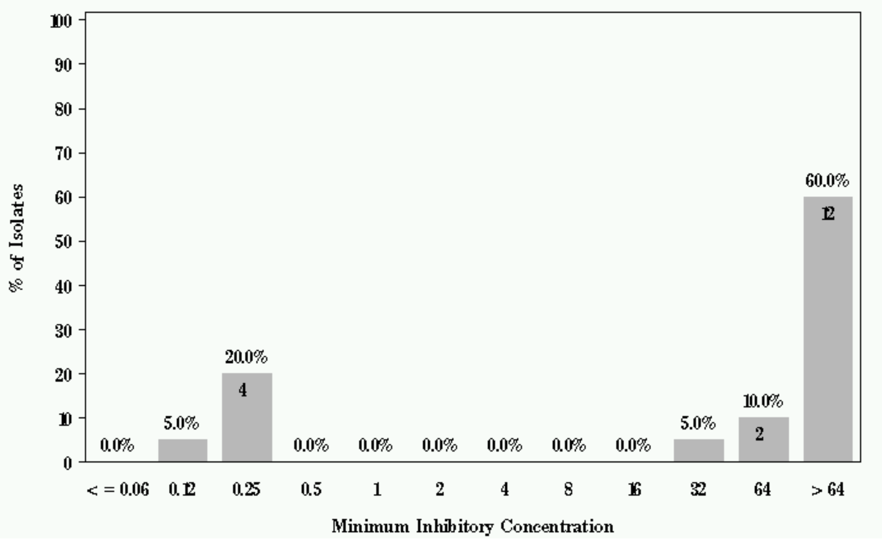


No Isolates found in Ground Beef in 2005

NARMS

Figure 11i: Minimum Inhibitory Concentration of Tetracycline for *Campylobacter* in Ground Turkey (N= 20 Isolates)

Breakpoints: Susceptible< = 4 μg/mL Resistant> = 16μg/mL



NARMS

Figure 11i: Minimum Inhibitory Concentration of Tetracycline for *Campylobacter* in Pork Chop (N= 2 Isolates)

Breakpoints: Susceptible< = 4 μg/mL Resistant> = 16μg/mL

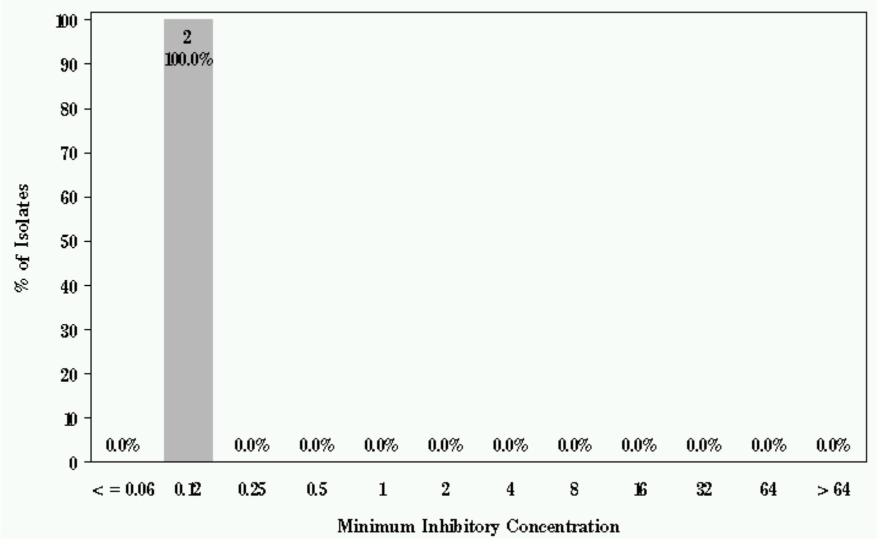


Table 16. Antimicrobial Resistance among *Campylobacter* by Meat Type*, 2002-2005

Meat Type	Year	Antimicrobial Agent										
		Aminoglycosides	Ketolides	Lincosamides	Macrolides		Penems	Phenicols	Quinolones†		Tetracyclines	
		GEN	TEL	CLI	AZI	ERY	MER	FFN	CIP	NAL	DOX	TET
Chicken Breast	2002 (n=288)	-‡	§				-					-
	2003 (n=477)	0.2%					-					-
	2004 (n=706)	-	2.5%	2.3%	3.1% 5.9%	3.1%		13.5%	15.4%	15.4% 27.4%		
	2005 (n=554)	-	2.5%	2.7%	3.1% 2.8%	3.1%		14.1%	19.0%	18.8% 29.4%		
	Total (n=2017)	-	2.5%	2.5%	3.1%	3.4%	-	-	15.8%	16.9%	28.7% 49.2%	47.5%
Ground Turkey	2002 (n=4)	-					–	-	50.0%		45.3%	-
	2003 (n=5)	-					–	-	20.0%			-
	2004 (n=12)	-	-	-	-	-			16.7%	16.7% 50.0%		
	2005 (n=19)	-	10.0%	-	10.0%	10.0%			31.6%	31.6% 60.0%		
	Total (n=41)	-	6.3%	-	6.3%	4.9%	-	-	29.3%	28.1%	55.6% 25.0%	56.3%
Ground Beef	2003 (n=1)	-					–				75.0%	-
	Total (n=1)	-					-					-
Pork Chop	2002 (n=5)	-					-					-
	2003 (n=4)	-			-		-	-		-		-
	2004 (n=3)	-	-	33.3%	33.3% 20.0%	33.3%		-	-	- 20.0%		
	2005 (n=1)	-	-	-	- 75.0%	-		-	100.0%	100.0% 50.0%		
	Total (n=14)	-	-	20.0%	20.0%	35.7%	-	-	7.1%	40.0%	33.3% 66.7%	40.0%
Total		**-**	**2.6%**	**2.5%**	**3.2%**	**3.7%**	-	**-**	**16.0%**	**17.3%**	29.0%	47.6%

* No *Campylobacter* recovered from ground beef.
† Presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones (N=479-2=477 in Chicken Breast in 2003, N=20-1=19 in Ground Turkey and 2-1=1 in Pork Chop in 2005).
‡ Dashes indicate 0.0% resistance to that antimicrobial.
§ Gray areas indicate that the antimicrobial was not included in the testing for that year.

Table 17. Antimicrobial Resistance among *Campylobacter* by Species, 2002-2005

		Antimicrobial Agent										
		Aminoglycosides	Ketolides	Lincosamides	Macrolides		Penems	Phenicols	Quinolones		Tetracycline	
Species	**Year**	**GEN**	**TEL**	**CLI**	**AZI**	**ERY**	**MER**	**FFN**	**CIP**	**NAL**	**DOX**	**TET**
C. jejuni	**2002 (n=202)***	-†	‡			-	-		15.3%		20.8%	
	2003 (n=330)	0.3%				-	-		14.2%		23.3%	
	2004 (n=517)	-	0.4%	0.4%	0.8%	0.8%		-	15.3%	15.3%		50.1%
	2005 (n=414)	-	0.5%	0.5%	0.5%	0.5%		-	15.2%	15.0%		46.9%
	Total (n=1463)	0.1%	0.4%	0.4%	0.6%	0.4%	-	-	15.0%	15.1%	22.4%	48.7%
C. coli	**2002 (n=95)**	-				18.9%	-		10.5%		42.1%	
	2003 (n=147)	-				10.9%	-		13.6%		44.9%	
	2004 (n=204)	-	7.8%	7.4%	9.3%	9.3%		-	15.7%	15.7%		45.6%
	2005 (n=160)	-	8.8%	8.1%	10.6%	10.6%		-	30.6%	30.6%		45.0%
	Total (n=606)	-	8.2%	7.7%	9.9%	11.6%	-	-	18.3%	22.3%	43.8%	45.3%
***C. lari*§**	**2003 (n=2)**	-				-	-		-		-	
	2005 (n=2)	-	-	-	-	-		-	§	§		-
	Total (n=4)	-	-	-	-	-	-	-	25.0%	100.0%	-	-
Total (n=2073)		**-**	**2.6%**	**2.5%**	**3.2%**	**3.7%**	**-**	**-**	**16.0%**	**17.3%**	**29.0%**	**47.6%**

* n= # of isolates in that species for that year.
† Dashes indicate 0.0% resistance to that antimicrobial.
‡ Gray areas indicate antimicrobial not included in testing that year.
§ Presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones.

Table 18. Antimicrobial Resistance among *Campylobacter* Species by Meat Type, 2002-2005

			Antimicrobial Agent										
			Aminoglycosides	Ketolides	Lincosamides	Macrolides		Penems	Phenicols	Quinolones*		Tetracyclines	
Meat Type	Species	Year	GEN	TEL	CLI	AZI	ERY	MER	FFN	CIP	NAL	DOX	TET
Chicken Breast	*C. jejuni*	2002 (n=198)	-*	↑			-	-					
		2003 (n=325)	0.3%					-					
		2004 (n=510)	-	0.4%	0.4%	0.8%	0.8%			15.1%	15.1% 20.7%		
		2005 (n=403)	-	0.5%	0.5%	0.5%	0.5%		15.2%	15.1%	14.9% 22.8%		
		Total (n=1436)	0.1%	0.4%	0.4%	0.7%	0.4%	-	- 14.5%	15.0%	15.0%	22.0% 50.2%	48.5%
	C. coli	2002 (n=90)	-					-				46.4	
		2003 (n=142)	-					-					
		2004 (n=196)	-	8.2%	7.1%	9.2% 18.9%	9.2%			16.3%	16.3% 42.2%		
		2005 (n=151)	-	7.9%	8.6%	9.9% 9.2%	9.9%		10.0%	29.1%	29.1% 45.1%		
		Total (n=579)	-	8.1%	7.8%	9.5%	10.9%	-	- 13.4%	18.0%	21.9%	44.0% 46.4%	44.7%
	C. lari	2003 (n=2)	-					-			§	- 42.4%	
		Total (n=2)	-					-			§	-	
	Total (n=2017)		-	2.5%	2.5%	3.1%	3.4%	-	-	15.8%	16.9%	28.7%	47.5%
Ground Turkey	*C. jejuni*	2002 (n=2)	-					-					
		2003 (n=4)	-					-					
		2004 (n=7)	-	-	-	-	-		§	28.6%	28.6% 50.0%		42.9%
		2005 (n=10)	-	-	-	-	-		50.0%	10.0%	10.0% 75.0%		70.0%
		Total (n=17)	-	-	-	-	-	-	-	17.4%	17.6%	66.7%	58.8%
	C. coli	2002 (n=2)	-					-					
		2003 (n=1)	-					-		100.0%		-	
		2004 (n=5)	-	-	-	-	-			-	- 50.0%		
		2005(n=9)	-	22.2%	-	22.2%	22.2%		- 50.0%	55.6%	55.6%		
		Total (n=23)	-	14.3%	-	14.3%	11.8%	-	-	41.2%	35.7%	33.3%	57.1%
	C. lari	2005 (n=1)	-	-	-	-	-		-	§	§	88.9%	-
		Total (n=1)	-	-	-	-	-	-	-	§	§		-
	Total (n=41)		-	6.3%	-	6.3%	4.9%	-	-	29.3%	28.1%	55.6%	56.3%
Ground Beef	*C. jejuni*	2003 (n=1)	-					-					
		Total (n=1)	-					-					
	Total (n=1)		-					-					
Pork Chop	*C. jejuni*	2002 (n=3)	-					-					
		2005 (n=4)	-	-	-	-	-		-	100.0%	100.0%		-
		Total (n=3)	-	-	-	-	-	-	-	33.3%	100.0%	-	-
	C. coli	2002 (n=10)	-					-					
		2003 (n=2)	-					-					
		2004 (n=1)	-	-	33.3%	33.3% 33.3%	33.3%		-	-	- 33.3%		
		Total (n=3)	-	-	33.3%	33.3% 75.0%	50.0%	-	-	-	- 50.0%	42.9%	66.7%
	C. lari	2005 (n=1)	-	-	-	-	-		-	§	§	7%	
		Total (n=1)	-	-	-	-	-		-	§	§		-
	Total (n=14)		-	-	20.0%	20.0%	35.7%	-	-	7.7%	25.0%	33.3%	40.0%
Total (n=2073)			-	2.6%	2.5%	3.2%	3.7%	-	-	16.0%	17.1%	29.0%	47.6%

*Dashes indicate 0.0% resistance to antimicrobial.

↑Gray areas indicate antimicrobial not included in testing that year. *Data presented for all species except *C. lari*, which is considered intrinsically resistant to Quinolones.

Table 19. Number of *Campylobacter* Resistant to Multiple Antimicrobial Agents, 2002-2005

Meat Type	Number of Antimicrobials	2002 (n=297)	2003 (n=479)	2004 (n=721)	2005 (n=576)	Total
Chicken Breast	**0**	172	283	284	230	**969**
	1	98	159	292	205	**754**
	2-4	18	27	125	110	**280**
	5-7	0	0	5	9	**14**
	≥8	N/A*	N/A	0	0	**0**
	Total	**288**	469	**706**	**554**	**2017**
Ground Turkey	**0**	1	1	8	4	**14**
	1	2	4	2	9	**17**
	2-4	1	0	2	5	**8**
	5-7	0	0	0	2	**2**
	≥8	N/A	N/A	0	0	**0**
	Total	**4**	**5**	**12**	**20**	**41**
Ground Beef	**0**	0	1	0	0	**1**
	1	0	0	0	0	**0**
	2-4	0	0	0	0	**0**
	5-7	0	0	0	0	**0**
	≥8	N/A	N/A	0	0	**0**
	Total	**0**	**1**	**0**	**0**	**1**
Pork Chop	**0**	4	1	1	0	**6**
	1	0	1	1	1	**3**
	2-4	1	2	1	1	**5**
	5-7	0	0	0	0	**0**
	≥8	N/A	N/A	0	0	**0**
	Total	**5**	**4**	**3**	**2**	**14**

* N/A indicates not more than five antimicrobial tested for 2002 and 2003.

Table 20. Overall *Enterococcus* Species Identified, 2002 - 2005

		2002	2003	2004	2005
	Species	**n**	**n**	**n**	**n**
1.	*E. faecalis*	893	1014	855	1001
2.	*E. faecium*	506	575	757	618
3.	*E. hirae*	102	129	129	117
4.	*E. durans*	10	8	3	19
5.	*E. gallinarum*	5	12	7	10
6.	*E. avium*	4	3	-	-
7.	*E. casseliflavus*	-*	1	3	-
8.	*E. mundtii*	-	-	1	-
	Total	**1520**	**1742**	**1755**	**1765**

*Indicates species not found.

Table 21. *Enterococcus* Species by Meat Type, 2002 - 2005

	Species	2002		2003		2004		2005	
Total (N) Isolates in that Year	*E. faecalis*	893		1014		855		1001	
	E. faecium	506		575		757		618	
	E. hirae	102		129		129		117	
	E. durans	10		8		3		19	
	E. gallinarum	5		12		7		10	
	E. avium	4		3		0		0	
	E. casseliflavus	0		1		3		0	
	E. mundtii	0		0		1		0	
	Total (N)	1520		1742		1755		1765	
Meat Type	**Species**	**n[*]**	**%[†]**	**n**	**%**	**n**	**%**	**n**	**%**
Chicken Breast	*E. faecalis*	134	15.0%	188	18.5%	88	10.3%	116	11.6%
	E. faecium	231	45.7%	248	43.1%	348	46.0%	307	49.7%
	E. hirae	12	11.8%	28	21.7%	27	20.9%	30	25.6%
	E. durans	1	10.0%	1	12.5%	2	66.7%	3	15.8%
	E. gallinarum	[‡]	-[§]		-		-	1	10.0%
	E. avium	3	75.0%	1	33.3%		-		-
	E. mundtii		-		-	1	100.0%		-
	Total (N)[**]	381	25.1%	466	26.8%	466	26.6%	457	25.9%
Ground Turkey	*E. faecalis*	294	32.9%	289	28.5%	260	30.4%	339	33.9%
	E. faecium	89	17.6%	118	20.5%	172	22.7%	107	17.3%
	E. hirae	2	2.0%	3	2.3%		-	1	0.9%
	E. durans		-		-	1	33.3%	1	5.3%
	E. gallinarum	2	40.0%	8	66.7%	4	57.1%	4	40.0%
	Total (N)	387	25.5%	418	24.0%	437	24.9%	452	25.6%
Ground Beef	*E. faecalis*	210	23.5%	224	22.1%	194	22.7%	226	22.6%
	E. faecium	93	18.4%	112	19.5%	162	21.4%	129	20.9%
	E. hirae	76	74.5%	84	65.1%	88	68.2%	82	70.1%
	E. durans	3	30.0%	7	87.5%		-	10	52.6%
	E. gallinarum		-	4	33.3%	2	28.6%		-
	E. avium	1	25.0%		-		-		-
	E. casseliflavus		-	1	100.0%	2	66.7%		-
	Total (N)	383	25.2%	432	24.8%	448	25.5%	447	25.3%
Pork Chop	*E. faecalis*	255	28.6%	313	30.9%	313	36.6%	320	32.0%
	E. faecium	93	18.4%	97	16.9%	75	9.9%	75	12.1%
	E. hirae	12	11.8%	14	10.9%	14	10.9%	4	3.4%
	E. durans	6	60.0%		-		-	5	26.3%
	E. gallinarum	3	60.0%		-	1	14.3%	5	50.0%
	E. avium		-	2	66.7%		-		-
	E. casseliflavus		-		-	1	33.3%		-
	Total (N)	369	24.3%	426	24.5%	404	23.0%	409	23.2%

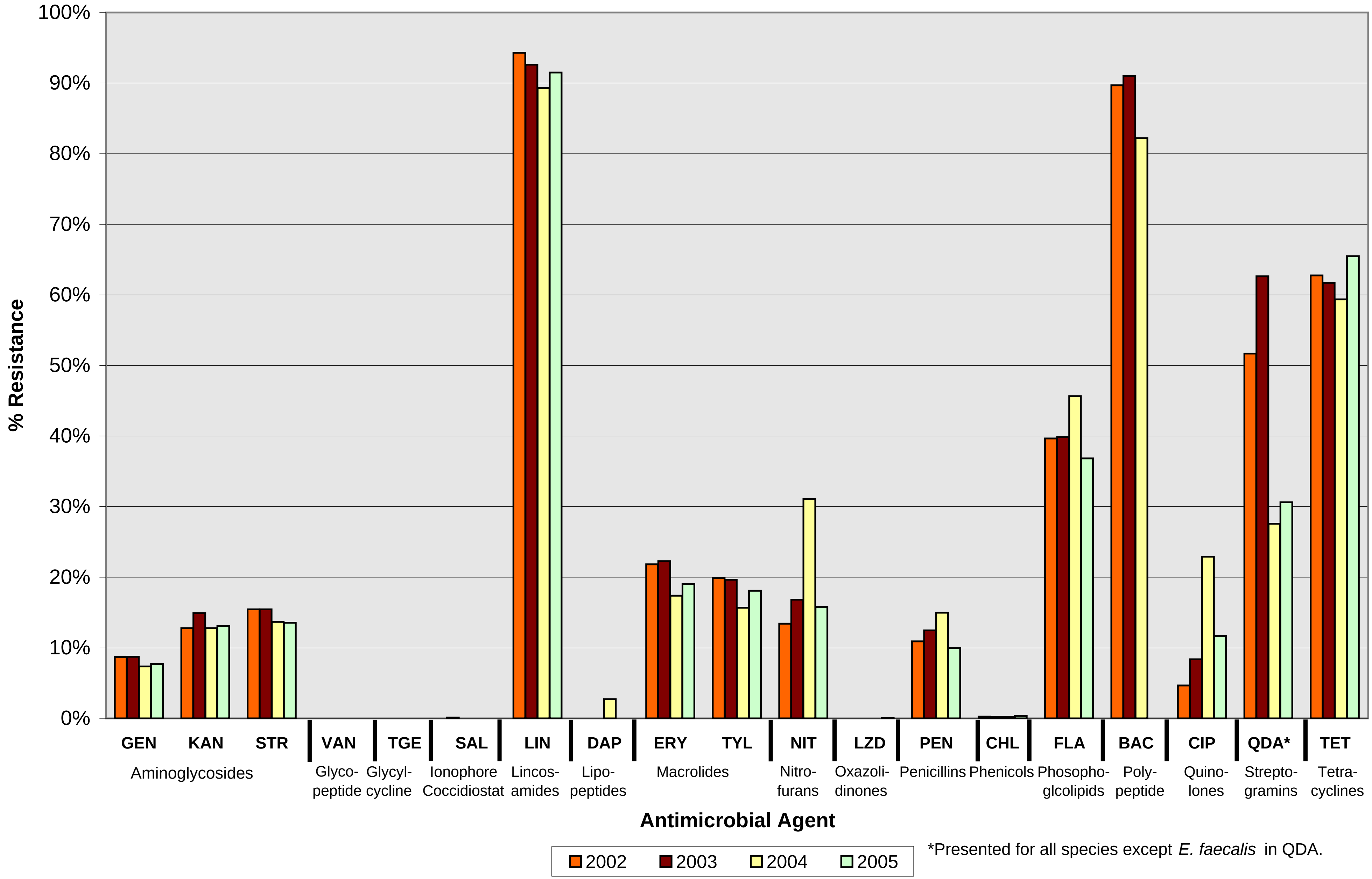
[*] Where n = # of isolates in that species.
[†] Where % = (#of Isolates per species per meat type) / (total # of isolates per species).
[‡] Gray area indicates no isolates of this species found.
[§] Dashes indicate no isolates from that species per meat type.
[**] Where % = (total # of isolates in meat type) / (total # of isolates in that year).

Table 22. Antimicrobial Resistance among *Enterococcus* Isolates, 2002 - 2005

Class	Antimicrobial Agent	2002 (N=1520)		2003 (N=1742)		2004 (N=1755)		2005 (N=1765)	
		n	%R*	n	%R	n	%R	n	%R
Aminoglycosides	Gentamicin	132	8.7%	152	8.7%	129	7.4%	136	7.7%
	Kanamycin	195	12.8%	260	14.9%	225	12.8%	231	13.1%
	Streptomycin	235	15.5%	269	15.4%	240	13.7%	239	13.5%
Glycopeptides	Vancomycin	0	-†	0	-	0	-	0	-
Glycylcycline	Tigecycline	‡						0	-
Ionophore Coccidiostat	Salinomycin	2	0.1%	0	-				
Lincosamides	Lincomycin	1434	94.3%	1613	92.6%	1568	89.3%	1615	91.5%
Lipopeptides	Daptomycin					48	2.7%	0	-
Macrolides	Erythromycin	332	21.8%	388	22.3%	305	17.4%	336	19.0%
	Tylosin	302	19.9%	342	19.6%	275	15.7%	319	18.1%
Nitrofurans	Nitrofurantoin	204	13.4%	293	16.8%	545	31.1%	279	15.8%
Oxazolidinones	Linezolid	0	-	0	-	0	-	1	0.1%
Penicillins	Penicillin	166	10.9%	217	12.5%	263	15.0%	176	10.0%
Phenicols	Chloramphenicol	4	0.3%	4	0.2%	4	0.2%	6	0.3%
Phosphoglycolipids	Flavomycin	603	39.7%	694	39.8%	801	45.6%	650	36.8%
Polypeptides	Bacitracin	1363	89.7%	1585	91.0%	1442	82.2%		
Quinolones	Ciprofloxacin	71	4.7%	146	8.4%	402	22.9%	205	11.6%
Streptogramins	Quinupristin-Dalfopristin§	324	51.7%	456	62.6%	248	27.6%	234	30.6%
Tetracyclines	Tetracycline	954	62.8%	1075	61.7%	1042	59.4%	1156	65.5%

* Where %R = (n/N).
† Dashes indicate 0.0 % Resistance.
‡ Gray area indicates antibiotic not tested in that year.
§ Data presented for all species except *E. faecalis,* which is considered intrinsically resistant to Quinupristin-Dalfopristin.

Figure 12. Antimicrobial Resistance among *Enterococcus* Isolates, 2002 - 2005



*Presented for all species except *E. faecalis* in QDA.

Fig 13. MIC Distributions Among All Antimicrobial Agents

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	Distribution (1499) 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	2002 (n=1520)	N/A	8.7%	(7.3 - 10.2)														91.1	0.2	0.7	1.0	7.0	
	2003 (n=1742)	N/A	8.7%	(7.4 - 10.2)														91.1	0.2	0.4	0.9	7.5	
	2004 (n=1755)	N/A	7.4%	(6.2 - 8.7)														92.2	0.5	0.6	0.5	6.4	
	2005 (n=1765)	N/A	7.7%	(6.5 - 9.0)														91.8	0.5	0.7	0.7	6.2	
Kanamycin	2002 (n=1520)	N/A	12.8%	(11.2 - 14.6)														68.2	12.8	6.2	0.6	12.2	
	2003 (n=1742)	N/A	14.9%	(13.3 - 16.7)														66.7	11.4	7.0	1.5	13.4	
	2004 (n=1755)	N/A	12.8%	(11.3 - 14.5)														64.2	11.8	11.2	1.1	11.7	
	2005 (n=1765)	N/A	13.1%	(11.5 - 14.8)														72.5	9.7	4.6	0.7	12.4	
Streptomycin	2002 (n=1520)	N/A	15.5%	(13.7 - 17.4)																84.5	2.4	3.4	9.7
	2003 (n=1742)	N/A	15.4%	(13.8 - 17.2)																84.6	2.6	2.8	10.1
	2004 (n=1755)	N/A	13.7%	(12.1 - 15.4)																86.4	3.5	3.8	6.5
	2005 (n=1765)	N/A	13.5%	(12.0 - 15.2)																86.5	3.1	3.3	7.1
Glycopeptides																							
Vancomycin	2002 (n=1520)	0.4%	0.0%	(0.0 - 0.2)						16.3	52.0	27.8	3.6	0.4									
	2003 (n=1742)	0.7%	0.0%	(0.0 - 0.2)						17.3	54.5	24.2	3.2	0.7									
	2004 (n=1755)	0.5%	0.0%	(0.0 - 0.2)						32.7	44.3	21.2	1.4	0.5									
	2005 (n=1765)	0.3%	0.0%	(0.0 - 0.2)						28.2	47.8	23.3	0.4	0.3									
Glycylcycline																							
Tigecycline	2005 (n=1765)	0.0%	0.0%	(0.0 - 0.2)	0.1	2.9	24.0	53.0	20.0														
Ionophore Coccidiostat																							
Salinomycin	2002 (n=1520)	0.5%	0.1%	(0.0 - 0.5)							57.7	20.0	11.7	9.9	0.5	0.1							
	2003 (n=1742)	0.1%	0.0%	(0.0 - 0.2)							57.7	18.7	13.7	9.9	0.1								
Lincosamides																							
Lincomycin	2002 (n=1520)	0.4%	94.3%	(93.1 - 95.4)							4.8	0.5	0.4	4.3	14.5	40.3	35.3						
	2003 (n=1742)	0.2%	92.6%	(91.3 - 93.8)							6.8	0.4	0.2	5.6	13.6	40.9	32.5						
	2004 (n=1755)	0.7%	89.3%	(87.8 - 90.8)							9.5	0.5	0.7	5.7	16.0	34.5	33.2						
	2005 (n=1765)	0.7%	91.5%	(90.1 - 92.8)							7.0	0.7	0.7	5.4	14.0	33.8	38.3						
Lipopeptides																							
Daptomycin[5]	2004 (n=1755)	0.0%	2.7%	(2.0 - 3.6)						4.1	37.8	24.2	31.2	2.1	0.6								
	2005 (n=1765)	1.1%	0.0%	(0.0 - 0.2)						23.6	39.6	25.3	10.5	1.1									
Macrolides																							
Erythromicin	2002 (n=1520)	43.3%	21.8%	(19.8 - 24.0)						34.9	26.3	10.0	7.0	1.6	20.3								
	2003 (n=1742)	43.8%	22.3%	(20.3 - 24.3)						33.9	27.7	8.4	7.7	1.5	20.8								
	2004 (n=1755)	42.5%	17.4%	(15.6 - 19.2)						40.2	23.7	12.0	6.8	1.2	16.2								
	2005 (n=1765)	40.1%	19.0%	(17.2 - 20.9)						40.9	23.8	10.1	6.1	1.1	18.0								
Tylosin	2002 (n=1520)	0.3%	19.9%	(17.9 - 22.0)						0.2	4.6	49.0	21.8	4.3	0.3	0.1	19.7						
	2003 (n=1742)	0.2%	19.6%	(17.8 - 21.6)					0.1	0.2	2.2	51.3	23.4	3.1	0.2		19.6						
	2004 (n=1755)	0.3%	15.7%	(14.0 - 17.5)						0.2	4.2	29.1	41.7	8.9	0.3	0.1	15.6						
	2005 (n=1765)	0.3%	18.1%	(16.3 - 19.9)					0.6	0.8	22.1	33.2	20.0	4.9	0.3	0.1	18.0						
Nitrofurans																							
Nitrofurantoin	2002 (n=1520)	22.9%	13.4%	(11.7 - 15.2)								0.1	0.3	36.6	20.1	6.5	22.9	9.3	4.1				
	2003 (n=1742)	19.5%	16.8%	(15.1 - 18.7)									0.1	34.2	24.2	5.3	19.5	10.6	6.2				
	2004 (n=1755)	16.9%	31.1%	(28.9 - 33.3)									0.1	18.6	29.1	4.3	17.0	31.0					
	2005 (n=1765)	22.7%	15.8%	(14.1 - 17.6)								0.2	0.3	21.8	33.1	6.2	22.6	15.8					
Oxazolidinones																							
Linezolid	2002 (n=1520)	0.3%	0.0%	(0.0 - 0.2)						0.4	4.2	95.1	0.3										
	2003 (n=1742)	0.6%	0.0%	(0.0 - 0.2)						0.1	3.1	96.2	0.6										
	2004 (n=1755)	9.9%	0.0%	(0.0 - 0.2)						0.2	1.5	88.5	9.9										
	2005 (n=1765)	2.8%	0.1%	(0.0 - 0.3)						0.5	3.3	93.4	2.8	0.1									
Penicillins																							
Penicillin	2002 (n=1520)	N/A	10.9%	(9.4 - 12.6)						7.0	2.4	18.5	57.1	4.1	3.0	7.9							
	2003 (n=1742)	N/A	12.5%	(10.9 - 14.1)						5.3	2.3	8.9	65.7	5.3	4.0	8.5							
	2004 (n=1755)	N/A	15.0%	(13.3 - 16.7)						7.0	3.7	26.4	43.8	4.2	7.8	7.2							
	2005 (n=1765)	N/A	10.0%	(8.6 - 11.5)						5.2	4.9	28.0	47.9	4.1	5.3	4.7							
Phenicols																							
Chloramphenicol	2002 (n=1520)	1.6%	0.3%	(0.1 - 0.7)								0.1	10.8	87.2	1.6	0.2	0.1						
	2003 (n=1742)	1.1%	0.2%	(0.1 - 0.6)								0.2	6.4	92.1	1.1		0.2						
	2004 (n=1755)	6.8%	0.2%	(0.1 - 0.6)								0.1	4.6	88.4	6.8	0.2	0.1						
	2005 (n=1765)	2.2%	0.3%	(0.1 - 0.7)								1.1	12.7	83.6	2.2	0.3	0.1						
Phosphoglcolipids																							
Flavomycin	2002 (n=1520)	0.4%	39.7%	(37.2 - 42.2)							25.3	29.4	4.1	1.1	0.4	0.5	39.2						
	2003 (n=1742)	0.6%	39.8%	(37.5 - 42.2)							23.4	31.5	4.1	0.6	0.6	0.2	39.7						
	2004 (n=1755)	2.7%	45.6%	(43.3 - 48.0)							45.5	2.8	1.0	2.3	2.7	1.5	44.2						
	2005 (n=1765)	2.6%	36.8%	(34.6 - 39.1)							55.5	2.2	1.5	1.5	2.6	36.8							
Polypeptides																							
Bacitracin	2002 (n=1520)	4.0%	89.7%	(88.0 - 91.2)										3.4	3.0	4.0	15.7	28.4	45.5				
	2003 (n=1742)	3.8%	91.0%	(89.5 - 92.3)										2.5	2.6	3.8	11.9	25.7	53.4				
	2004 (n=1755)	7.5%	82.2%	(80.3 - 83.9)										7.3	3.1	7.5	25.6	17.4	39.1				
Quinolones																							
Ciprofloxacin	2002 (n=1520)	16.6%	4.7%	(3.7 - 5.9)					2.0	17.5	59.3	16.6	4.2	0.5									
	2003 (n=1742)	21.2%	8.4%	(7.1 - 9.8)				0.1	2.5	12.6	55.2	21.2	6.9	1.4									
	2004 (n=1755)	41.1%	22.9%	(21.0 - 24.9)				0.3	0.1	5.3	30.3	41.1	18.3	4.6									
	2005 (n=1765)	29.0%	11.6%	(10.2 - 13.2)					1.0	9.1	49.4	28.9	10.2	1.4									
Streptogramins																							
Quinupristin-Dalfopristin	2002 (n=627)	36.4%	51.7%	(47.7 - 55.7)							12.0	36.4	27.1	12.1	8.9	3.5							
	2003 (n=728)	22.8%	62.6%	(59.0 - 66.2)							14.6	22.8	38.7	12.8	9.5	1.6							
	2004 (n=900)	47.7%	27.6%	(24.7 - 30.6)							24.7	47.7	7.4	13.1	5.9	1.1							
	2005 (n=764)	47.3%	30.6%	(27.4 - 34.0)							22.1	47.3	11.4	11.8	5.9	1.6							
Tetracyclines																							
Tetracycline	2002 (n=1520)	0.6%	62.8%	(60.3 - 65.2)									36.6	0.6	0.9	3.7	58.2						
	2003 (n=1742)	1.0%	61.7%	(59.4 - 64.0)									37.3	1.0	1.0	4.0	56.7						
	2004 (n=1755)	1.8%	59.4%	(57.0 - 61.7)									38.8	1.8	1.2	4.4	53.8						
	2005 (n=1765)	1.0%	65.5%	(63.2 - 67.7)									33.5	1.0	1.8	6.7	57.1						

[1] Percent of isolates with intermediate susceptibility

[2] Percent resistant; for daptomycin, the percent non-susceptible

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

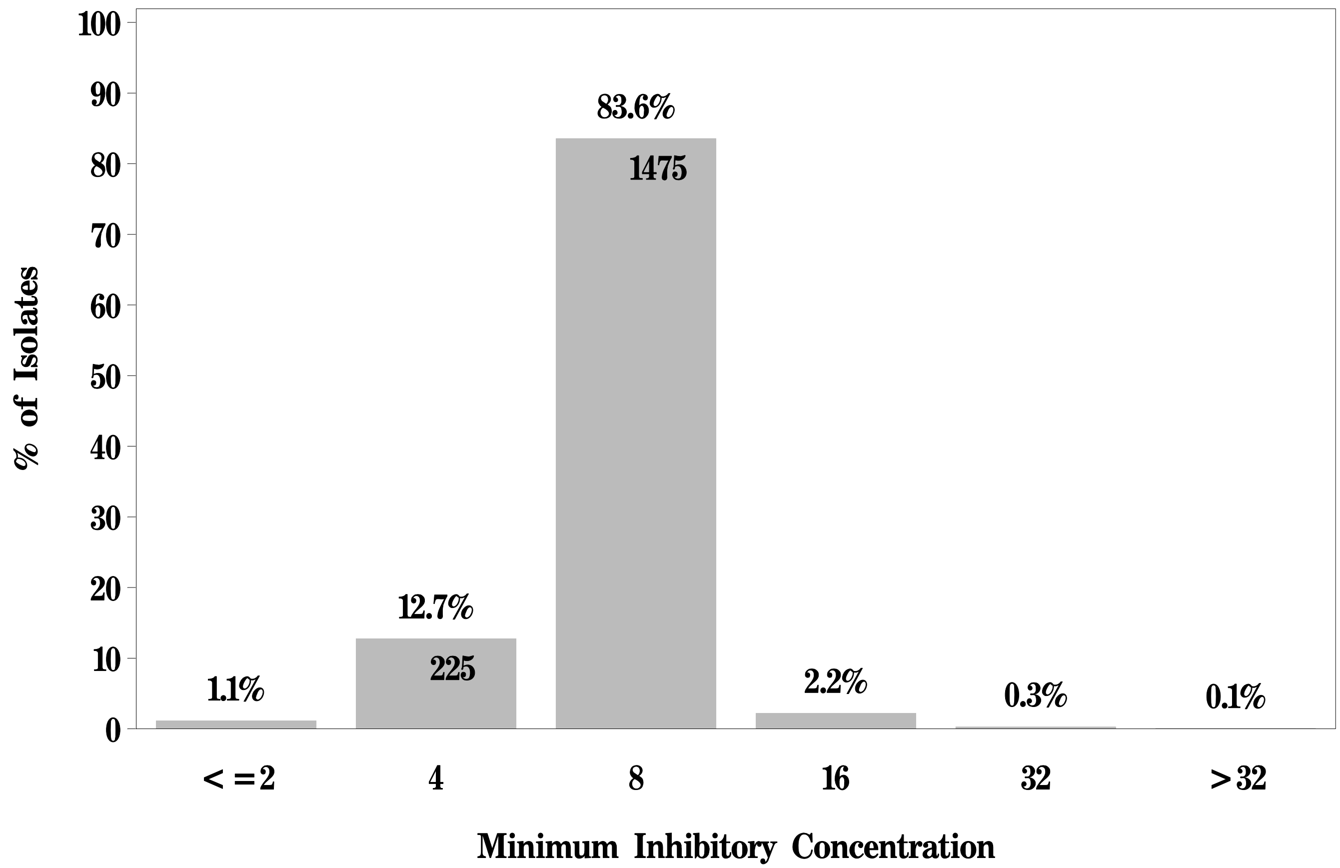
[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Vertical black lines indicate the breakpoints for susceptibility, while vertical red lines indicate the breakpoints for resistance. Numbers in the shaded area indicate the percentages of isolates with MICs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

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

NARMS

Figure 13a: Minimum Inhibitory Concentration of Chloramphenicol for *Enterococcus* (N=1765 Isolates)

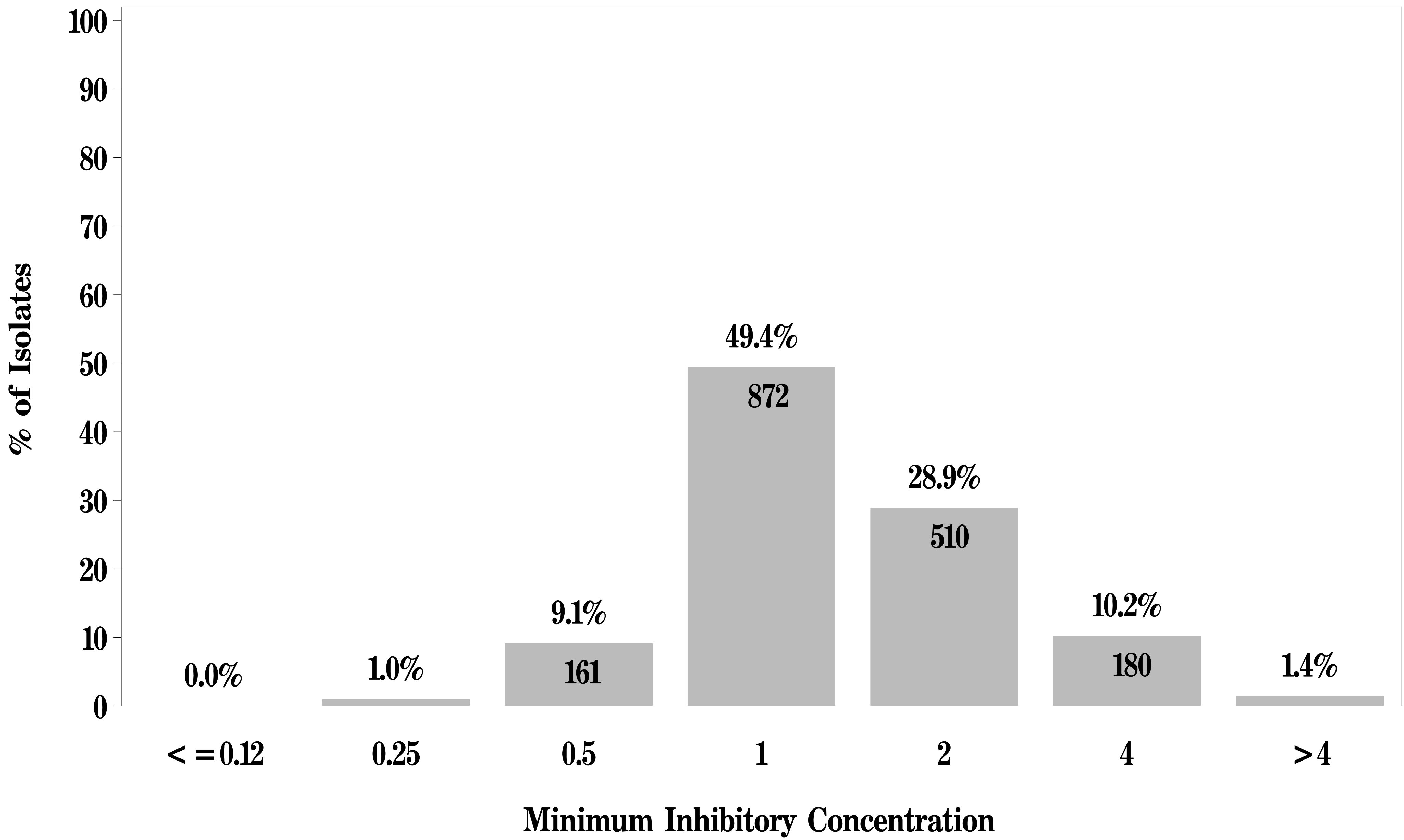
Breakpoints: Susceptible <=8 µg/mL Resistant >=32 µg/mL



NARMS

Figure 13b: Minimum Inhibitory Concentration of Ciprofloxacin for *Enterococcus* (N=1765 Isolates)

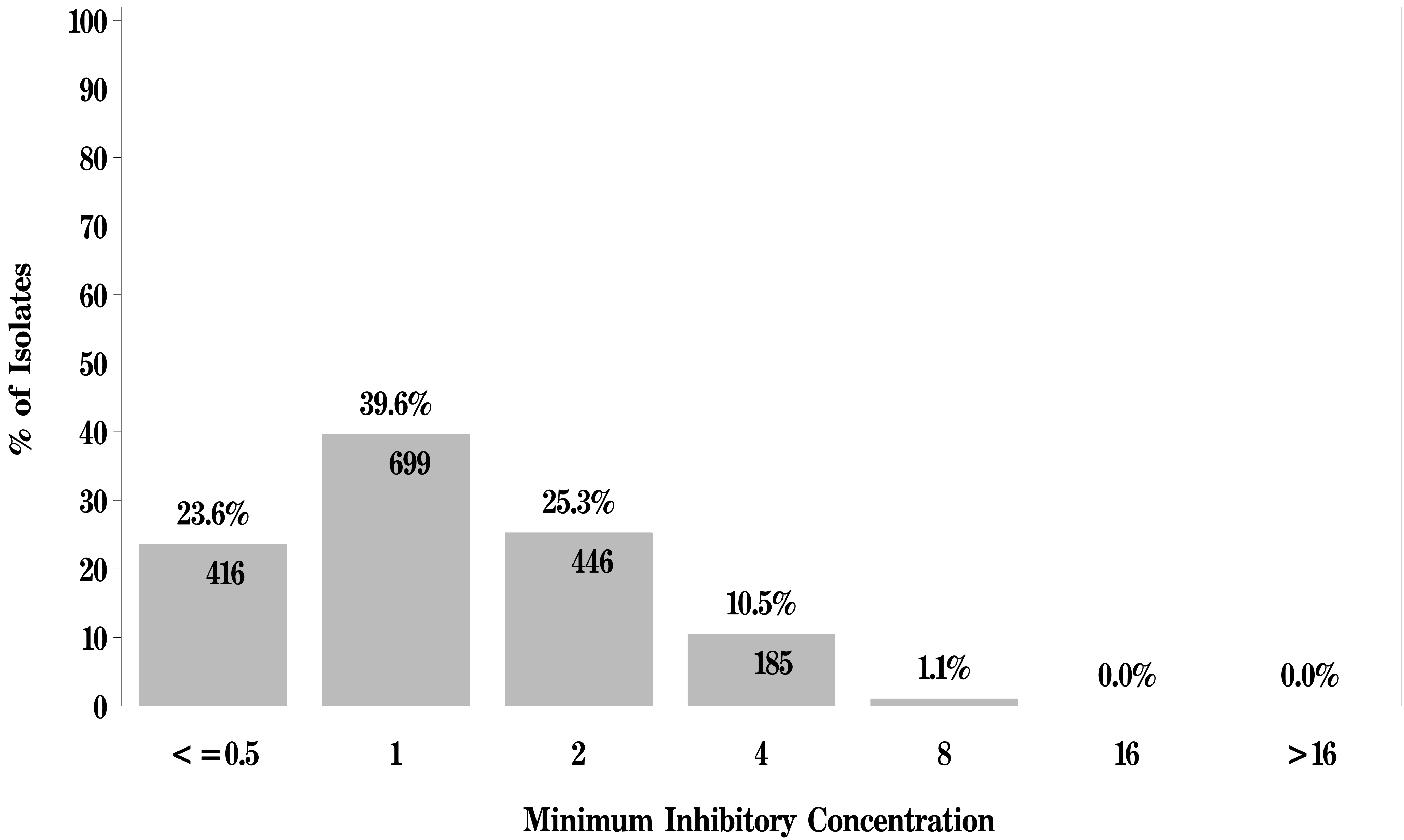
Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL



NARMS

Figure 13c: Minimum Inhibitory Concentration of Daptomycin for *Enterococcus* (N=1765 Isolates)

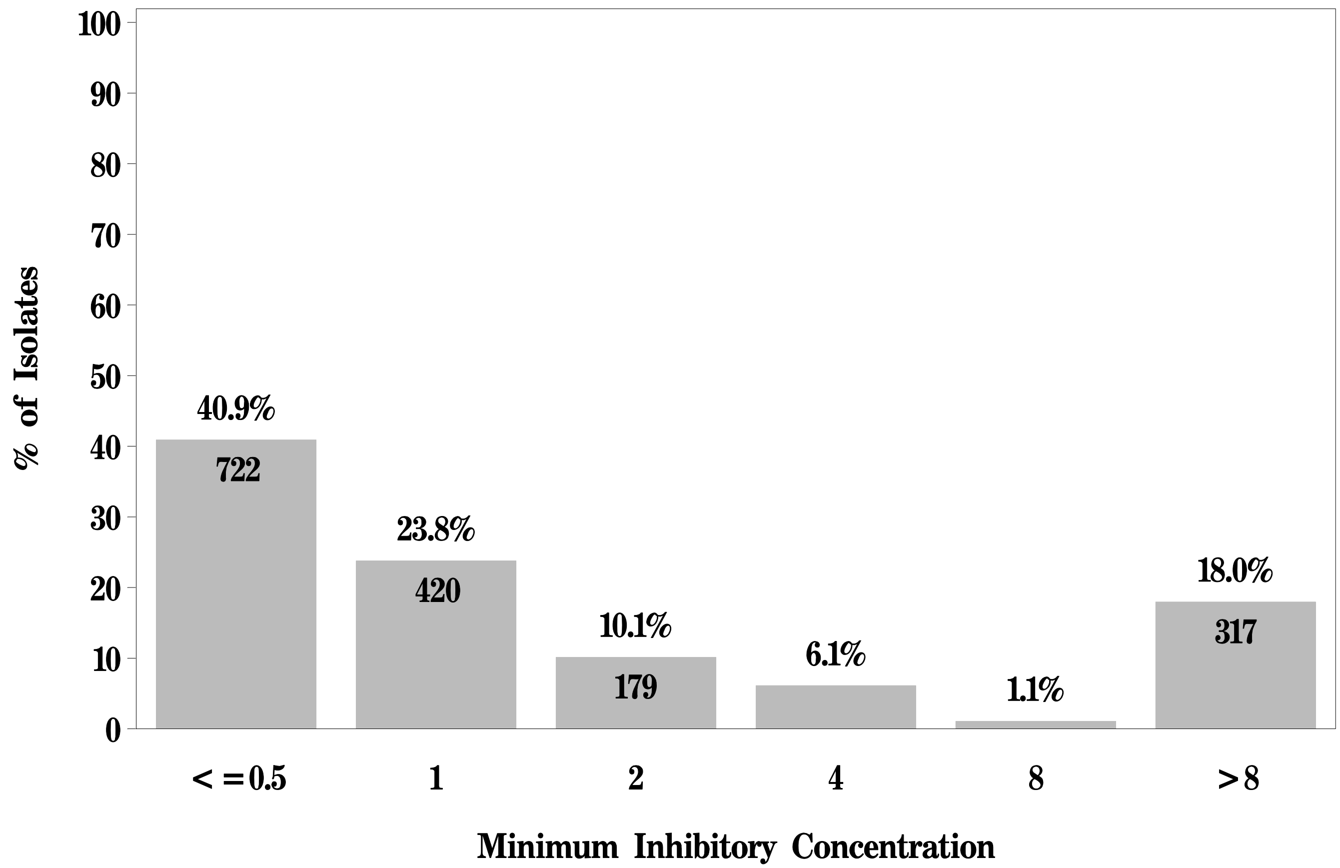
Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL



NARMS

Figure 13d: Minimum Inhibitory Concentration of Erythromycin for *Enterococcus* (N=1765 Isolates)

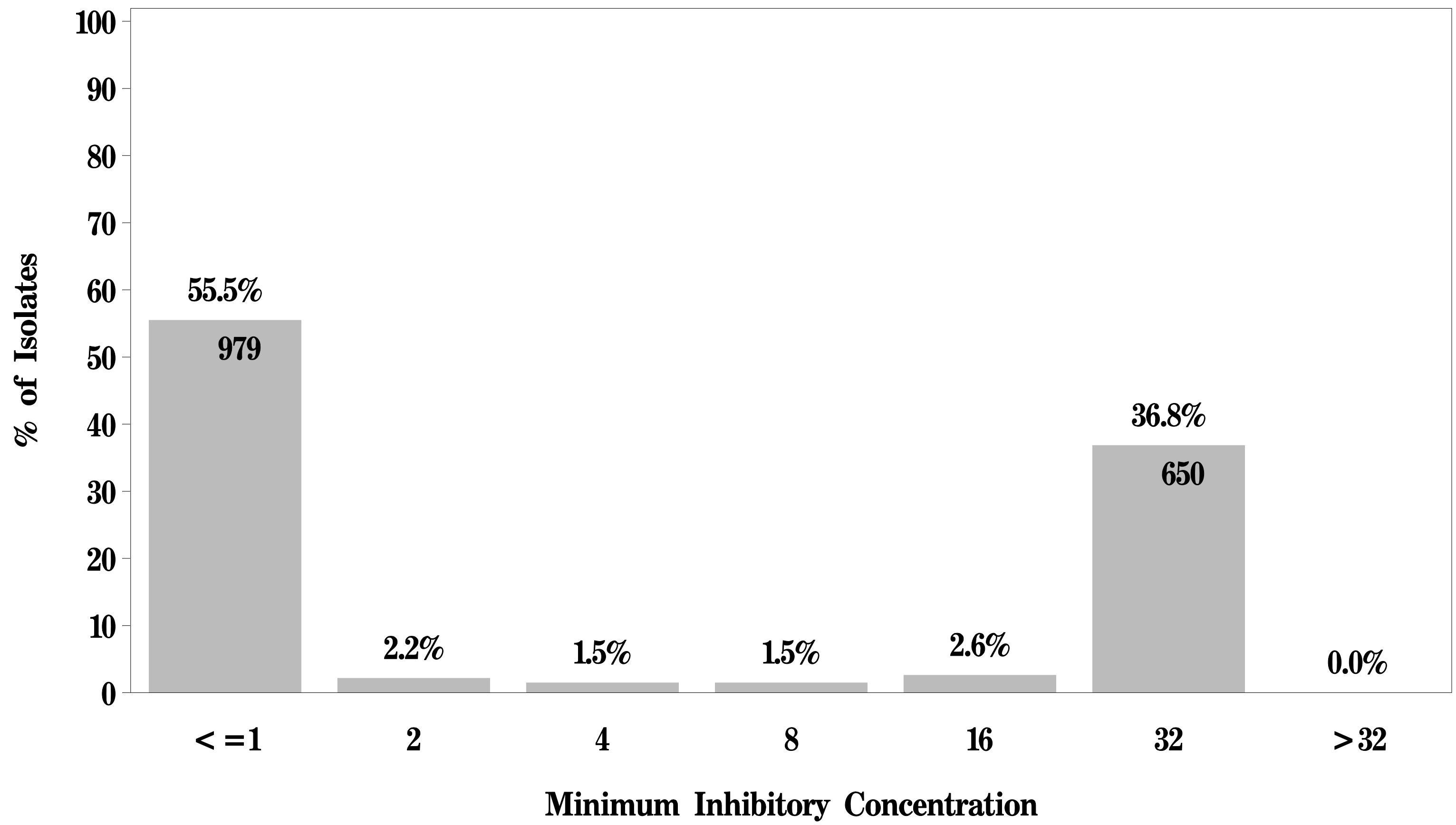
Breakpoints: Susceptible <=0.5 μg/mL Resistant >=8 μg/mL



NARMS

Figure 13e: Minimum Inhibitory Concentration of Flavomycin for *Enterococcus* (N=1765 Isolates)

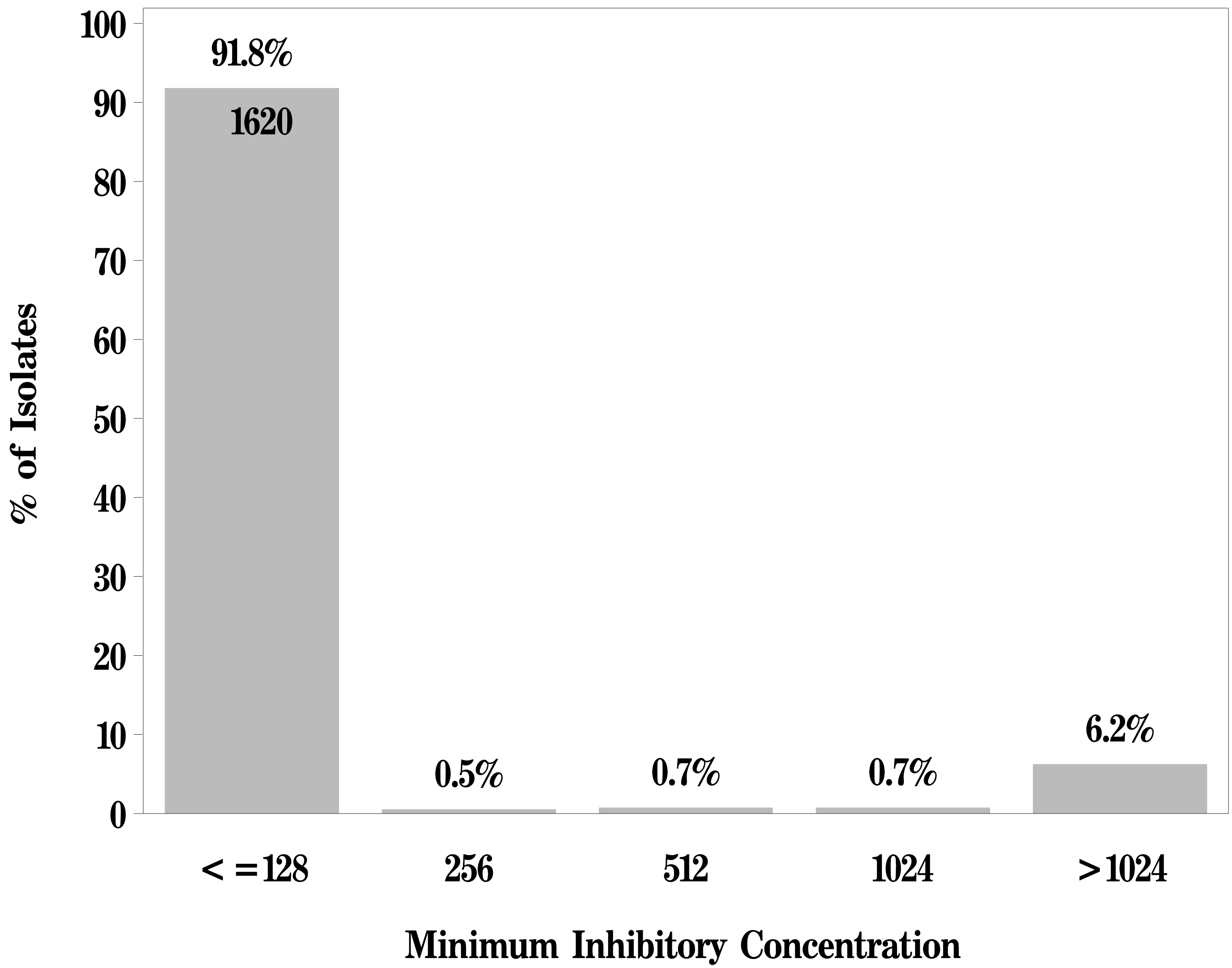
Breakpoints: Susceptible <=8 µg/mL Resistant >=32 µg/mL



NARMS

Figure 13f: Minimum Inhibitory Concentration of Gentamicin for *Enterococcus* (N=1765 Isolates)

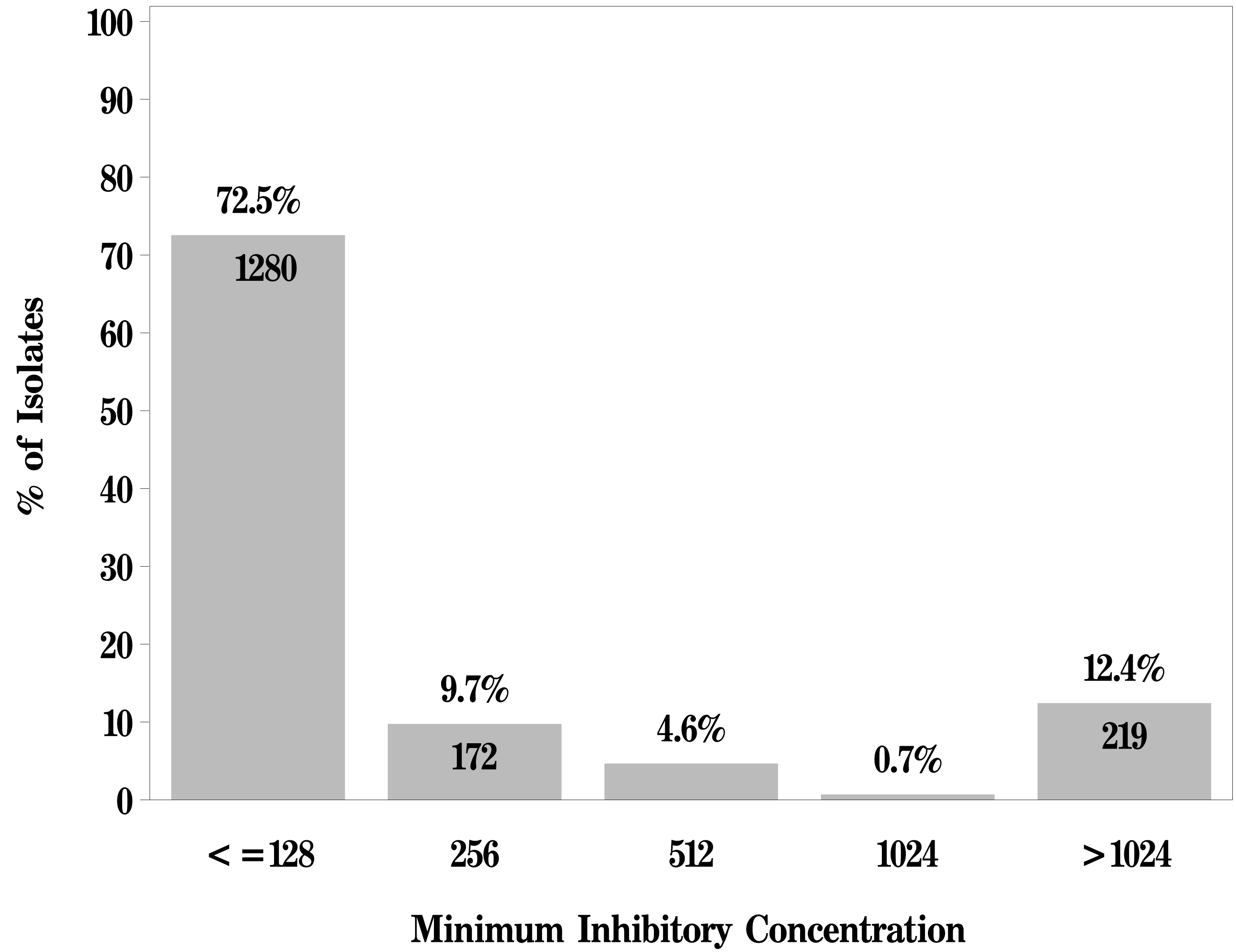
Breakpoints: Susceptible<=500 μg/mL Resistant>=500 μg/mL



NARMS

Figure 13g: Minimum Inhibitory Concentration of Kanamycin for *Enterococcus* (N=1765 Isolates)

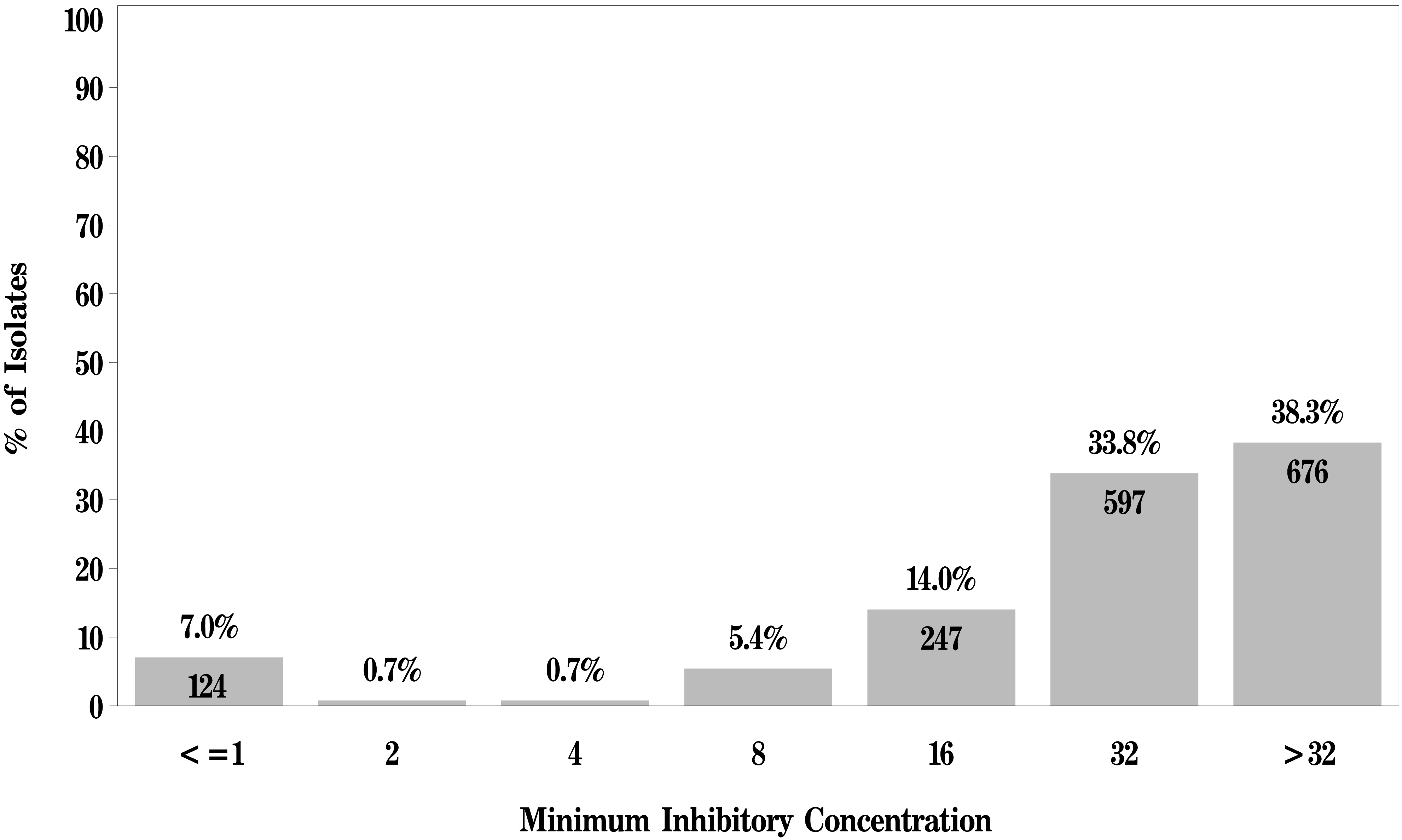
Breakpoints: Susceptible <=512 μg/mL Resistant >=1024 μg/mL



NARMS

Figure 13h: Minimum Inhibitory Concentration of Lincomycin for *Enterococcus* (N=1765 Isolates)

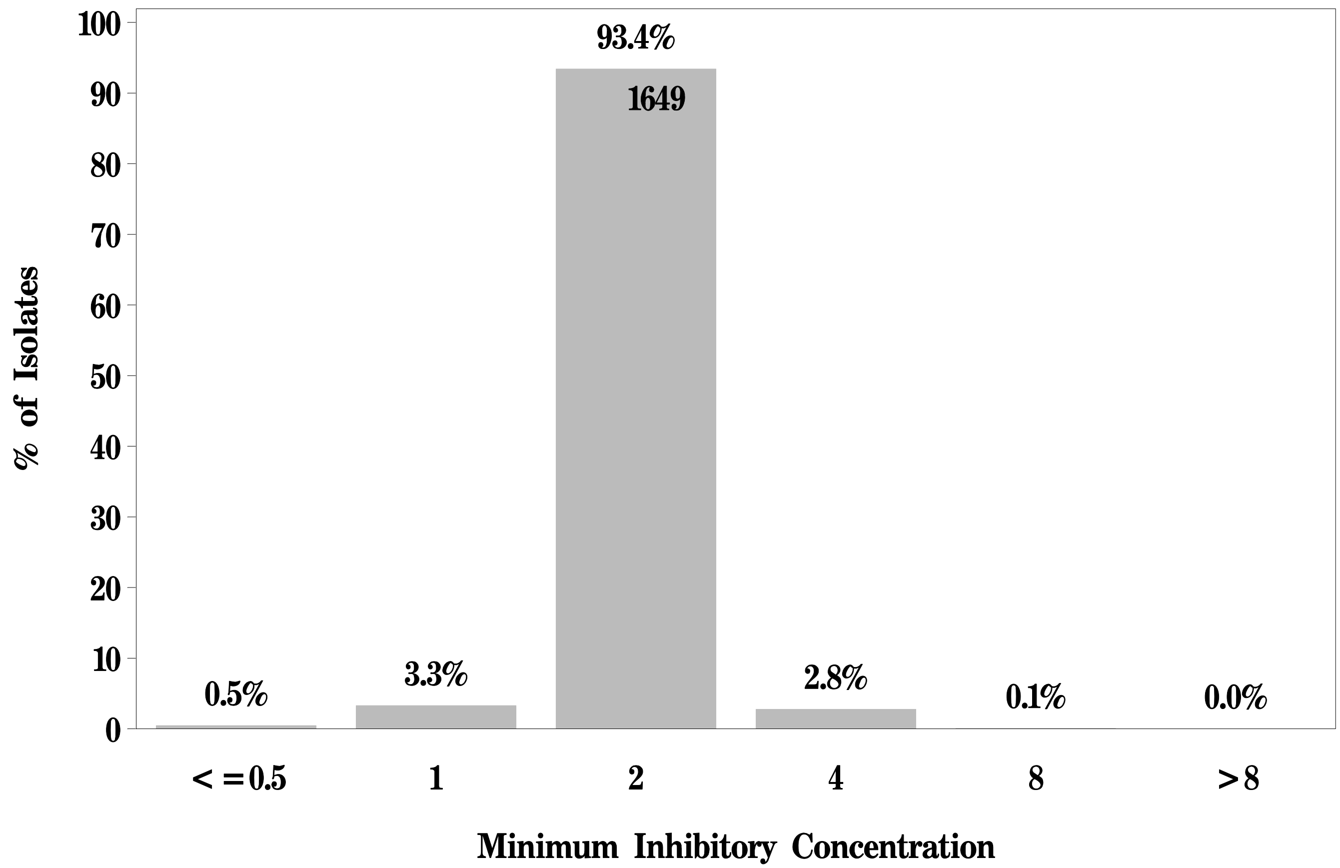
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 13i: Minimum Inhibitory Concentration of Linezolid for *Enterococcus* (N=1765 Isolates)

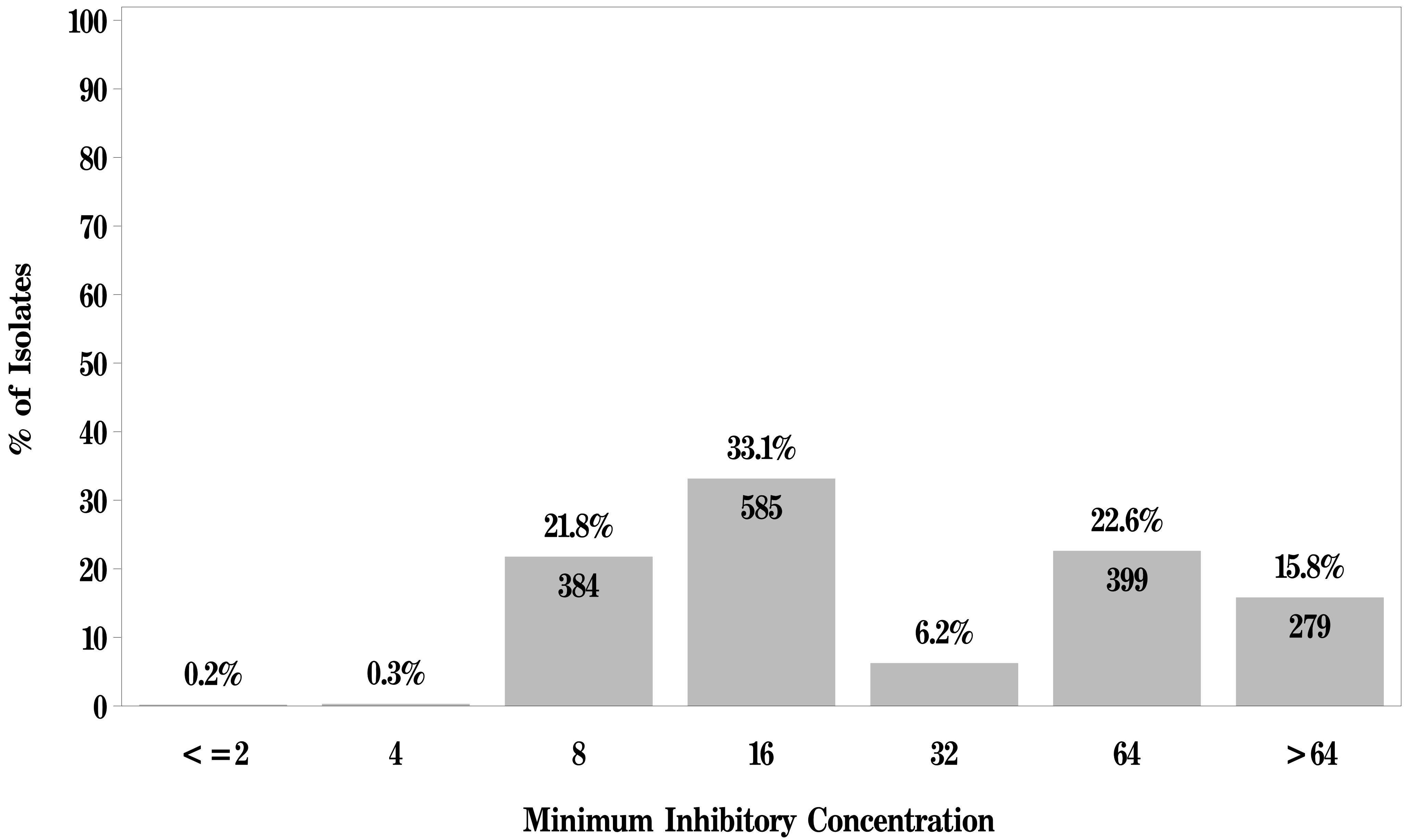
Breakpoints: Susceptible<=2 µg/mL Resistant>=8 µg/mL



NARMS

Figure 13j: Minimum Inhibitory Concentration of Nitrofurantoin for *Enterococcus* (N=1765 Isolates)

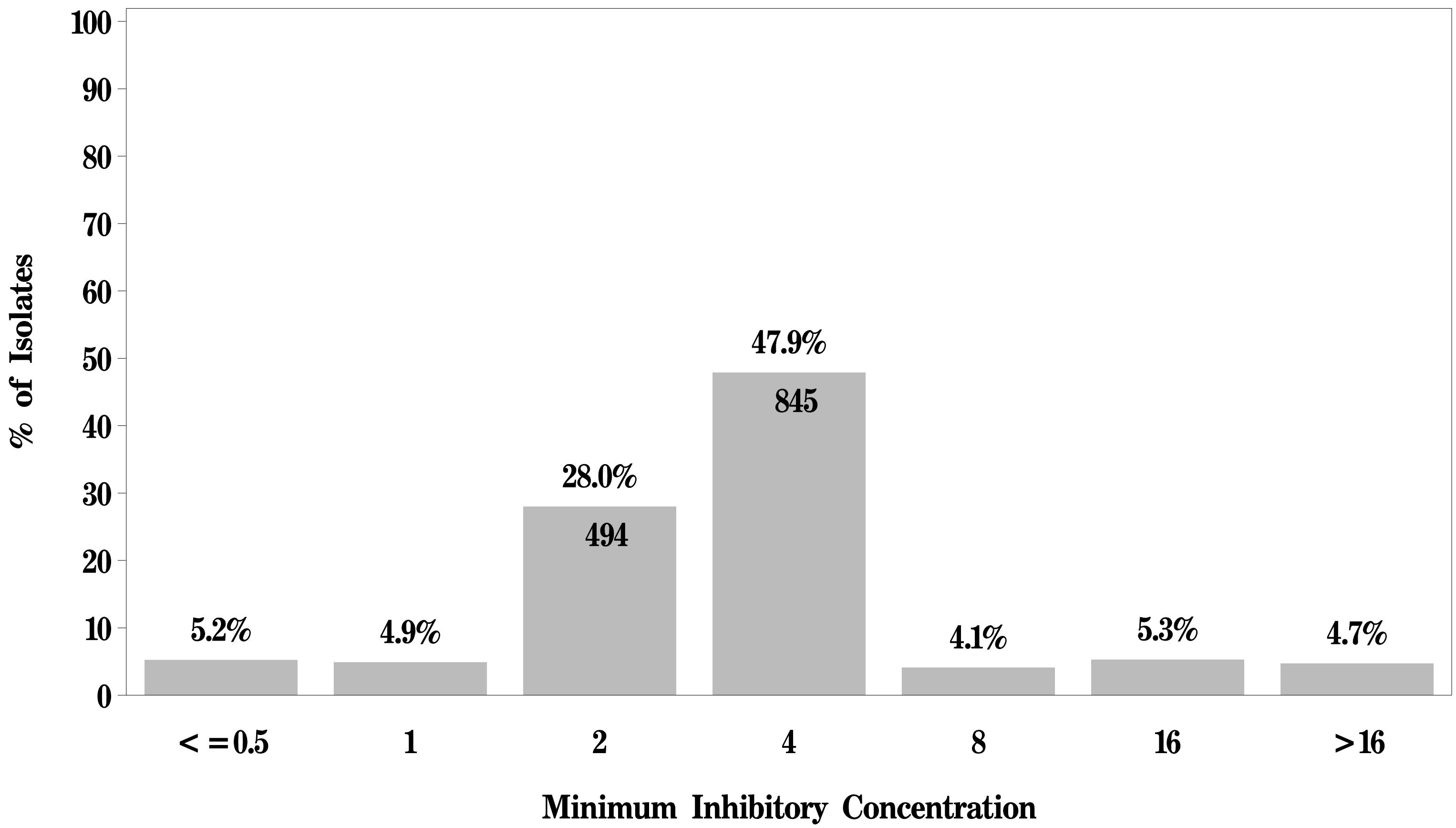
Breakpoints: Susceptible <=32 μg/mL Resistant >=128 μg/mL



NARMS

Figure 13k: Minimum Inhibitory Concentration of Penicillin for *Enterococcus* (N=1765 Isolates)

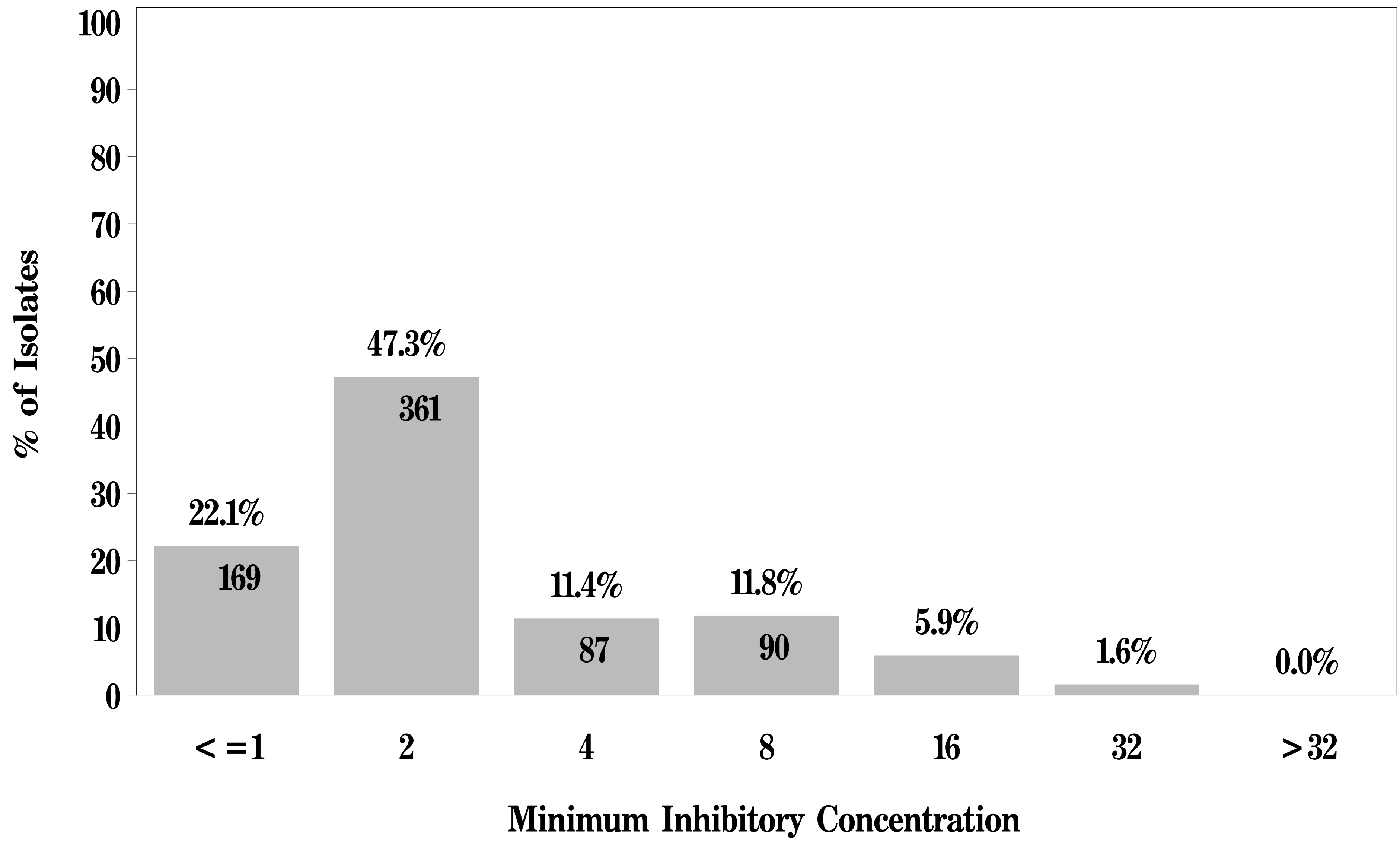
Breakpoints: Susceptible <=8 μg/mL Resistant >=16 μg/mL



NARMS

Figure 13l: Minimum Inhibitory Concentration of Quinupristin−dalfopristin* for *Enterococcus* (N=764 Isolates)

Breakpoints: Susceptible <=1 μg/mL Resistant >=4 μg/mL

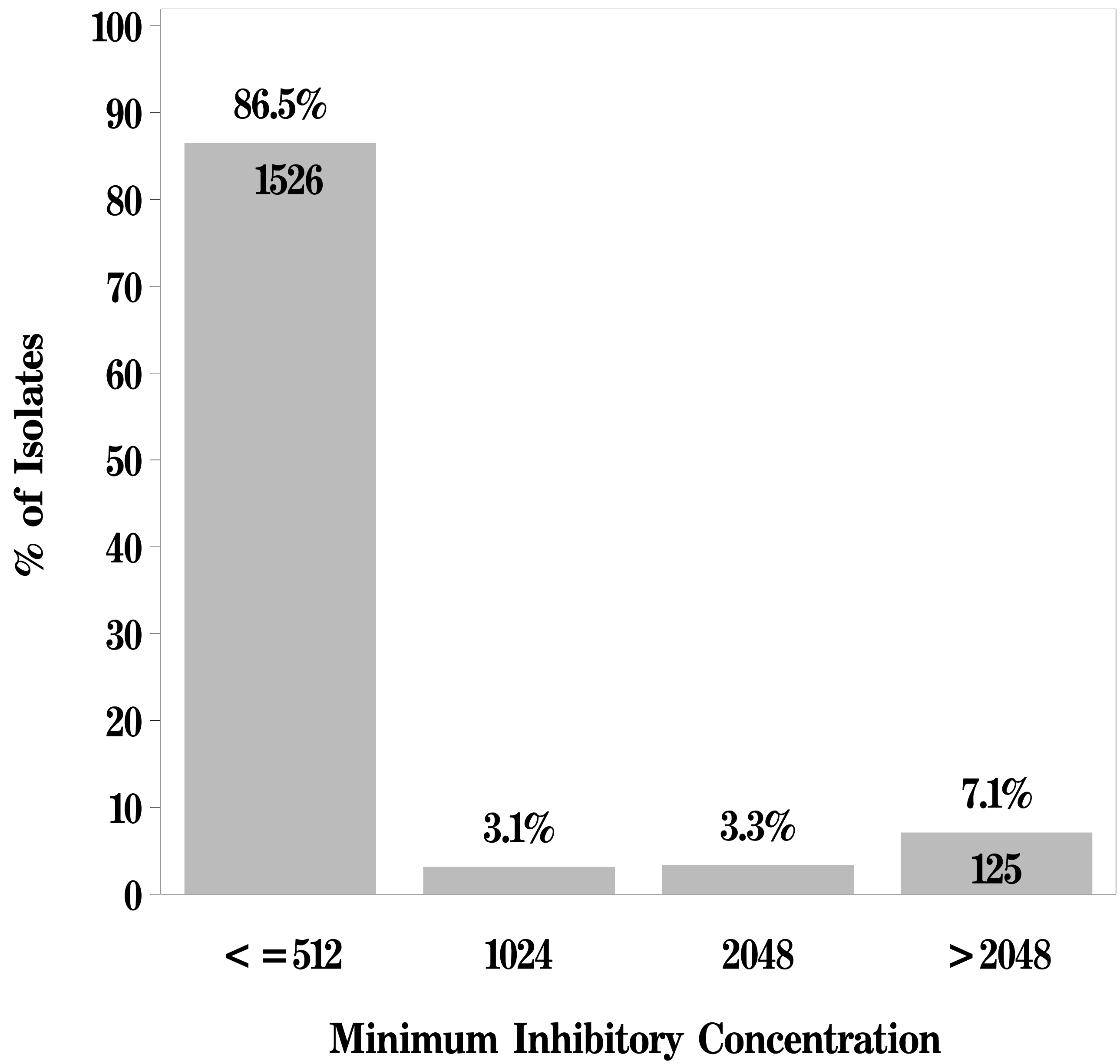


*Presented for all species except *E.faecalis* (N=1765−1001=764)

NARMS

Figure 13m: Minimum Inhibitory Concentration of Streptomycin for *Enterococcus* (N=1765 Isolates)

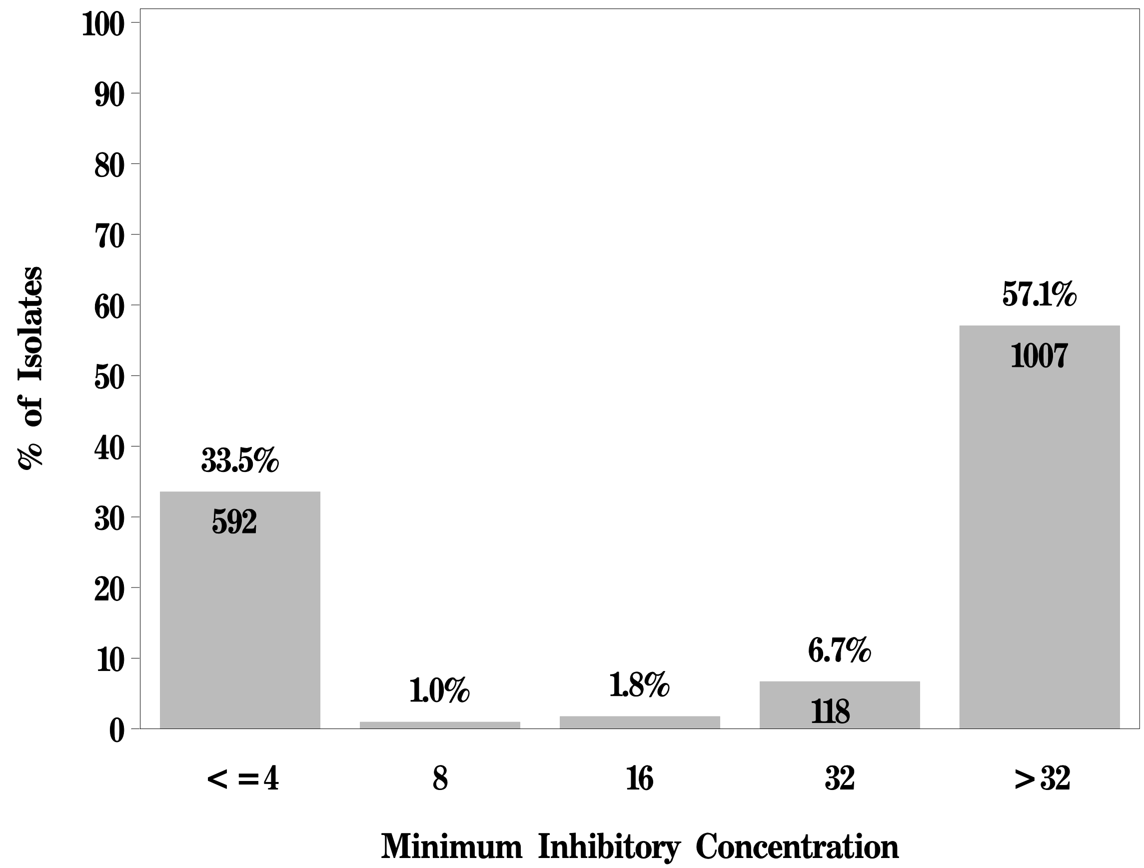
Breakpoints: Susceptible<=1000 μg/mL Resistant>=1000 μg/mL



NARMS

Figure 13n: Minimum Inhibitory Concentration of Tetracycline for *Enterococcus* (N=1765 Isolates)

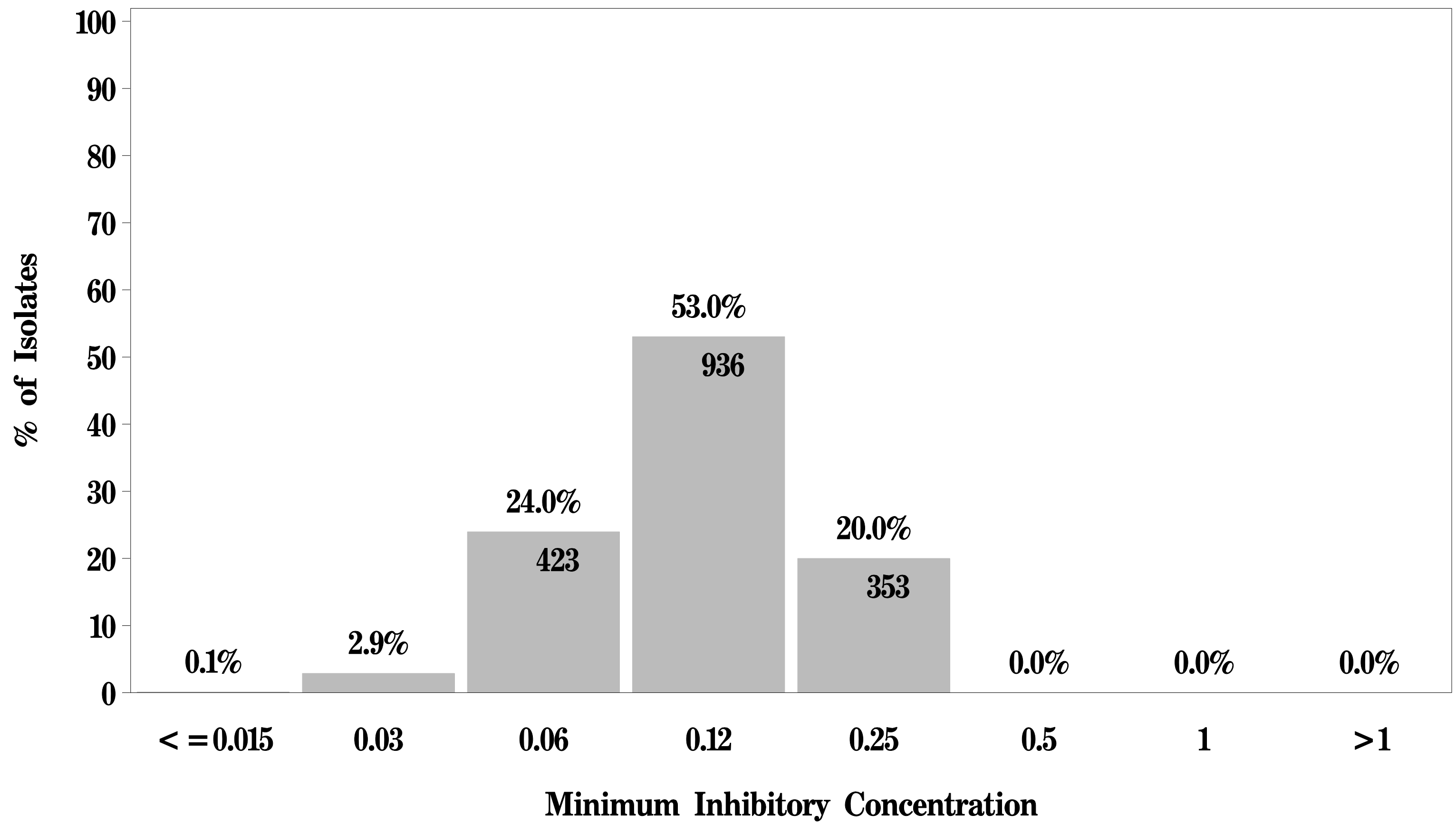
Breakpoints: Susceptible <=4 µg/mL Resistant >=16 µg/mL



NARMS

Figure 13o: Minimum Inhibitory Concentration of Tigecycline for *Enterococcus* (N=1765 Isolates)

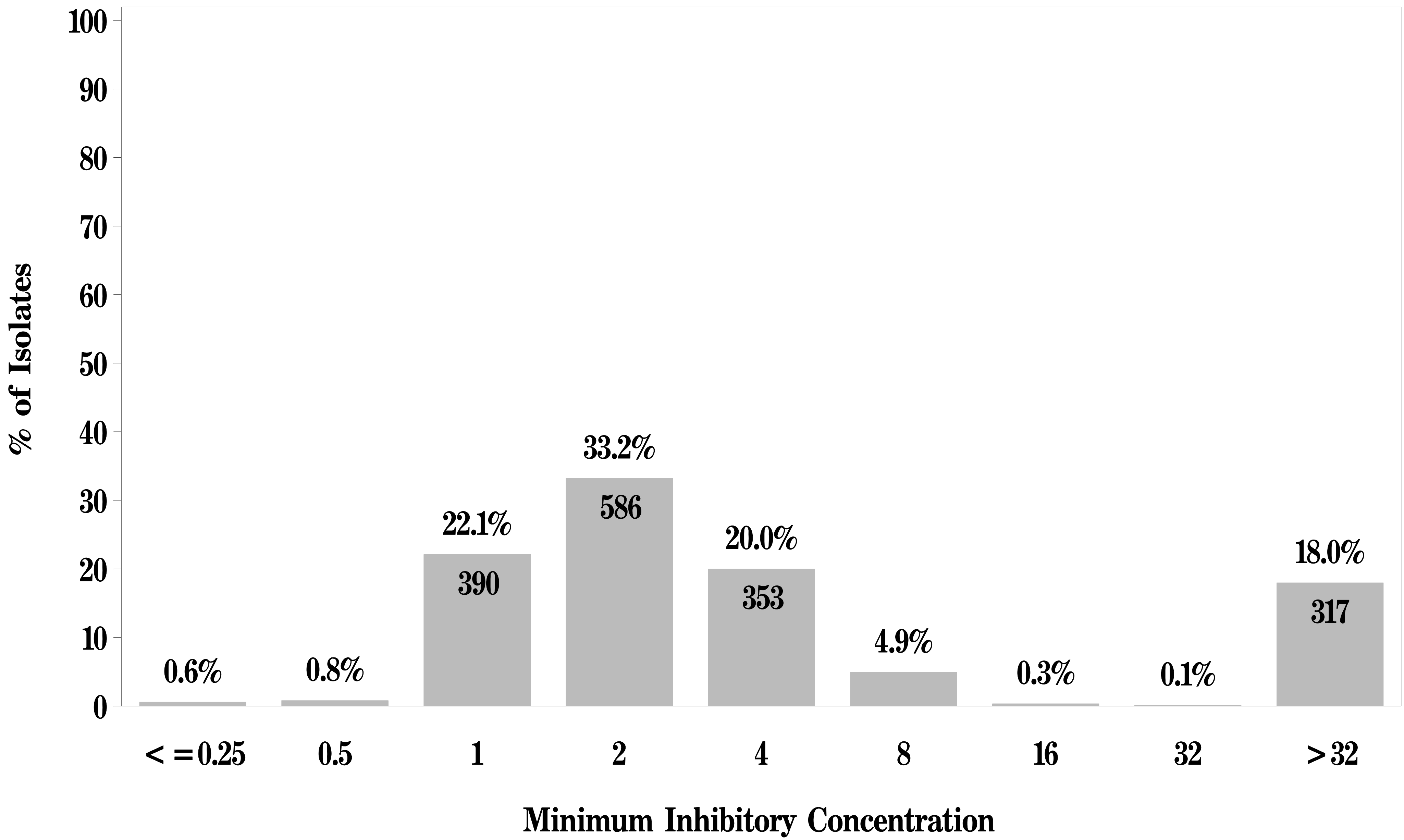
Breakpoints: Susceptible<=0.25 μg/mL Resistant>=1 μg/mL



NARMS

Figure 13p: Minimum Inhibitory Concentration of Tylosin for *Enterococcus* (N=1765 Isolates)

Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 13q: Minimum Inhibitory Concentration of Vancomycin for *Enterococcus* (N=1765 Isolates)

Breakpoints: Susceptible <=4 μg/mL Resistant >=32 μg/mL

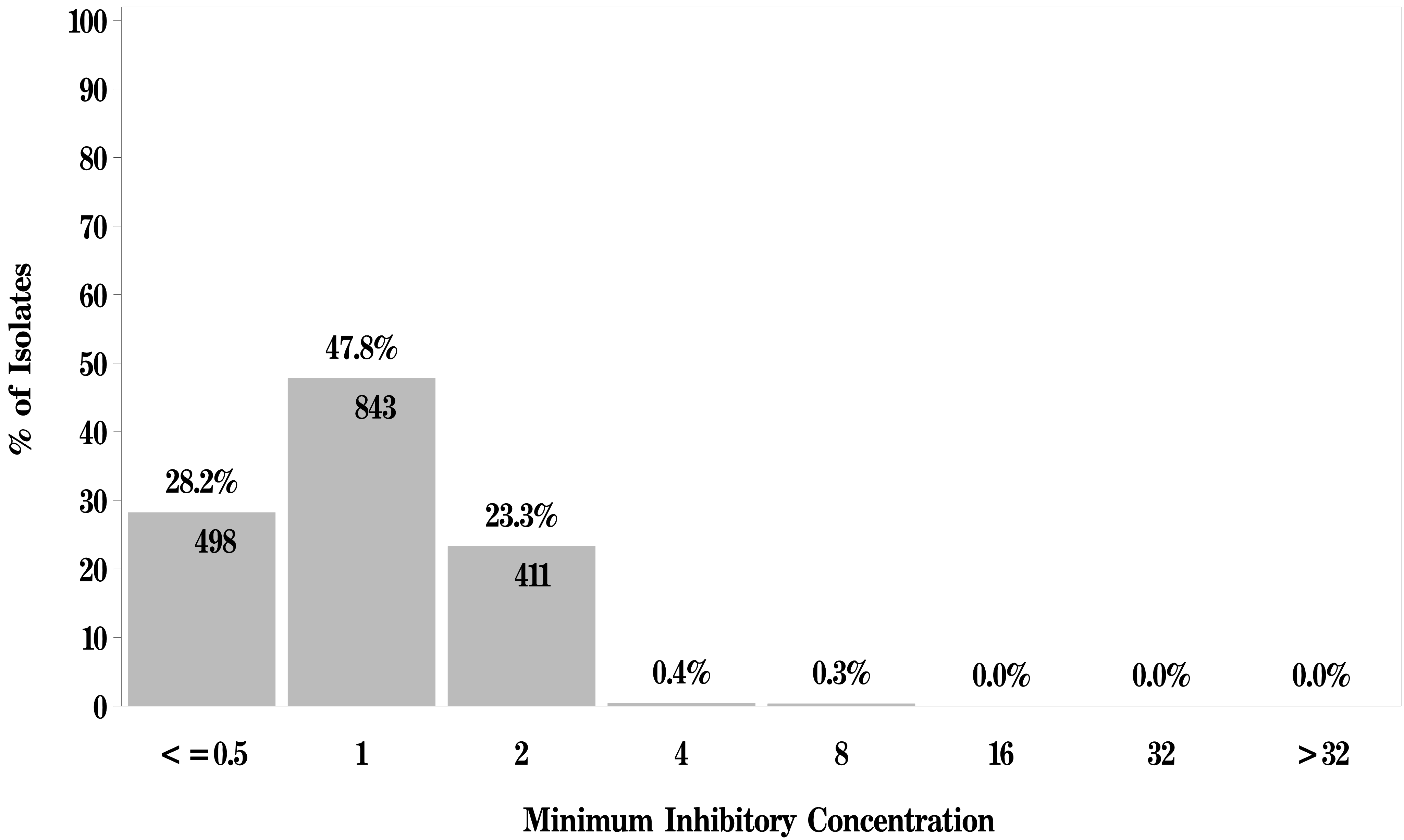


Fig 14a. MIC Distribution Among Enterococcus from Chicken Breast

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	Distribution (1499) 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	2002 (n=381)	N/A	10.0%	(7.2 - 13.4)														89.2	0.8	2.1	1.3	6.6	
	2003 (n=466)	N/A	11.2%	(8.4 - 14.4)														88.4	0.4	1.1	2.4	7.7	
	2004 (n=466)	N/A	7.1%	(4.9 - 9.8)														92.3	0.6	1.1	0.6	5.4	
	2005 (n=457)	N/A	9.6%	(7.1 - 12.7)														89.3	1.1	0.9	1.3	7.4	
Kanamycin	2002 (n=381)	N/A	15.7%	(12.2 - 19.8)														45.9	26.0	12.3	0.3	15.5	
	2003 (n=466)	N/A	18.2%	(14.8 - 22.1)														45.5	23.0	13.3	2.8	15.5	
	2004 (n=466)	N/A	11.8%	(9.0 - 15.1)														41.0	24.2	23.0	2.6	9.2	
	2005 (n=457)	N/A	16.0%	(12.7 - 19.7)														55.8	18.8	9.4	1.3	14.7	
Streptomycin	2002 (n=381)	N/A	21.0%	(17.0 - 25.4)																79.0	4.7	3.7	12.6
	2003 (n=466)	N/A	21.2%	(17.6 - 25.2)																78.8	5.4	5.2	10.7
	2004 (n=466)	N/A	11.4%	(8.6 - 14.6)																88.6	3.4	4.1	3.9
	2005 (n=457)	N/A	15.5%	(12.3 - 19.2)																84.5	6.3	4.4	4.8
Glycopeptides																							
Vancomycin	2002 (n=381)	0.0%	0.0%	(0.0 - 1.0						18.6	62.5	16.3	2.6										
	2003 (n=466)	0.0%	0.0%	(0.0 - 0.8)						19.1	60.9	17.8	2.1										
	2004 (n=466)	0.0%	0.0%	(0.0 - 0.8)						47.6	36.1	15.7	0.6										
	2005 (n=457)	0.0%	0.0%	(0.0 - 0.8)						47.3	38.1	14.2	0.4										
Glycylcycline																							
Tigecycline	2005 (n=457)	0.0%	0.0%	(0.0 - 0.8)	0.2	5.0	33.0	47.9	13.8														
Ionophore Coccidiostat																							
Salinomycin	2002 (n=381)	0.5%	0.0%	(0.0 - 1.0)							23.4	9.7	32.6	33.9	0.5								
	2003 (n=466)	0.2%	0.0%	(0.0 - 0.8)							25.1	12.7	32.8	29.2	0.2								
Lincosamides																							
Lincomycin	2002 (n=381)	0.0%	91.9%	(88.6 - 94.4)							8.1			1.8	11.0	16.8	62.2						
	2003 (n=466)	0.4%	92.7%	(90.0 - 94.9)							6.9		0.4	2.8	11.8	18.2	59.9						
	2004 (n=466)	0.2%	86.7%	(83.3 - 89.6)							13.1		0.2	1.9	17.6	12.9	54.3						
	2005 (n=457)	0.4%	85.1%	(81.5 - 88.3)							13.6	0.9	0.4	2.4	14.4	10.7	57.5						
Lipopeptides																							
Daptomycin[5]	2004 (n=466)	0.0%	3.0%	(1.7 - 5.0)						0.4	14.8	24.7	57.1	2.1	0.9								
	2005 (n=457)	1.3%	0.0%	(0.0 - 0.8)						12.3	23.4	40.3	22.8	1.3									
Macrolides																							
Erythromycin	2002 (n=381)	33.3%	32.8%	(28.1 - 37.8)						33.9	13.4	14.7	5.3	1.6	31.2								
	2003 (n=466)	32.4%	31.1%	(26.9 - 35.5)						36.5	16.5	9.0	6.9	1.3	29.8								
	2004 (n=466)	45.1%	17.0%	(13.7 - 20.7)						38.0	18.9	18.9	7.3	1.7	15.2								
	2005 (n=457)	37.8%	22.8%	(19.0 - 26.9)						39.4	17.3	14.2	6.3	0.7	22.1								
Tylosin	2002 (n=381)	0.0%	31.2%	(26.6 - 36.2)							3.4	28.6	29.7	7.1			31.2						
	2003 (n=466)	0.4%	28.1%	(24.1 - 32.4)							1.1	35.8	30.9	3.6	0.4		28.1						
	2004 (n=466)	0.0%	15.0%	(11.9 - 18.6)							2.4	24.7	44.4	13.5			15.0						
	2005 (n=457)	0.0%	21.7%	(18.0 - 25.7)					0.7	0.9	20.4	19.5	31.7	5.3			21.7						
Nitrofurans																							
Nitrofurantoin	2002 (n=381)	29.4%	33.9%	(29.1 - 38.9)									0.3	17.6	13.9	5.0	29.4	19.7	14.2				
	2003 (n=466)	20.8%	35.6%	(31.3 - 40.2)										22.5	15.5	5.6	20.8	15.0	20.6				
	2004 (n=466)	13.9%	65.5%	(60.9 - 69.8)										4.7	13.1	2.8	13.9	65.5					
	2005 (n=457)	30.6%	38.7%	(34.2 - 43.4)									0.2	8.1	16.2	6.1	30.6	38.7					
Oxazolidinones																							
Linezolid	2002 (n=381)	0.8%	0.0%	(0.0 - 1.0)						0.5	5.8	92.9	0.8										
	2003 (n=466)	0.9%	0.0%	(0.0 - 0.8)							3.0	96.1	0.9										
	2004 (n=466)	11.2%	0.0%	(0.0 - 0.8)							1.1	87.8	11.2										
	2005 (n=457)	2.2%	0.2%	(0.0 - 1.2)						0.7	3.1	93.9	2.2	0.2									
Penicillins																							
Penicillin	2002 (n=381)	N/A	27.3%	(22.9 - 32.1)						1.3	1.1	15.5	48.3	6.6	8.4	18.9							
	2003 (n=466)	N/A	27.9%	(23.9 - 32.2)						1.3	0.4	7.1	54.5	8.8	10.1	17.8							
	2004 (n=466)	N/A	30.9%	(26.7 - 35.3)						1.1	3.0	20.4	35.6	9.0	16.5	14.4							
	2005 (n=457)	N/A	21.4%	(17.8 - 25.5)						1.8	4.4	21.4	42.2	8.8	10.9	10.5							
Phenicols																							
Chloramphenicol	2002 (n=381)	3.4%	0.0%	(0.0 - 1.0)									13.4	83.2	3.4								
	2003 (n=466)	0.9%	0.0%	(0.0 - 0.8)								0.2	5.6	93.3	0.9								
	2004 (n=466)	6.9%	0.0%	(0.0 - 0.8)									4.7	88.4	6.9								
	2005 (n=457)	2.2%	0.2%	(0.0 - 1.2)								1.3	17.3	79.0	2.2	0.2							
Phosphoglcolipids																							
Flavomycin	2002 (n=381)	0.5%	62.2%	(57.1 - 67.1)							13.4	18.9	2.9	2.1	0.5	1.3	60.9						
	2003 (n=466)	1.1%	57.5%	(52.9 - 62.0)							16.7	22.3	1.7	0.6	1.1		57.5						
	2004 (n=466)	5.6%	68.5%	(64.0 - 72.7)							18.2	0.6	1.5	5.6	5.6	3.4	65.0						
	2005 (n=457)	6.3%	58.4%	(53.8 - 63.0)							25.6	3.1	3.3	3.3	6.3	58.4							
Polypeptides																							
Bacitracin	2002 (n=381)	1.1%	97.4%	(95.2 - 98.7)											1.6	1.1	5.8	14.7	76.9				
	2003 (n=466)	0.9%	98.5%	(96.9 - 99.4)										0.4	0.2	0.9	4.5	18.2	75.8				
	2004 (n=466)	1.7%	94.0%	(91.4 - 96.0)										2.8	1.5	1.7	13.3	16.5	64.2				
Quinolones																							
Ciprofloxacin	2002 (n=381)	28.9%	8.1%	(5.6 - 11.4)					1.1	10.5	51.4	28.9	7.6	0.5									
	2003 (n=466)	26.8%	11.6%	(8.8 - 14.8)				0.2	3.2	7.7	50.4	26.8	10.5	1.1									
	2004 (n=466)	40.6%	40.8%	(36.3 - 45.4)				0.2	0.4	4.9	13.1	40.6	32.6	8.2									
	2005 (n=457)	34.1%	23.2%	(19.4 - 27.3)					0.7	8.8	33.3	34.1	21.4	1.8									
Streptogramins																							
Quinupristin-Dalfopristin	2002 (n=247)	30.8%	56.3%	(49.8 - 62.6)							13.0	30.8	22.7	17.8	11.3	4.5							
	2003 (n=278)	26.3%	61.9%	(55.9 - 67.6)							11.9	26.3	33.1	15.5	10.8	2.5							
	2004 (n=378)	42.6%	29.9%	(25.3 - 34.8)							27.5	42.6	6.3	18.5	5.0								
	2005 (n=341)	34.9%	39.0%	(33.8 - 44.4)							26.1	34.9	13.8	16.4	7.0	1.8							
Tetracyclines																							
Tetracycline	2002 (n=381)	1.8%	61.2%	(56.1 - 66.1)									37.0	1.8	1.3	4.5	55.4						
	2003 (n=466)	1.9%	59.2%	(54.6 - 63.7)									38.8	1.9	1.9	6.9	50.4						
	2004 (n=466)	5.6%	49.1%	(44.5 - 53.8)									45.3	5.6	2.1	3.2	43.8						
	2005 (n=457)	3.3%	58.9%	(54.2 - 63.4									37.9	3.3	1.5	5.5	51.9						

[1] Percent of isolates with intermediate susceptibility

[2] Percent resistant; for daptomycin, the percent non-susceptible

[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. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of isolates with MICs equal to or less than the lowest tested concentratic CLSI breakpoints were used when available. No CLSI breakpoints for Tigecycline and Daptomycin.

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

Fig 14b. MIC Distribution Among Enterococcus from Ground Turkey

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	Distribution (1499) 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	2002 (n=387)	N/A	20.4%	(16.5 - 24.8)														79.6			0.8	19.6	
	2003 (n=418)	N/A	22.7%	(18.8 - 27.0)														77.0	0.2	0.2	0.7	21.8	
	2004 (n=437)	N/A	20.1%	(16.5 - 24.2)														79.4	0.5	0.7	0.5	18.9	
	2005 (n=452)	N/A	17.9%	(14.5 - 21.8)														81.6	0.4	1.1	0.7	16.2	
Kanamycin	2002 (n=387)	N/A	28.9%	(24.5 - 33.7)														60.2	7.0	3.9	1.3	27.7	
	2003 (n=418)	N/A	33.3%	(28.8 - 38.0)														51.4	9.1	6.2	1.0	32.3	
	2004 (n=437)	N/A	31.8%	(27.5 - 36.4)														49.4	9.6	9.2	0.9	30.9	
	2005 (n=452)	N/A	28.1%	(24.0 - 32.5)														61.9	6.2	3.8	1.3	26.8	
Streptomycin	2002 (n=387)	N/A	27.6%	(23.2 - 32.4)																72.4	2.8	4.7	20.2
	2003 (n=418)	N/A	30.1%	(25.8 - 34.8)																69.9	3.1	3.6	23.4
	2004 (n=437)	N/A	29.5%	(25.3 - 34.0)																70.5	6.6	5.7	17.1
	2005 (n=452)	N/A	24.8%	(20.9 - 29.0)																75.2	4.0	5.3	15.5
Glycopeptides																							
Vancomycin	2002 (n=387)	0.5%	0.0%	(0.0 - 0.9)						5.2	59.2	29.2	5.9	0.5									
	2003 (n=418)	1.9%	0.0%	(0.0 - 0.9)						6.7	55.7	30.1	5.5	1.9									
	2004 (n=437)	0.9%	0.0%	(0.0 - 0.8)						22.7	46.0	28.6	1.8	0.9									
	2005 (n=452)	0.9%	0.0%	(0.0 - 0.8)						12.2	58.2	28.5	0.2	0.9									
Glycylcycline																							
Tigecycline	2005 (n=452)	0.0%	0.0%	(0.0 - 0.8)	0.2	0.7	13.5	60.6	25.0														
Ionophore Coccidiostat																							
Salinomycin	2002 (n=387)	0.3%	0.5%	(0.1 - 1.9)							74.2	11.1	9.6	4.4	0.3	0.5							
	2003 (n=418)	0.0%	0.0%	(0.0 - 0.9)							68.2	9.6	16.7	5.5									
Lincosamides																							
Lincomycin	2002 (n=387)	0.5%	96.6%	(94.3 - 98.2)							2.6	0.3	0.5	0.8	7.5	39.3	49.1						
	2003 (n=418)	0.0%	96.2%	(93.9 - 97.8)							3.3	0.5		0.7	8.6	34.9	51.9						
	2004 (n=437)	0.5%	94.7%	(92.2 - 96.6)							4.3	0.5	0.5	0.7	8.0	30.0	56.1						
	2005 (n=452)	1.8%	96.2%	(94.0 - 97.8)							1.5	0.4	1.8	1.3	4.9	33.8	56.2						
Lipopeptides																							
Daptomycin[5]	2004 (n=437)	0.0%	3.0%	(1.6 - 5.0)						5.9	47.1	16.9	27.0	2.7	0.2								
	2005 (n=452)	1.3%	0.0%	(0.0 - 0.8)						34.7	40.7	16.2	7.1	1.3									
Macrolides																							
Erythromicin	2002 (n=387)	38.2%	35.1%	(30.4 - 40.1)						26.6	29.2	6.2	2.8	1.6	33.6								
	2003 (n=418)	28.9%	43.1%	(38.3 - 48.0)						28.0	22.7	3.8	2.4	2.2	40.9								
	2004 (n=437)	28.4%	37.1%	(32.5 - 41.8)						34.6	21.3	5.7	1.4	1.1	35.9								
	2005 (n=452)	27.2%	38.5%	(34.0 - 43.2)						34.3	21.2	4.4	1.5	2.2	36.3								
Tylosin	2002 (n=387)	0.3%	32.6%	(27.9 - 37.5)							4.7	48.8	12.9	0.8	0.3	0.5	32.0						
	2003 (n=418)	0.0%	38.5%	(33.8 - 43.4)							0.5	41.1	18.7	1.2			38.5						
	2004 (n=437)	0.0%	34.6%	(30.1 - 39.2)						0.2	3.9	21.7	34.8	4.8		0.2	34.3						
	2005 (n=452)	0.2%	36.1%	(31.6 - 40.7)					0.4	0.9	17.0	29.6	13.9	1.8	0.2	0.2	35.8						
Nitrofurans																							
Nitrofurantoin	2002 (n=387)	12.1%	13.4%	(10.2 - 17.2)								0.5	0.8	49.6	21.2	2.3	12.1	11.4	2.1				
	2003 (n=418)	14.1%	15.8%	(12.4 - 19.6)										44.3	23.9	1.9	14.1	13.9	1.9				
	2004 (n=437)	13.7%	27.0%	(22.9 - 31.4)										29.3	28.8	1.1	13.7	27.0					
	2005 (n=452)	12.8%	11.9%	(9.1 - 15.3)								0.4	0.2	32.5	38.5	3.5	12.8	11.9					
Oxazolidinones																							
Linezolid	2002 (n=387)	0.3%	0.0%	(0.0 - 0.9)							7.8	92.0	0.3										
	2003 (n=418)	0.5%	0.0%	(0.0 - 0.9)							6.5	93.1	0.5										
	2004 (n=437)	6.6%	0.0%	(0.0 - 0.8)						0.2	2.3	90.8	6.6										
	2005 (n=452)	2.2%	0.0%	(0.0 - 0.8)						0.9	4.0	92.9	2.2										
Penicillins																							
Penicillin	2002 (n=387)	N/A	15.2%	(11.8 - 19.2)						1.3	1.0	23.3	56.6	2.6	3.6	11.6							
	2003 (n=418)	N/A	18.4%	(14.8 - 22.5)						1.0	0.5	9.1	67.7	3.3	4.1	14.4							
	2004 (n=437)	N/A	24.3%	(20.3 - 28.6)						1.1	0.9	26.1	43.5	4.1	11.9	12.4							
	2005 (n=452)	N/A	15.5%	(12.3 - 19.2)						1.1	0.7	28.8	50.7	3.3	8.4	7.1							
Phenicols																							
Chloramphenicol	2002 (n=387)	0.5%	0.3%	(0.0 - 1.4)								0.3	8.0	91.0	0.5		0.3						
	2003 (n=418)	2.2%	0.0%	(0.0 - 0.9)								0.2	5.5	92.1	2.2								
	2004 (n=437)	10.8%	0.0%	(0.0 - 0.8)								0.5	3.7	85.1	10.8								
	2005 (n=452)	2.7%	0.0%	(0.0 - 0.8)								1.8	9.5	96.1	2.7								
Phosphoglcolipids																							
Flavomycin	2002 (n=387)	0.5%	22.2%	(18.2 - 26.7)							34.1	36.4	5.7	1.0	0.5		22.2						
	2003 (n=418)	0.7%	29.9%	(25.6 - 34.5)							28.2	35.4	4.8	1.0	0.7	0.5	29.4						
	2004 (n=437)	2.5%	35.7%	(31.2 - 40.4)							55.8	2.1	1.1	2.7	2.5	0.9	34.8						
	2005 (n=452)	2.2%	22.3%	(18.6 - 26.5)							72.3	1.3	1.1	0.7	2.2	22.3							
Polypeptides																							
Bacitracin	2002 (n=387)	1.8%	97.2%	(94.3 - 98.2)										0.8	0.3	1.8	15.0	22.2	60.0				
	2003 (n=418)	1.4%	97.8%	(93.9 - 97.8)										0.7		1.4	7.4	19.1	71.3				
	2004 (n=437)	2.7%	95.9%	(92.2 - 96.6)										0.5	0.9	2.7	15.8	12.8	67.3				
Quinolones																							
Ciprofloxacin	2002 (n=387)	13.7%	5.4%	(3.4 - 8.2)					0.5	12.1	68.2	13.7	4.9	0.5									
	2003 (n=418)	22.7%	11.2%	(8.4 - 14.7)					1.0	9.1	56.0	22.7	8.6	2.6									
	2004 (n=437)	46.0%	24.7%	(20.7 - 29.0)					0.2	3.7	25.4	46.0	19.5	5.3									
	2005 (n=452)	26.3%	12.2%	(9.3 - 15.5)					0.7	4.4	56.4	26.3	11.3	0.9									
Streptogramins																							
Quinupristin-Dalfopristin	2002 (n=93)	17.2%	79.6%	(69.9 - 87.2)							3.2	17.2	14.0	24.7	29.0	11.8							
	2003 (n=129)	13.2%	79.8%	(71.9 - 86.4)							7.0	13.2	28.7	20.9	27.1	3.1							
	2004 (n=177)	22.6%	62.7%	(55.1 - 69.9)							14.7	22.6	11.3	26.6	19.2	5.6							
	2005 (n=113)	27.4%	61.1%	(51.4 - 70.1)							11.5	27.4	11.5	25.7	18.6	5.3							
Tetracyclines																							
Tetracycline	2002 (n=387)	0.3%	85.8%	(81.9 - 89.1)									14.0	0.3	0.5	1.0	84.2						
	2003 (n=418)	0.5%	87.3%	(83.7 - 90.4)									12.2	0.5	1.0	2.4	84.0						
	2004 (n=437)	0.2%	87.0%	(83.4 - 90.0)									12.8	0.2	0.9	3.2	82.8						
	2005 (n=452)	0.2%	85.8%	(82.3 - 88.9)									13.9	0.2	1.3	4.9	79.6						

[1] Percent of isolates with intermediate susceptibility

[2] Percent resistant; for daptomycin, the percent non-susceptible

[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. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. No CLSI breakpoints for Tigecycline and Daptomycin.

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

Fig 14c. MIC Distribution Among Enterococcus from Ground Beef

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	Distribution (1499) 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	2002 (n=383)	N/A	1.8%	(0.7 - 3.7)														98.2		0.5	1.0	0.3	
	2003 (n=432)	N/A	0.9%	(0.3 - 2.4)														99.1			0.2	0.7	
	2004 (n=448)	N/A	0.4%	(0.1 - 1.6)														99.1	0.4		0.2	0.2	
	2005 (n=447)	N/A	1.3%	(0.5 - 2.9)														98.4	0.2	0.2	0.7	0.4	
Kanamycin	2002 (n=383)	N/A	2.1%	(0.9 - 4.1)														82.3	11.0	4.7	0.8	1.3	
	2003 (n=432)	N/A	4.4%	(2.7 - 6.8)														83.6	6.7	5.3	1.6	2.8	
	2004 (n=448)	N/A	4.5%	(2.7 - 6.8)														78.1	8.3	9.2	0.4	4.0	
	2005 (n=447)	N/A	3.4%	(1.9 - 5.5)														84.6	8.7	3.4		3.4	
Streptomycin	2002 (n=383)	N/A	3.9%	(2.2 - 6.4)																96.1	0.8	2.1	1.0
	2003 (n=432)	N/A	4.2%	(2.5 - 6.5)																95.8	1.4	1.2	1.6
	2004 (n=448)	N/A	5.4%	(3.5 - 7.9)																94.6	2.0	1.1	2.2
	2005 (n=447)	N/A	5.6%	(3.7 - 8.1)																94.4	0.9	2.0	2.7
Glycopeptides																							
Vancomycin	2002 (n=383)	0.0%	0.0%	(0.0 - 1.0)						25.9	40.5	32.1	1.6										
	2003 (n=432)	1.2%	0.0%	(0.0 - 0.9)						26.4	49.3	21.3	1.9	1.2									
	2004 (n=448)	0.7%	0.0%	(0.0 - 0.8)						43.1	38.8	16.1	1.3	0.7									
	2005 (n=447)	0.0%	0.0%	(0.0 - 0.8)						35.8	41.6	22.4	0.2										
Glycylcycline																							
Tigecycline	2005 (n=447)	0.0%	0.0%	(0.0 - 0.8)		3.8	33.6	47.7	15.0														
Ionophore Coccidiostat																							
Salinomycin	2002 (n=383)	0.8%	0.0%	(0.0 - 1.0)							60.6	35.3	2.9	0.5	0.8								
	2003 (n=432)	0.0%	0.0%	(0.0 - 0.9)							61.1	33.8	2.8	2.3									
Lincosamides																							
Lincomycin	2002 (n=383)	0.5%	91.9%	(88.7 - 94.4)							7.1	0.5	0.5	5.7	18.8	53.3	14.1						
	2003 (n=432)	0.2%	85.9%	(82.2 - 89.0)							12.7	1.2	0.2	5.6	18.8	54.4	7.2						
	2004 (n=448)	1.1%	84.4%	(80.7 - 87.6)							13.6	0.9	1.1	8.3	23.9	44.9	7.4						
	2005 (n=447)	0.7%	91.1%	(88.0 - 93.5)							6.7	1.6	0.7	9.2	21.7	42.3	17.9						
Lipopeptides																							
Daptomycin[5]	2004 (n=448)	0.0%	4.7%	(2.9 - 7.1)						2.9	34.6	33.3	24.6	3.3	1.3								
	2005 (n=447)	1.6%	0.0%	(0.0 - 0.8)						20.4	40.3	28.6	9.2	1.6									
Macrolides																							
Erythromicin	2002 (n=383)	54.6%	7.6%	(5.1 - 10.7)						37.9	36.6	11.0	7.1	1.0	6.5								
	2003 (n=432)	52.1%	7.9%	(5.5 - 10.8)						40.0	32.2	10.9	9.0	1.6	6.3								
	2004 (n=448)	46.9%	6.5%	(4.4 - 9.2)						46.7	23.0	13.2	10.7	0.9	5.6								
	2005 (n=447)	47.0%	6.9%	(4.8 - 9.7)						46.1	24.8	11.4	10.7	0.9	6.0								
Tylosin	2002 (n=383)	0.8%	6.5%	(4.3 - 9.5)							6.5	61.1	20.6	4.4	0.8		6.5						
	2003 (n=432)	0.2%	5.8%	(3.8 - 8.4)							4.6	63.0	20.6	5.8	0.2		5.8						
	2004 (n=448)	1.1%	5.1%	(3.3 - 7.6)							6.7	39.1	38.6	9.4	1.1		5.1						
	2005 (n=447)	0.4%	7.2%	(4.9 - 10.0)					0.2	0.9	21.3	43.0	20.4	6.7	0.4		7.2						
Nitrofurans																							
Nitrofurantoin	2002 (n=383)	26.6%	4.7%	(2.8 - 7.3)									0.3	32.1	23.0	13.3	26.6	4.4	0.3				
	2003 (n=432)	25.9%	10.0%	(7.3 - 13.2)										30.6	22.9	10.6	25.9	9.3	0.7				
	2004 (n=448)	27.7%	20.1%	(16.5 - 24.1)									0.2	15.4	27.9	8.7	27.7	20.0					
	2005 (n=447)	32.9%	7.8%	(5.5 - 10.7)										16.6	32.2	10.7	32.7	7.8					
Oxazolidinones																							
Linezolid	2002 (n=383)	0.3%	0.0%	(0.0 - 1.0)						0.3	0.8	98.7	0.3										
	2003 (n=432)	0.9%	0.0%	(0.0 - 0.9)						0.2	0.9	97.9	0.9										
	2004 (n=448)	11.6%	0.0%	(0.0 - 0.8)						0.2	0.4	87.7	11.6										
	2005 (n=447)	2.5%	0.0%	(0.0 - 0.8)						0.2	2.7	94.6	2.5										
Penicillins																							
Penicillin	2002 (n=383)	N/A	0.0%	(0.0 - 1.0)						10.2	4.7	22.5	58.2	4.4									
	2003 (n=432)	N/A	2.1%	(1.0 - 3.9)						6.5	6.5	13.2	65.3	6.5	1.2	0.9							
	2004 (n=448)	N/A	1.3%	(0.5 - 2.9)						14.1	8.5	27.7	45.8	2.7	0.4	0.9							
	2005 (n=447)	N/A	0.7%	(0.1 - 1.9)						11.0	11.2	28.4	46.5	2.2	0.4	0.2							
Phenicols																							
Chloramphenicol	2002 (n=383)	1.8%	0.5%	(0.1 - 1.9)									11.8	85.9	1.8	0.5							
	2003 (n=432)	0.7%	0.0%	(0.0 - 0.9)									10.0	89.4	0.7								
	2004 (n=448)	4.5%	0.4%	(0.1 - 1.6)									6.5	88.6	4.5	0.4							
	2005 (n=447)	2.0%	0.2%	(0.0 - 1.2)								0.7	16.1	81.0	2.0	0.2							
Phosphoglcolipids																							
Flavomycin	2002 (n=383)	0.5%	43.1%	(38.1 - 48.2)							21.2	31.1	3.9	0.3	0.5	0.3	42.8						
	2003 (n=432)	0.2%	46.5%	(41.7 - 51.4)							21.8	26.9	4.4	0.2	0.2	0.2	46.3						
	2004 (n=448)	2.0%	53.3%	(48.6 - 58.0)							39.5	3.6	1.1	0.4	2.0	1.1	52.2						
	2005 (n=447)	1.1%	45.6%	(41.0 - 50.4)							50.1	1.3	0.7	1.1	1.1	45.6							
Polypeptides																							
Bacitracin	2002 (n=383)	9.9%	70.2%	(65.4 - 74.8)										10.7	9.1	9.9	16.5	32.4	21.4				
	2003 (n=432)	5.1%	78.2%	(74.0 - 82.0)										7.2	9.5	5.1	12.5	32.9	32.9				
	2004 (n=448)	13.4%	62.3%	(57.6 - 66.8)										20.1	4.2	13.4	29.0	21.2	12.1				
Quinolones																							
Ciprofloxacin	2002 (n=383)	14.4%	3.1%	(1.6 - 5.4)					4.7	27.4	50.4	14.4	2.6	0.5									
	2003 (n=432)	20.6%	8.8%	(6.3 - 11.9)					3.2	22.0	45.4	20.6	6.7	2.1									
	2004 (n=448)	38.2%	15.8%	(12.6 - 19.6)					0.2	7.8	37.9	38.2	13.2	2.7									
	2005 (n=447)	28.2%	6.5%	(4.4 - 9.2)					0.7	14.1	50.6	28.2	4.3	2.2									
Streptogramins																							
Quinupristin-Dalfopristin	2002 (n=173)	36.4%	46.2%	(38.6 - 54.0)							17.3	36.4	42.8	3.5									
	2003 (n=208)	20.7%	54.3%	(47.3 - 61.2)							25.0	20.7	47.6	5.3	1.4								
	2004 (n=254)	63.4%	7.5%	(4.6 - 11.4)							29.1	63.4	7.5										
	2005 (n=221)	68.3%	9.0%	(5.6 - 13.6)							22.6	68.3	7.2	1.8									
Tetracyclines																							
Tetracycline	2002 (n=383)	0.0%	28.2%	(23.7 - 33.0)									71.8			4.7	23.5						
	2003 (n=432)	0.7%	27.8%	(23.6 - 32.3)									71.5	0.7	0.2	2.8	24.8						
	2004 (n=448)	0.2%	30.4%	(26.1 - 34.8)									69.4	0.2	0.9	5.8	23.7						
	2005 (n=447)	0.0%	38.5%	(33.9 - 43.2)									61.5		2.5	8.5	27.5						

[1] Percent of isolates with intermediate susceptibility

[2] Percent resistant; for daptomycin, the percent non-susceptible

[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. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of isolates with MICs equal to or less than the lowest tested concentration. CLSI breakpoints were used when available. No CLSI breakpoints for Tigecycline and Datpmycin.

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

Fig 14d. MIC Distribution Among Enterococcus from Pork Chops

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	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	2002 (n=369)	N/A	2.2%	(0.9 - 4.2)														97.8		0.3	0.8	1.1	
	2003 (n=426)	N/A	0.2%	(0.0 - 1.3)														99.8		0.2			
	2004 (n=404)	N/A	1.5%	(0.5 - 3.2)														98.0	0.5	0.5	0.5	0.5	
	2005 (n=409)	N/A	1.2%	(0.4 - 2.8)														98.5	0.2	0.7	0.2	0.2	
Kanamycin	2002 (n=369)	N/A	4.1%	(2.3 - 6.6)														85.1	7.1	3.8		4.1	
	2003 (n=426)	N/A	4.0%	(2.3 - 6.3)														87.8	5.6	2.6	0.5	3.5	
	2004 (n=404)	N/A	2.7%	(1.4 - 4.8)														91.6	3.7	1.9	0.5	2.2	
	2005 (n=409)	N/A	3.9%	(2.3 - 6.3)														89.7	4.6	1.7		3.9	
Streptomycin	2002 (n=369)	N/A	8.9%	(6.2 - 12.3)																91.1	1.4	3.0	4.6
	2003 (n=426)	N/A	6.1%	(4.0 - 8.8)																93.9	0.2	0.9	4.9
	2004 (n=404)	N/A	8.4%	(5.9 - 11.6)																91.5	1.5	4.2	2.7
	2005 (n=409)	N/A	7.6%	(5.2 - 10.6)																92.4	1.0	1.5	5.1
Glycopeptides																							
Vancomycin	2002 (n=369)	1.1%	0.0%	(0.0 - 1.0)						15.5	45.5	33.9	4.1	1.1									
	2003 (n=426)	0.0%	0.0%	(0.0 - 0.9)						16.4	51.6	28.4	3.5										
	2004 (n=404)	0.2%	0.0%	(0.0 - 0.9)						14.6	57.9	25.2	2.0	0.2									
	2005 (n=409)	0.5%	0.0%	(0.0 - 0.9)						16.4	53.8	28.6	0.7	0.5									
Glycylcycline																							
Tigecycline	2005 (n=409)	0.0%	0.0%	(0.0 - 0.9)		2.0	14.9	56.2	26.9														
Ionophore Coccidiostat																							
Salinomycin	2002 (n=369)	0.5%	0.0%	(0.0 - 1.0)							72.9	24.1	1.6	0.8	0.5								
	2003 (n=426)	0.0%	0.0%	(0.0 - 0.9)							79.6	18.8	0.9	0.7									
Lincosamides																							
Lincomycin	2002 (n=369)	0.5%	97.0%	(94.7 - 98.5)							1.4	1.1	0.5	9.2	20.9	52.0	14.9						
	2003 (n=426)	0.2%	95.8%	(93.4 - 97.5)							4.0		0.2	13.6	15.3	57.7	9.2						
	2004 (n=404)	0.1%	92.1%	(89.0 - 94.5)							6.4	0.5	1.0	12.3	14.1	53.0	12.6						
	2005 (n=409)	0.0%	93.9%	(91.1 - 96.0)							6.1			9.0	15.2	50.4	19.3						
Lipopeptides																							
Daptomycin[5]	2004 (n=404)	0.0%	0.0%	(0.0 - 0.9)						7.7	57.7	21.5	13.1										
	2005 (n=409)	0.0%	0.0%	(0.0 - 0.9)						27.4	55.7	14.9	2.0										
Macrolides																							
Erythromicin	2002 (n=369)	47.2%	11.4%	(8.3 - 15.1)						41.5	25.8	8.1	13.3	2.2	9.2								
	2003 (n=426)	62.4%	6.8%	(4.6 - 9.6)						30.8	40.4	9.6	12.4	0.9	5.9								
	2004 (n=404)	49.8%	8.7%	(6.1 - 11.8)						41.6	32.7	9.1	7.9	1.0	7.7								
	2005 (n=409)	49.1%	6.6%	(4.4 - 9.5)						44.3	32.8	10.5	5.9	0.5	6.1								
Tylosin	2002 (n=369)	0.0%	8.7%	(6.0 - 12.0)						0.8	3.8	57.7	24.1	4.9			8.7						
	2003 (n=426)	0.0%	5.9%	(3.8 - 8.5)					0.2	0.7	2.6	66.4	22.5	1.6			5.9						
	2004 (n=404)	0.2%	7.7%	(5.3 - 10.7)						0.5	4.0	30.9	49.2	7.4	0.2		7.7						
	2005 (n=409)	0.7%	6.1%	(4.0 - 8.9)					1.0	0.5	30.6	41.8	13.2	6.1	0.7	0.2	5.9						
Nitrofurans																							
Nitrofurantoin	2002 (n=369)	23.6%	1.4%	(0.4 - 3.1)										47.4	22.5	5.2	23.6	1.4					
	2003 (n=426)	16.7%	4.2%	(2.5 - 6.6)									0.2	40.6	35.2	3.1	16.7	4.0	0.2				
	2004 (n=404)	11.9%	7.9%	(5.5 - 11.0)										26.7	49.3	4.2	11.9	7.9					
	2005 (n=409)	13.4%	3.2%	(1.7 - 5.4)								0.2	0.7	31.1	46.9	4.4	13.4	3.2					
Oxazolidinones																							
Linezolid	2002 (n=369)	0.0%	0.0%	(0.0 - 1.0)						0.8	2.4	96.8											
	2003 (n=426)	0.0%	0.0%	(0.0 - 0.9)						0.2	2.1	97.7											
	2004 (n=404)	9.9%	0.0%	(0.0 - 0.9)							2.5	87.6	9.9										
	2005 (n=409)	4.4%	0.0%	(0.0 - 0.9)							3.4	92.2	4.4										
Penicillins																							
Penicillin	2002 (n=369)	N/A	0.8%	(0.2 - 2.4)						15.5	2.7	12.5	65.6	3.0		0.8							
	2003 (n=426)	N/A	0.2%	(0.0 - 1.3)						12.7	1.9	6.3	76.5	2.3		0.2							
	2004 (n=404)	N/A	1.7%	(0.7 - 3.5)						12.4	2.2	31.9	51.2	0.5	1.5	0.2							
	2005 (n=409)	N/A	1.2%	(0.4 - 2.8)						7.3	3.2	34.0	52.6	1.7	0.7	0.5							
Phenicols																							
Chloramphenicol	2002 (n=369)	0.5%	0.3%	(0.0 - 1.5)								0.3	10.0	88.9	0.5	0.3							
	2003 (n=426)	0.7%	0.9%	(0.3 - 2.4)								0.2	4.5	93.7	0.7		0.9						
	2004 (n=404)	5.0%	0.5%	(0.1 - 1.8)									3.2	91.3	5.0	0.2	0.2						
	2005 (n=409)	2.0%	1.0%	(0.3 - 2.5)								0.7	7.6	88.8	2.0	0.7	0.2						
Phosphoglcolipids																							
Flavomycin	2002 (n=369)	0.0%	31.2%	(26.5 - 36.2)							32.8	31.2	4.1	0.8		0.3	30.9						
	2003 (n=426)	0.2%	23.5%	(19.5 - 27.8)							27.5	42.3	5.9	0.7	0.2		23.5						
	2004 (n=404)	0.2%	21.5%	(17.6 - 25.9)							72.3	5.4	0.2	0.2	0.2	0.2	21.2						
	2005 (n=409)	0.5%	19.1%	(15.4 - 23.2)							76.0	2.9	0.7	0.7	0.5	19.1							
Polypeptides																							
Bacitracin	2002 (n=369)	3.3%	94.0%	(94.7 - 98.5)										1.9	0.8	3.3	26.0	45.0	23.0				
	2003 (n=426)	8.2%	89.0%	(93.4 - 97.5)										1.9	0.9	8.2	23.7	33.1	32.2				
	2004 (n=404)	12.9%	75.7%	(89.0 - 94.5)										5.4	5.9	12.9	46.5	19.3	9.9				
Quinolones																							
Ciprofloxacin	2002 (n=369)	9.2%	1.9%	(0.8 - 3.9)					1.6	20.1	67.2	9.2	1.6	0.3									
	2003 (n=426)	14.1%	1.6%	(0.7 - 3.4)				0.2	2.6	11.7	69.7	14.1	1.6										
	2004 (n=404)	39.9%	8.2%	(5.7 - 11.3)					0.5	4.7	46.8	39.9	6.2	2.0									
	2005 (n=409)	26.9%	3.7%	(2.1 - 6.0)					2.0	9.3	58.4	26.7	2.9	0.7									
Streptogramins																							
Quinupristin-Dalfopristin	2002 (n=114)	64.0%	27.2%	(19.3 - 36.3)							8.8	64.0	23.7	2.6	0.9								
	2003 (n=113)	29.2%	60.2%	(50.5 - 69.3)							10.6	29.2	47.8	10.6	0.9	0.9							
	2004 (n=91)	73.6%	5.5%	(1.8 - 12.4)							20.9	73.6	4.4	1.1									
	2005 (n=89)	67.4%	13.5%	(7.2 - 22.4)							19.1	67.4	12.4	1.1									
Tetracyclines																							
Tetracycline	2002 (n=369)	0.3%	76.2%	(71.5 - 80.4)									23.6	0.3	1.6	4.6	69.9						
	2003 (n=426)	0.7%	73.7%	(69.3 - 77.8)									25.6	0.7	0.9	3.5	69.2						
	2004 (n=404)	1.0%	73.5%	(68.9 - 77.8)									25.4	1.0	0.7	5.4	67.3						
	2005 (n=409)	0.2%	80.0%	(75.7 - 83.7)									19.8	0.2	1.7	8.1	70.2						

Distribution (1499) of MICs (µg/ml)[4]

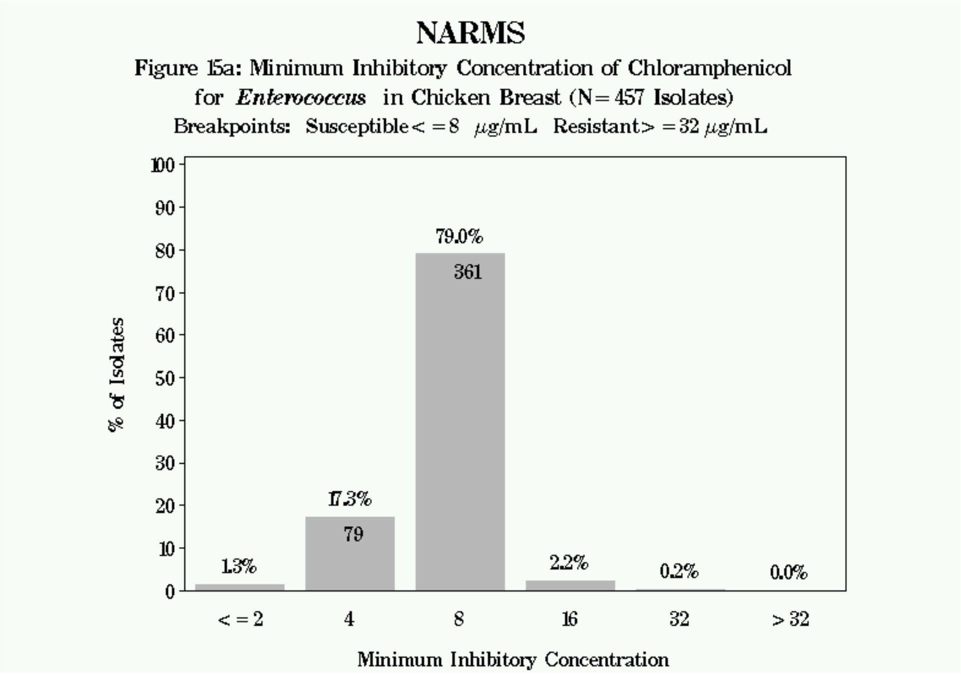
[1] Percent of isolates with intermediate susceptibility

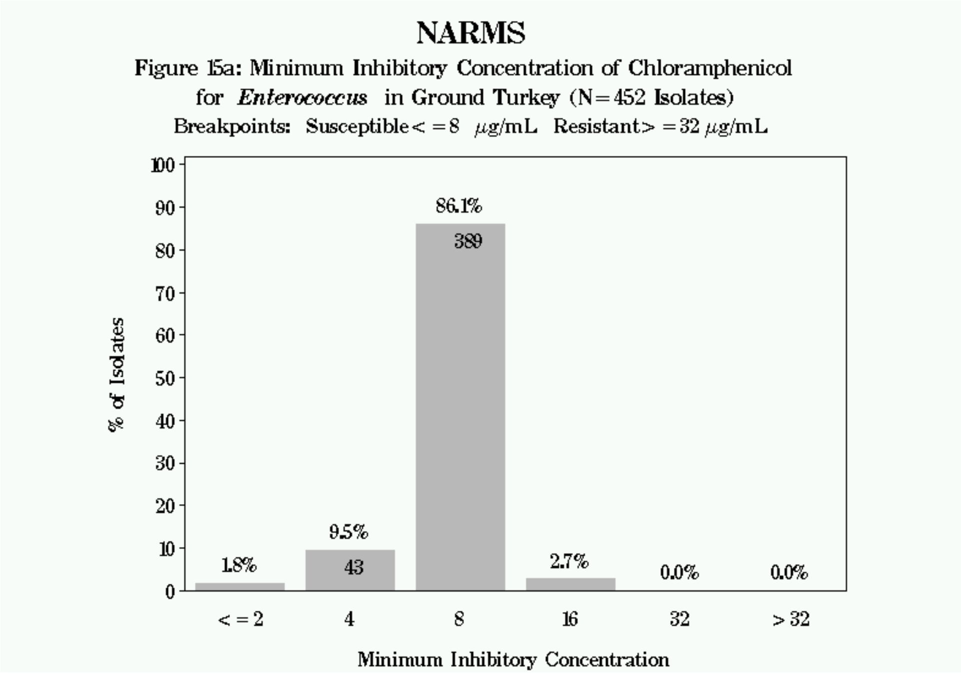
[2] Percent resistant; for daptomycin, the percent non-susceptible

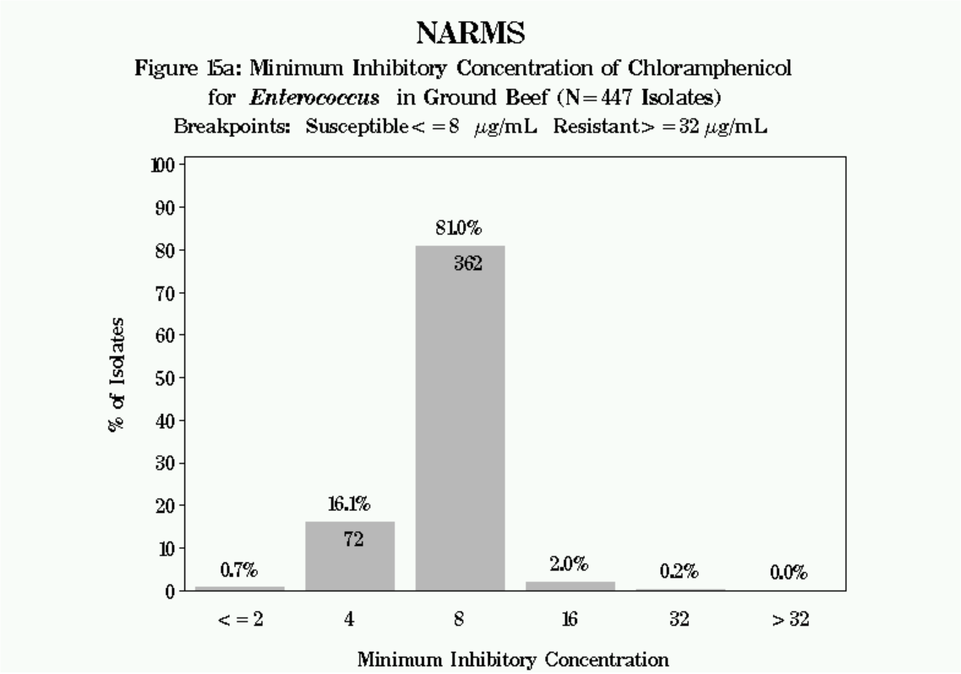
[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

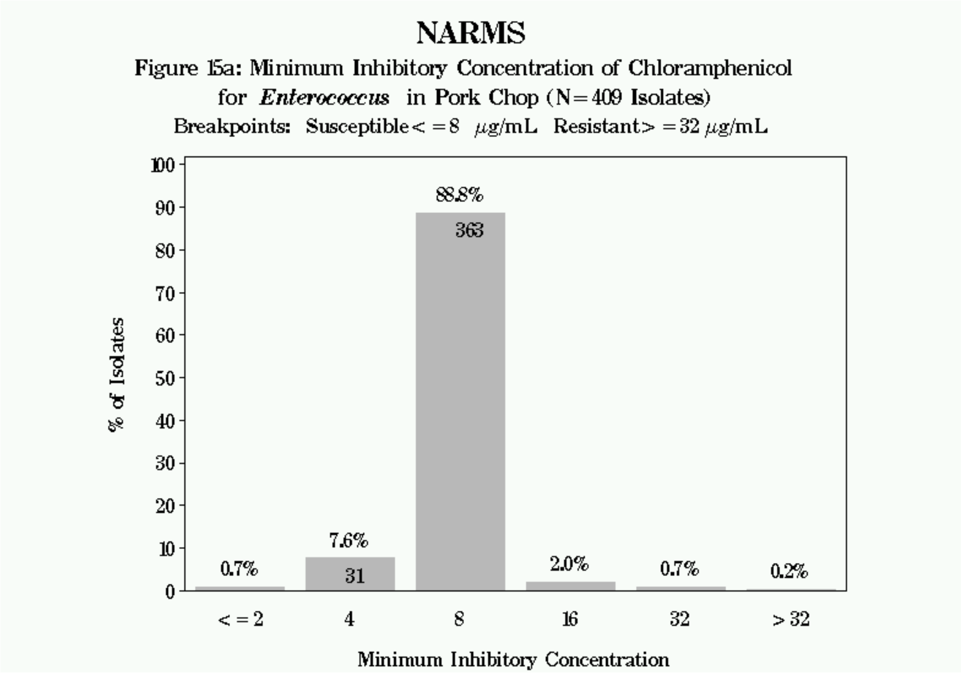
[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Vertical black bars indicate the breakpoints for susceptibility, while vertical red bars indicate the breakpoints for resistance. Numbers in the shaded area indic the percentages of isolates with MICs greater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

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


NARMS
Figure 15a: Minimum Inhibitory Concentration of Chloramphenicol
for Enterococcus in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=2 4 8 16 32 >32
1.3% 17.3% 79.0% 2.2% 0.2% 0.0%
79 361


NARMS
Figure 15a: Minimum Inhibitory Concentration of Chloramphenicol
for Enterococcus in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=2 4 8 16 32 >32
1.8% 9.5% 86.1% 2.7% 0.0% 0.0%
43 389

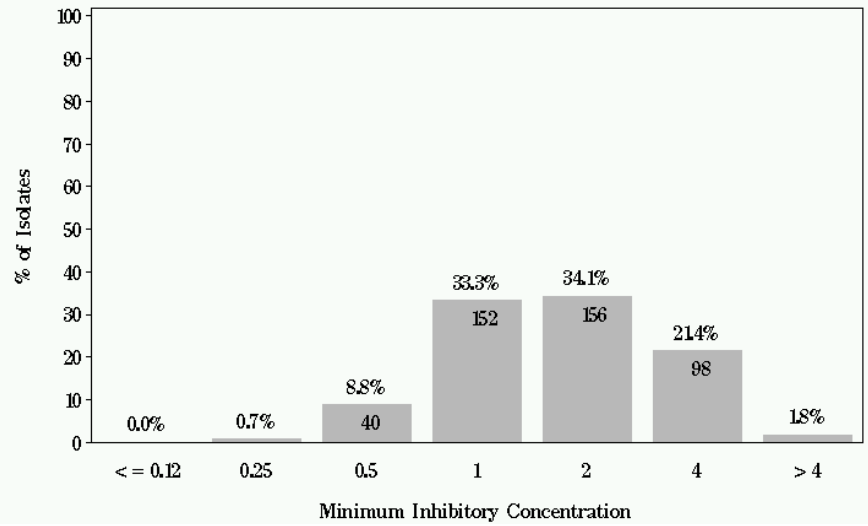

NARMS
Figure 15a: Minimum Inhibitory Concentration of Chloramphenicol
for Enterococcus in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=2 4 8 16 32 >32
0.7% 16.1% 81.0% 2.0% 0.2% 0.0%
72 362


NARMS
Figure 15a: Minimum Inhibitory Concentration of Chloramphenicol
for Enterococcus in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=2 4 8 16 32 >32
0.7% 7.6% 88.8% 2.0% 0.7% 0.2%
31 363

NARMS

Figure 15b: Minimum Inhibitory Concentration of Ciprofloxacin for *Enterococcus* in Chicken Breast (N=457 Isolates)

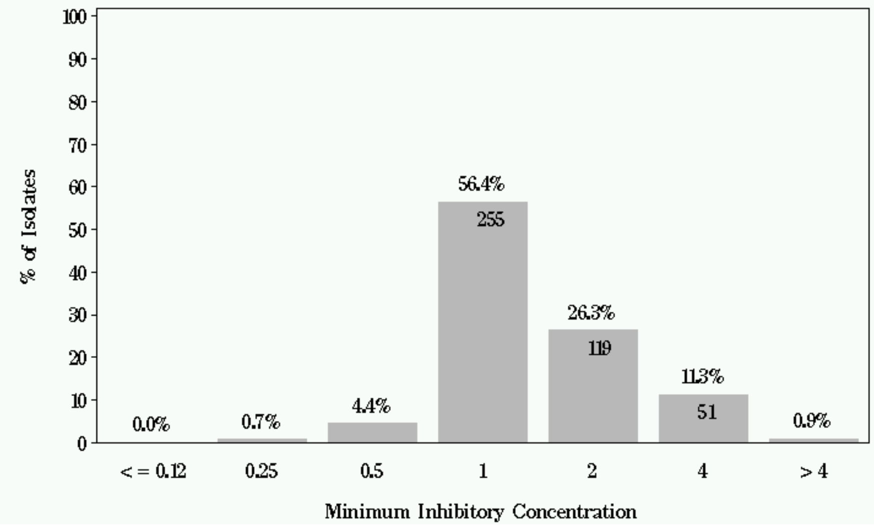
Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL



NARMS

Figure 15b: Minimum Inhibitory Concentration of Ciprofloxacin for *Enterococcus* in Ground Turkey (N=452 Isolates)

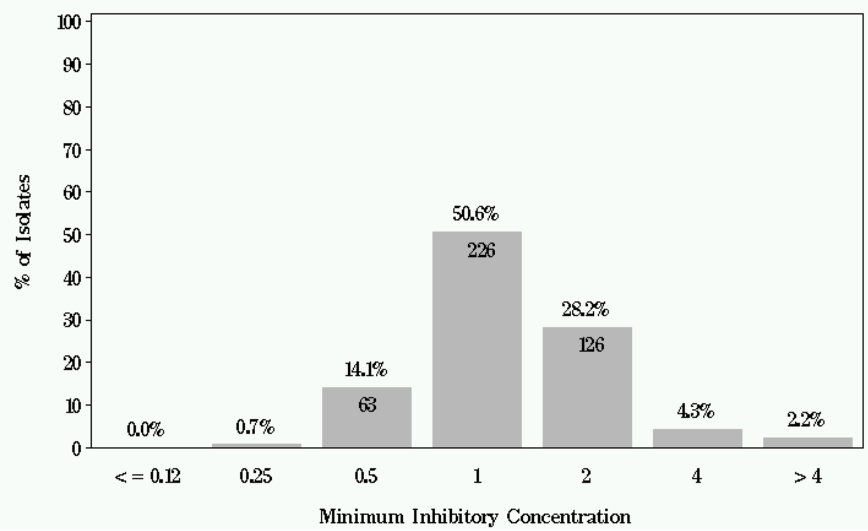
Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL



NARMS

Figure 15b: Minimum Inhibitory Concentration of Ciprofloxacin for *Enterococcus* in Ground Beef (N=447 Isolates)

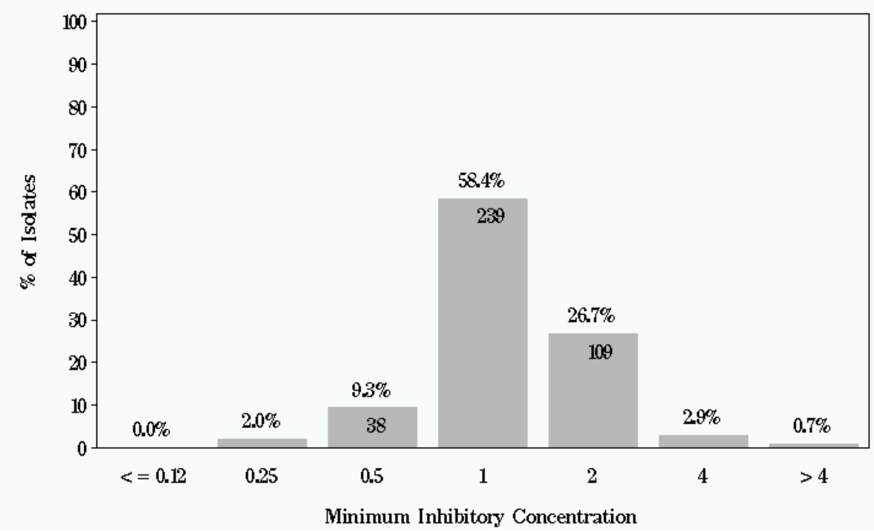
Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL



NARMS

Figure 15b: Minimum Inhibitory Concentration of Ciprofloxacin for *Enterococcus* in Pork Chop (N=409 Isolates)

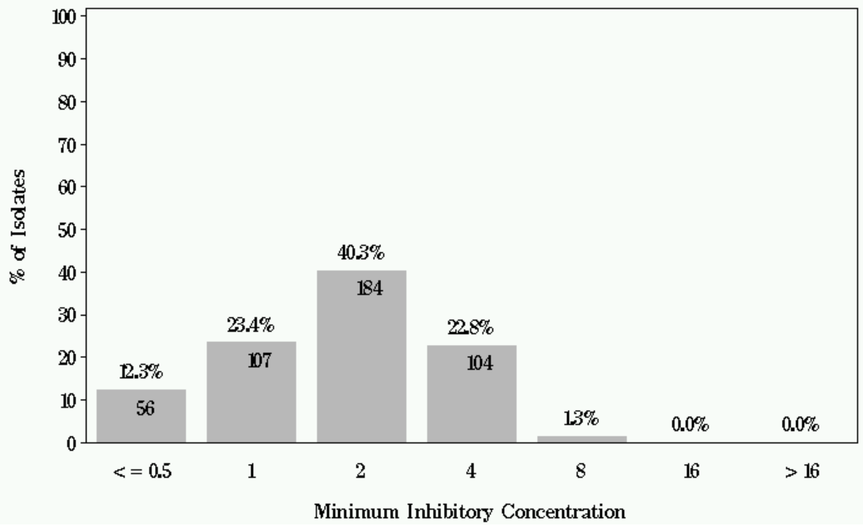
Breakpoints: Susceptible<=1 µg/mL Resistant>=4 µg/mL



NARMS

Figure 15c: Minimum Inhibitory Concentration of Daptomycin for *Enterococcus* in Chicken Breast (N=457 Isolates)

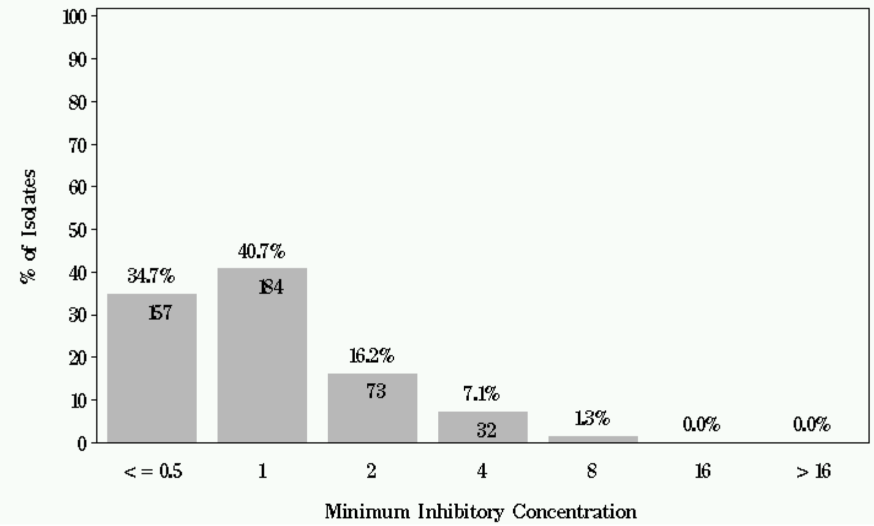
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 15c: Minimum Inhibitory Concentration of Daptomycin for *Enterococcus* in Ground Turkey (N=452 Isolates)

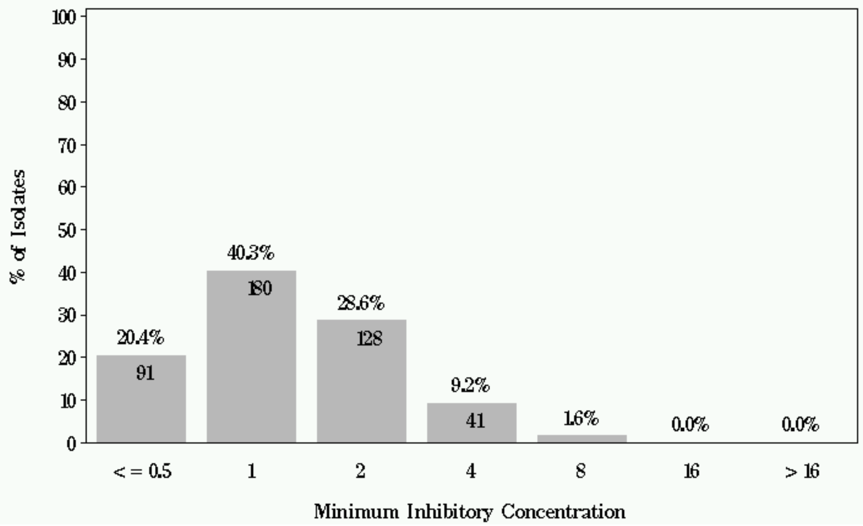
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 15c: Minimum Inhibitory Concentration of Daptomycin for *Enterococcus* in Ground Beef (N=447 Isolates)

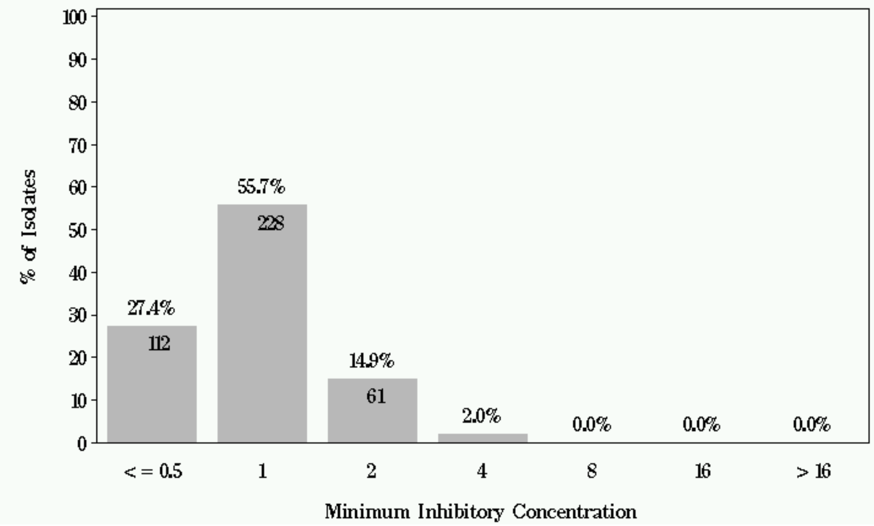
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 15c: Minimum Inhibitory Concentration of Daptomycin for *Enterococcus* in Pork Chop (N=409 Isolates)

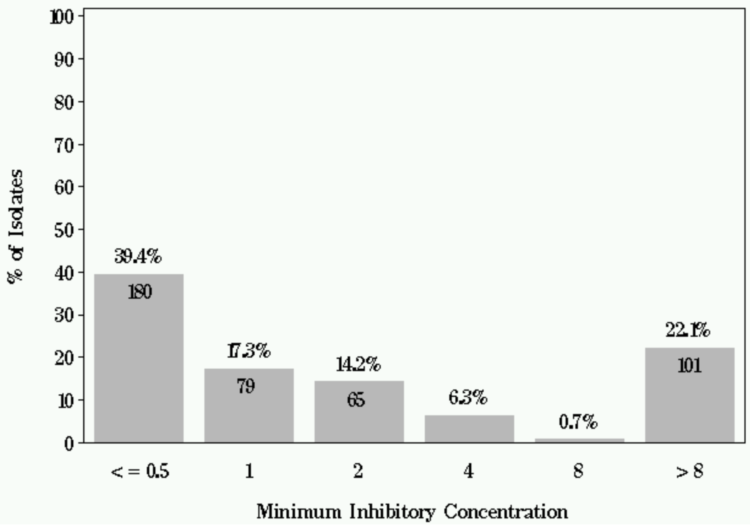
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 15d: Minimum Inhibitory Concentration of Erythromycin for *Enterococcus* in Chicken Breast (N=457 Isolates)

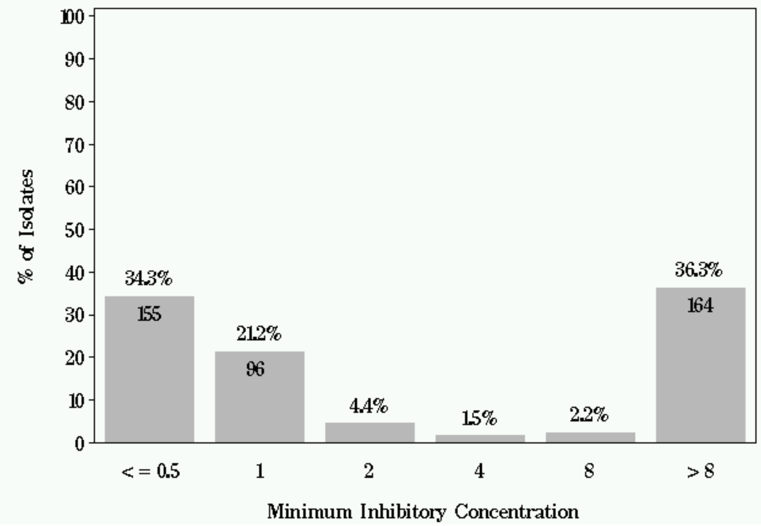
Breakpoints: Susceptible<=0.5 μg/mL Resistant>=8 μg/mL



NARMS

Figure 15d: Minimum Inhibitory Concentration of Erythromycin for *Enterococcus* in Ground Turkey (N=452 Isolates)

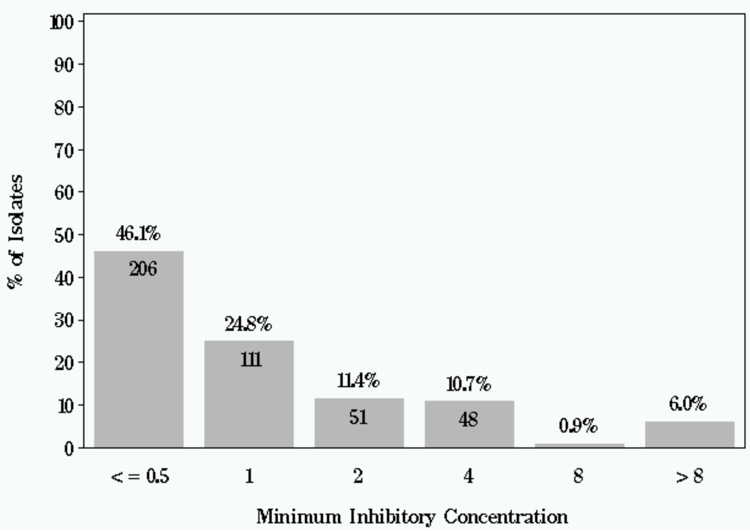
Breakpoints: Susceptible<=0.5 μg/mL Resistant>=8 μg/mL



NARMS

Figure 15d: Minimum Inhibitory Concentration of Erythromycin for *Enterococcus* in Ground Beef (N=447 Isolates)

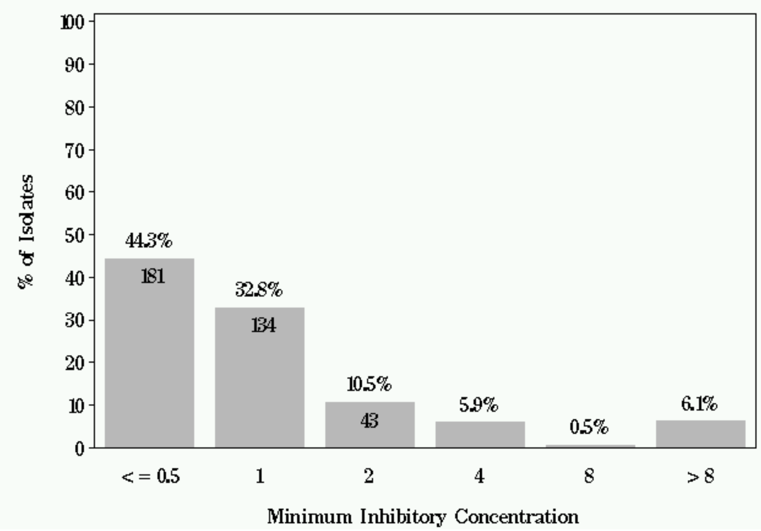
Breakpoints: Susceptible<=0.5 μg/mL Resistant>=8 μg/mL



NARMS

Figure 15d: Minimum Inhibitory Concentration of Erythromycin for *Enterococcus* in Pork Chop (N=409 Isolates)

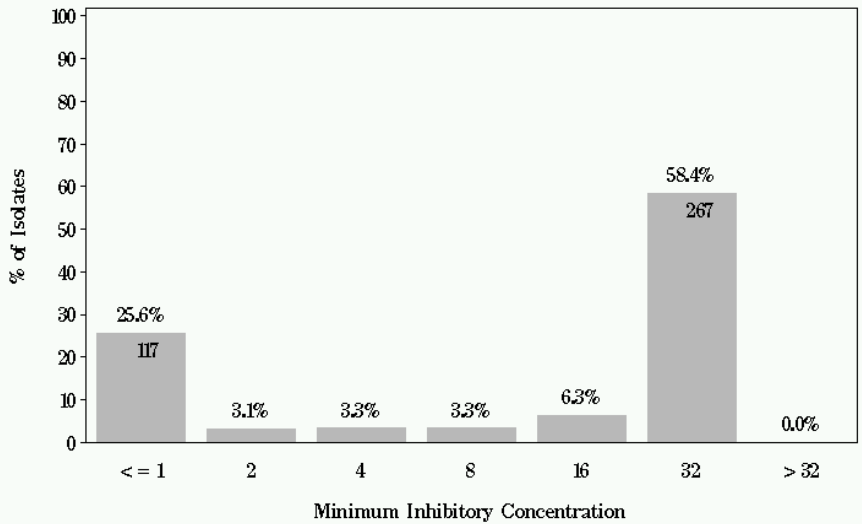
Breakpoints: Susceptible<=0.5 μg/mL Resistant>=8 μg/mL



NARMS

Figure 15e: Minimum Inhibitory Concentration of Flavomycin for *Enterococcus* in Chicken Breast (N=457 Isolates)

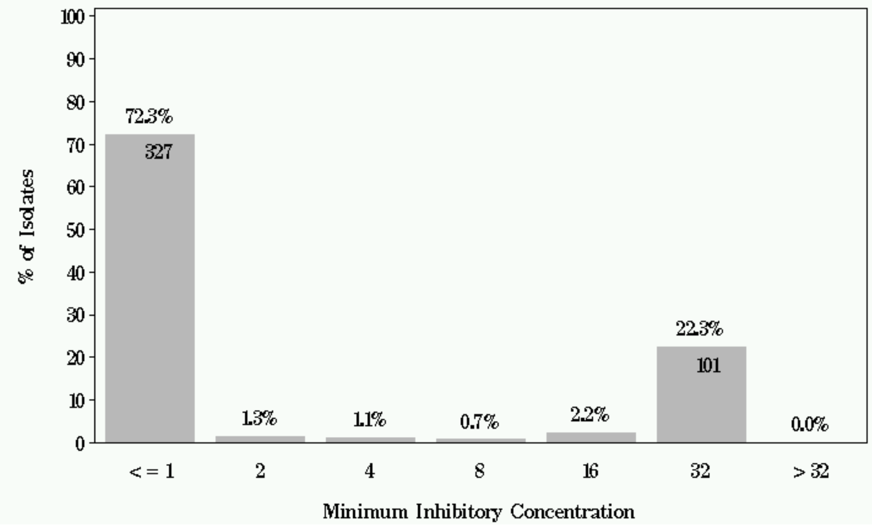
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15e: Minimum Inhibitory Concentration of Flavomycin for *Enterococcus* in Ground Turkey (N=452 Isolates)

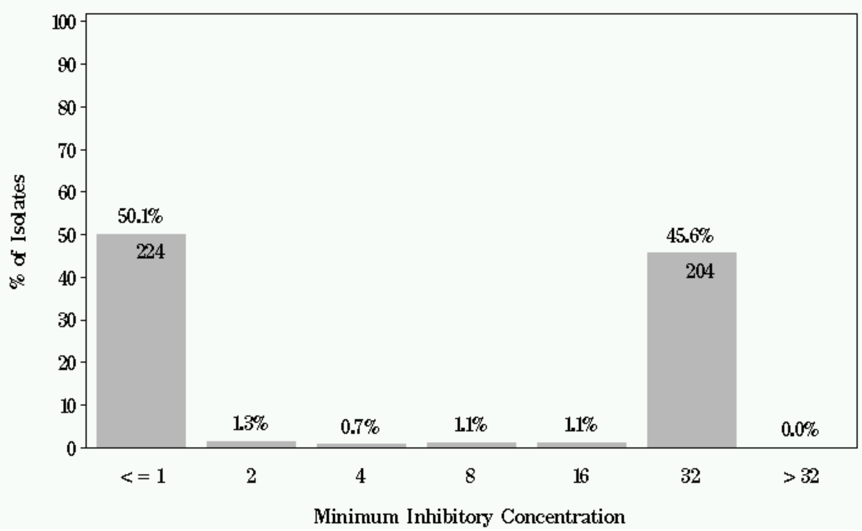
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15e: Minimum Inhibitory Concentration of Flavomycin for *Enterococcus* in Ground Beef (N=447 Isolates)

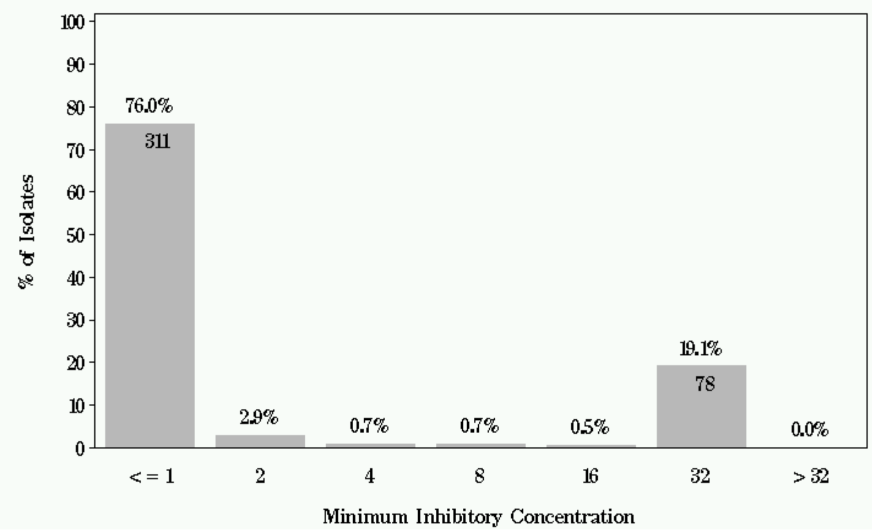
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15e: Minimum Inhibitory Concentration of Flavomycin for *Enterococcus* in Pork Chop (N=409 Isolates)

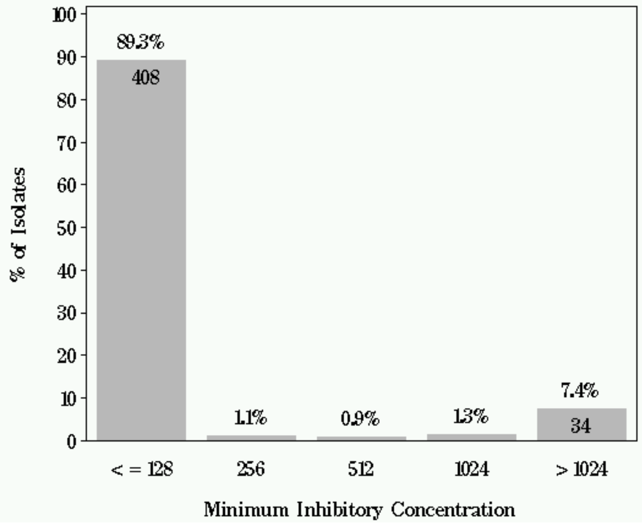
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15f: Minimum Inhibitory Concentration of Gentamicin for ***Enterococcus*** in Chicken Breast (N=457 Isolates)

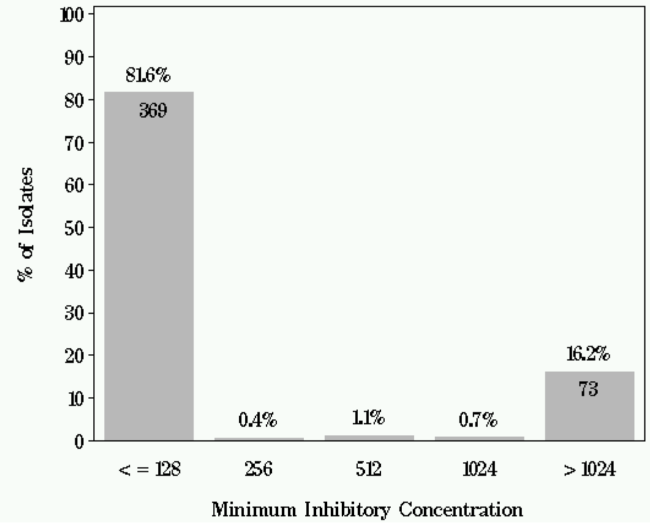
Breakpoints: Susceptible<=500 $\mu g/mL$ Resistant>=500 $\mu g/mL$



NARMS

Figure 15f: Minimum Inhibitory Concentration of Gentamicin for ***Enterococcus*** in Ground Turkey (N=452 Isolates)

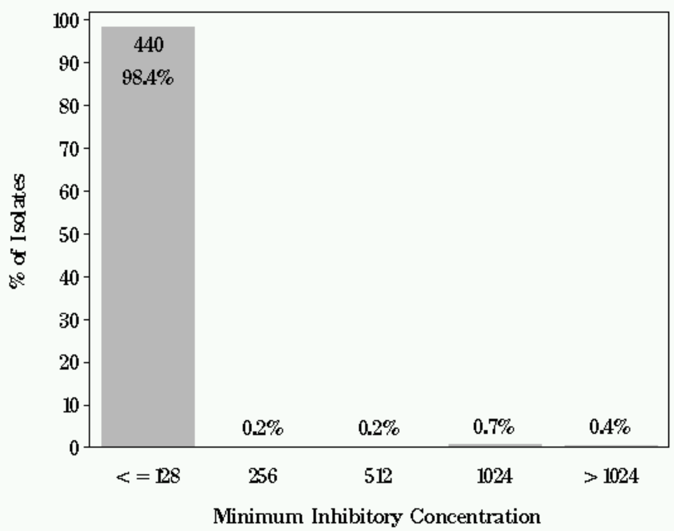
Breakpoints: Susceptible<=500 $\mu g/mL$ Resistant>=500 $\mu g/mL$



NARMS

Figure 15f: Minimum Inhibitory Concentration of Gentamicin for ***Enterococcus*** in Ground Beef (N=447 Isolates)

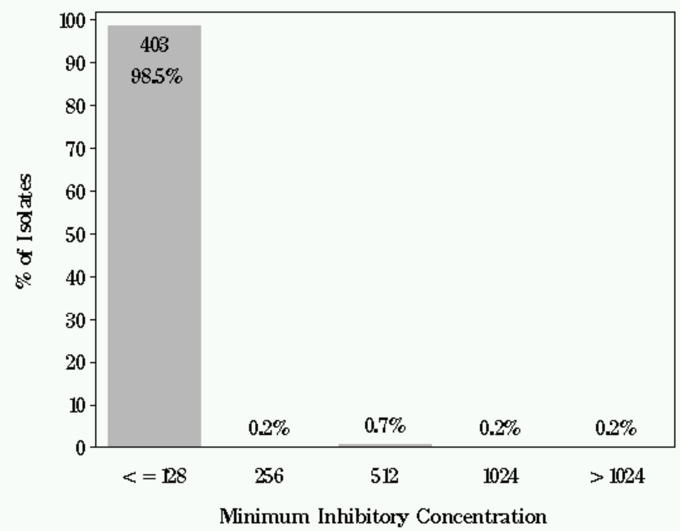
Breakpoints: Susceptible<=500 $\mu g/mL$ Resistant>=500 $\mu g/mL$



NARMS

Figure 15f: Minimum Inhibitory Concentration of Gentamicin for ***Enterococcus*** in Pork Chop (N=409 Isolates)

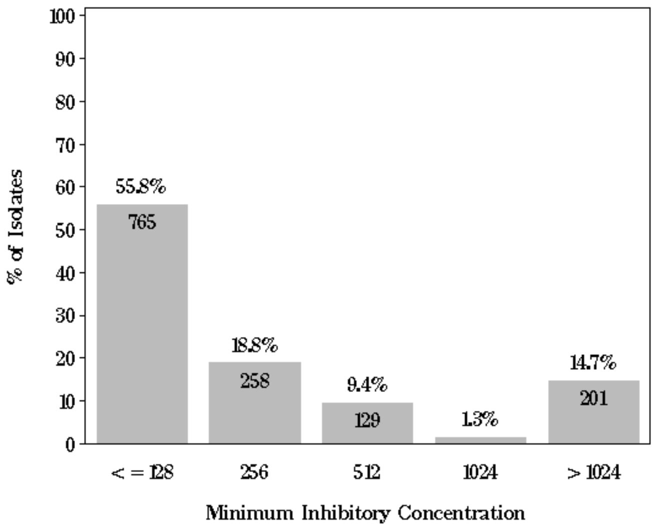
Breakpoints: Susceptible<=500 $\mu g/mL$ Resistant>=500 $\mu g/mL$



NARMS

Figure 15g: Minimum Inhibitory Concentration of Kanamycin for ***Enterococcus*** in Chicken Breast (N=457 Isolates)

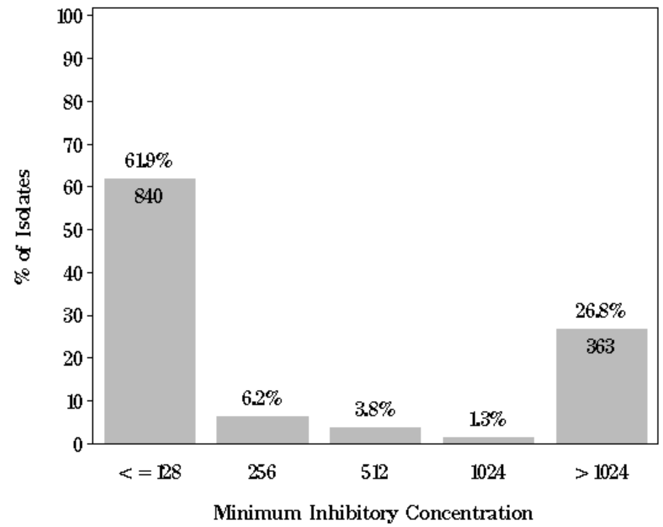
Breakpoints: Susceptible<=512 μg/mL Resistant>=1024 μg/mL



NARMS

Figure 15g: Minimum Inhibitory Concentration of Kanamycin for ***Enterococcus*** in Ground Turkey (N=452 Isolates)

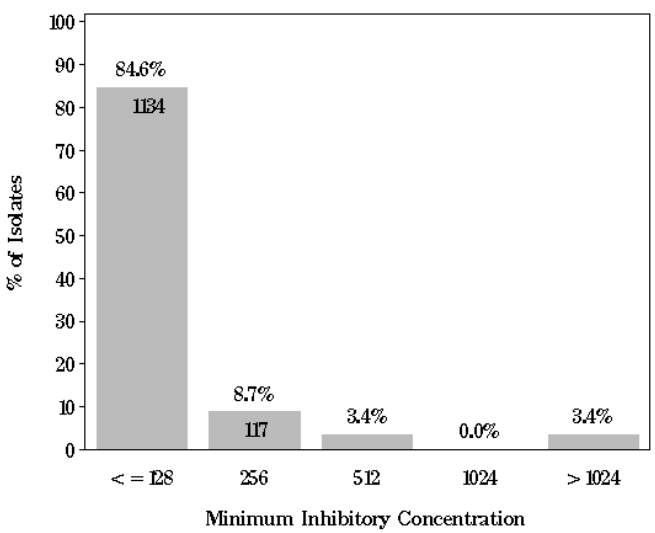
Breakpoints: Susceptible<=512 μg/mL Resistant>=1024 μg/mL



NARMS

Figure 15g: Minimum Inhibitory Concentration of Kanamycin for ***Enterococcus*** in Ground Beef (N=447 Isolates)

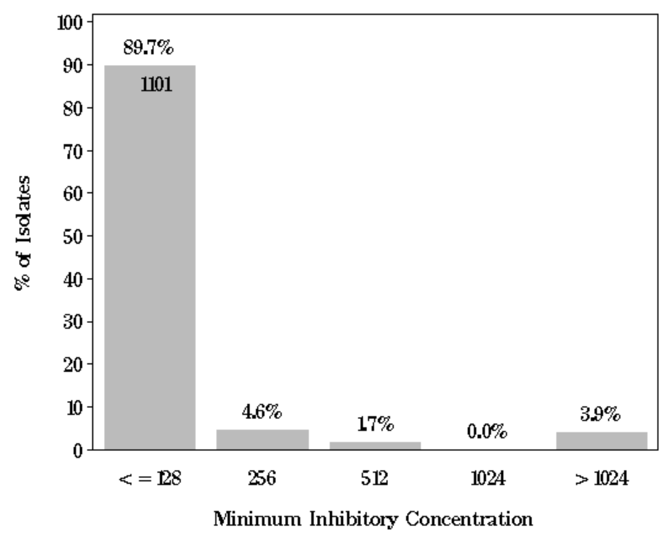
Breakpoints: Susceptible<=512 μg/mL Resistant>=1024 μg/mL



NARMS

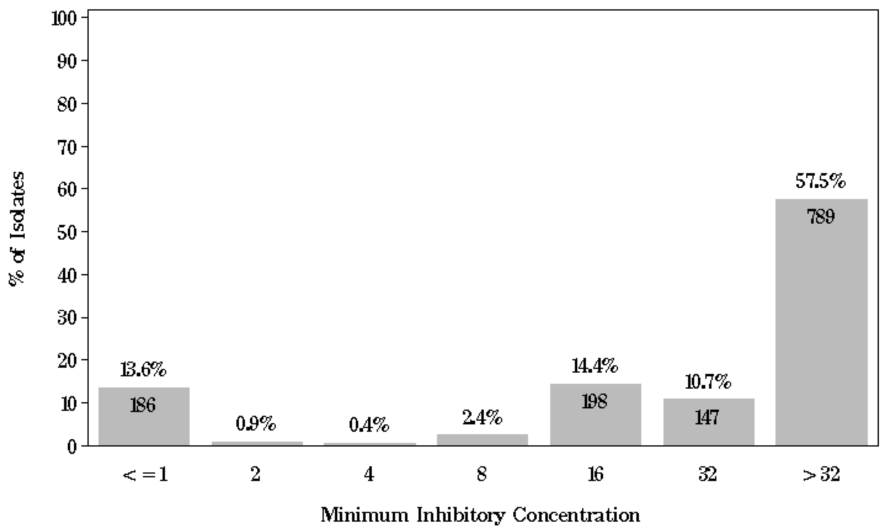
Figure 15g: Minimum Inhibitory Concentration of Kanamycin for ***Enterococcus*** in Pork Chop (N=409 Isolates)

Breakpoints: Susceptible<=512 μg/mL Resistant>=1024 μg/mL



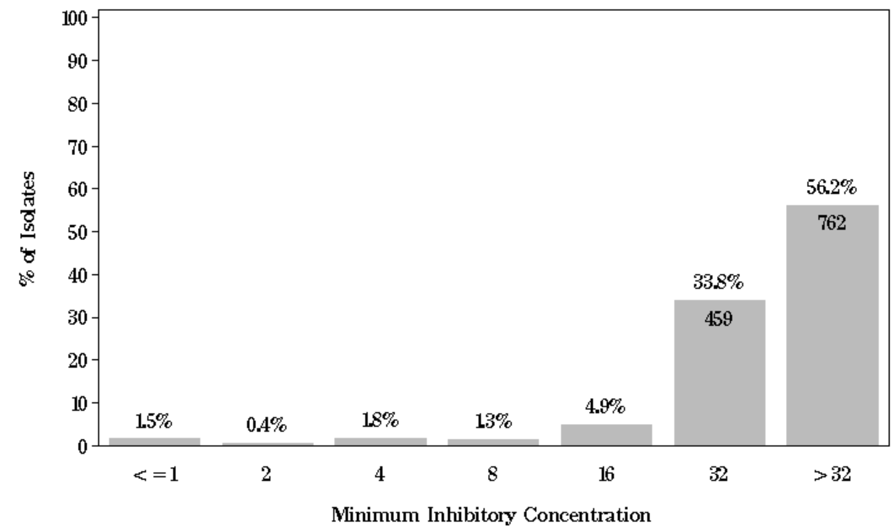
NARMS

Figure 15h: Minimum Inhibitory Concentration of Lincomycin for *Enterococcus* in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



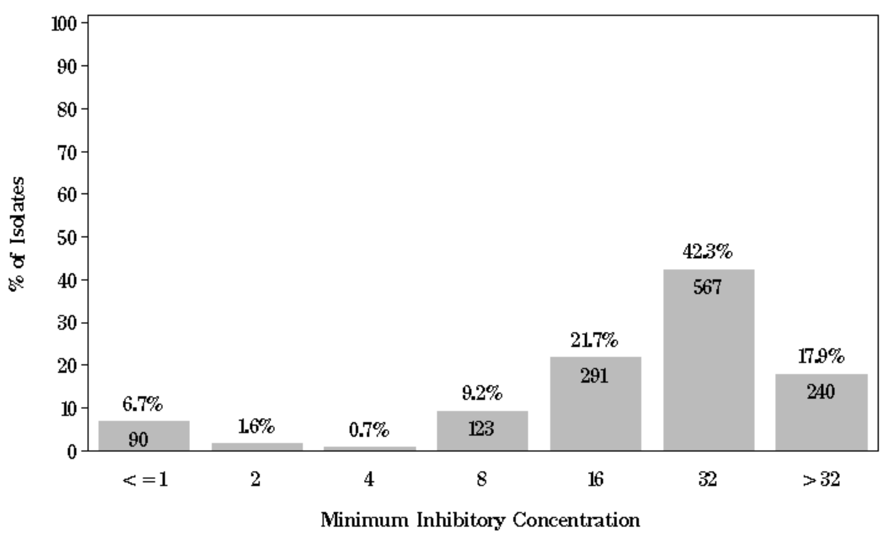
NARMS

Figure 15h: Minimum Inhibitory Concentration of Lincomycin for *Enterococcus* in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



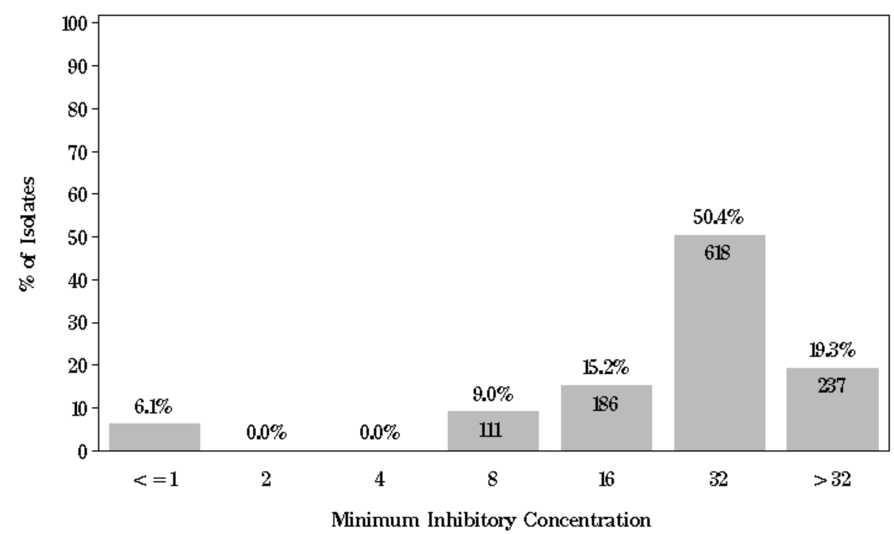
NARMS

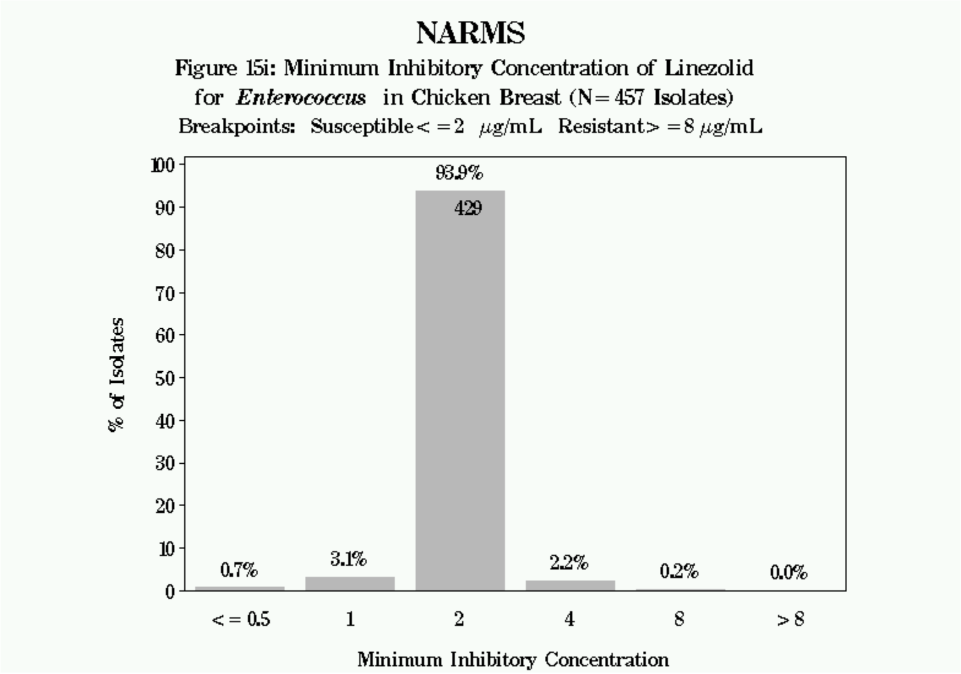
Figure 15h: Minimum Inhibitory Concentration of Lincomycin for *Enterococcus* in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL

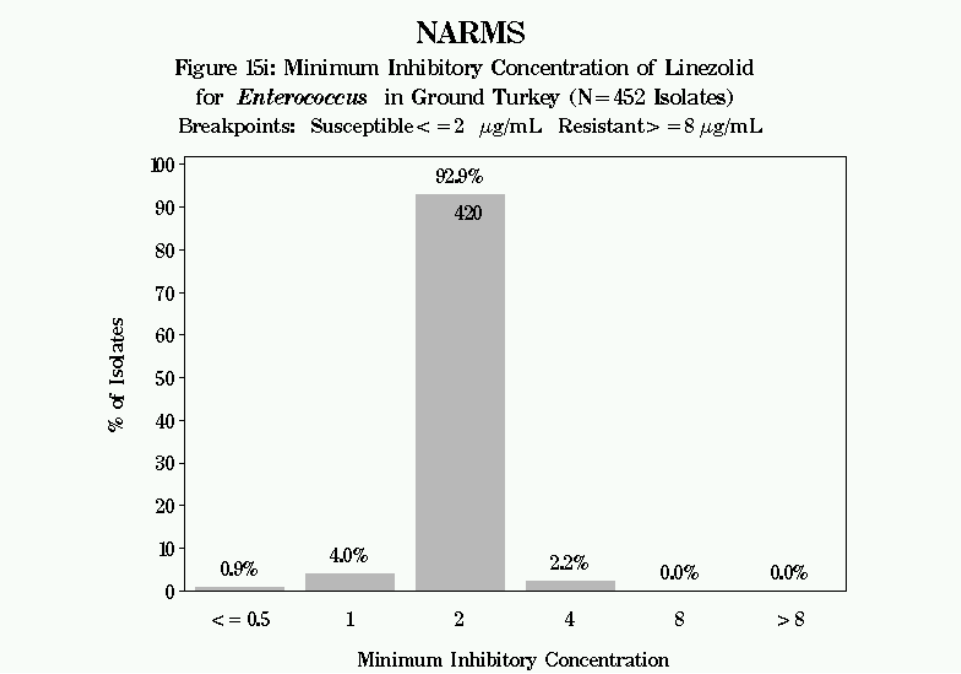


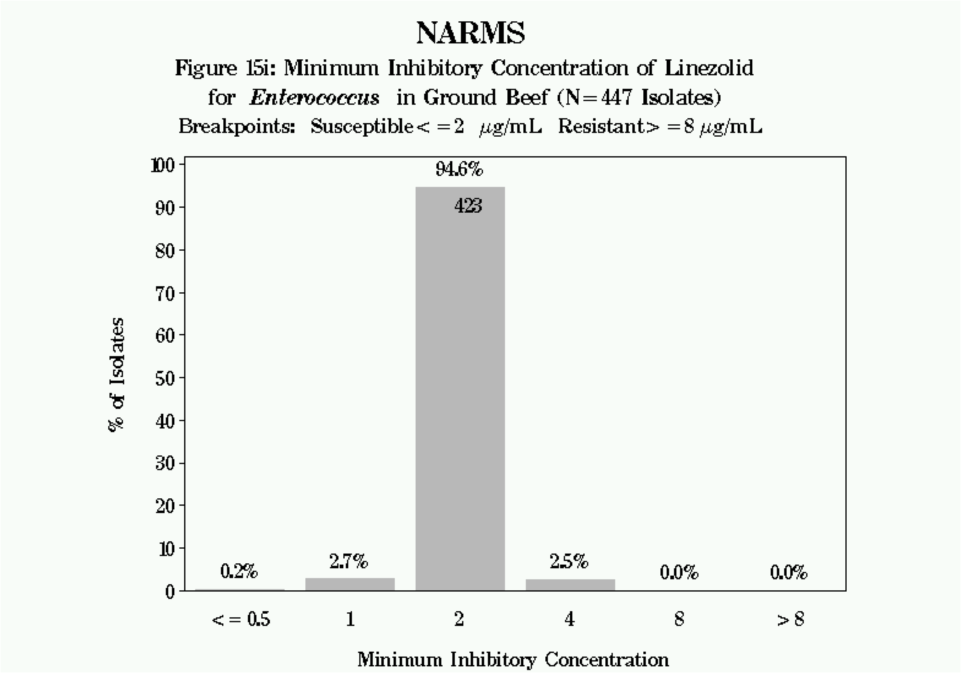
NARMS

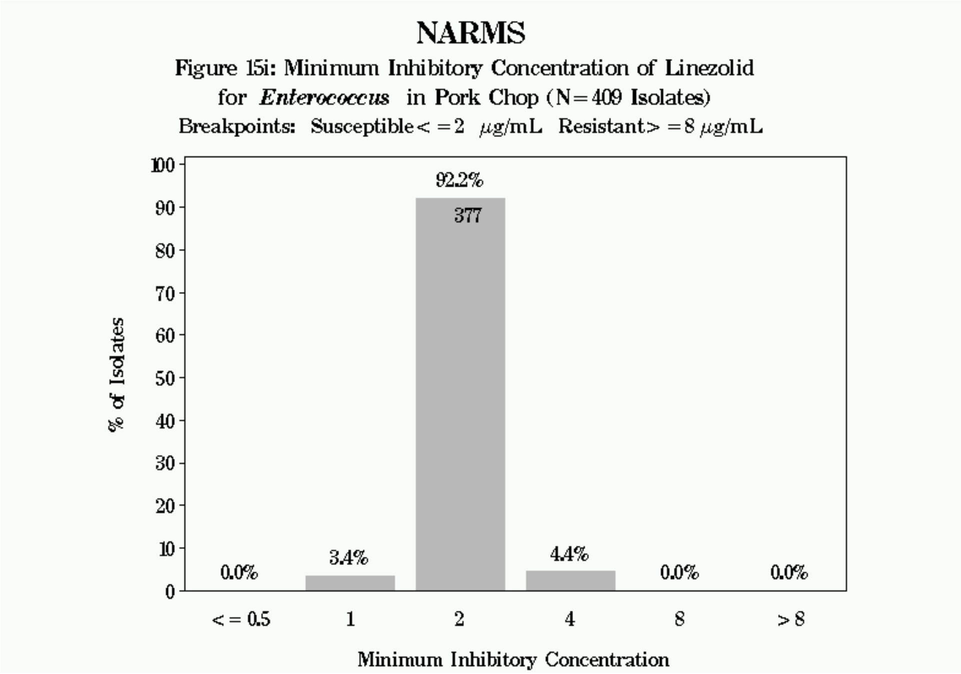
Figure 15h: Minimum Inhibitory Concentration of Lincomycin for *Enterococcus* in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL




NARMS
Figure 15i: Minimum Inhibitory Concentration of Linezolid
for *Enterococcus* in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
0.7%
3.1%
93.9%
429
2.2%
0.2%
0.0%
<=0.5
1
2
4
8
>8
Minimum Inhibitory Concentration


NARMS
Figure 15i: Minimum Inhibitory Concentration of Linezolid
for *Enterococcus* in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
0.9%
4.0%
92.9%
420
2.2%
0.0%
0.0%
<=0.5
1
2
4
8
>8
Minimum Inhibitory Concentration

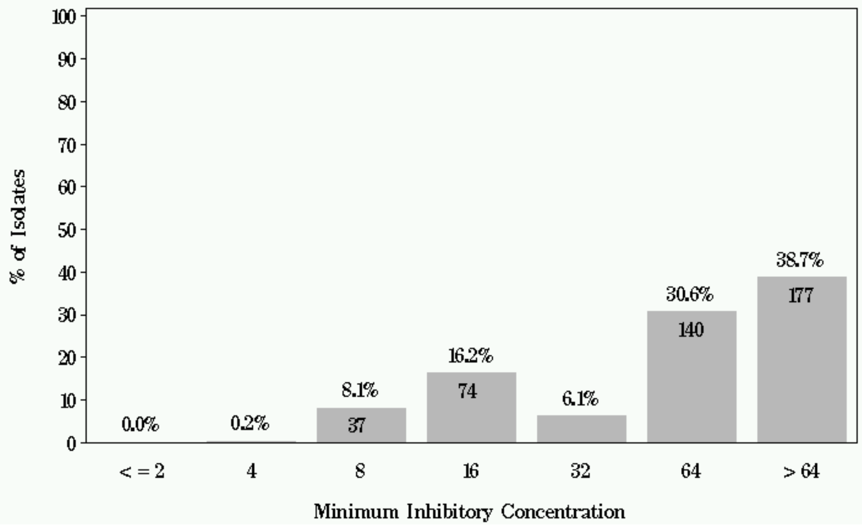

NARMS
Figure 15i: Minimum Inhibitory Concentration of Linezolid
for *Enterococcus* in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
0.2%
2.7%
94.6%
423
2.5%
0.0%
0.0%
<=0.5
1
2
4
8
>8
Minimum Inhibitory Concentration


NARMS
Figure 15i: Minimum Inhibitory Concentration of Linezolid
for *Enterococcus* in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
0.0%
3.4%
92.2%
377
4.4%
0.0%
0.0%
<=0.5
1
2
4
8
>8
Minimum Inhibitory Concentration

NARMS

Figure 15j: Minimum Inhibitory Concentration of Nitrofurantoin for *Enterococcus* in Chicken Breast (N=457 Isolates)

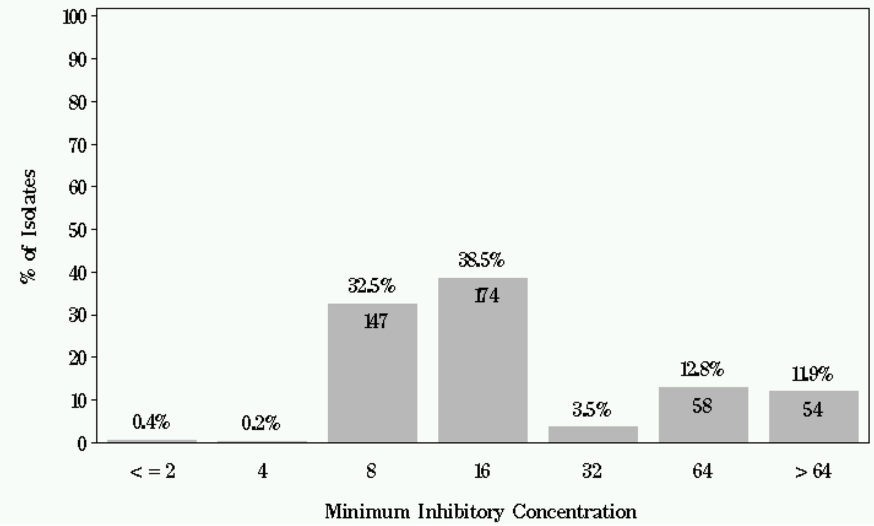
Breakpoints: Susceptible<=32 μg/mL Resistant>=128 μg/mL



NARMS

Figure 15j: Minimum Inhibitory Concentration of Nitrofurantoin for *Enterococcus* in Ground Turkey (N=452 Isolates)

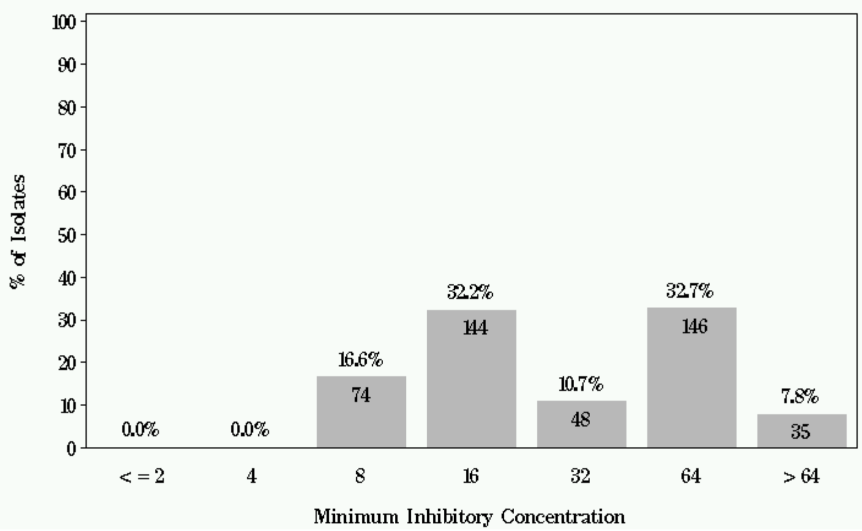
Breakpoints: Susceptible<=32 μg/mL Resistant>=128 μg/mL



NARMS

Figure 15j: Minimum Inhibitory Concentration of Nitrofurantoin for *Enterococcus* in Ground Beef (N=447 Isolates)

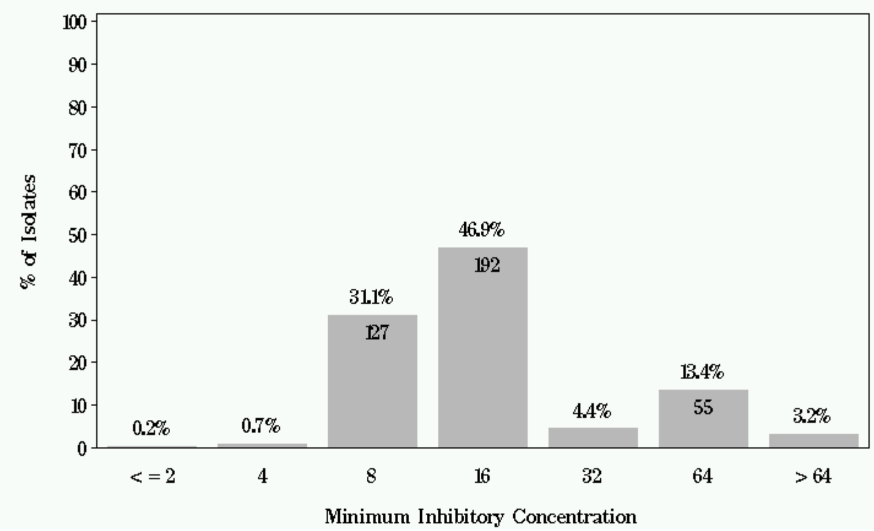
Breakpoints: Susceptible<=32 μg/mL Resistant>=128 μg/mL

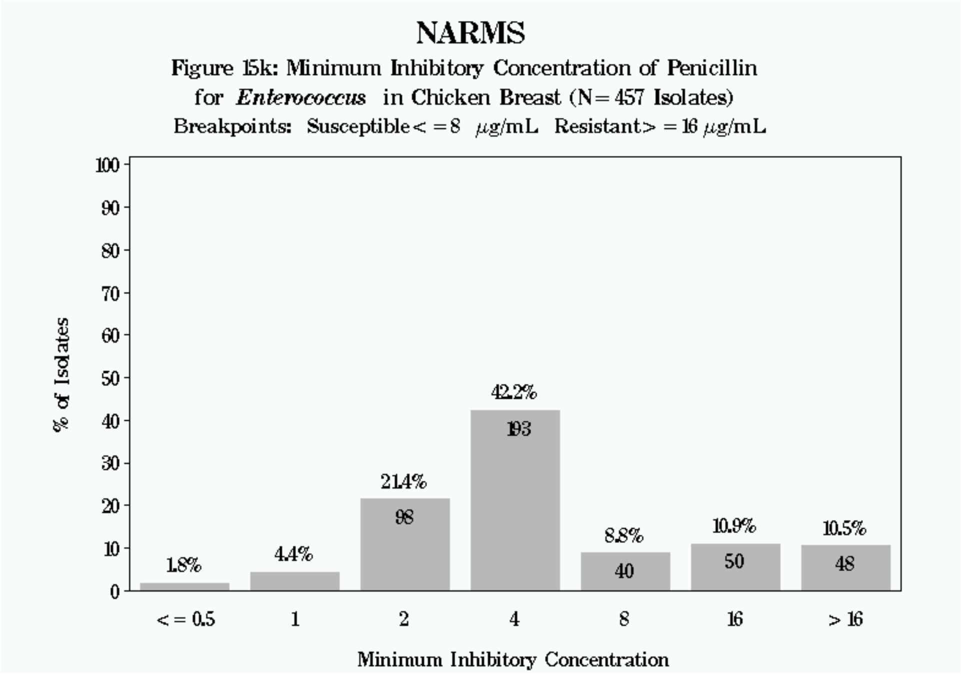


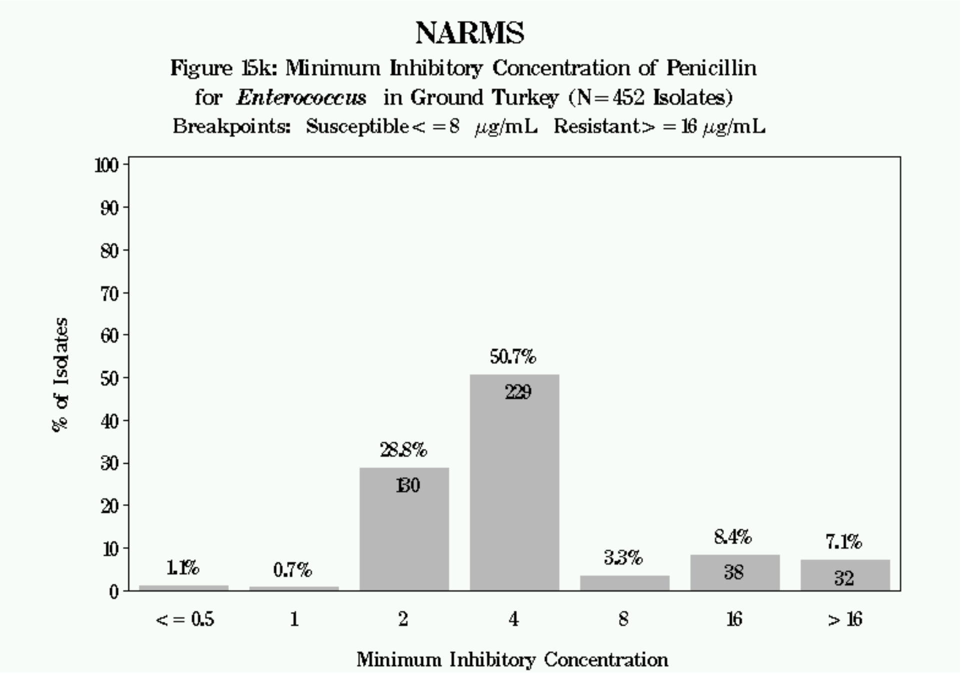
NARMS

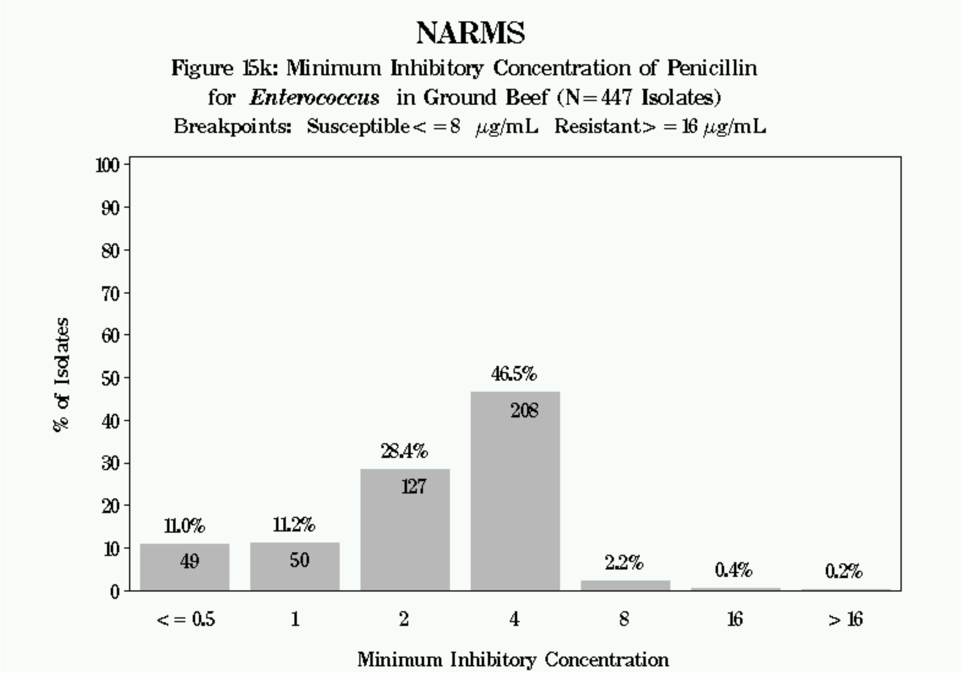
Figure 15j: Minimum Inhibitory Concentration of Nitrofurantoin for *Enterococcus* in Pork Chop (N=409 Isolates)

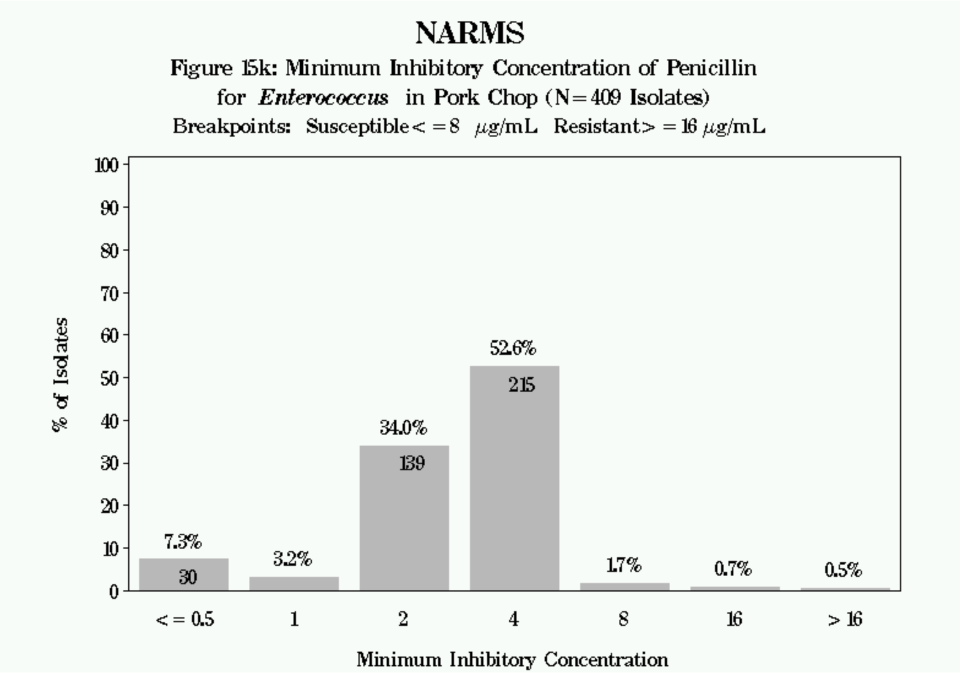
Breakpoints: Susceptible<=32 μg/mL Resistant>=128 μg/mL




NARMS
Figure 15k: Minimum Inhibitory Concentration of Penicillin
for Enterococcus in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=16 μg/mL
% of Isolates
1.8%
4.4%
21.4%
98
42.2%
193
8.8%
40
10.9%
50
10.5%
48
<= 0.5
1
2
4
8
16
> 16
Minimum Inhibitory Concentration

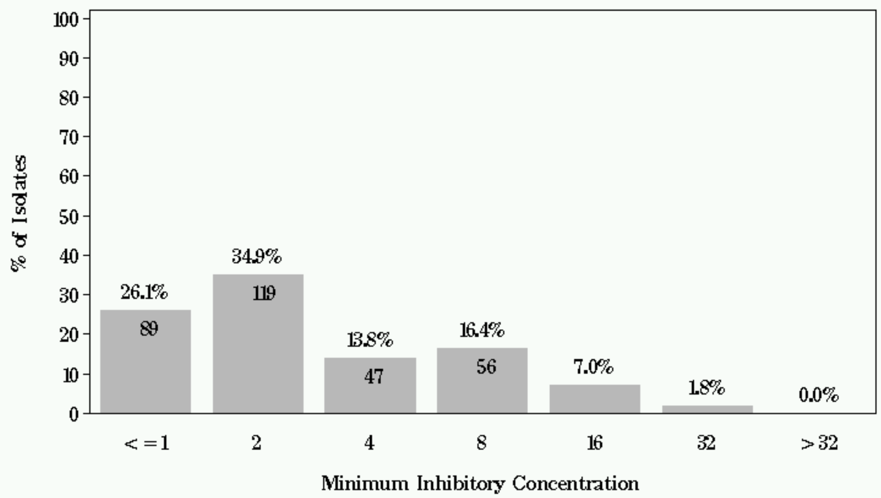

NARMS
Figure 15k: Minimum Inhibitory Concentration of Penicillin
for Enterococcus in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=16 μg/mL
% of Isolates
1.1%
0.7%
28.8%
130
50.7%
229
3.3%
8.4%
38
7.1%
32
<= 0.5
1
2
4
8
16
> 16
Minimum Inhibitory Concentration


NARMS
Figure 15k: Minimum Inhibitory Concentration of Penicillin
for Enterococcus in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=16 μg/mL
% of Isolates
11.0%
49
11.2%
50
28.4%
127
46.5%
208
2.2%
0.4%
0.2%
<= 0.5
1
2
4
8
16
> 16
Minimum Inhibitory Concentration


NARMS
Figure 15k: Minimum Inhibitory Concentration of Penicillin
for Enterococcus in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=16 μg/mL
% of Isolates
7.3%
30
3.2%
34.0%
139
52.6%
215
1.7%
0.7%
0.5%
<= 0.5
1
2
4
8
16
> 16
Minimum Inhibitory Concentration

NARMS

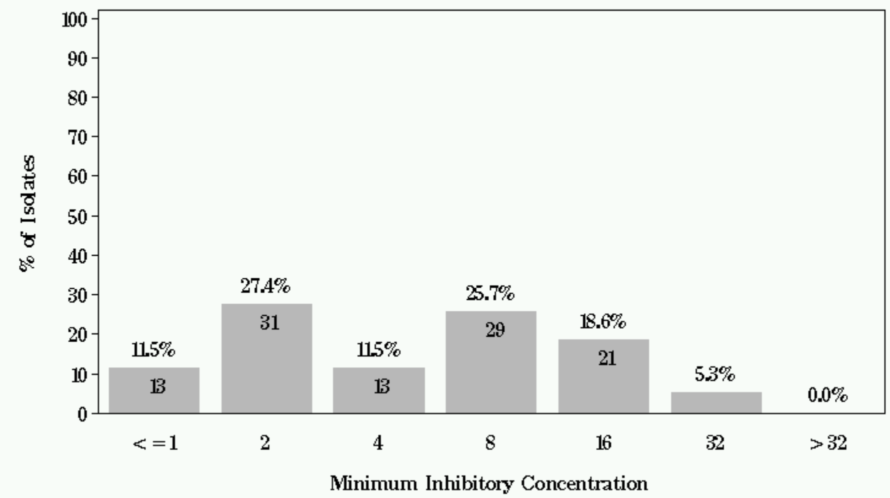
Figure 15l: Minimum Inhibitory Concentration of **Quinupristin−dalfopristin***
for ***Enterococcus*** in Chicken Breast (N=341 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL



*Presented for all species except *E.faecalis* (N=457−116=341)

NARMS

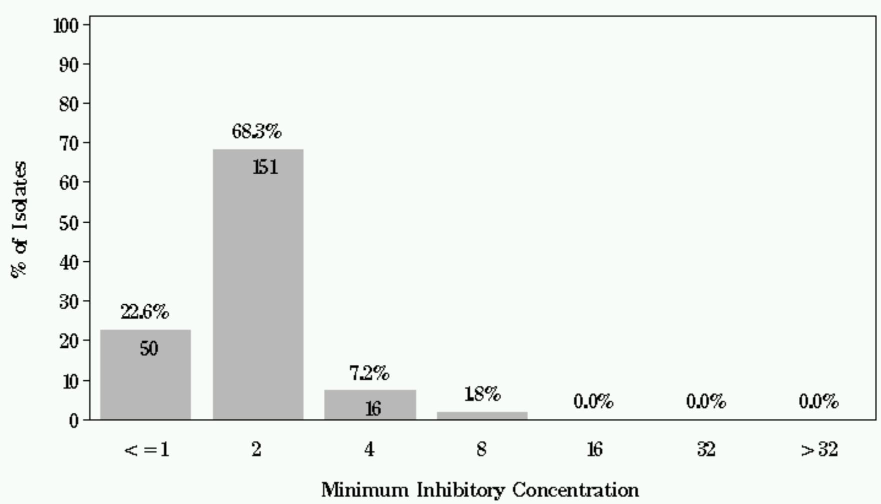
Figure 15l: Minimum Inhibitory Concentration of **Quinupristin−dalfopristin***
for ***Enterococcus*** in Ground Turkey (N=113 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL



*Presented for all species except *E.faecalis* (N=452−339=113)

NARMS

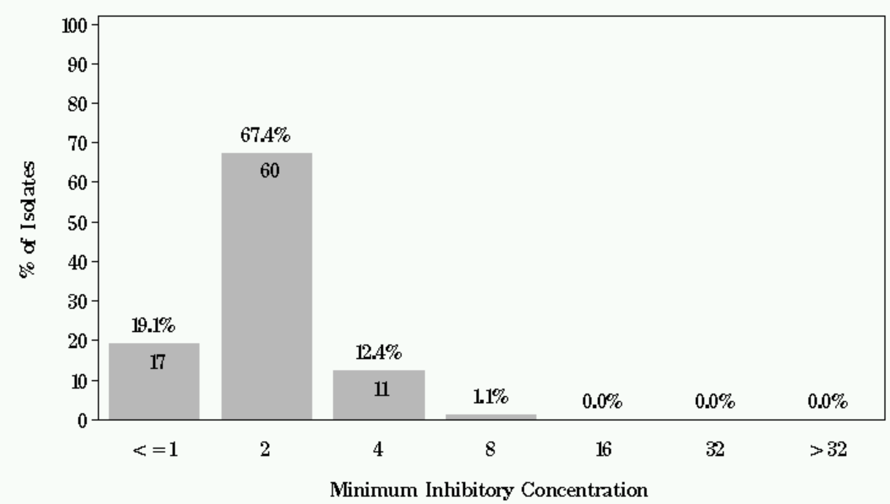
Figure 15l: Minimum Inhibitory Concentration of **Quinupristin−dalfopristin***
for ***Enterococcus*** in Ground Beef (N=221 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL



*Presented for all species except *E.faecalis* (N=447−226=221)

NARMS

Figure 15l: Minimum Inhibitory Concentration of **Quinupristin−dalfopristin***
for ***Enterococcus*** in Pork Chop (N=89 Isolates)
Breakpoints: Susceptible<=1 μg/mL Resistant>=4 μg/mL

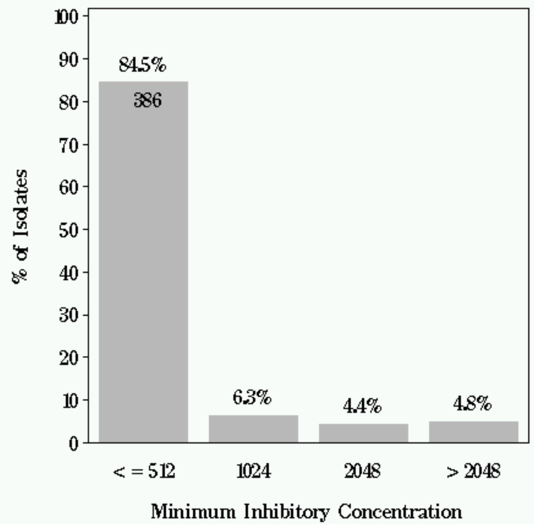


*Presented for all species except *E.faecalis* (N=409−320=89)

NARMS

Figure 15m: Minimum Inhibitory Concentration of Streptomycin for *Enterococcus* in Chicken Breast (N=457 Isolates)

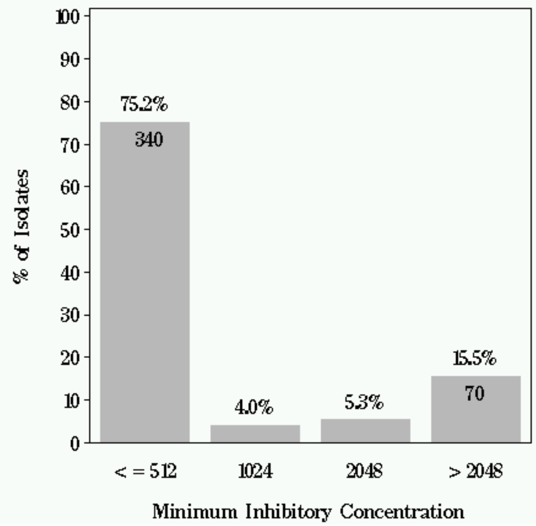
Breakpoints: Susceptible<=1000 $\mu g/mL$ Resistant>=1000 $\mu g/mL$



NARMS

Figure 15m: Minimum Inhibitory Concentration of Streptomycin for *Enterococcus* in Ground Turkey (N=452 Isolates)

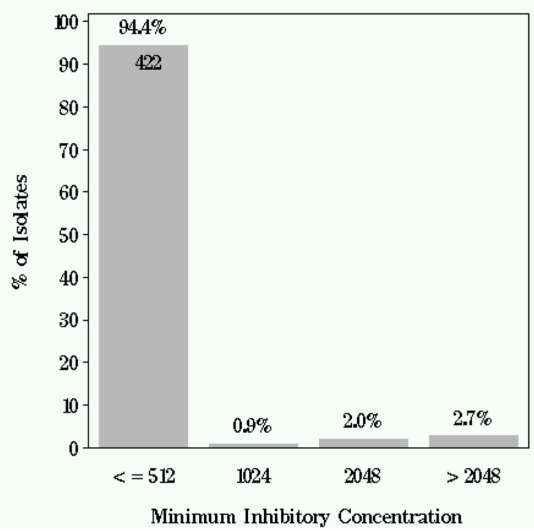
Breakpoints: Susceptible<=1000 $\mu g/mL$ Resistant>=1000 $\mu g/mL$



NARMS

Figure 15m: Minimum Inhibitory Concentration of Streptomycin for *Enterococcus* in Ground Beef (N=447 Isolates)

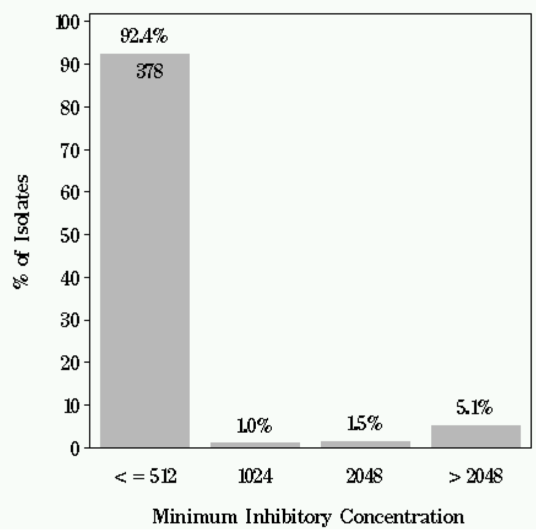
Breakpoints: Susceptible<=1000 $\mu g/mL$ Resistant>=1000 $\mu g/mL$

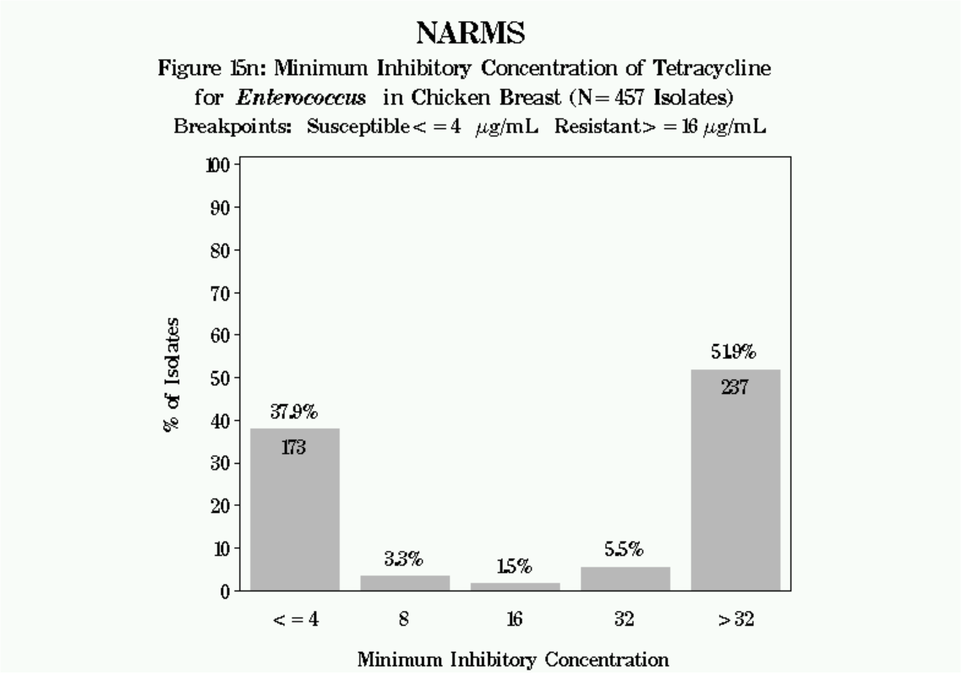


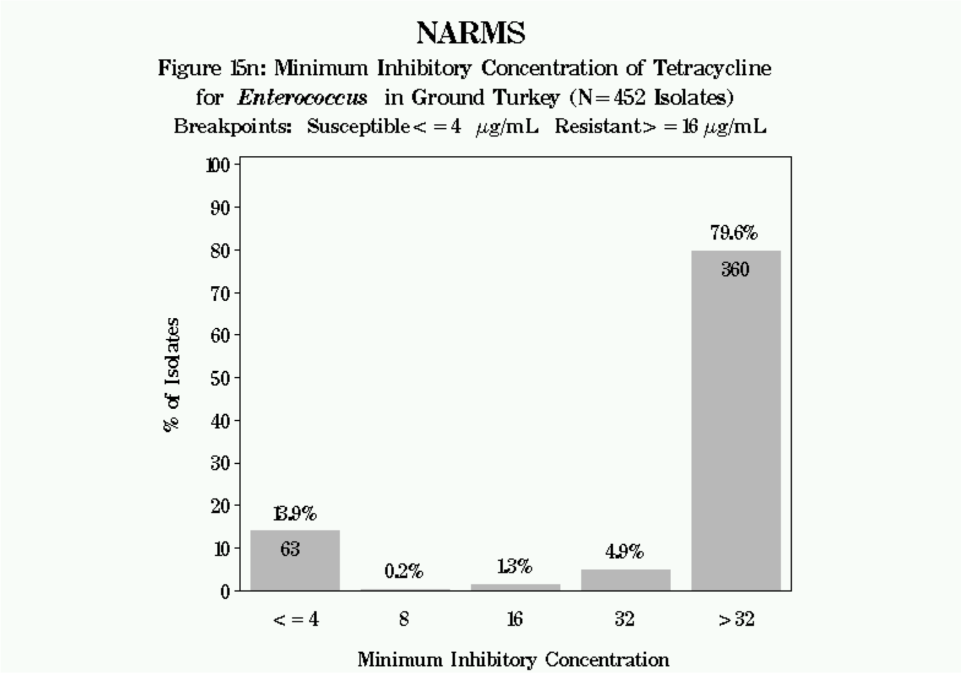
NARMS

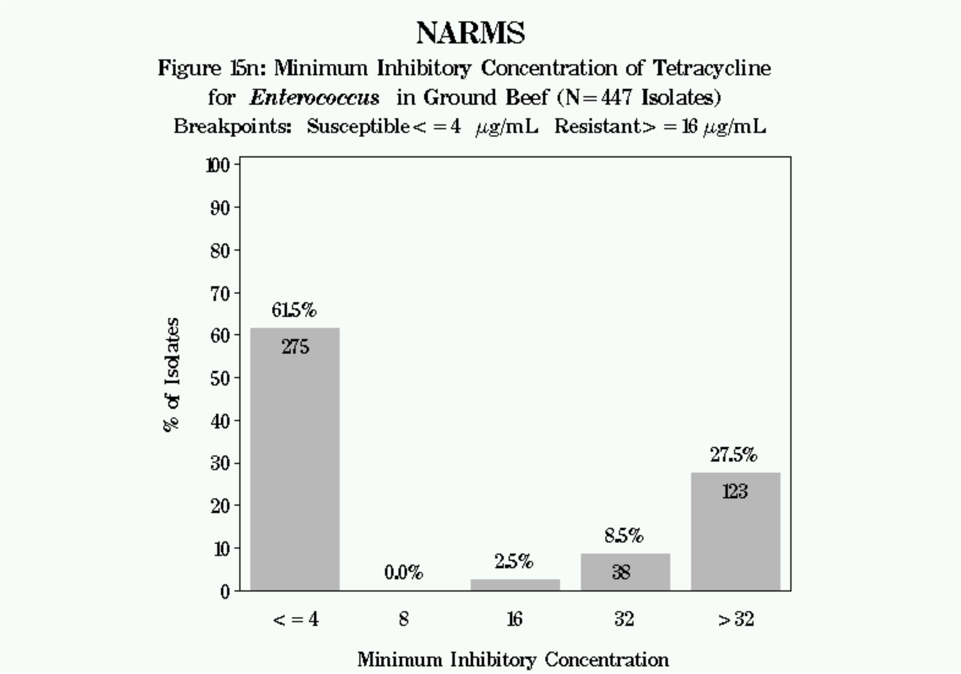
Figure 15m: Minimum Inhibitory Concentration of Streptomycin for *Enterococcus* in Pork Chop (N=409 Isolates)

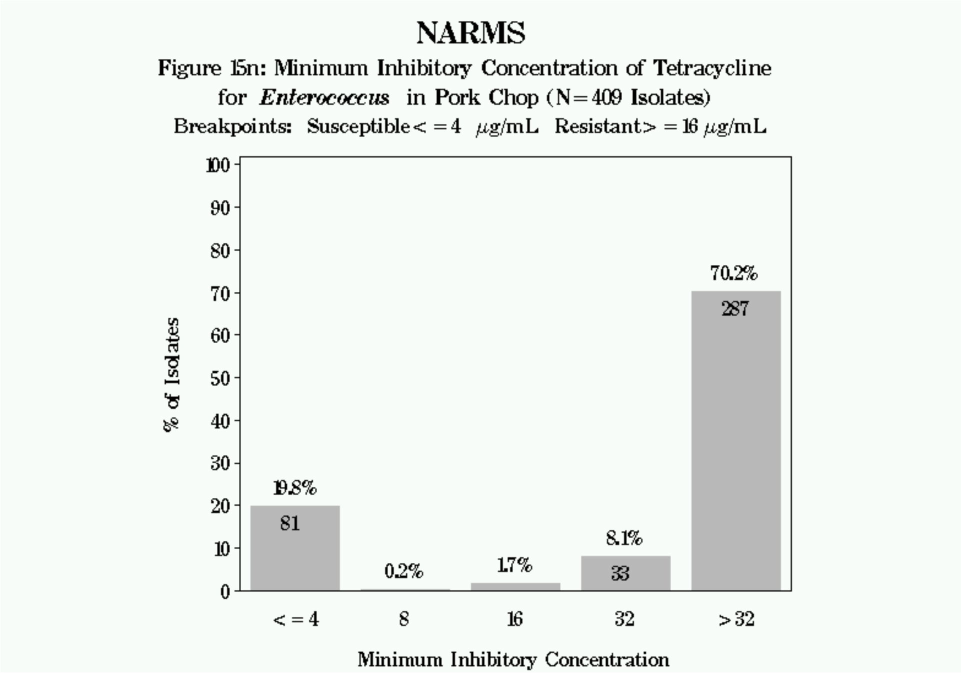
Breakpoints: Susceptible<=1000 $\mu g/mL$ Resistant>=1000 $\mu g/mL$




NARMS
Figure 15n: Minimum Inhibitory Concentration of Tetracycline for *Enterococcus* in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL
% of Isolates
37.9% 173
3.3%
1.5%
5.5%
51.9% 237
<=4 8 16 32 >32
Minimum Inhibitory Concentration


NARMS
Figure 15n: Minimum Inhibitory Concentration of Tetracycline for *Enterococcus* in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL
% of Isolates
13.9% 63
0.2%
1.3%
4.9%
79.6% 360
<=4 8 16 32 >32
Minimum Inhibitory Concentration

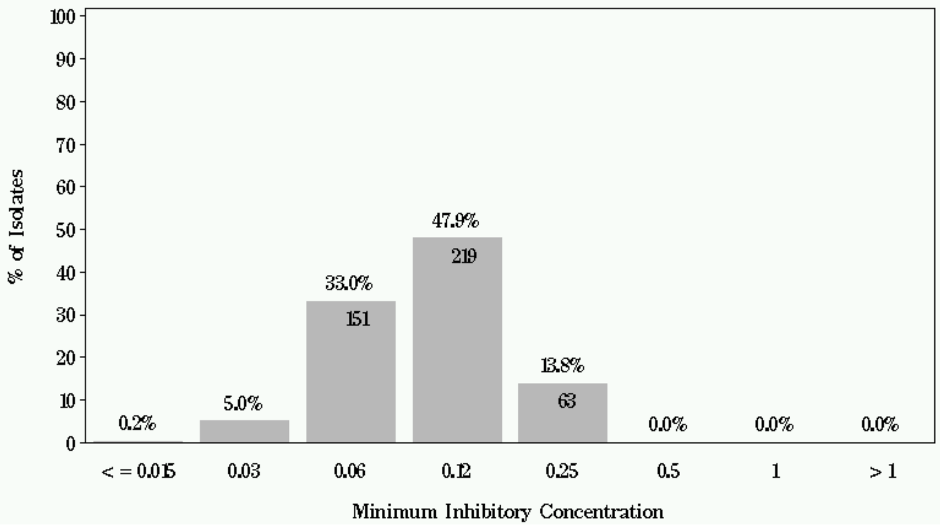

NARMS
Figure 15n: Minimum Inhibitory Concentration of Tetracycline for *Enterococcus* in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL
% of Isolates
61.5% 275
0.0%
2.5%
8.5% 38
27.5% 123
<=4 8 16 32 >32
Minimum Inhibitory Concentration


NARMS
Figure 15n: Minimum Inhibitory Concentration of Tetracycline for *Enterococcus* in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL
% of Isolates
19.8% 81
0.2%
1.7%
8.1% 33
70.2% 287
<=4 8 16 32 >32
Minimum Inhibitory Concentration

NARMS

Figure 15o: Minimum Inhibitory Concentration of Tigecycline for *Enterococcus* in Chicken Breast (N=457 Isolates)

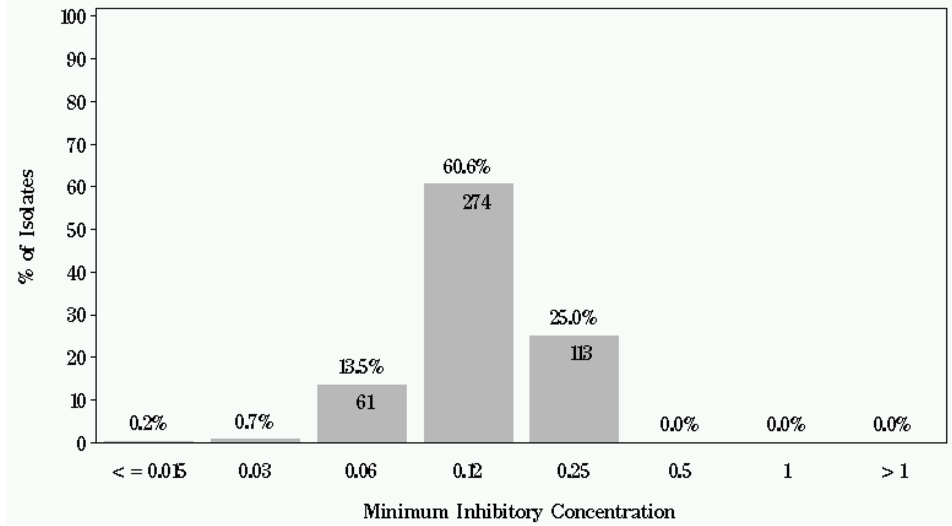
Breakpoints: Susceptible<=0.25 μg/mL Resistant>=1μg/mL



NARMS

Figure 15o: Minimum Inhibitory Concentration of Tigecycline for *Enterococcus* in Ground Turkey (N=452 Isolates)

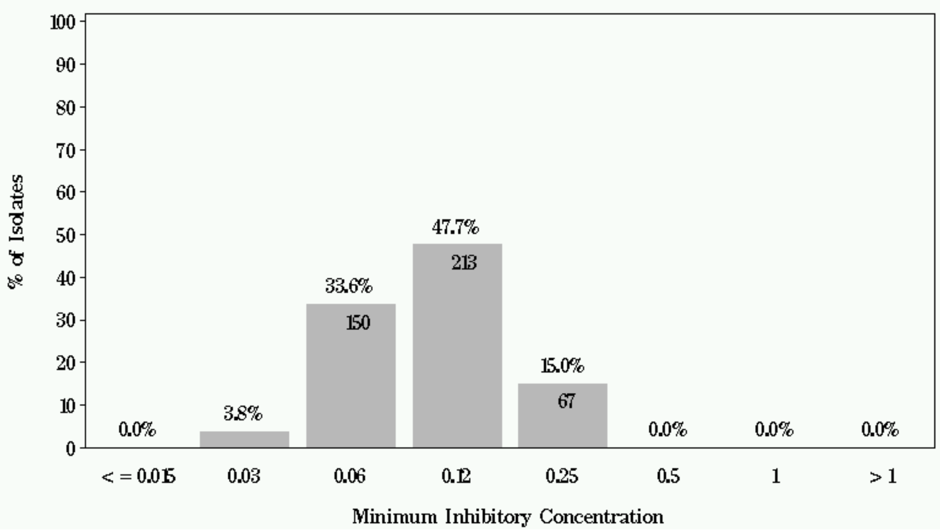
Breakpoints: Susceptible<=0.25 μg/mL Resistant>=1μg/mL



NARMS

Figure 15o: Minimum Inhibitory Concentration of Tigecycline for *Enterococcus* in Ground Beef (N=447 Isolates)

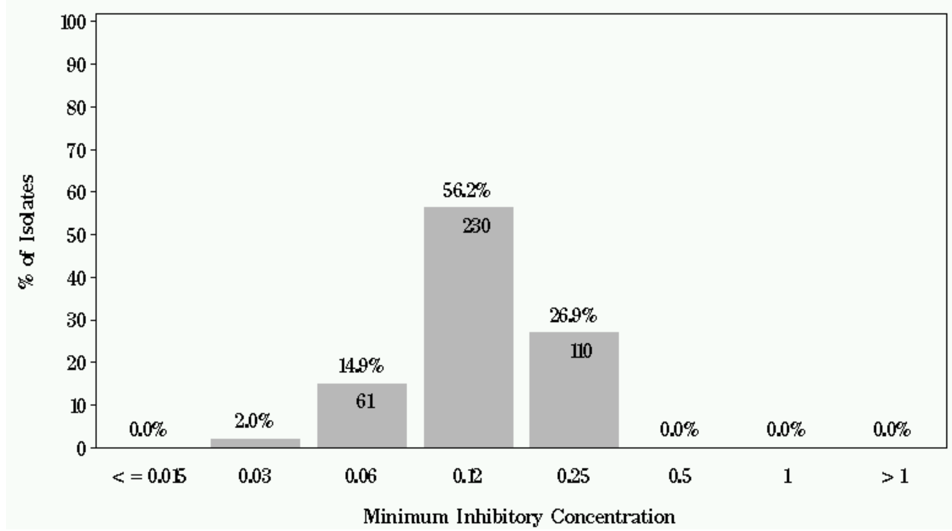
Breakpoints: Susceptible<=0.25 μg/mL Resistant>=1μg/mL

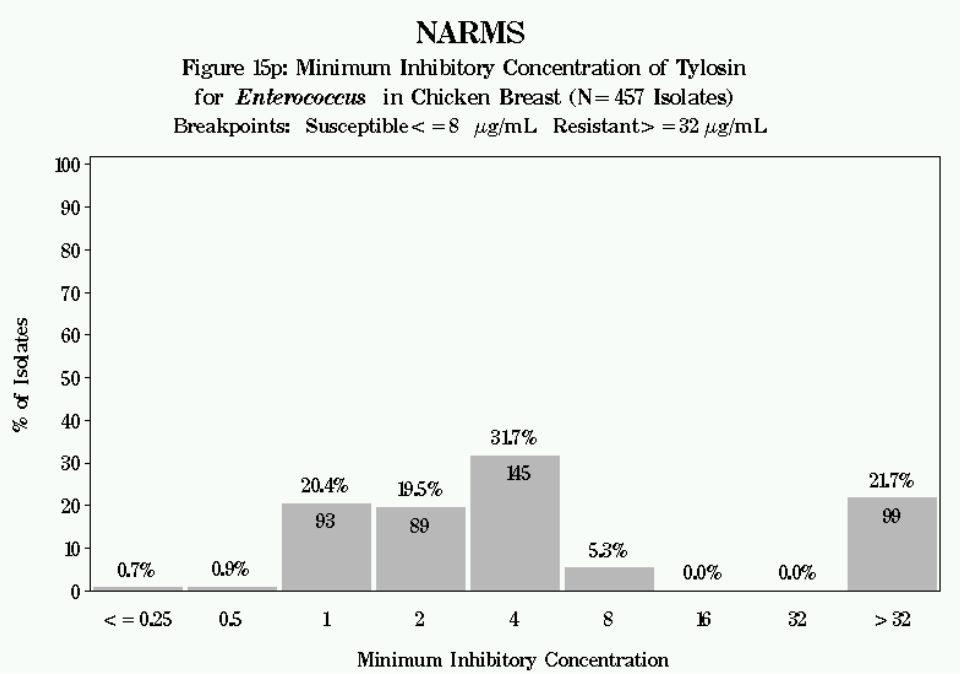


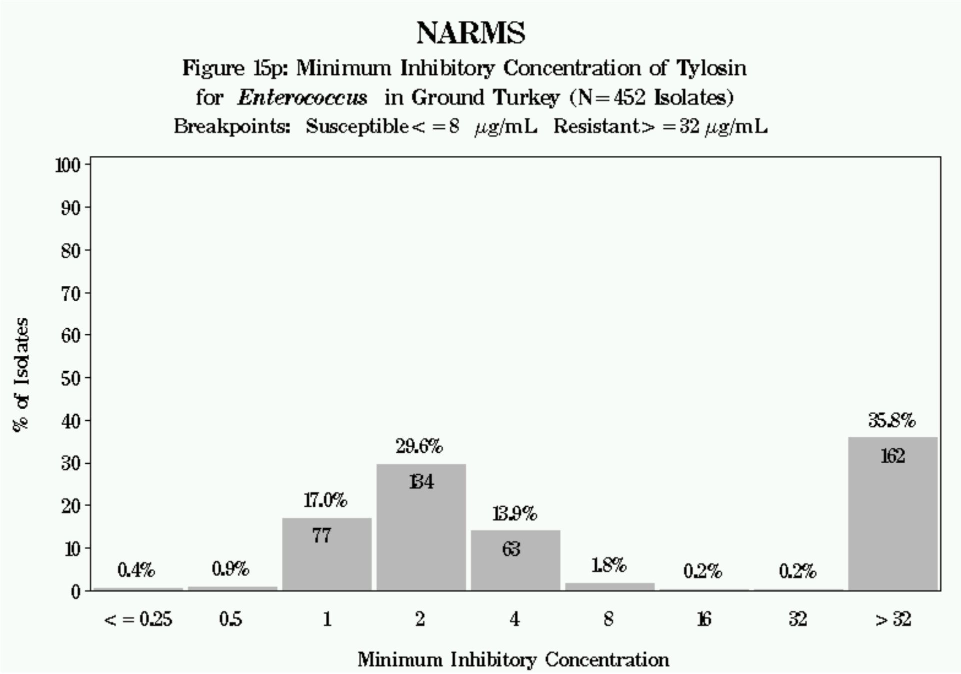
NARMS

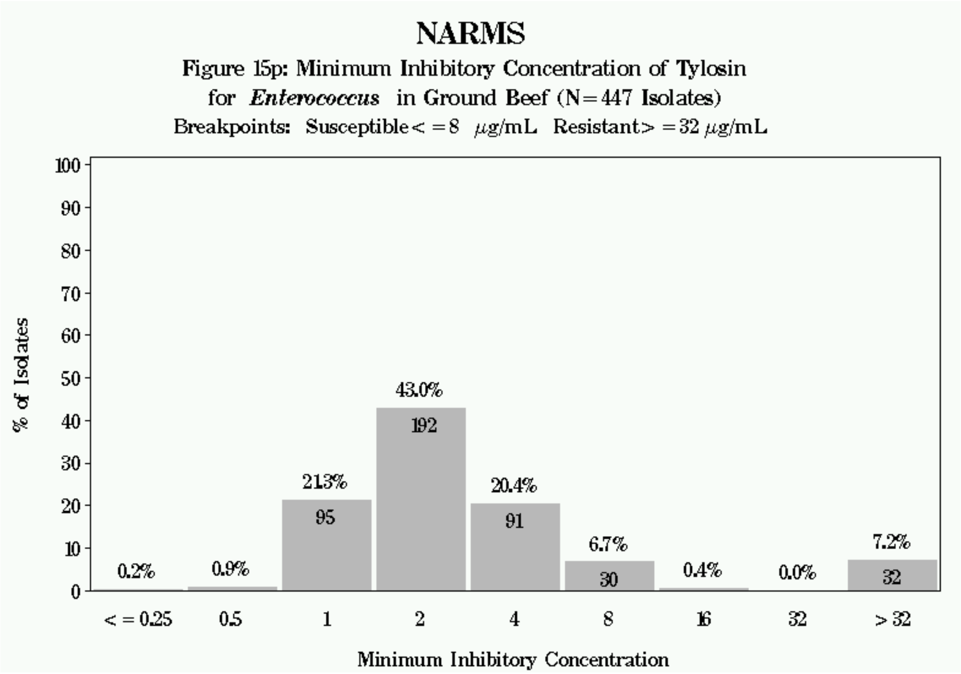
Figure 15o: Minimum Inhibitory Concentration of Tigecycline for *Enterococcus* in Pork Chop (N=409 Isolates)

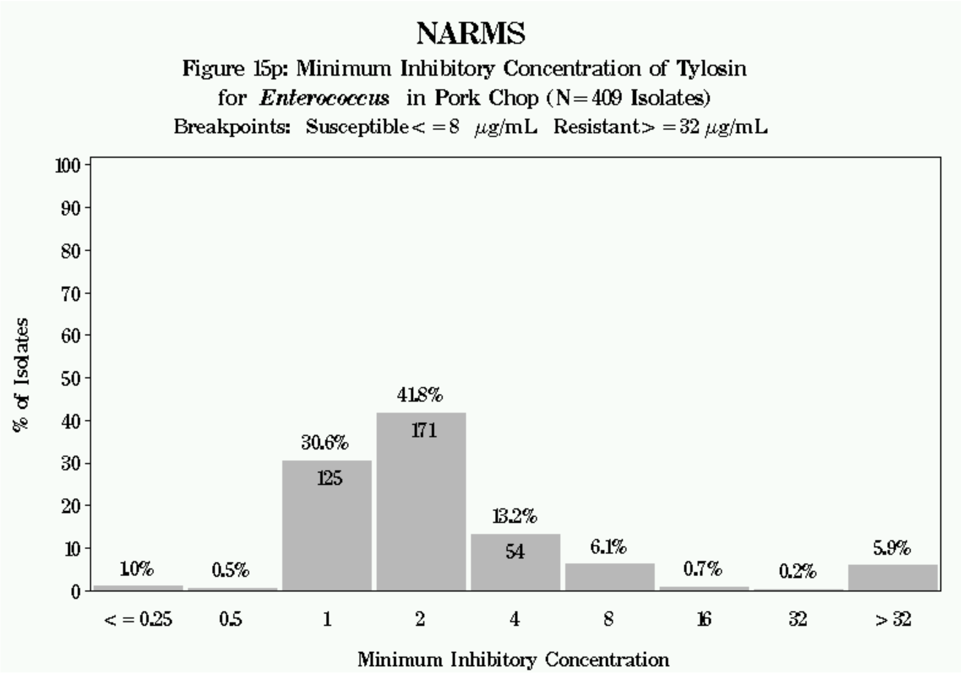
Breakpoints: Susceptible<=0.25 μg/mL Resistant>=1μg/mL




NARMS
Figure 15p: Minimum Inhibitory Concentration of Tylosin
for Enterococcus in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
0.7%
0.9%
20.4%
93
19.5%
89
31.7%
145
5.3%
0.0%
0.0%
21.7%
99
<=0.25
0.5
1
2
4
8
16
32
>32
Minimum Inhibitory Concentration

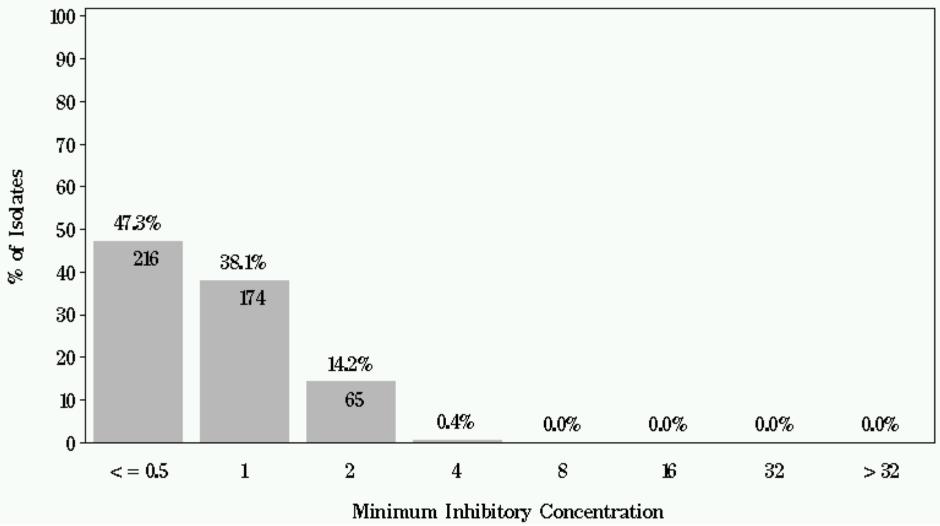

NARMS
Figure 15p: Minimum Inhibitory Concentration of Tylosin
for Enterococcus in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
0.4%
0.9%
17.0%
77
29.6%
134
13.9%
63
1.8%
0.2%
0.2%
35.8%
162
<=0.25
0.5
1
2
4
8
16
32
>32
Minimum Inhibitory Concentration


NARMS
Figure 15p: Minimum Inhibitory Concentration of Tylosin
for Enterococcus in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
0.2%
0.9%
21.3%
95
43.0%
192
20.4%
91
6.7%
30
0.4%
0.0%
7.2%
32
<=0.25
0.5
1
2
4
8
16
32
>32
Minimum Inhibitory Concentration


NARMS
Figure 15p: Minimum Inhibitory Concentration of Tylosin
for Enterococcus in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
1.0%
0.5%
30.6%
125
41.8%
171
13.2%
54
6.1%
0.7%
0.2%
5.9%
<=0.25
0.5
1
2
4
8
16
32
>32
Minimum Inhibitory Concentration

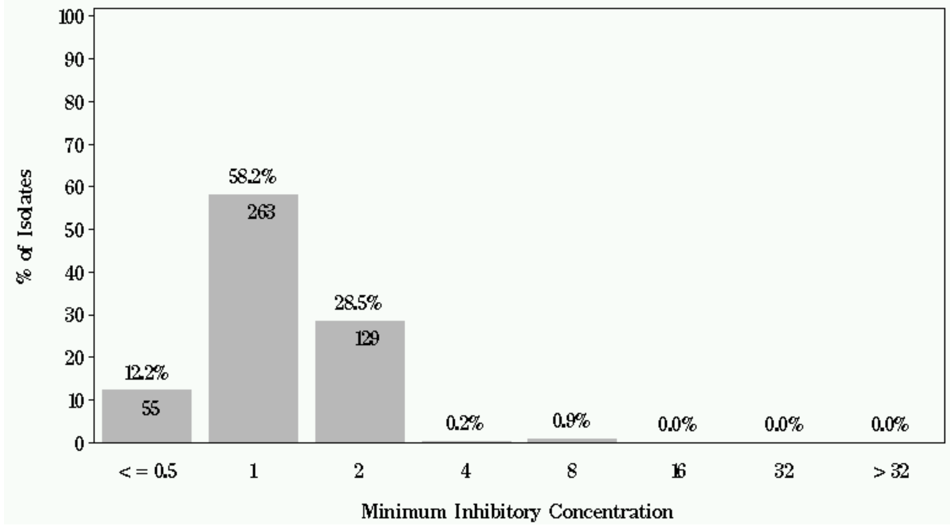
NARMS

Figure 15q: Minimum Inhibitory Concentration of Vancomycin
for *Enterococcus* in Chicken Breast (N=457 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=32 μg/mL



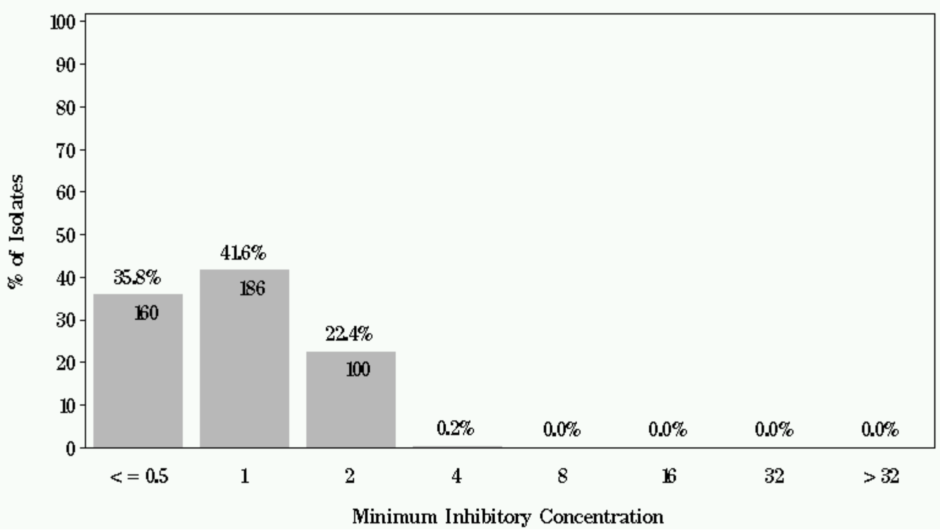
NARMS

Figure 15q: Minimum Inhibitory Concentration of Vancomycin
for *Enterococcus* in Ground Turkey (N=452 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15q: Minimum Inhibitory Concentration of Vancomycin
for *Enterococcus* in Ground Beef (N=447 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=32 μg/mL



NARMS

Figure 15q: Minimum Inhibitory Concentration of Vancomycin
for *Enterococcus* in Pork Chop (N=409 Isolates)
Breakpoints: Susceptible<=4 μg/mL Resistant>=32 μg/mL

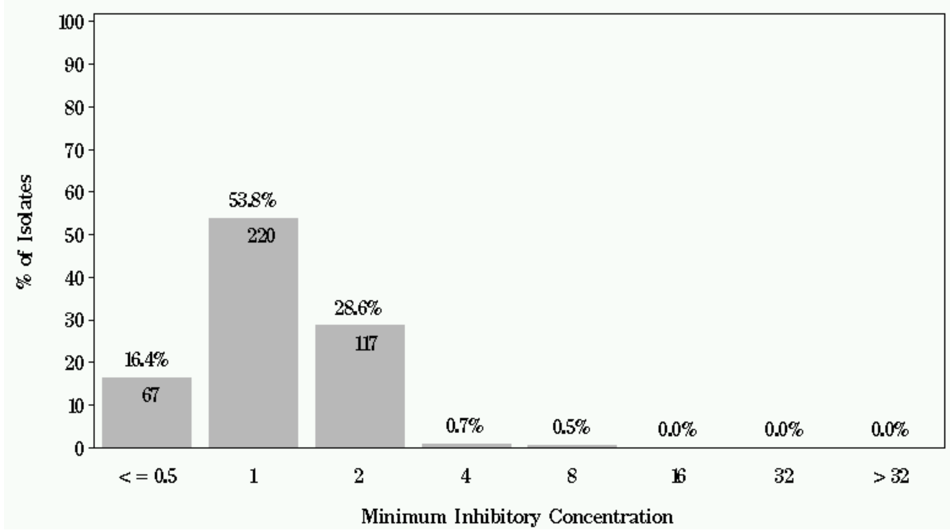


Table 23. Antimicrobial Resistance among *Enterococcus* by Meat Type, 2002-2005

Meat Type	Year	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Ionophore Coccidiostat	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Phospho-glycolipids	Poly-peptides	Quino-lones	Strepto-gramins	Tetra-cyclines
		GEN	KAN	STR	VAN	TGC	SAL	LIN	DAP	ERY	TYL	NIT	LZD	PEN	CHL	FLA	BAC	CIP	QDA[*]	TET
Chicken Breast	2002 (n=381)	10.0%	15.7%	21.0%	-[†]	[‡]		91.9%		32.8%	31.2%	33.9%	-	27.3%	-	62.2%	97.4%	8.1%	56.3%	61.2%
	2003 (n=466)	11.2%	18.2%	21.2%	-			92.7%		31.1%	28.1%	35.6%	-	27.9%	-	57.5%	98.5%	11.6%	61.9%	59.2%
	2004 (n=466)	7.1%	11.8%	11.4%	-			86.7%	3.0%	17.0%	15.0%	65.5%	-	30.9%	-	68.5%	94.0%	40.8%	29.9%	49.1%
	2005 (n=457)	9.6%	16.0%	15.5%	-	-		85.1%	-	22.8%	21.7%	38.7%	0.2%	21.4%	0.2%	58.4%			39.0%	58.9%
	Total	**9.4%**	**15.4%**	**17.1%**	**-**	**-**	**-**	**89.0%**	**1.5%**	**25.6%**	**23.7%**	**43.9%**	**0.1%**	**26.9%**	**0.1%**	**61.6%**	**96.6%**	**21.5%**	**44.8%**	**56.9%**
Ground Turkey	2002 (n=387)	20.4%	28.9%	27.6%	-		0.5%	96.6%		35.1%	32.6%	13.4%	-	15.2%	0.3%	22.2%	23.2% 97.2%	5.4%	79.6%	85.8%
	2003 (n=418)	22.7%	33.3%	30.1%	-			96.2%		43.1%	38.5%	15.8%	-	18.4%	-	29.9%	97.8%	11.2%	79.8%	87.3%
	2004 (n=437)	20.1%	31.8%	29.5%	-			94.7%	3.0%	37.1%	34.6%	27.0%	-	24.3%	-	35.7%	95.9%	24.7%	62.7%	87.0%
	2005 (n=452)	17.9%	28.1%	24.8%	-	-		96.2%	-	38.5%	36.1%	11.9%	-	15.5%	-	22.3%			61.1%	85.8%
	Total	**20.2%**	**30.5%**	**28.0%**	**-**	**-**	**0.2%**	**95.9%**	**1.5%**	**38.5%**	**35.5%**	**17.1%**	**-**	**18.4%**	**0.1%**	**27.6%**	**96.9%**	**13.6%**	**69.7%**	**86.5%**
Ground Beef	2002 (n=383)	1.8%	2.1%	3.9%	-			91.9%		7.6%	6.5%	4.7%	-	-	0.5%	43.1%	12.2% 70.2%	3.1%	46.2%	28.2%
	2003 (n=432)	0.9%	4.4%	4.2%	-			85.9%		7.9%	5.8%	10.0%	-	2.1%	-	46.5%	78.2%	8.8%	54.3%	27.8%
	2004 (n=448)	0.4%	4.5%	5.4%	-			84.4%	4.7%	6.5%	5.1%	20.1%	-	1.3%	0.4%	53.3%	62.3%	15.8%	7.5%	30.4%
	2005 (n=447)	1.3%	3.4%	5.6%	-	-		91.1%	-	6.9%	7.2%	7.8%	-	0.7%	0.2%	45.6%			9.0%	38.5%
	Total	**1.1%**	**3.6%**	**4.8%**	**-**	**-**	**-**	**88.2%**	**2.3%**	**7.2%**	**6.1%**	**10.9%**	**-**	**1.1%**	**0.3%**	**47.3%**	**70.2%**	**8.8%**	**27.1%**	**31.3%**
Pork Chop	2002 (n=369)	2.2%	4.1%	8.9%	-			97.0%		11.4%	8.7%	1.4%	-	0.8%	0.3%	31.2%	6.5% 94.0%	1.9%	27.2%	76.2%
	2003 (n=426)	0.2%	4.0%	6.1%	-			95.8%		6.8%	5.9%	4.2%	-	0.2%	0.9%	23.5%	89.0%	1.6%	60.2%	73.7%
	2004 (n=404)	1.5%	2.7%	8.4%	-			92.1%	-	8.7%	7.7%	7.9%	-	1.7%	0.5%	21.5%	75.7%	8.2%	5.5%	73.5%
	2005 (n=409)	1.2%	3.9%	7.6%	-	-		93.9%	-	6.6%	6.1%	3.2%	-	1.2%	1.0%	19.1%			13.5%	80.0%
	Total	**1.2%**	**3.7%**	**7.7%**	**-**	**-**	**-**	**94.7%**	**-**	**8.3%**	**7.0%**	**4.2%**	**-**	**1.0%**	**0.7%**	**23.6%**	**86.1%**	**3.9%**	**28.5%**	**75.8%**
	Grand Total	**8.1%**	**13.4%**	**14.5%**	**-**	**-**	**0.1%**	**91.9%**	**1.4%**	**20.1%**	**18.3%**	**19.5%**	**-**	**12.1%**	**0.3%**	**40.5%**	3.7% **87.5%**	**12.1%**	**41.8%**	**62.3%**

[*] Data presented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.
[†] Dashes indicate 0.0% resistance to antimicrobial.
[‡] Gray area indicates that drug was not tested in that year.

Table 24. Antimicrobial Resistance among *Enterococcus* by Species, 2005

	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Phospho-glycolipids	Quino-lones	Strepto-gramins	Tetra-cyclines
Species	**GEN**	**KAN**	**STR**	**VAN**	**TGC**	**LIN**	**DAP**	**ERY**	**TYL**	**NIT**	**LZD**	**PEN**	**CHL**	**FLA**	**CIP**	**QDA**	**TET**
E. faecalis	9.8%*	14.3%	13.8%	-	-	97.0%	-	20.2%	20.6%	1.6%	-	0.9%	0.5%	1.3%	1.8%	†	72.5%
E. faecium	5.3%	12.3%	14.1%	-	-	81.1%	-	16.0%	12.5%	39.8%	0.2%	26.9%	-	81.7%	29.9%	33.7%	55.7%
E. hirae	3.4%	7.7%	10.3%	-	-	99.1%	-	29.1%	28.2%	6.0%	-	-	0.9%	95.7%	-	18.8%	59.8%
E. durans	- ‡		-	-	-	89.5%	-	5.3%	10.5%	52.6%	-	5.3%	-	73.7%	10.5%	15.8%	47.4%
E. gallinarum	10.0%	30.0%	20.0%	-	-	100.0%	-	-	10.0%	-	-	-	-	60.0%	-	10.0%	70.0%
Total	**7.7%**	**13.1%**	**13.5%**	**-**	**-**	**91.5%**	**-**	**19.0%**	**18.1%**	**15.8%**	**0.1%**	**10.0%**	**0.3%**	**36.8%**	**11.6%**	**30.6%**	**65.5%**

* Where % resistance = (# isolates per species resistant to antimicrobial) / (total # isolates per species).
† Data presented for all species except *E. faecalis*, which is considered intrinsically resistant to Quinupristin-Dalfopristin.
‡ Dashes indicate 0.0% resistance to antimicrobial.

Table 25. Antimicrobial Resistance among *Enterococcus faecalis & E. faecium* by Meat Type, 2002-2005

Meat Type	Species	Year	Aminoglycosides			Glyco-peptides	Glycyl-cycline	Ionophore Coccidiostat	Lincos-amides	Lipo-peptides	Macrolides		Nitro-furans	Oxazolidi-nones	Penicillins	Phenicols	Phospho-glycolipids	Poly-peptides	Quino-lones	Strepto-gramins	Tetra-cyclines
			GEN	**KAN**	**STR**	**VAN**	**TGC**	**SAL**	**LIN**	**DAP**	**ERY**	**TYL**	**NIT**	**LZD**	**PEN**	**CHL**	**FLA**	**BAC**	**CIP**	**QDA***	**TET**
Chicken Breast	***E. faecalis*** **(n=134)**	2002	22.4%[†]	32.1%	29.1%	-[‡]			99.3%		45.5%	48.5%	0.7%	-	-	-	-	97.0%	-	-	67.2%
	E. faecium **(n=231)**		3.0%	6.5%	16.9%	-			87.0%		25.5%	21.2%	54.5%	-	44.2%	-	96.5%	100.0%	13.0%	55.4%	56.7%
	E. faecalis **(n=188)**	2003	20.2%	27.1%	22.9%	-			99.5%		43.1%	42.6%	1.1%	-	-	-	-	97.9%	-	-	68.6%
	E. faecium **(n=248)**		5.6%	10.5%	16.9%	-			86.7%		17.3%	12.5%	64.5%	-	51.2%	-	96.8%	99.6%	21.8%	59.7%	51.6%
	E. faecalis **(n=88)**	2004	19.3%	22.7%	18.2%	-	-		98.9%	-	35.2%	34.1%	1.1%	-	-	-	-	98.9%	8.0%	-	63.6%
	E. faecium **(n=348)**		4.3%	9.5%	8.3%	-	-			4.0%	12.6%	10.3%	85.3%	-	39.1%	-	83.6%	96.0%	52.3%	31.6%	45.1%
	E. faecalis **(n=116)**	2005	18.1%	26.7%	18.1%	-	- -			-	37.1%	37.1%	4.3%	-	-	-	0.9%		0.9%	-	75.0%
	E. faecium **(n=307)**		6.2%	10.7%	14.0%	-	-			-	13.7%	12.4%	54.7%	0.3%	31.9%	-	76.2%		33.9%	39.1%	54.4%
Ground Turkey	***E. faecalis*** **(n=294)**	2002	22.1%	26.2%	24.1%	-		83.3%	97.3%		31.0%	32.0%	2.0%	-	-	0.3%	-	96.9%	0.3%	-	85.0%
	E. faecium **(n=89)**		15.7%	39.3%	39.3%	-		99.1%	94.4%		50.6%	36.0%	50.6%	-	66.3%	-	92.1%	98.9%	22.5%	82.0%	88.8%
	E. faecalis **(n=289)**	2003	27.7%	36.0%	30.4%	-		78.2%	99.0%		43.6%	43.9%	1.4%	-	-	-	-	98.6%	-	-	87.9%
	E. faecium **(n=118)**		12.7%	28.0%	32.2%	-			89.0%		44.1%	27.1%	52.5%	-	65.3%	-	96.6%	96.6%	39.0%	79.7%	91.5%
	E. faecalis **(n=260)**	2004	24.6%	29.6%	26.9%	-	0.7%		98.8%	-	33.8%	34.6%	1.2%	-	-	-	-	95.4%	5.8%	-	88.1%
	E. faecium **(n=172)**		13.4%	35.5%	34.3%	-	-			7.6%	43.0%	35.5%	66.9%	-	61.6%	-	87.8%	96.5%	53.5%	64.5%	86.6%
	E. faecalis **(n=339)**	2005	20.1%	27.4%	21.5%	-	- -			-	38.3%	38.3%	2.4%	-	1.5%	-	2.1%		2.1%	-	84.4%
	E. faecium **(n=107)**		12.1%	29.9%	34.6%	-	-			-	41.1%	29.9%	43.0%	-	59.8%	-	83.2%		43.9%	63.6%	91.6%
Ground Beef	***E. faecalis*** **(n=210)**	2002	2.4%	1.9%	4.8%	-		88.4%	98.6%		1.4%	1.9%	-	-	-	-	0.5%	85.7%	-	-	18.6%
	E. faecium **(n=93)**		1.1%	4.3%	3.2%	-		97.3%	76.3%		11.8%	6.5%	18.3%	-	-	1.1%	94.6%	91.4%	12.9%	47.3%	22.6%
	E. faecalis **(n=224)**	2003	1.8%	3.1%	5.4%	-		92.5%	96.4%		4.9%	4.9%	-	-	-	-	-	93.8%	0.4%	-	20.5%
	E. faecium **(n=112)**		-	8.0%	2.7%	-			58.9%		8.9%	0.9%	36.6%	-	8.0%	-	96.4%	97.3%	33.0%	50.0%	28.6%
	E. faecalis **(n=194)**	2004	1.0%	3.1%	7.7%	-	-			-	3.6%	3.6%	-	-	-	-	-	86.6%	12.9%	-	25.3%
	E. faecium **(n=162)**		-	8.6%	5.6%	-	-			0.6%	9.3%	5.6%	51.9%	-	3.1%	1.2%	91.4%	64.8%	27.2%	6.2%	24.7%
	E. faecalis **(n=226)**	2005	1.8%	4.0%	8.4%	-	- -			-	4.4%	5.8%	0.9%	-	-	0.4%	1.3%		0.9%	-	34.1%
	E. faecium **(n=129)**		0.8%	3.9%	1.6%	-	-			-	4.7%	2.3%	18.6%	-	2.3%	-	89.1%		20.9%	7.8%	28.7%
Pork Chop	***E. faecalis*** **(n=255)**	2002	2.7%	4.7%	10.6%	-		97.4%	99.2%		9.0%	9.0%	-	-	-	0.4%	2.0%	96.9%	1.2%	-	80.4%
	E. faecium **(n=93)**		1.1%	3.2%	5.4%	-		67.9%	90.3%		20.4%	9.7%	5.4%	-	3.2%	-	97.8%	94.6%	4.3%	24.7%	68.8%
	E. faecalis **(n=313)**	2003	0.3%	4.8%	7.3%	-		97.8%	98.1%		7.0%	7.0%	-	-	-	1.0%	-	91.7%	-	-	78.0%
	E. faecium **(n=97)**		-	2.1%	3.1%	-		74.4%	89.7%		6.2%	2.1%	16.5%	-	1.0%	-	87.6%	90.7%	6.2%	64.9%	69.1%
	E. faecalis **(n=313)**	2004	1.9%	2.6%	9.3%	-	-		94.9%	-	9.9%	9.9%	0.3%	-	-	0.6%	-	80.2%	6.1%	-	75.7%
	E. faecium **(n=75)**		-	2.7%	6.7%	-	-		84.0%	-	5.3%	-	37.3%	-	8.0%	-	94.7%	68.0%	17.3%	6.7%	72.0%
	E. faecalis **(n=320)**	2005	1.6%	3.1%	7.8%	-	- -			-	5.9%	6.3%	0.3%	-	1.3%	1.3%	0.6%		2.5%	-	86.3%
	E. faecium **(n=75)**		-	8.0%	6.7%	-	-			-	9.3%	5.3%	10.7%	-	1.3%	-	89.3%		9.3%	13.3%	56.0%
Total			**8.7%**	**14.2%**	**15.1%**	-	**-**	**0.1%**	**91.7%**	**0.9%**	**20.2%**	**18.3%**	**20.5%**	**-**	**13.0%**	**0.2%**	**35.6%**	**92.8%**	**13.1%**	**43.7%**	**63.2%**

95.3%
88.0%

* Data not presented for *E. faecalis*, as it is considered intrinsically resistant to Quinupristin-Dalfopristin.
† Where % resistance = (# isolates resistant to antimicrobial per meat type) / (total # isolates per meat type).
‡ Dashes indicate 0.0% resistance to antimicrobial.

Table 26. Number of *Enterococcus faecalis* Resistant to Multiple Antimicrobial Agents*, 2002-2005

Meat Type	*Number of Antimicrobials*	Year				
		2002 (N=893)	2003 (N=1014)	2004 (N=855)	2005 (N=1001)	Total
Chicken Breast	0	1	0	0	1	2
	1	4	4	1	25	34
	2-4	66	89	53	63	271
	5-7	52	90	31	26	199
	≥8	11	5	3	1	20
	Total	134	188	88	116	526
Ground Turkey	0	3	4	1	2	10
	1	3	5	4	48	60
	2-4	152	133	150	200	635
	5-7	105	103	73	84	365
	≥8	31	44	32	5	112
	Total	294	289	260	339	1182
Ground Beef	0	1	5	2	3	11
	1	23	9	21	143	196
	2-4	179	200	163	70	612
	5-7	3	6	8	9	26
	≥8	3	4	0	1	8
	Total	209	224	194	226	853
Pork Chop	0	0	0	2	4	6
	1	7	10	30	51	98
	2-4	223	281	252	251	1007
	5-7	22	20	23	12	77
	≥8	4	2	6	2	14
	Total	256	313	313	320	1202

* Data does not include QDA, as E. faecalis is considered intrinsically resistant.

Table 27. Number of *Enterococcus faecium* Resistant to Multiple Antimicrobial Agents, 2002-2005

Meat Type	*Number of Antimicrobials*	Year				
		2002 (N=506)	2003 (N=575)	2004 (N=757)	2005 (N=618)	Total
Chicken Breast		0	0	0	5	**5**
	1	0	0	4	28	**32**
	2-4	80	52	155	141	**428**
	5-7	118	155	168	109	**550**
	≥8	33	41	21	24	**119**
	Total	**231**	**248**	**348**	**307**	**1134**
Ground Turkey	**0**	0	1	0	0	**1**
	1	0	0	1	1	**2**
	2-4	12	16	27	29	**84**
	5-7	32	48	78	45	**203**
	≥8	45	53	66	32	**196**
	Total	**89**	**118**	**172**	**107**	**486**
Ground Beef	**0**	0	0	0	2	**2**
	1	2	2	22	14	**40**
	2-4	77	67	123	105	**372**
	5-7	15	37	8	6	**66**
	≥8	0	6	9	2	**17**
	Total	**94**	**112**	**162**	**129**	**497**
Pork Chop	**0**	0	0	0	1	**1**
	1	1	2	5	5	**13**
	2-4	70	50	55	62	**237**
	5-7	18	42	15	5	**80**
	≥8	3	3	0	2	**8**
	Total	**92**	**97**	**75**	**75**	**339**

Table 28. *Escherichia coli* by Meat Type, 2002-2005

Meat Type	2002			2003			2004			2005		
	N*	n†	%‡	N	n	%	N	n	%	N	n	%
Chicken Breast	390	282	72.3%	477	396	83.0%	476	400	84.0%	468	393	84.0%
Ground Turkey	395	304	77.0%	447	333	74.5%	466	376	80.7%	470	396	84.3%
Ground Beef	399	295	73.9%	470	311	66.2%	480	338	70.4%	468	316	67.5%
Pork Chop	390	184	47.2%	479	218	45.5%	478	232	48.5%	465	205	44.1%
Total	**1574**	**1065**	**67.7%**	**1873**	**1258**	**67.2%**	**1900**	**1346**	**70.8%**	**1871**	**1310**	**70.0%**

* Where N = Number of retail meat samples.
† Where n = number of positive isolates.
‡ Where % = (n / N).

Table 29. Antimicrobial Resistance among *E. coli* Isolates, 2002-2005

Class	Antimicrobial Agent (µg/ml)	2002		2003		2004		2005		Cochran Armitage Trend Test	
		n	%R*	n	%R	n	%R	n	%R	Z Statistic	P Value
Aminoglycosides	Amikacin (MIC ≥ 64)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	N/A †	N/A
	Gentamicin (MIC ≥ 16)	150	14.1%	221	17.6%	235	17.5%	257	19.6%	3.2909	0.0010
	Kanamycin (MIC ≥ 64)	74	6.9%	111	8.8%	114	8.5%		6.9%	-0.3209	0.7483
	Streptomycin (MIC ≥ 64)	383	36.0%	475	37.8%	501	37.2%		31.8%	-2.2769	0.0228
Aminopenicillins	Ampicillin (MIC ≥ 32)	199	18.7%	264	21.0%	246	18.3% 90 416	292	22.3%	1.5438	0.1226
Beta-Lactamase Inhibitor Combinations	Amoxicillin-Clavulanic Acid (MIC ≥ 32)	67	6.3%	82	6.5%	86	6.4%	72	5.5%	-0.8547	0.3927
Cephems	Cephalothin (MIC ≥ 32)	141	13.2%	201	16.0%	‡					N/A
	Ceftiofur (MIC ≥ 32)	24	2.3%	34	2.7%	31	2.3%	46	3.5%	1.6223	0.1047
	Ceftriaxone (MIC ≥ 64)	0	0.0%	0	0.0%	0	0.0%	2	0.2%	1.8323	0.0669
	Cefoxitin (MIC ≥ 32)	51	4.8%	47	3.7%	59	4.4%	64	4.9%	0.4550	0.6491
Folate Pathway Inhibitors	Sulfisoxazole (MIC ≥ 512)§	289	27.1%	389	30.9%	436	32.4%	430	32.8% N/A	3.0073	0.0026
	Trimethoprim-Sulfamethoxazole (MIC ≥ 4)	26	2.4%	58	4.6%	42	3.1%	54	4.1%	1.3269	0.1845
Phenicols	Chloramphenicol (MIC ≥ 512)	9	0.8%	28	2.2%	32	2.4%	30	2.3%	2.3491	0.0188
Quinolones	Ciprofloxacin (MIC ≥ 4)	0	0.0%	1	0.1%	3	0.2%	1	0.1%	0.8534	0.3935
	Nalidixic Acid (MIC ≥ 32)	22	2.1%	59	4.7%	73	5.4%		5.6%	4.0992	<0.0001
Tetracyclines	Tetracycline (MIC ≥ 16)	552	51.8%	608	48.3%	678	50.4%	638	48.7%	-1.0526	0.2925

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* Where % R = (n / N).
† N/A = No Z statistic or P value could be calculated for this antibiotic.
‡ Gray area indicates antibiotic not tested for this year.
§ Sulfisoxazole replaced Sulfamethoxazole on NARMS plate in 2004. Data in 2002 and 2003 column of Sulfisoxazole is for Sulfamethoxazole.

Figure 16. Antimicrobial Resistance among E. coli isolates, 2002-2005

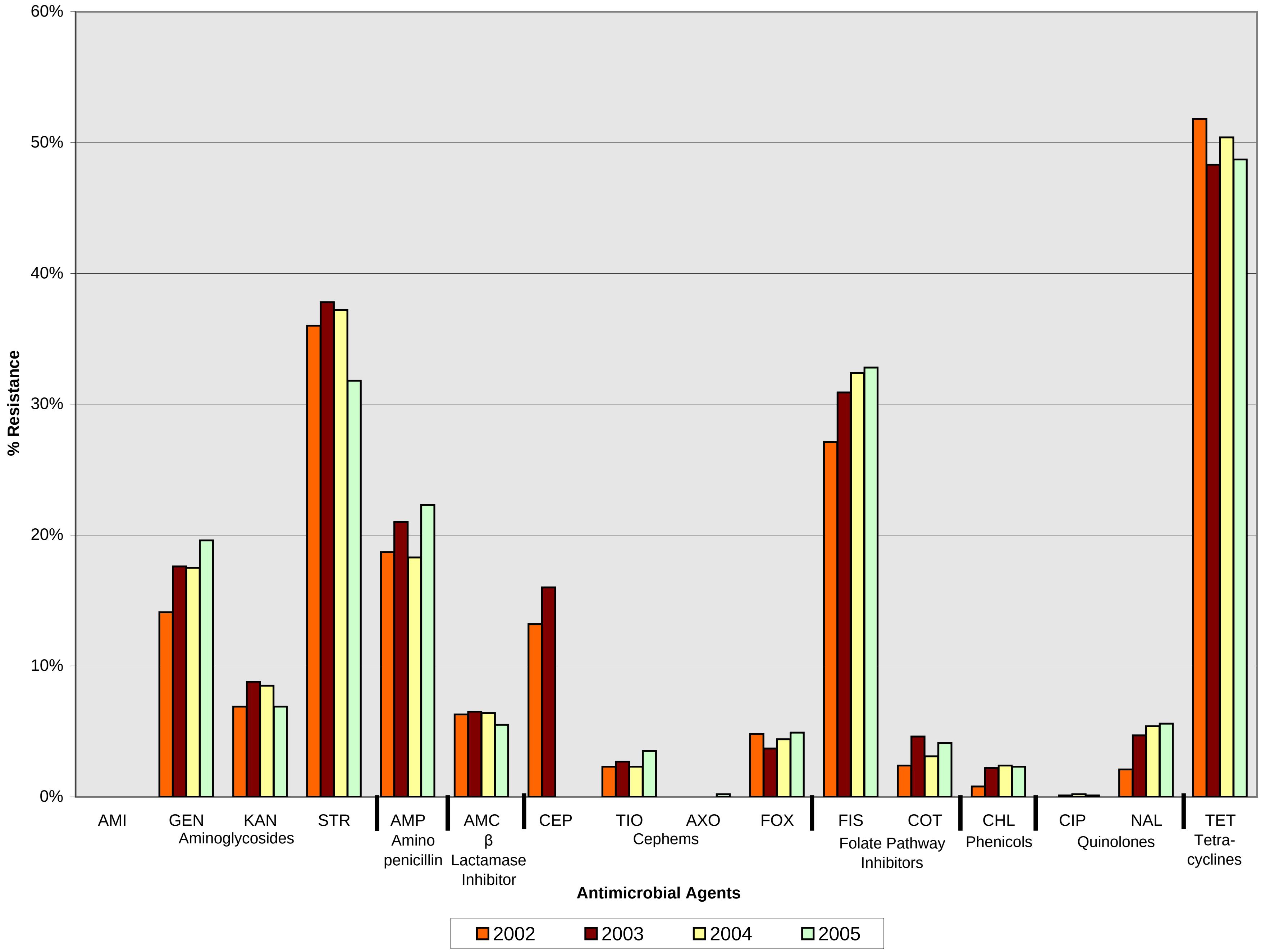


Figure 17. MIC Distribution among all Antimicrobial Agents

Antimicrobial	Year # of Isolates	%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 (n=1065)	0.0	0.0	(0.0 - 0.3)						0.5	22.8	62.8	11.4	2.5							
	2003 (n=1258)	0.0	0.0	(0.0 - 0.3)						0.5	20.4	63.1	13.2	2.8							
	2004 (n=1346)	0.0	0.0	(0.0 - 0.3)						0.1	15.9	65.1	16.6	2.1	0.3						
	2005 (n=1310)	0.1	0.0	(0.0 - 0.3)						0.4	14.0	66.2	16.6	2.6	0.1	0.1					
Gentamicin	2002 (n=1065)	1.2	14.1	(12.0 - 16.3)					5.4	56.5	19.1	3.0	0.8	1.2	6.0	8.1					
	2003 (n=1258)	1.0	17.6	(15.5 - 19.8)					4.1	49.8	24.4	2.8	0.4	1.0	6.4	11.2					
	2004 (n=1346)	1.5	17.5	(15.5 - 19.6)					7.1	51.7	19.5	2.4	0.3	1.5	6.5	11.0					
	2005 (n=1310)	1.9	19.6	(17.5 - 21.9)					5.0	49.5	22.0	1.8	0.2	1.9	9.0	10.6					
Kanamycin	2002 (n=1065)	0.4	6.9	(5.5 - 8.6)										90.5	2.2	0.4	0.2	6.8			
	2003 (n=1258)	0.8	8.8	(7.3 - 10.5)										84.7	5.6	0.8	0.2	8.6			
	2004 (n=1346)	0.9	8.5	(7.0 - 10.1)										84.6	6.0	0.9	0.1	8.4			
	2005 (n=1310)	0.5	6.9	(5.6 - 8.4)										88.8	3.9	0.5	0.3	6.6			
Streptomycin	2002 (n=1065)	N/A	36.0	(33.1 - 38.9)												64.0	13.0	23.0			
	2003 (n=1258)	N/A	37.8	(35.1 - 40.5)												62.3	11.5	26.2			
	2004 (n=1346)	N/A	37.2	(34.6 - 39.9)												62.8	11.7	25.5			
	2005 (n=1310)	N/A	31.8	(39.2 - 34.4)												68.2	13.1	18.6			
Aminopenicillins																					
Ampicillin	2002 (n=1065)	0.7	18.7	(16.4 - 21.2)							3.3	29.4	43.5	4.5	0.7	0.7	18.0				
	2003 (n=1258)	0.4	21.0	(18.8 - 23.3)							3.7	24.2	46.7	4.1	0.4	0.2	20.7				
	2004 (n=1346)	0.5	18.3	(16.2 - 20.4)							8.2	40.5	31.4	1.0	0.5	0.5	17.8				
	2005 (n=1310)	0.9	22.3	(20.1 - 24.6)							8.5	39.8	27.3	1.2	0.9	0.4	21.9				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=1065)	2.3	6.3	(4.9 - 7.9)							2.6	21.0	52.6	15.2	2.3	4.0	2.3				
	2003 (n=1258)	2.3	6.5	(5.2 - 8.0)							3.9	18.7	51.3	17.3	2.3	2.6	3.9				
	2004 (n=1346)	1.3	6.4	(5.1 - 7.8)							2.7	22.7	50.2	16.7	1.3	5.1	1.3				
	2005 (n=1310)	2.1	5.5	(4.3 - 6.9)							5.2	16.9	49.9	20.3	2.1	4.2	1.3				
Cephems																					
Cephalothin	2002 (n=1065)	34.9	13.2	(11.3 - 15.4)								0.6	9.5	41.8	34.9	6.7	6.57				
	2003 (n=1258)	40.5	16.0	(14.0 - 18.1)								1.0	6.8	35.8	40.5	8.3	7.6				
Ceftiofur	2002 (n=1065)	0.1	2.3	(1.4 - 3.3)				7.7	57.3	29.4	2.6	0.7	0.1	1.8	0.5						
	2003 (n=1258)	0.5	2.7	(1.9 - 3.8)				6.1	51.2	37.0	2.1	0.4	0.5	1.8	0.9						
	2004 (n=1346)	0.5	2.3	(1.6 - 3.3)				4.5	49.7	40.4	2.2	0.4	0.5	1.5	0.8						
	2005 (n=1310)	0.9	3.5	(2.6 - 4.7)				3.6	49.2	39.8	1.9	1.0	0.9	2.4	1.1						
Ceftriaxone	2002 (n=1065)	0.6	0.0	(0.0 - 0.3)					94.9	1.4	0.9	0.2	0.7	1.3	0.6						
	2003 (n=1258)	1.4	0.0	(0.0 - 0.3)					94.6	0.7	1.3	0.2	0.5	1.3	1.3	0.2					
	2004 (n=1346)	1.4	0.0	(0.0 - 0.3)					94.2	1.5	1.4	0.1		1.3	0.9	0.5					
	2005 (n=1310)	1.5	0.2	(2.6 - 0.6)					92.3	1.5	1.7	0.2	0.5	2.2	1.3	0.2	0.2				
Cefoxitin	2002 (n=1065)	2.5	4.8	(3.6 - 6.2)							0.8	19.3	56.3	16.3	2.5	4.8					
	2003 (n=1258)	3.3	3.7	(2.8 - 4.9)							0.5	14.1	55.2	23.3	3.3	3.7					
	2004 (n=1346)	1.4	4.4	(3.4 - 5.6)						0.1	1.8	23.0	55.2	14.1	1.4	2.2	2.2				
	2005 (n=1310)	0.9	4.9	(3.8 - 6.2)							3.1	32.1	49.0	10.1	0.9	1.8	3.1				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=1065)	N/A	27.1	(29.9 - 35.0)											70.3	1.88	0.4	0.19	0.1		27.14
	2003 (n=1258)	N/A	30.9	(30.3 - 35.4)											67.5	1.3	0.2		0.1	0.1	30.8
Sulfisoxazole	2004 (n=1346)	N/A	32.4	(29.9 - 35.0)											60.1	3.3	4.1	0.1	0.1	32.4	
	2005 (n=1310)	N/A	32.8	(30.3 - 35.4)											49.8	13.2	3.9	0.2	0.2	32.8	
Trimethoprim-Sulfamethoxazole	2002 (n=1065)	N/A	2.4	(1.6 - 3.6)				85.2	7.2	4.6	0.3	0.3	0.1	2.4							
	2003 (n=1258)	N/A	4.6	(3.5 - 5.9)				88.0	4.5	2.0	0.6	0.2		4.6							
	2004 (n=1346)	N/A	3.1	(2.3 - 4.2)				89.2	5.6	1.6	0.4	0.1		3.4							
	2005 (n=1310)	N/A	4.1	(3.1 - 5.3)				74.2	15.6	4.6	1.4	0.2	0.2	3.9							
Phenicols																					
Chloramphenicol	2002 (n=1065)	1.4	0.8	(0.4 - 1.6)								2.1	36.8	58.9	1.4	0.3	0.6				
	2003 (n=1258)	4.2	2.2	(1.5 - 3.2)								1.2	20.8	71.5	4.2	0.9	1.4				
	2004 (n=1346)	1.3	2.4	(1.6 - 3.3)								1.6	33.1	61.6	1.3	0.4	2.0				
	2005 (n=1310)	2.1	2.3	(1.6 - 3.3)								1.8	37.0	56.8	2.1	0.4	1.9				
Quinolones																					
Ciprofloxacin	2002 (n=1065)	0.1	0.0	(0.0 - 0.3)	92.7	5.1	0.3	0.4	1.0	0.2	0.3	0.1									
	2003 (n=1258)	0.0	0.1	(0.0 - 0.4)	91.7	3.4	0.2	2.0	2.3	0.4				0.1							
	2004 (n=1346)	0.0	0.2	(0.0 - 0.6)	90.9	2.7	0.4	1.6	3.6	0.5				0.2							
	2005 (n=1310)	0.0	0.1	(0.0 - 0.4)	85.6	4.6	1.7	3.5	4.4	0.1	0.1			0.1							
Nalidixic Acid	2002 (n=1065)	N/A	2.1	(1.3 - 3.1)							1.1	16.5	75.1	5.0	0.2	0.1	2.0				
	2003 (n=1258)	N/A	4.7	(3.6 - 6.0)						0.1	2.9	44.6	45.9	1.7	0.1	0.1	4.6				
	2004 (n=1346)	N/A	5.4	(4.3 - 6.8)							5.4	64.8	23.0	1.0	0.3	0.4	5.0				
	2005 (n=1310)	N/A	5.6	(4.5 - 7.0)						0.1	7.6	66.0	17.5	1.8	1.4	0.8	4.8				
Tetracyclines																					
Tetracycline	2002 (n=1065)	1.8	51.8	(48.8 - 54.9)									46.4	1.8	2.0	1.7	48.2				
	2003 (n=1258)	1.8	48.3	(45.5 - 51.1)									49.9	1.7	1.3	1.0	46.1				
	2004 (n=1346)	2.4	50.4	(47.7 - 53.1)									47.3	2.4	0.8	4.2	45.3				
	2005 (n=1310)	2.4	48.7	(46.0 - 51.4)									48.9	2.4	0.4	2.0	46.3				

[1] Percent of isolates with intermediate susceptibility

[2] Percent of isolates that were resistant

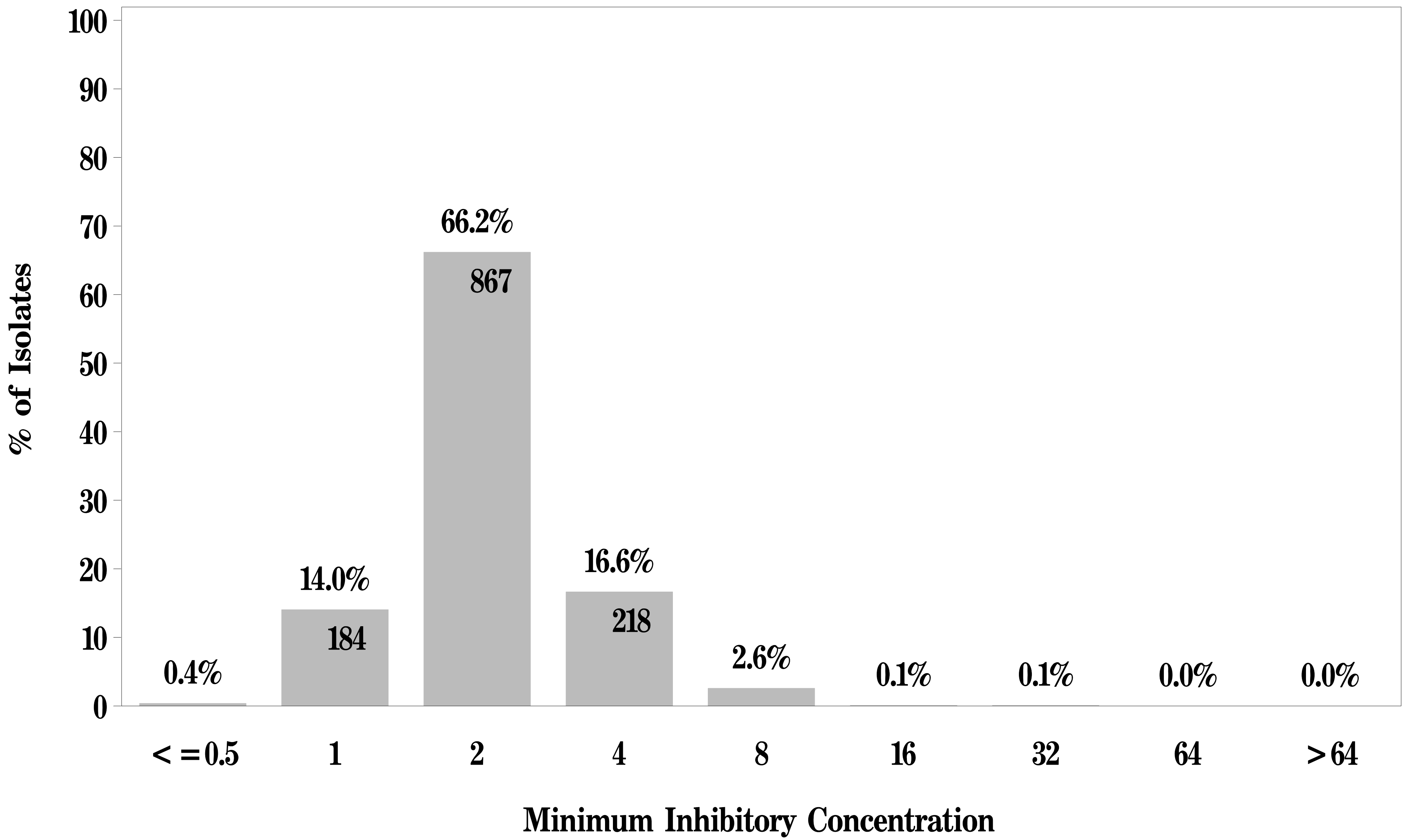
[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of 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

NARMS

Figure 17a: Minimum Inhibitory Concentration of Amikacin for *Escherichia* (N=1310 Isolates)

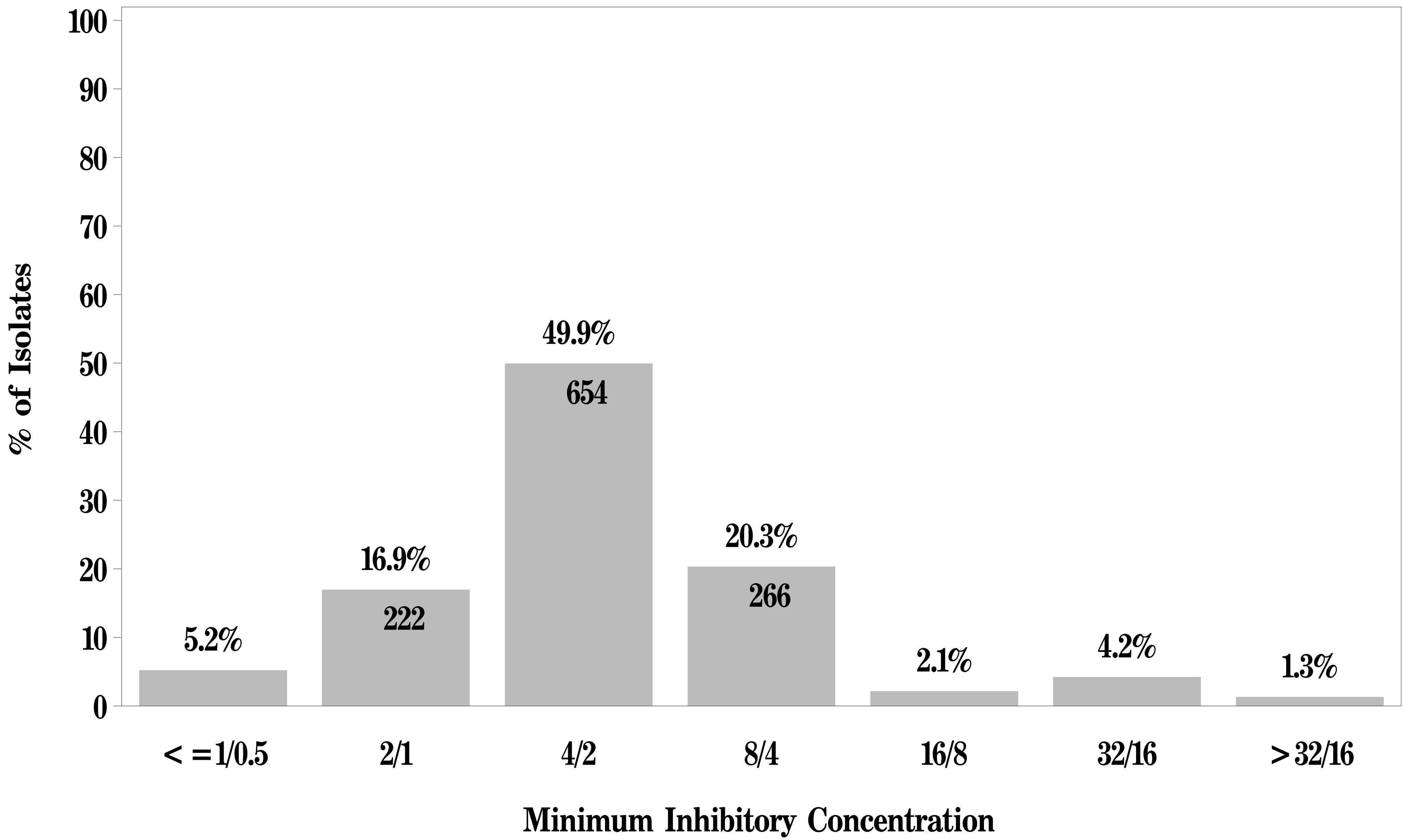
Breakpoints: Susceptible <=16 μg/mL Resistant >=64 μg/mL



NARMS

Figure 17b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid for *Escherichia* (N=1310 Isolates)

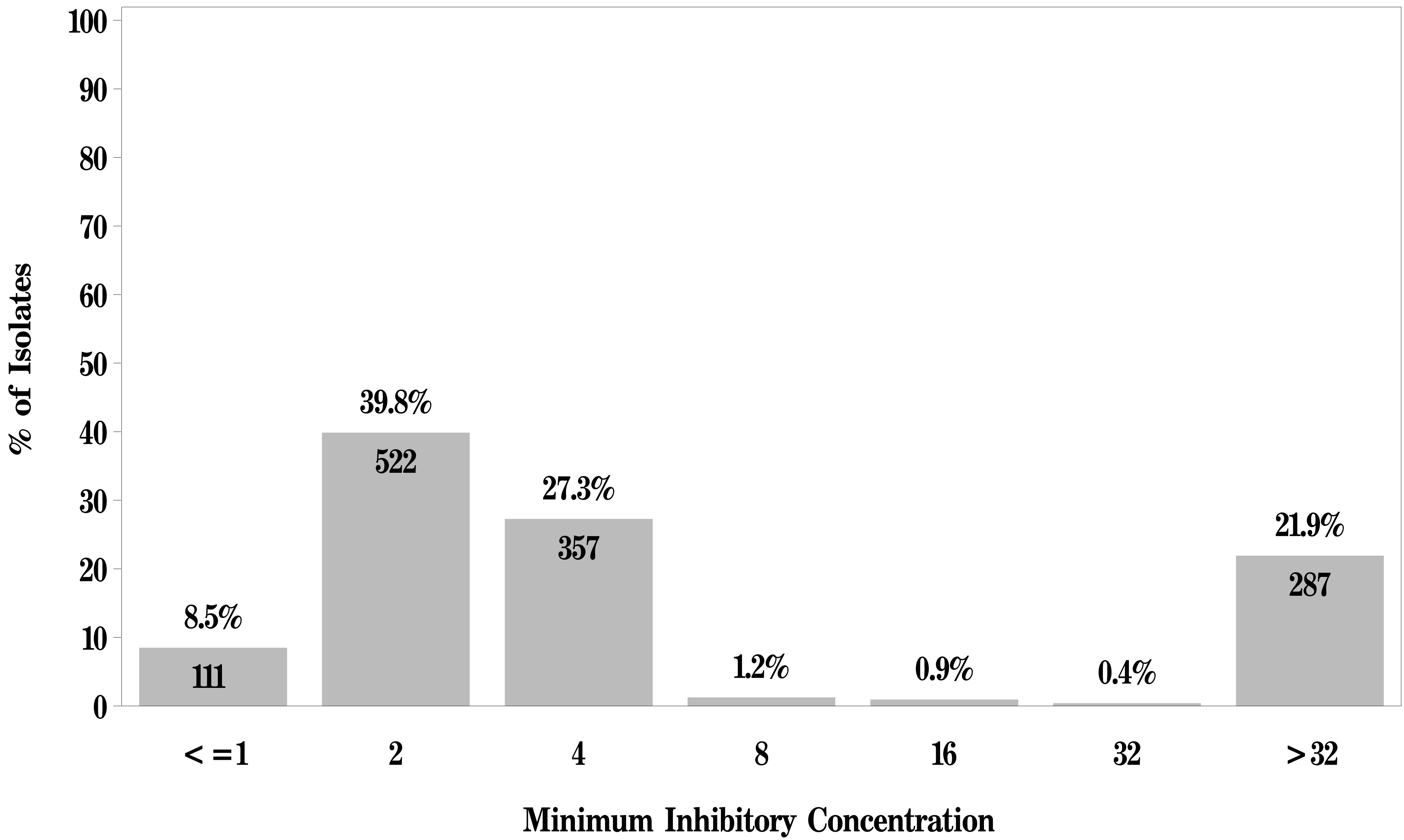
Breakpoints: Susceptible <=8 μg/mL Resistant >=32 μg/mL



NARMS

Figure 17c: Minimum Inhibitory Concentration of Ampicillin for *Escherichia* (N=1310 Isolates)

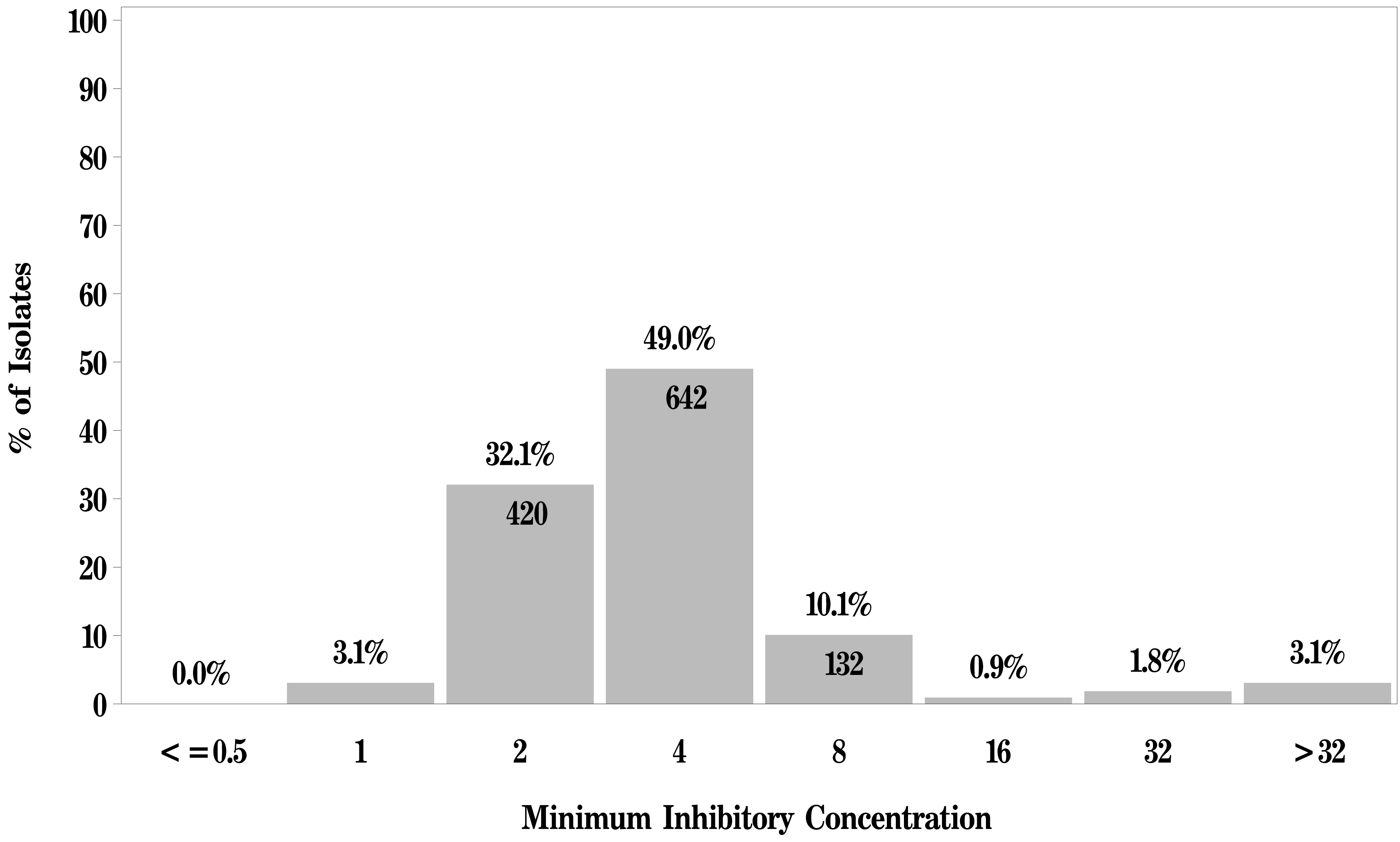
Breakpoints: Susceptible <=8 μg/mL Resistant >=32 μg/mL



NARMS

Figure 17d: Minimum Inhibitory Concentration of Cefoxitin for *Escherichia* (N=1310 Isolates)

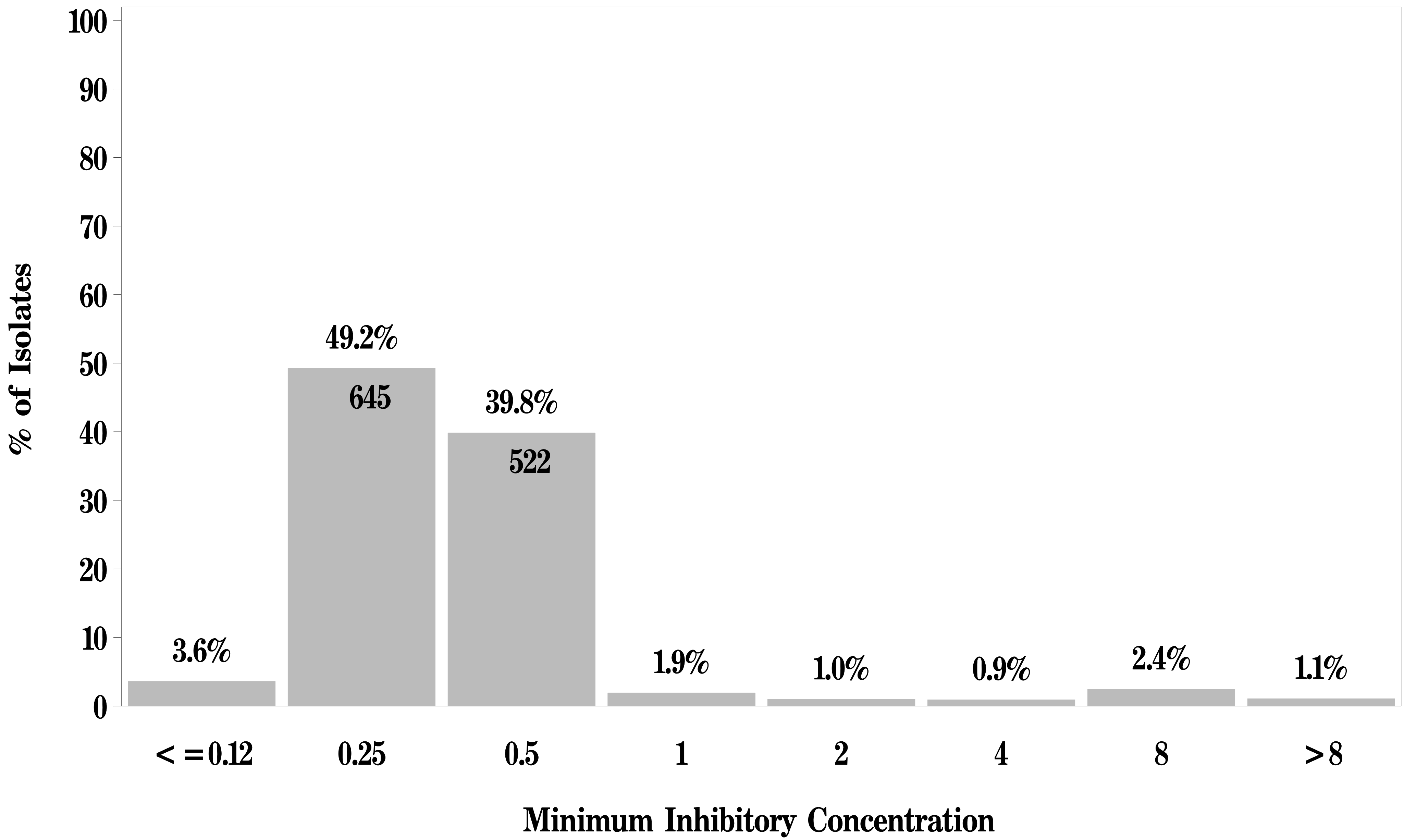
Breakpoints: Susceptible <=8 μg/mL Resistant >=32 μg/mL



NARMS

Figure 17e: Minimum Inhibitory Concentration of Ceftiofur for *Escherichia* (N=1310 Isolates)

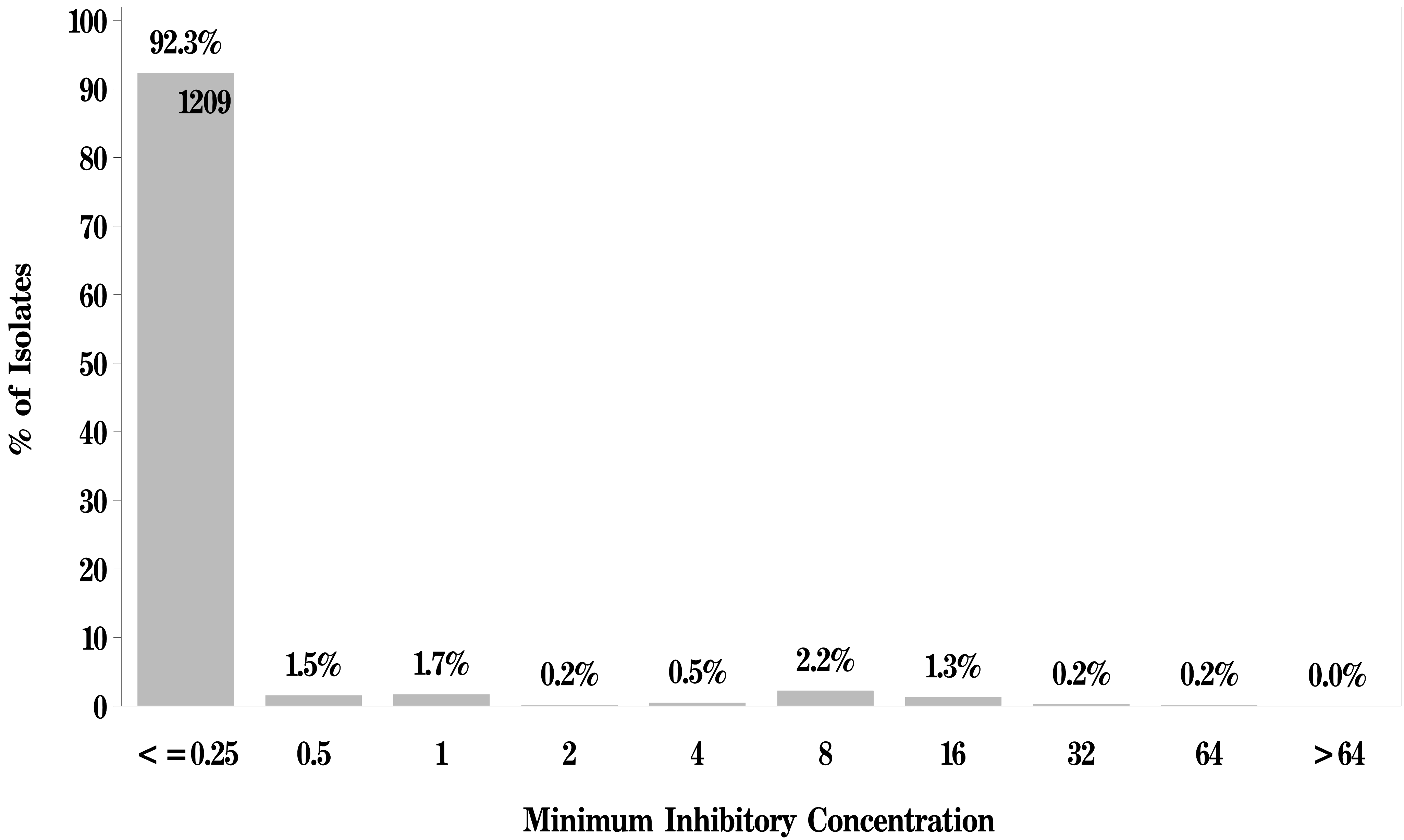
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL



NARMS

Figure 17f: Minimum Inhibitory Concentration of Ceftriaxone for *Escherichia* (N=1310 Isolates)

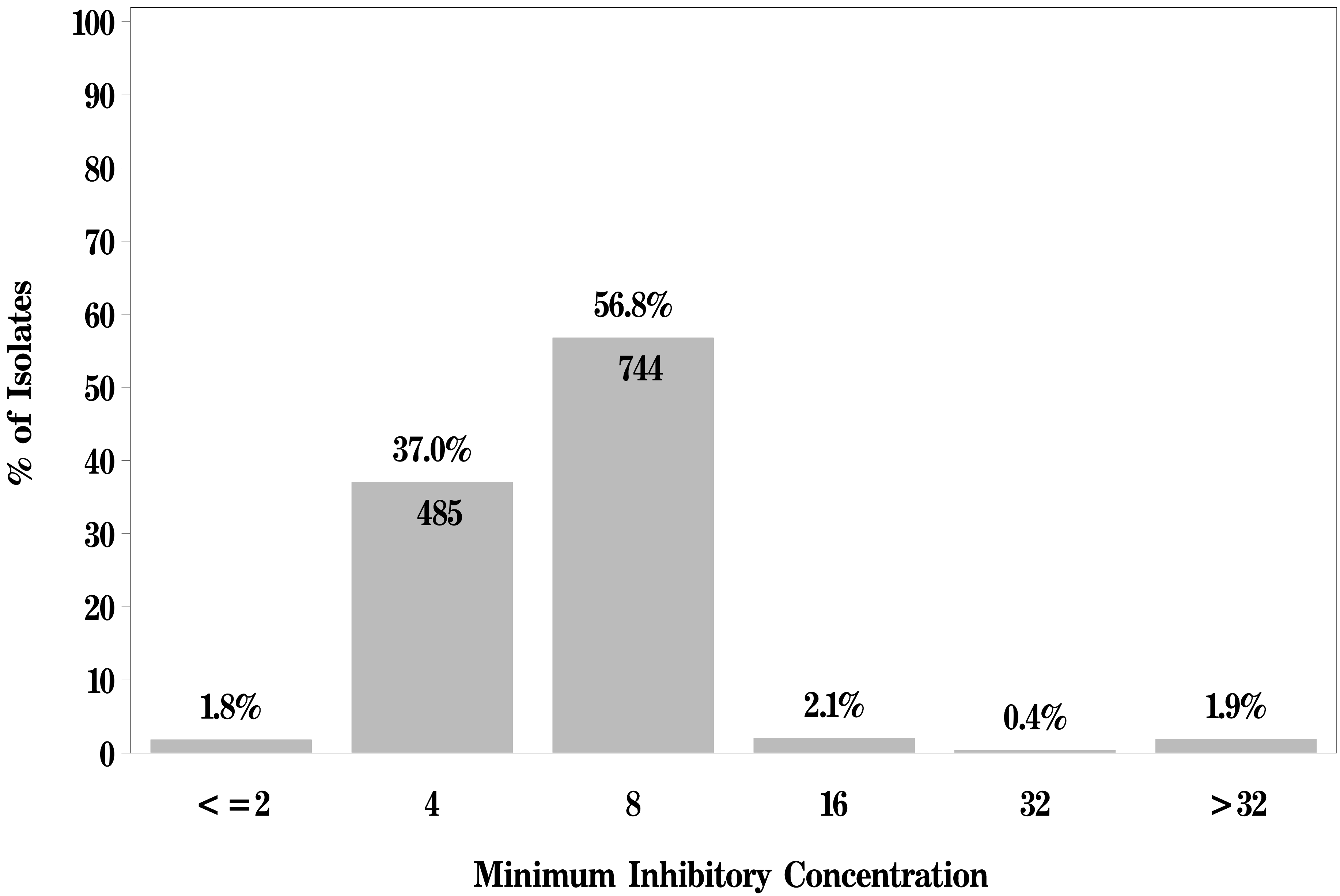
Breakpoints: Susceptible <=8 µg/mL Resistant >=64 µg/mL



NARMS

Figure 17g: Minimum Inhibitory Concentration of Chloramphenicol for *Escherichia* (N=1310 Isolates)

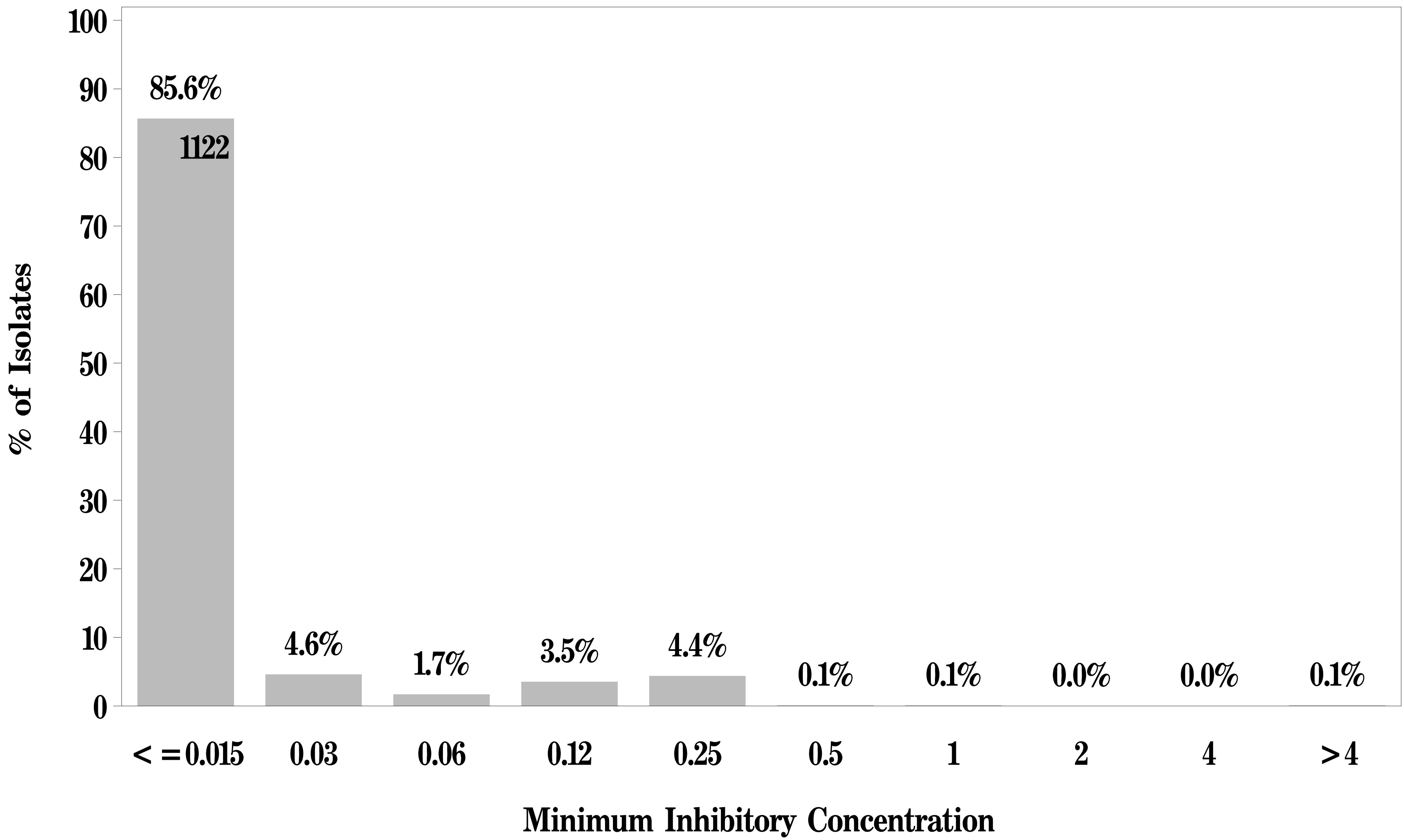
Breakpoints: Susceptible <=8 µg/mL Resistant >=32 µg/mL



NARMS

Figure 17h: Minimum Inhibitory Concentration of Ciprofloxacin for *Escherichia* (N=1310 Isolates)

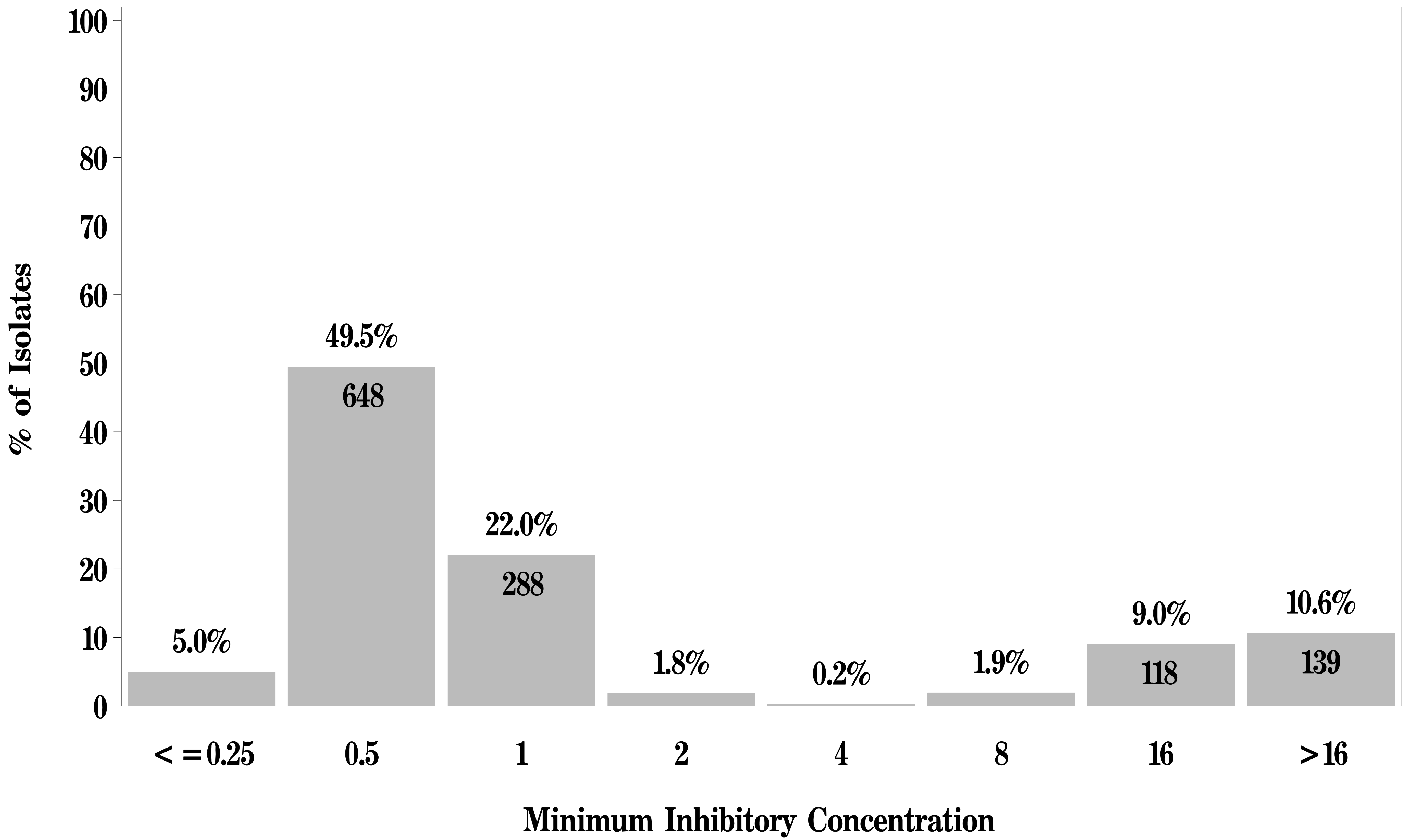
Breakpoints: Susceptible <=1 μg/mL Resistant >=4 μg/mL



NARMS

Figure 17i: Minimum Inhibitory Concentration of Gentamicin for *Escherichia* (N=1310 Isolates)

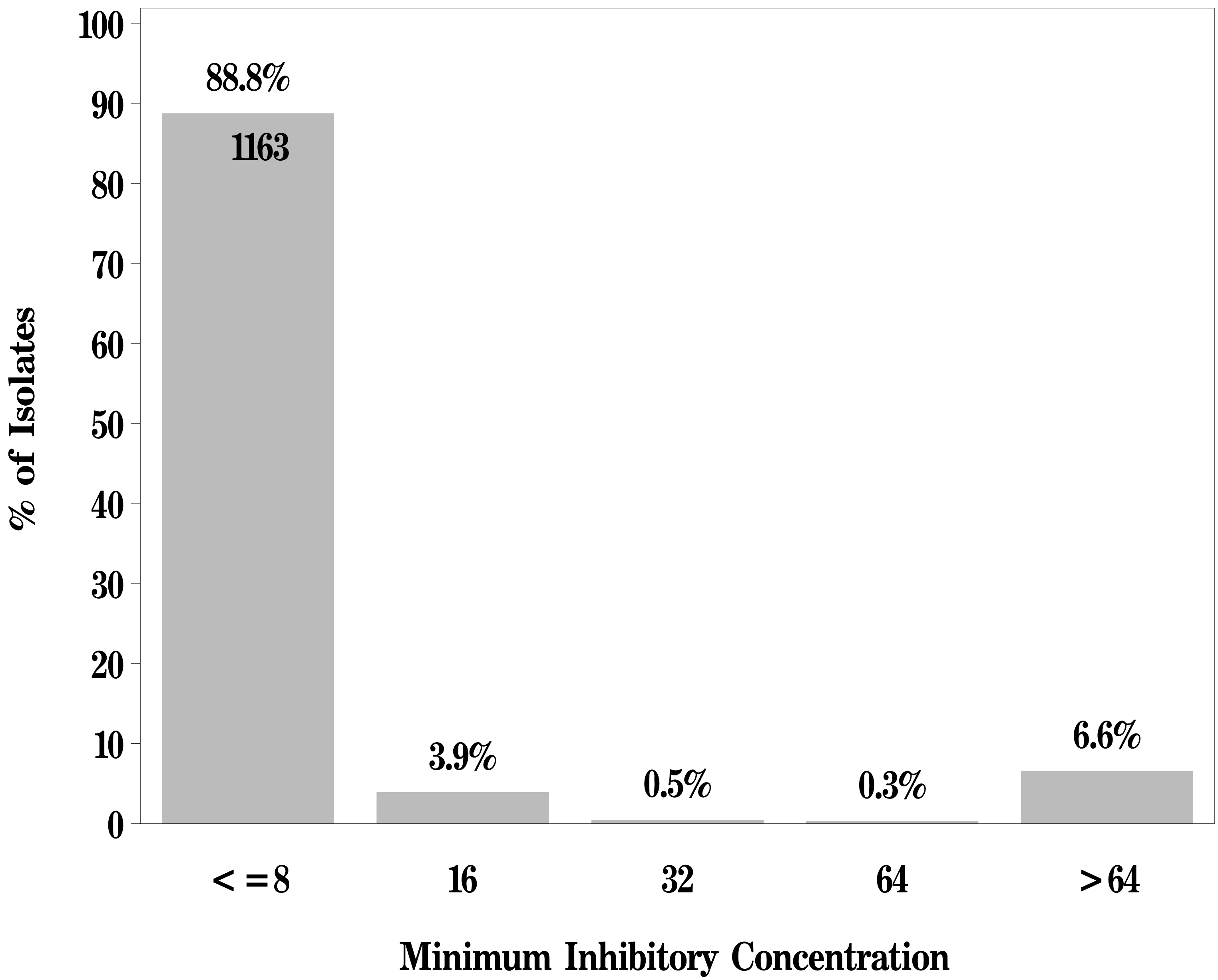
Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL



NARMS

Figure 17j: Minimum Inhibitory Concentration of Kanamycin for *Escherichia* (N=1310 Isolates)

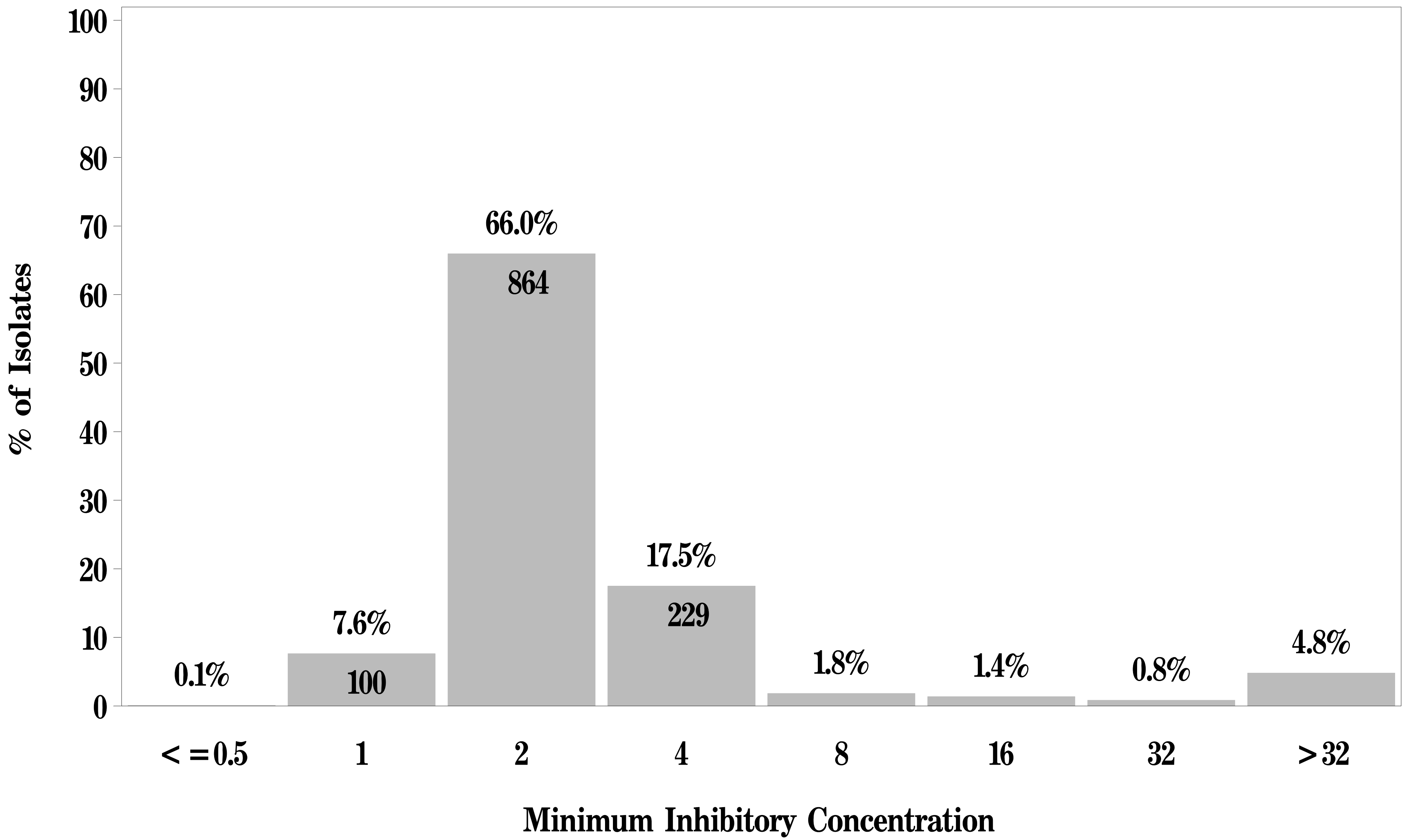
Breakpoints: Susceptible<=16 μg/mL Resistant>=64 μg/mL



NARMS

Figure 17k: Minimum Inhibitory Concentration of Nalidixic acid for *Escherichia* (N=1310 Isolates)

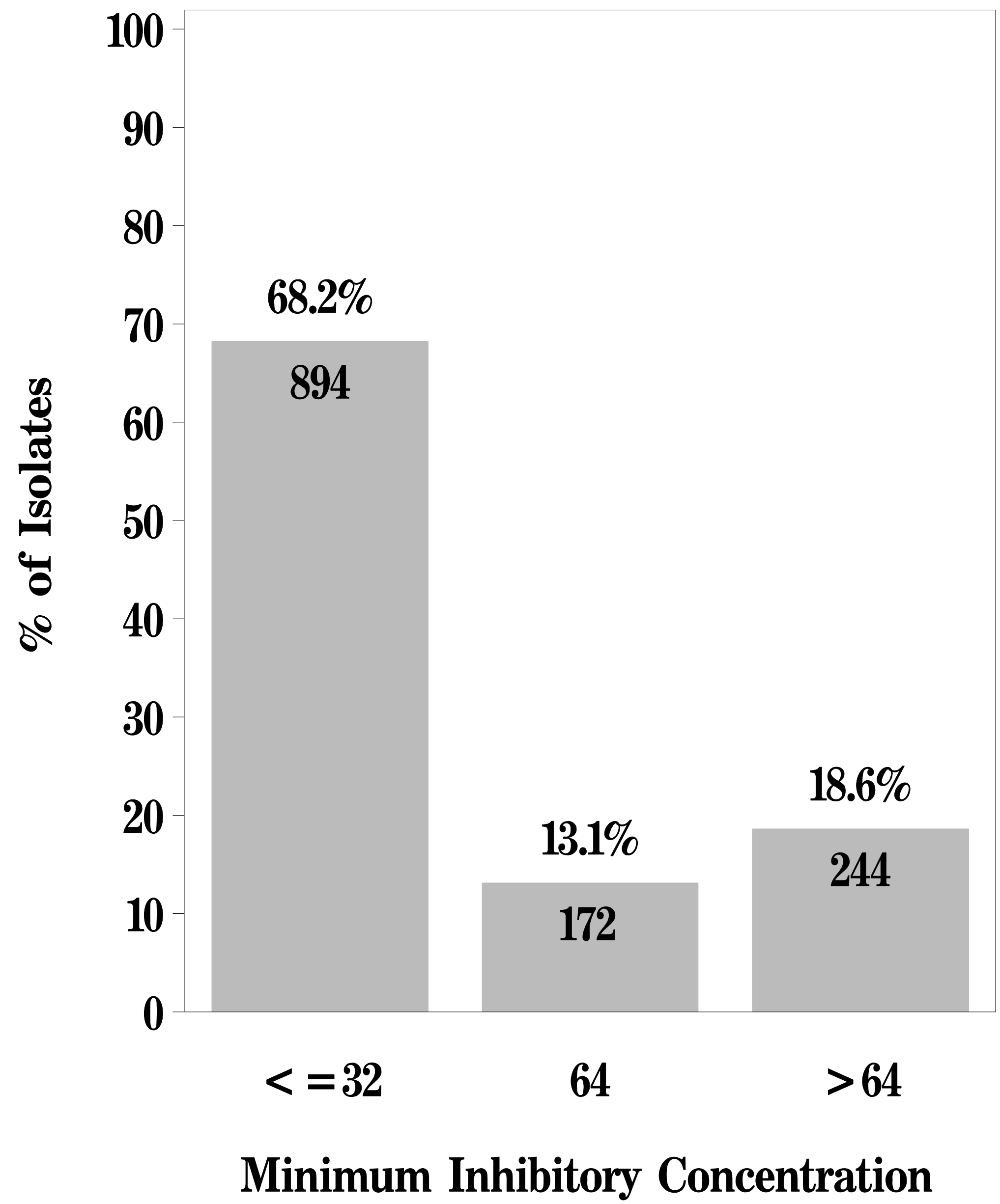
Breakpoints: Susceptible <=16 μg/mL Resistant >=32 μg/mL



NARMS

Figure 17l: Minimum Inhibitory Concentration of Streptomycin for *Escherichia* (N=1310 Isolates)

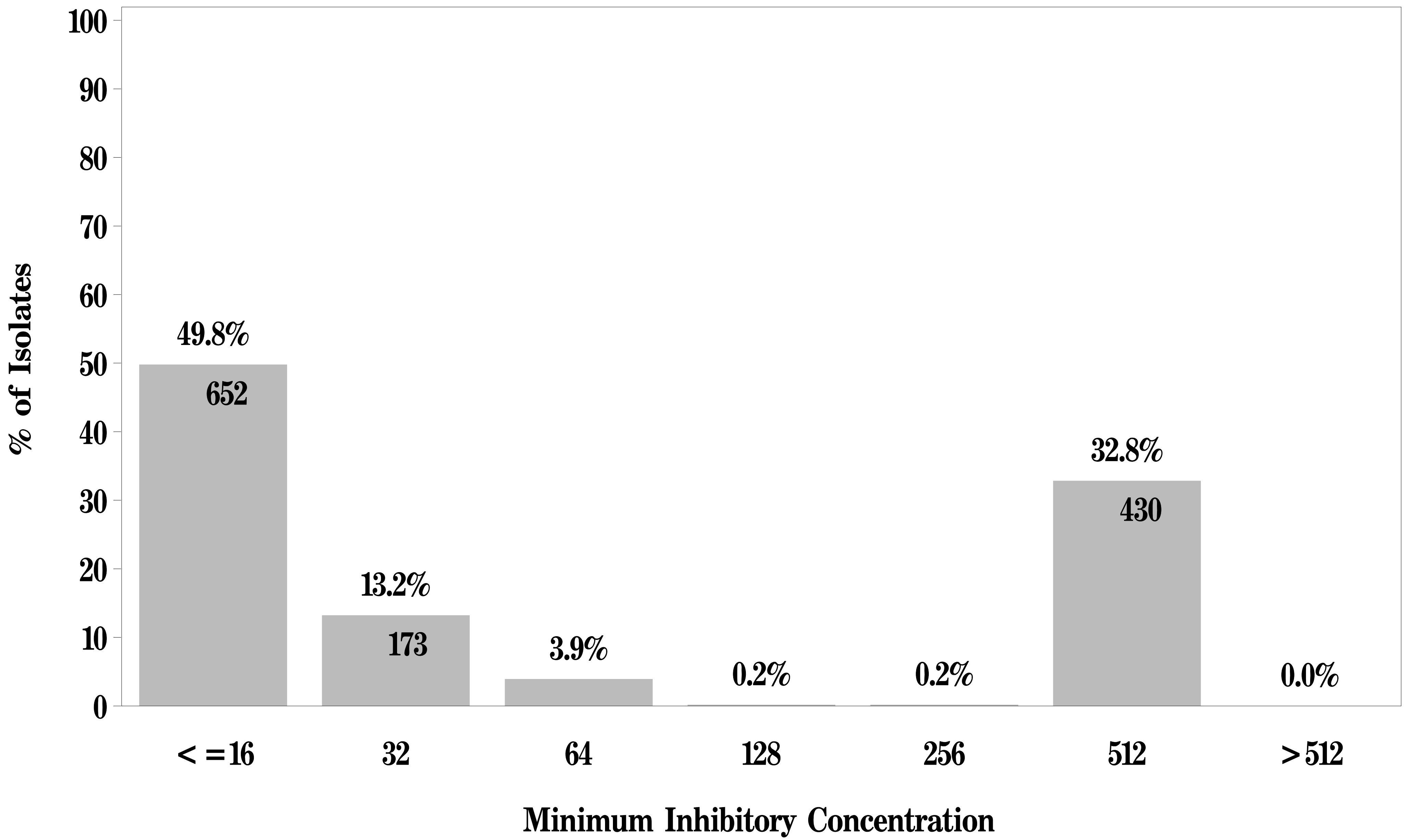
Breakpoints: Susceptible <=32 μg/mL Resistant >=64 μg/mL



NARMS

Figure 17m: Minimum Inhibitory Concentration of Sulfisoxazole for *Escherichia* (N=1310 Isolates)

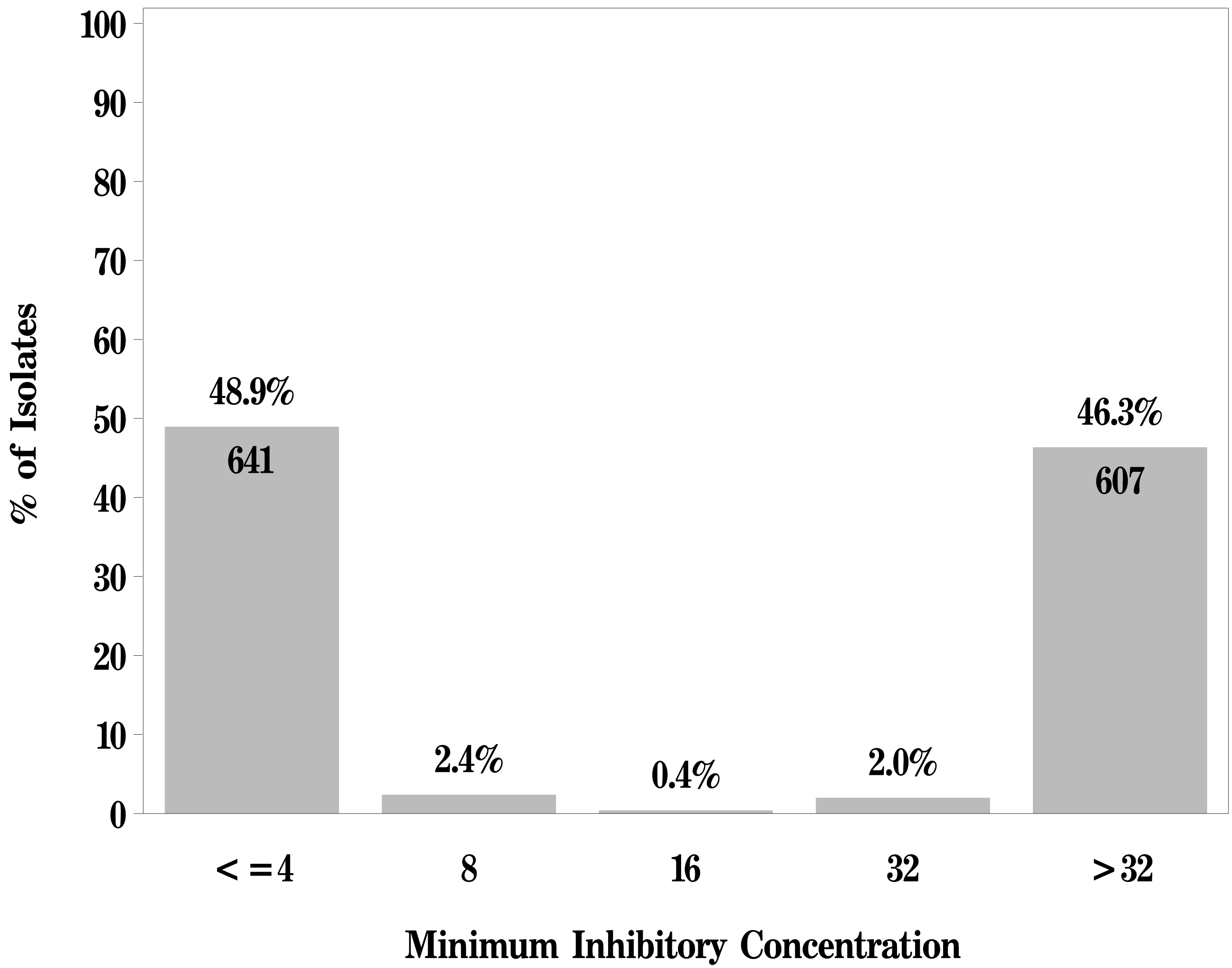
Breakpoints: Susceptible<=256 μg/mL Resistant>=512 μg/mL



NARMS

Figure 17n: Minimum Inhibitory Concentration of Tetracycline for *Escherichia* (N=1310 Isolates)

Breakpoints: Susceptible <=4 μg/mL Resistant >=16 μg/mL



NARMS

Figure 17o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Escherichia* (N=1310 Isolates)

Breakpoints: Susceptible <=2 μg/mL Resistant >=4 μg/mL

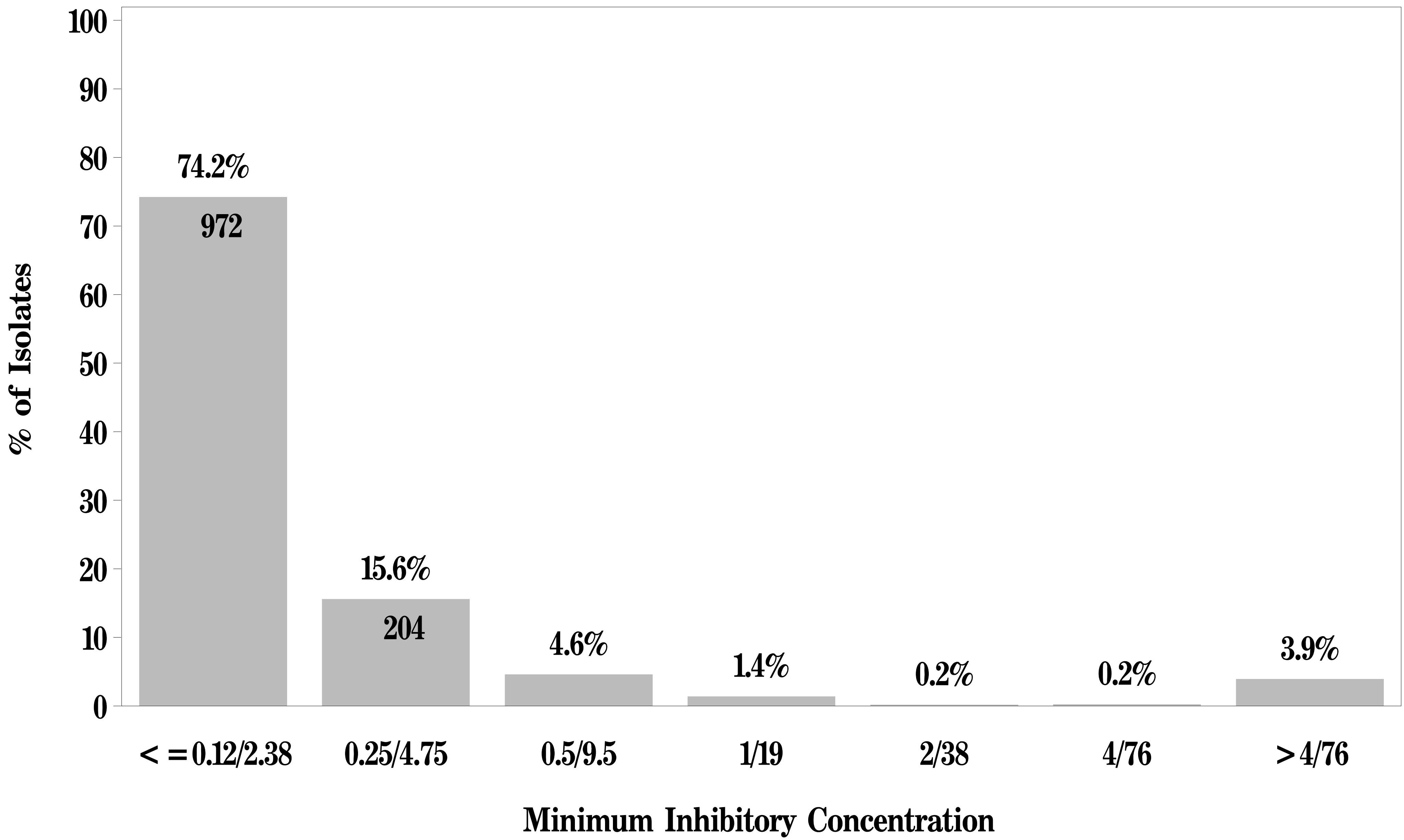


Figure 18a. MIC Distribution among *E. coli* from Chicken Breast

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
					Distribution (%) of MICs (µg/ml)[4]																
Aminoglycosides																					
Amikacin	2002 (n=282)	0.0	**0.0**	(0.0 - 1.3)						0.7	19.5	64.2	11.7	3.9							
	2003 (n=396)	0.0	**0.0**	(0.0 - 0.9)						0.8	20.2	63.4	12.4	3.3							
	2004 (n=400)	0.0	**0.0**	(0.0 - 0.9)							15.0	65.0	17.0	2.5	0.5						
	2005 (n=393)	0.0	**0.0**	(0.0 - 0.9)							14.8	64.6	18.6	1.8	0.3						
Gentamicin	2002 (n=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 (n=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 (n=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 (n=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**					
Kanamycin	2002 (n=282)	0.0	**6.0**	(3.6 - 9.5)										91.5	2.5			**6.0**			
	2003 (n=396)	1.3	**6.8**	(4.5 - 9.8)										84.1	7.8	1.3	**0.5**	**6.3**			
	2004 (n=400)	1.0	**6.8**	(4.5 - 9.7)										81.8	10.5	1.0		**6.8**			
	2005 (n=393)	1.0	**7.1**	(4.8 - 10.1)										84.0	7.9	1.0		**7.1**			
Streptomycin	2002 (n=282)	N/A	**49.3**	(43.3 - 55.3)												50.7	**11.4**	**37.9**			
	2003 (n=396)	N/A	**56.1**	(51.0 - 61.0)												44.0	**15.2**	**40.9**			
	2004 (n=400)	N/A	**56.8**	(51.7 - 61.7)												43.3	**13.0**	**43.8**			
	2005 (n=393)	N/A	**50.9**	(45.8 - 55.9)												49.1	**17.8**	**33.1**			
Aminopenicillins																					
Ampicillin	2002 (n=282)	0.4	**21.6**	(17.0 - 26.9)							6.0	27.7	39.0	5.3	0.4	**0.4**	**21.3**				
	2003 (n=396)	0.3	**25.3**	(21.0 - 29.8)							1.5	24.5	43.9	4.5	0.3	**0.5**	**24.7**				
	2004 (n=400)	0.3	**17.0**	(13.4 - 21.0)							6.8	40.3	34.0	1.8	0.3	**0.3**	**16.8**				
	2005 (n=393)	0.8	**24.7**	(20.5 - 29.3)							5.9	35.4	31.8	1.5	0.8	**0.3**	**24.4**				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=282)	3.2	**12.1**	(8.5 - 16.4)							3.2	21.3	47.9	12.4	3.2	**6.0**	**6.0**				
	2003 (n=396)	1.5	**13.6**	(10.4 - 17.4)							2.3	21.2	45.7	15.7	1.5	**4.3**	**9.3**				
	2004 (n=400)	0.5	**10.0**	(7.2 - 13.4)							1.8	21.8	51.3	14.8	0.5	**7.3**	**2.8**				
	2005 (n=393)	1.8	**12.0**	(8.9 - 15.6)							3.1	16.8	47.3	19.1	1.8	**9.7**	**2.3**				
Cephems																					
Cephalothin	2002 (n=282)	32.3	**21.3**	(16.6 - 26.5)								0.7	11.4	34.4	32.3	**7.8**	**13.48**				
	2003 (n=396)	39.7	**22.0**	(18.0 - 26.4)								0.5	6.1	31.8	39.6	**6.8**	**15.2**				
Ceftiofur	2002 (n=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 (n=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 (n=400)	1.0	**5.8**	(3.7 - 8.5)				4.8	50.5	35.3	2.8		1.0	**4.3**	**1.5**						
	2005 (n=393)	1.5	**8.9**	(6.3 - 12.2)				2.0	38.4	46.3	2.3	0.5	1.5	**6.9**	**2.0**						
Ceftriaxone	2002 (n=282)	2.1	**0.0**	(0.0 - 1.3)					87.6	1.8	2.5	0.4	1.8	3.9	2.1						
	2003 (n=396)	4.0	**0.0**	(0.0 - 0.9)					87.1	1.0	2.5	0.3	1.5	3.5	3.5	0.5					
	2004 (n=400)	3.0	**0.0**	(0.0 - 0.9)					90.0	1.3	2.0	0.3		3.5	2.0	1.0					
	2005 (n=393)	2.8	**0.5**	(0.1 - 1.8)					87.0	0.8	1.8	0.3	1.0	5.9	2.5	0.3	**0.5**				
Cefoxitin	2002 (n=282)	5.0	**11.0**	(7.6 - 15.2)							1.1	16.3	52.5	14.2	5.0	**11.0**					
	2003 (n=396)	3.8	**9.3**	(6.7 - 12.6)								10.6	50.5	25.8	3.8	**9.3**					
	2004 (n=400)	2.3	**8.3**	(5.7 - 11.4)							0.3	15.5	53.0	20.8	2.3	**3.8**	**4.5**				
	2005 (n=393)	1.5	**11.2**	(8.3 - 14.7)							1.0	24.9	49.9	11.5	1.5	**4.3**	**6.9**				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=282)	N/A	**32.3**	(26.8 - 38.1)											66.0	1.42		0.35			**32.3**
	2003 (n=396)	N/A	**38.4**	(33.6 - 43.4)											59.8	1.3	0.5				**38.4**
Sulfisoxazole	2004 (n=400)	N/A	**41.3**	(36.4 - 46.2)											48.5	6.3	4.0			**41.3**	
	2005 (n=393)	N/A	**48.1**	(43.1 - 53.2)											39.4	9.2	2.8	0.3	0.3	**48.1**	
Trimethoprim-Sulfamethoxazole	2002 (n=282)	N/A	**3.5**	(1.7 - 6.4)				82.6	6.4	6.0	0.4	1.1		**3.6**							
	2003 (n=396)	N/A	**7.1**	(4.7 - 10.1)				83.6	5.3	2.3	1.3	0.5		**7.1**							
	2004 (n=400)	N/A	**4.3**	(2.5 - 6.7)				85.5	7.0	2.5	0.5	0.3		**4.3**							
	2005 (n=393)	N/A	**7.4**	(5.0 - 10.4)				66.2	17.3	6.4	2.5	0.3	**0.5**	**6.9**							
Phenicols																					
Chloramphenicol	2002 (n=282)	1.8	**0.7**	(0.1 - 2.5)								3.9	41.5	52.1	1.8		**0.7**				
	2003 (n=396)	3.5	**0.0**	(0.0 - 0.9)								1.5	25.5	69.4	3.5						
	2004 (n=400)	2.5	**1.8**	(0.7 - 3.6)								3.3	34.5	58.0	2.5	**0.3**	**1.5**				
	2005 (n=393)	2.0	**0.5**	(0.1 - 1.8)								2.5	41.2	53.7	2.0		**0.5**				
Quinolones																					
Ciprofloxacin	2002 (n=282)	0.4	**0.0**	(0.0 - 0.3)	90.4	6.4	0.4	0.4	1.4	0.4	0.4	0.4									
	2003 (n=396)	0.0	**0.0**	(0.0 - 0.9)	92.9	3.0		2.3	1.5	0.3											
	2004 (n=400)	0.0	**0.0**	(0.0 - 0.9)	90.3	2.3	0.5	1.8	4.0	1.3											
	2005 (n=393)	0.0	**0.0**	(0.0 - 0.9)	84.0	4.8	2.3	4.1	4.6	0.3											
Nalidixic Acid	2002 (n=282)	N/A	**2.8**	(1.2 - 5.5)							1.1	17.7	72.3	5.7	0.4		**2.8**				
	2003 (n=396)	N/A	**4.0**	(2.3 - 6.5)							4.0	47.5	43.2	1.3		**0.3**	**3.8**				
	2004 (n=400)	N/A	**7.0**	(4.7 - 10.0)							6.5	63.0	23.3	0.3		**0.3**	**6.8**				
	2005 (n=393)	N/A	**6.6**	(4.4 - 9.5)							8.1	66.4	15.8	2.0	1.0	**0.5**	**6.1**				
Tetracyclines																					
Tetracycline	2002 (n=282)	1.1	**46.1**	(40.2 - 52.1)									52.8	1.1	**1.1**	**1.4**	**43.6**				
	2003 (n=396)	1.5	**42.9**	(38.0 - 48.0)									55.6	1.5	**0.8**	**1.0**	**41.2**				
	2004 (n=400)	0.8	**48.0**	(43.0 - 53.0)									51.3	0.8	**0.5**	**3.3**	**44.3**				
	2005 (n=393)	2.0	**46.6**	(41.5 - 51.6)									51.4	2.0		**2.8**	**43.8**				

[1] Percent of isolates with intermediate susceptibility

[2] Percent of isolates that were resistant

[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. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of 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

Figure 18b. MIC Distribution among *E. coli* from Ground Turkey

Antimicrobial	Year / # of Isolates	%I[1]	%R[2]	[95% CI][3]	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512	1024
					Distribution (%) of MICs (µg/ml)[4]																
Aminoglycosides																					
Amikacin	2002 (n=304)	0.0	0.0	(0.0 - 1.2)							25.0	62.2	10.5	2.3							
	2003 (n=333)	0.0	0.0	(0.0 - 1.1)						0.6	24.9	58.6	14.1	1.8							
	2004 (n=376)	0.0	0.0	(0.0 - 1.0)							17.3	66.5	13.8	2.4							
	2005 (n=396)	0.0	0.0	(0.0 - 0.9)						0.3	16.7	68.2	12.1	2.8							
Gentamicin	2002 (n=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 (n=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 (n=376)	2.1	29.3	(24.7 - 34.1)					4.8	42.6	19.1	2.1		2.1	12.5	16.8					
	2005 (n=396)	3.0	27.5	(23.2 - 32.2)					4.0	46.2	17.2	2.0		3.0	12.4	15.2					
Kanamycin	2002 (n=304)	1.0	13.2	(9.6 - 17.5)										82.2	3.6	1.0	0.3	12.8			
	2003 (n=333)	1.5	16.8	(13.0 - 21.3)										74.2	7.5	1.5	0.3	16.5			
	2004 (n=376)	2.1	16.0	(12.4 - 20.1)										75.0	6.9	2.1	0.3	15.7			
	2005 (n=396)	0.5	11.4	(8.4 - 14.9)										84.1	4.0	0.5	0.3	11.1			
Streptomycin	2002 (n=304)	N/A	57.6	(51.8 - 63.2)												42.4	23.0	34.5			
	2003 (n=333)	N/A	54.7	(49.1 - 60.1)												45.3	17.7	36.9			
	2004 (n=376)	N/A	49.2	(44.0 - 54.4)												50.8	18.6	30.6			
	2005 (n=396)	N/A	43.4	(38.5 - 48.5)												56.6	19.2	24.2			
Aminopenicillins																					
Ampicillin	2002 (n=304)	0.7	31.3	(36.1 - 36.8)							0.7	27.6	36.8	3.0	0.7		31.3				
	2003 (n=333)	0.0	35.7	(30.6 - 41.1)							3.0	19.2	40.5	1.5		0.3	35.4				
	2004 (n=376)	0.3	33.2	(28.5 - 38.3)							6.4	33.2	26.9		0.3	0.8	32.4				
	2005 (n=396)	0.0	38.1	(33.3 - 43.1)							5.6	36.1	19.9	0.3			38.1				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=304)	4.3	5.6	(3.3 - 8.8)							1.6	18.1	46.1	24.3	4.3	4.6	1.0				
	2003 (n=333)	6.0	3.0	(1.4 - 5.5)							3.0	15.3	45.6	27.0	6.0	1.5	1.5				
	2004 (n=376)	3.5	5.3	(3.3 - 8.1)							1.3	19.9	41.8	28.2	3.5	4.5	0.8				
	2005 (n=396)	5.1	3.8	(2.1 - 6.2)							4.8	12.4	42.7	31.3	5.1	2.8	1.0				
Cephems																					
Cephalothin	2002 (n=304)	41.8	14.8	(11.0 - 19.3)									6.3	37.2	41.8	8.9	5.9				
	2003 (n=333)	46.6	18.9	(14.9 - 23.5)								0.3	6.0	28.2	46.5	14.7	4.2				
Ceftiofur	2002 (n=304)	0.0	1.0	(0.2 - 2.9)				5.3	57.6	33.2	2.6	0.3		1.0							
	2003 (n=333)	0.0	0.3	(0.0 - 1.7)				4.2	55.3	38.7	1.2	0.3		0.3							
	2004 (n=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 (n=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						
Ceftriaxone	2002 (n=304)	0.0	0.0	(0.0 - 1.2)					95.7	2.3	0.7		0.7	0.7							
	2003 (n=333)	0.3	0.0	(0.0 - 1.1)					97.9	0.3	1.2	0.3			0.3						
	2004 (n=376)	0.5	0.0	(0.0 - 1.0)					95.5	1.3	1.9			0.8	0.3	0.3					
	2005 (n=396)	1.3	0.0	(0.0 - 0.9)					93.7	1.8	2.0	0.3		1.0	1.0	0.3					
Cefoxitin	2002 (n=304)	2.3	3.3	(1.6 - 6.0)								17.1	57.6	19.7	2.3	3.3					
	2003 (n=333)	3.3	1.2	(0.3 - 3.0)							0.3	12.6	60.4	22.2	3.3	1.2					
	2004 (n=376)	0.8	4.5	(2.7 - 7.1)							0.8	22.1	55.9	16.0	0.8	2.7	1.9				
	2005 (n=396)	1.0	3.3	(1.8 - 5.5)							2.0	35.9	47.2	10.6	1.0	1.3	2.0				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=304)	N/A	48.0	(42.3 - 53.8)											49.3	1.6	1.0				48.0
	2003 (n=333)	N/A	51.7	(46.1 - 57.1)											45.9	2.1			0.3		51.7
Sulfisoxazole	2004 (n=376)	N/A	48.4	(43.2 - 53.6)											44.4	3.2	4.0			48.4	
	2005 (n=396)	N/A	48.0	(43.0 - 53.0)											33.1	14.4	4.5			48.0	
Trimethoprim-Sulfamethoxazole	2002 (n=304)	N/A	3.9	(2.1 - 6.8)				77.3	13.5	4.9	0.3			4.0							
	2003 (n=333)	N/A	6.9	(4.4 - 10.2)				81.7	7.5	3.0	0.6	0.3		6.9							
	2004 (n=376)	N/A	3.7	(2.1 - 6.2)				83.8	9.3	2.7	0.5			3.7							
	2005 (n=396)	N/A	5.1	(3.1 - 7.7)				69.4	18.2	5.8	1.3	0.3	0.3	4.8							
Phenicols																					
Chloramphenicol	2002 (n=304)	1.3	0.3	(0.0 - 1.8)								3.0	42.1	53.3	1.3		0.3				
	2003 (n=333)	2.4	3.6	(1.9 - 6.2)								1.2	24.0	68.8	2.4	0.6	3.0				
	2004 (n=376)	0.8	0.8	(0.2 - 2.3)								1.3	36.7	60.4	0.8		0.8				
	2005 (n=396)	2.5	4.0	(2.3 - 6.5)								0.5	34.1	58.8	2.5		4.0				
Quinolones																					
Ciprofloxacin	2002 (n=304)	0.0	0.0	(0.0 - 1.2)	90.1	5.6		1.0	2.3	0.3	0.7										
	2003 (n=333)	0.0	0.3	(0.0 - 1.7)	83.5	3.9	0.6	4.2	6.3	1.2				0.3							
	2004 (n=376)	0.0	0.8	(0.2 - 2.3)	84.3	3.5	0.8	2.9	7.4	0.3				0.8							
	2005 (n=396)	0.0	0.0	(0.0 - 0.9)	81.3	4.8	1.3	4.0	8.6												
Nalidixic Acid	2002 (n=304)	N/A	4.3	(2.3 - 7.2)							0.7	16.1	72.7	6.3			4.3				
	2003 (n=333)	N/A	11.7	(8.5 - 15.7)						0.3	3.0	41.7	41.4	1.5	0.3		11.7				
	2004 (n=376)	N/A	10.6	(7.7 - 14.2)							3.7	62.0	21.5	1.6	0.5	0.5	10.1				
	2005 (n=396)	N/A	10.4	(7.5 - 13.8)							7.1	60.9	19.2	1.8	0.8	0.8	9.6				
Tetracyclines																					
Tetracycline	2002 (n=304)	0.3	77.0	(71.8 - 81.6)									22.7	0.3	0.3	1.6	75.0				
	2003 (n=333)	0.9	77.8	(72.9 - 82.1)									21.3	0.9	0.3	0.9	76.6				
	2004 (n=376)	0.5	74.2	(69.5 - 78.6)									25.3	0.5		6.9	67.3				
	2005 (n=396)	0.3	78.0	(73.6 - 82.0)									21.7	0.3		2.0	76.0				

[1] Percent of isolates with intermediate susceptibility

[2] Percent of isolates that were resistant

[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. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of 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

Figure 18c. MIC Distribution among *E. coli* from Ground Beef

Antimicrobial	Year # of Isolates	%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 (n=295)	0.0	0.0	(0.0 - 1.2)						0.7	27.1	61.0	9.8	1.4							
	2003 (n=311)	0.0	0.0	(0.0 - 1.2)							18.6	68.8	11.6	1.0							
	2004 (n=338)	0.0	0.0	(0.0 - 1.1)							15.7	69.8	12.4	1.8	0.3						
	2005 (n=316)	0.0	0.0	(0.0 - 1.2)						0.3	11.7	68.4	18.0	1.6							
Gentamicin	2002 (n=295)	0.0	0.3	(0.0 - 1.9)					6.8	69.8	19.3	3.1	0.7		0.3						
	2003 (n=311)	0.6	1.0	(0.2 - 2.8)					4.2	62.7	28.0	3.5		0.6	0.6	0.3					
	2004 (n=338)	0.0	0.6	(0.1 - 2.1)					9.2	67.8	20.7	1.8				0.6					
	2005 (n=316)	0.0	0.0	(0.0 - 1.2)					6.3	65.2	26.3	2.2									
Kanamycin	2002 (n=295)	0.0	2.4	(1.0 - 4.8)										96.6	1.0		0.3	2.0			
	2003 (n=311)	0.0	2.9	(1.3 - 5.4)										93.2	3.9			2.9			
	2004 (n=338)	0.0	2.4	(1.0 - 4.6)										95.6	2.1			2.4			
	2005 (n=316)	0.0	0.6	(0.1 - 2.3)										98.1	1.3			0.6			
Streptomycin	2002 (n=295)	N/A	9.5	(6.4 - 13.4)												90.5	5.4	4.1			
	2003 (n=311)	N/A	9.0	(6.1 - 12.7)												91.0	3.5	5.5			
	2004 (n=338)	N/A	11.8	(8.6 - 15.8)												88.2	4.7	7.1			
	2005 (n=316)	N/A	5.4	(3.2 - 8.5)												94.6	3.5	1.9			
Aminopenicillins																					
Ampicillin	2002 (n=295)	0.3	6.1	(3.7 - 9.5)							4.8	32.2	51.9	4.8	0.3	2.0	4.1				
	2003 (n=311)	0.3	5.1	(3.0 - 8.2)							8.4	28.3	52.4	5.5	0.3		5.1				
	2004 (n=338)	0.9	5.3	(3.2 - 8.3)							8.9	46.2	37.9	0.9	0.9	0.3	5.0				
	2005 (n=316)	1.3	3.5	(1.8 - 6.1)							14.9	49.7	30.1	0.6	1.3		3.5				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=295)	0.3	2.0	(0.7 - 4.4)							3.7	22.0	61.7	10.2	0.3	1.4	0.7				
	2003 (n=311)	0.6	2.3	(0.9 - 4.6)							7.4	19.6	62.4	7.7	0.6	1.6	0.6				
	2004 (n=338)	0.3	3.8	(2.1 - 6.5)							4.4	23.4	60.9	7.1	0.3	3.6	0.3				
	2005 (n=316)	0.0	1.3	(0.3 - 3.2)							9.8	20.3	60.8	7.9		0.6	0.6				
Cephems																					
Cephalothin	2002 (n=295)	36.6	5.8	(3.4 - 9.1)								1.0	11.9	44.8	36.6	3.7	2.0				
	2003 (n=311)	36.3	8.0	(5.3 - 11.6)								2.6	9.0	44.1	36.3	4.5	3.5				
Ceftiofur	2002 (n=295)	0.0	0.0	(0.0 - 1.2)				11.9	60.7	26.4	0.7	0.3									
	2003 (n=311)	0.0	0.3	(0.0 - 1.8)				11.3	55.3	31.5	1.6			0.3							
	2004 (n=338)	0.6	0.9	(0.2 - 2.6)				5.0	49.4	41.7	2.1	0.3	0.6		0.9						
	2005 (n=316)	1.0	0.9	(0.2 - 2.7)				8.5	54.4	32.9	1.3	0.9	0.9	0.6	0.3						
Ceftriaxone	2002 (n=295)	0.0	0.0	(0.0 - 1.2)					99.3	0.3		0.3									
	2003 (n=311)	0.0	0.0	(0.0 - 1.2)					98.4	0.6	0.3	0.3		0.3							
	2004 (n=338)	1.2	0.0	(0.0 - 1.1)					95.9	1.8	0.6	0.3		0.3	0.6	0.6					
	2005 (n=316)	1.0	0.0	(0.0 - 1.2)					94.6	1.6	1.6		0.6	0.6	0.6	0.3					
Cefoxitin	2002 (n=295)	1.0	1.4	(0.4 - 3.4)							1.7	23.7	57.6	14.6	1.0	1.4					
	2003 (n=311)	2.6	0.3	(0.0 - 1.8)							1.6	21.2	56.3	18.0	2.6	0.3					
	2004 (n=338)	1.8	1.2	(0.3 - 3.0)							4.1	30.2	53.8	8.9	1.8	0.3	0.9				
	2005 (n=316)	0.3	0.9	(0.2 - 2.7)							7.9	37.3	45.9	7.6	0.3	0.3	0.6				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=295)	N/A	9.8	(6.7 - 13.8)											88.1	1.69			0.34		9.8
	2003 (n=311)	N/A	10.3	(7.1 - 14.2)											89.1	0.6				0.3	10.0
Sulfisoxazole	2004 (n=338)	N/A	13.0	(9.6 - 17.1)											84.6		2.4			13.0	
	2005 (n=316)	N/A	7.0	(4.4 - 10.4)											75.3	13.6	4.1			7.0	
Trimethoprim-Sulfamethoxazole	2002 (n=295)	N/A	0.7	(0.1 - 2.4)				93.6	3.4	2.4				0.7							
	2003 (n=311)	N/A	0.3	(0.0 - 1.8)				97.4	1.3	1.0				0.3							
	2004 (n=338)	N/A	0.6	(0.1 - 2.1)				97.0	2.1		0.3			0.6							
	2005 (n=316)	N/A	0.6	(0.1 - 2.3)				89.6	8.5	0.9	0.3			0.6							
Phenicols																					
Chloramphenicol	2002 (n=295)	0.7	1.0	(0.2 - 2.9)								0.3	30.2	67.8	0.7		1.0				
	2003 (n=311)	5.1	2.3	(0.9 - 4.6)								1.0	15.4	76.2	5.1	1.3	1.0				
	2004 (n=338)	0.9	3.6	(1.8 - 6.1)								0.3	26.9	68.3	0.9	0.3	3.3				
	2005 (n=316)	1.3	1.6	(0.5 - 3.7)								1.9	36.7	58.5	1.3	0.3	1.3				
Quinolones																					
Ciprofloxacin	2002 (n=295)	0.0	0.0	(0.0 - 1.2)	95.3	4.8															
	2003 (n=311)	0.0	0.0	(0.0 - 1.2)	95.5	3.5		0.6	0.3												
	2004 (n=338)	0.0	0.0	(0.0 - 1.1)	94.4	3.8		0.6	0.9	0.3											
	2005 (n=316)	0.0	0.0	(0.0 - 1.2)	90.2	3.8	1.9	2.5	1.3		0.3										
Nalidixic Acid	2002 (n=295)	N/A	0.0	(0.0 - 1.2)							1.0	15.6	80.7	2.7							
	2003 (n=311)	N/A	1.0	(0.2 - 2.8)							1.6	44.1	51.1	2.3			1.0				
	2004 (n=338)	N/A	1.5	(0.5 - 3.4)							3.0	67.5	26.9	1.2		0.9	0.6				
	2005 (n=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				
Tetracyclines																					
Tetracycline	2002 (n=295)	4.8	30.8	(25.6 - 36.5)									64.4	4.8	4.4	2.0	24.4				
	2003 (n=311)	3.5	25.1	(20.4 - 30.3)									71.4	3.5	2.6	1.0	21.5				
	2004 (n=338)	6.5	22.8	(18.4 - 27.6)									70.7	6.5	2.7	1.2	18.9				
	2005 (n=316)	6.3	16.5	(12.5 - 21.0)									77.2	6.3	1.6	0.6	14.2				

[1] Percent of isolates with intermediate susceptibility

[2] Percent of isolates that were resistant

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

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of 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

Figure 18d. MIC Distribution among *E. coli* from Pork Chop

Antimicrobial	Year # of Isolates	%I[1]	%R[2]	[95% CI][3]	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 (n=184)	0.0	0.0	(0.0 - 2.0)						0.5	17.4	64.7	14.7	2.7							
	2003 (n=218)	0.0	0.0	(0.0 - 1.7)						0.5	16.5	61.5	15.6	6.0							
	2004 (n=232)	0.0	0.0	(0.0 - 1.6)						0.4	15.5	56.0	26.3	1.3	0.4						
	2005 (n=205)	0.5	0.0	(0.0 - 1.8)						1.5	11.2	62.0	19.5	5.4		0.5					
Gentamicin	2002 (n=184)	0.0	1.1	(0.1 - 3.9)					4.9	66.3	21.2	6.0	0.5		1.1						
	2003 (n=218)	0.0	1.4	(0.3 - 4.0)					3.7	53.2	36.2	5.0	0.5		0.5	0.9					
	2004 (n=232)	0.4	1.3	(0.3 - 3.7)					10.3	57.8	26.7	3.4		0.4		1.3					
	2005 (n=205)	1.0	0.0	(0.0 - 1.8)					6.8	56.1	34.1	2.0		1.0							
Kanamycin	2002 (n=184)	0.5	5.4	(2.6 - 9.8)										92.9	1.1	0.5		5.4			
	2003 (n=218)	0.0	8.7	(5.3 - 13.3)										89.9	1.4			8.7			
	2004 (n=232)	0.0	8.2	(5.0 - 12.5)										89.2	2.6			8.2			
	2005 (n=205)	0.0	7.3	(4.2 - 11.8)										92.7			1.5	5.9			
Streptomycin	2002 (n=184)	N/A	22.3	(16.5 - 29.0)												77.7	10.9	11.4			
	2003 (n=218)	N/A	19.7	(14.7 - 25.6)												80.3	6.9	12.8			
	2004 (n=232)	N/A	21.1	(16.1 - 26.9)												78.9	8.6	12.5			
	2005 (n=205)	N/A	13.2	(8.9 - 18.6)												86.8	7.3	5.9			
Aminopenicillins																					
Ampicillin	2002 (n=184)	1.6	13.6	(9.0 - 19.4)							1.1	30.4	47.8	5.4	1.6		13.6				
	2003 (n=218)	1.4	13.3	(9.1 - 18.5)							1.8	25.7	52.8	5.0	1.4		13.3				
	2004 (n=232)	0.9	15.1	(10.7 - 20.4)							12.9	44.4	25.0	1.7	0.9	0.9	14.2				
	2005 (n=205)	2.4	16.1	(11.3 - 21.9)							9.3	40.5	28.3	3.4	2.4	2.0	14.1				
β-Lactam/β-Lactamase Inhibitor Combinations																					
Amoxicillin-Clavulanic Acid	2002 (n=184)	0.5	5.4	(2.6 - 9.8)							1.6	23.9	56.0	12.5	0.5	4.4	1.1				
	2003 (n=218)	0.5	5.0	(2.5 - 8.8)							3.2	17.9	54.1	19.3	0.5	2.8	2.3				
	2004 (n=232)	0.4	5.6	(3.0 - 9.4)							4.3	27.6	46.6	15.5	0.4	4.7	0.9				
	2005 (n=205)	0.5	2.9	(1.1 - 6.3)							2.9	21.0	52.2	20.5	0.5	2.0	1.0				
Cephems																					
Cephalothin	2002 (n=184)	25.0	10.3	(6.3 - 15.7)								0.5	8.2	56.0	25.0	6.0	4.4				
	2003 (n=218)	39.0	11.9	(7.9 - 17.0)								0.5	6.0	42.7	39.0	6.9	5				
Ceftiofur	2002 (n=184)	0.0	0.5	(0.0 - 3.0)				7.1	64.1	27.2	0.5	0.5		0.5							
	2003 (n=218)	0.0	0.9	(0.1 - 3.3)				5.5	53.7	38.1	1.8			0.9							
	2004 (n=232)	0.0	0.4	(0.0 - 2.4)				7.3	51.7	39.7	0.9			0.4							
	2005 (n=205)	1.0	0.5	(0.0 - 2.7)				3.4	58.0	34.6	2.0	0.5	1.0		0.5						
Ceftriaxone	2002 (n=184)	0.0	0.0	(0.0 - 2.0)					97.8	1.1	0.5			0.5							
	2003 (n=218)	0.5	0.0	(0.0 - 1.7)					97.7	0.9	0.5			0.5	0.5						
	2004 (n=232)	0.4	0.0	(0.0 - 1.6)					97.0	1.7	0.9				0.4						
	2005 (n=205)	0.5	0.0	(0.0 - 1.8)					96.1	2.4	1.0				0.5						
Cefoxitin	2002 (n=184)	1.6	3.3	(1.2 - 7.0)								20.1	58.2	16.9	1.6	3.3					
	2003 (n=218)	3.2	2.3	(0.7 - 5.3)								12.4	54.1	28.0	3.2	2.3					
	2004 (n=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 (n=205)	0.5	2.0	(0.5 - 4.9)							1.5	30.2	55.6	10.2	0.5	0.5	1.5				
Folate Pathway Inhibitors																					
Sulfamethoxazole	2002 (n=184)	N/A	12.5	(8.1 - 18.2)											83.2	3.26	0.5	0.54			12.5
	2003 (n=218)	N/A	15.1	(10.7 - 20.6)											83.5	0.9	0.5				15.1
Sulfisoxazole	2004 (n=232)	N/A	19.4	(14.5 - 25.1)											69.8	3.0	6.9	0.4	0.4	19.4	
	2005 (n=205)	N/A	14.1	(9.7 - 19.7)											62.4	18.0	4.4	0.5	0.5	14.1	
Trimethoprim-Sulfamethoxazole	2002 (n=184)	N/A	1.1	(0.1 - 3.9)				88.6	4.4	5.4	0.5		0.5	0.5							
	2003 (n=218)	N/A	2.8	(1.0 - 5.9)				92.2	3.2	1.4	0.5			2.8							
	2004 (n=232)	N/A	3.9	(1.8 - 7.2)				93.1	2.2	0.9				3.9							
	2005 (n=205)	N/A	1.5	(0.3 - 4.2)				75.1	18.0	4.4	1.0			1.5							
Phenicols																					
Chloramphenicol	2002 (n=184)	2.2	1.6	(0.3 - 4.7)								0.5	31.5	64.1	2.2	1.6					
	2003 (n=218)	6.9	4.1	(1.9 - 7.7)								0.9	15.1	72.9	6.9	2.3	1.8				
	2004 (n=232)	0.9	4.3	(2.1 - 7.8)								0.9	34.1	59.9	0.9	1.3	3.0				
	2005 (n=205)	2.4	3.4	(1.4 - 6.9)								2.9	35.1	56.1	2.4	2.0	1.5				
Quinolones																					
Ciprofloxacin	2002 (n=184)	0.0	0.0	(0.0 - 2.0)	96.2	2.7	1.1														
	2003 (n=218)	0.0	0.0	(0.0 - 1.7)	96.3	3.2			0.5												
	2004 (n=232)	0.0	0.0	(0.0 - 1.6)	97.8	0.9	0.4	0.4	0.4												
	2005 (n=205)	0.0	0.5	(0.0 - 2.7)	90.2	4.9	1.0	2.9	0.5					0.5							
Nalidixic Acid	2002 (n=184)	N/A	0.5	(0.0 - 3.0)							2.2	16.9	74.5	5.4	0.5	0.5					
	2003 (n=218)	N/A	0.5	(0.0 - 2.5)							2.8	44.5	50.0	2.3			0.5				
	2004 (n=232)	N/A	0.0	(0.0 - 1.6)							9.9	68.5	19.4	1.3	0.9						
	2005 (n=205)	N/A	1.5	(0.3 - 4.2)							9.8	67.3	18.0	2.4	1.0	1.5					
Tetracyclines																					
Tetracycline	2002 (n=184)	0.5	52.7	(45.2 - 60.1)									46.7	0.5	2.2	1.6	48.9				
	2003 (n=218)	0.9	46.3	(39.6 - 53.2)									52.8	0.9	1.8	0.9	43.6				
	2004 (n=232)	2.2	56.0	(49.4 - 62.5)									41.8	2.2		6.0	50.0				
	2005 (n=205)	1.0	45.9	(38.9 - 52.9)									53.2	1.0		2.4	43.4				

Distribution (%) of MICs (µg/ml)[4]

[1] Percent of isolates with intermediate susceptibility

[2] Percent of isolates that were resistant

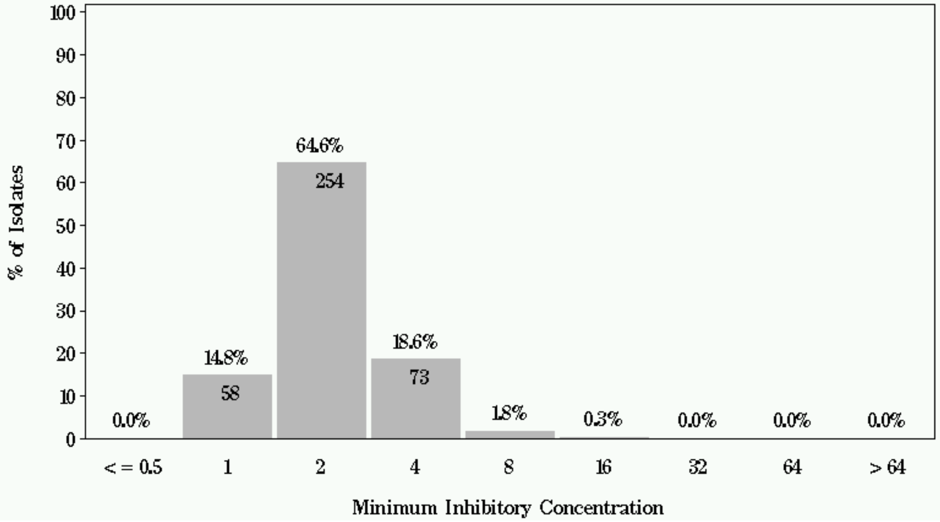
[3] 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

[4] The unshaded areas indicate the dilution range of the Sensititre plates used to test isolates. Vertical black bars indicate the breakpoints for susceptibility, while vertical red 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 percentages of 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

NARMS

Figure 19a: Minimum Inhibitory Concentration of Amikacin for *Escherichia* in Chicken Breast (N=393 Isolates)

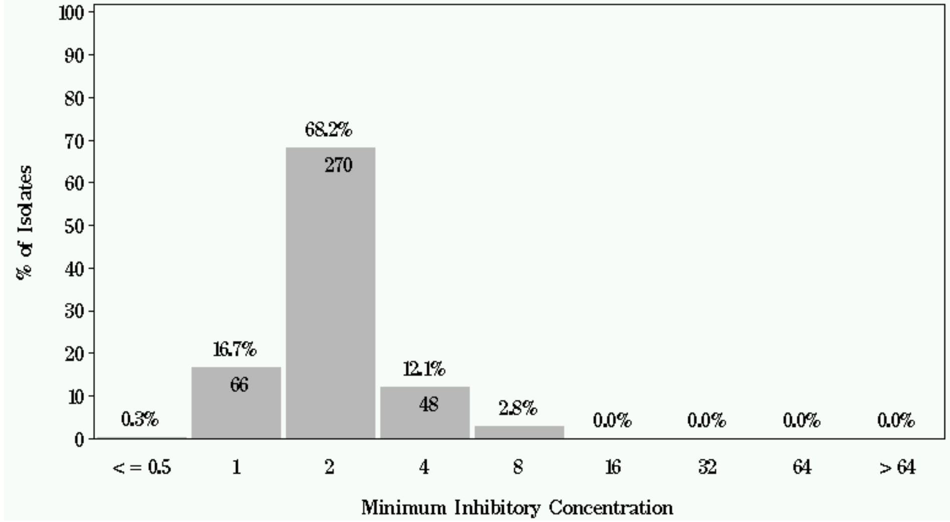
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$



NARMS

Figure 19a: Minimum Inhibitory Concentration of Amikacin for *Escherichia* in Ground Turkey (N=396 Isolates)

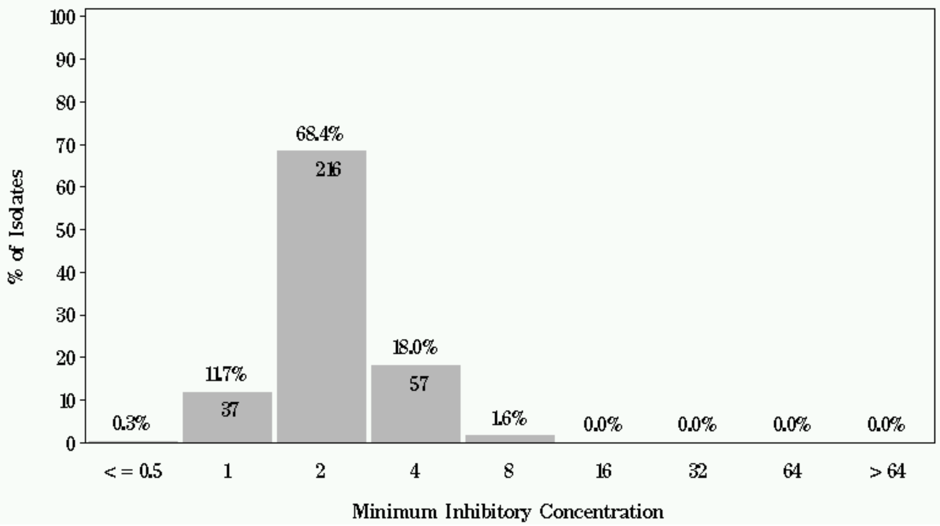
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$



NARMS

Figure 19a: Minimum Inhibitory Concentration of Amikacin for *Escherichia* in Ground Beef (N=316 Isolates)

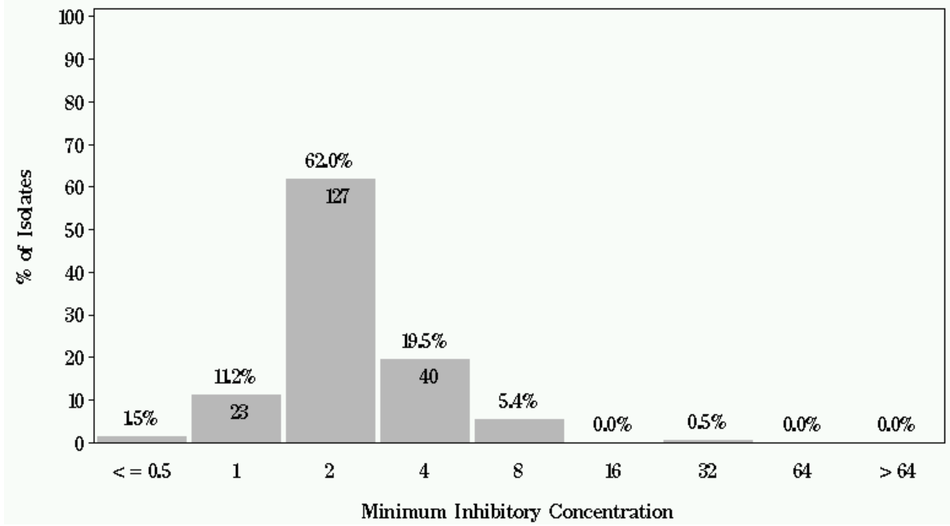
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$

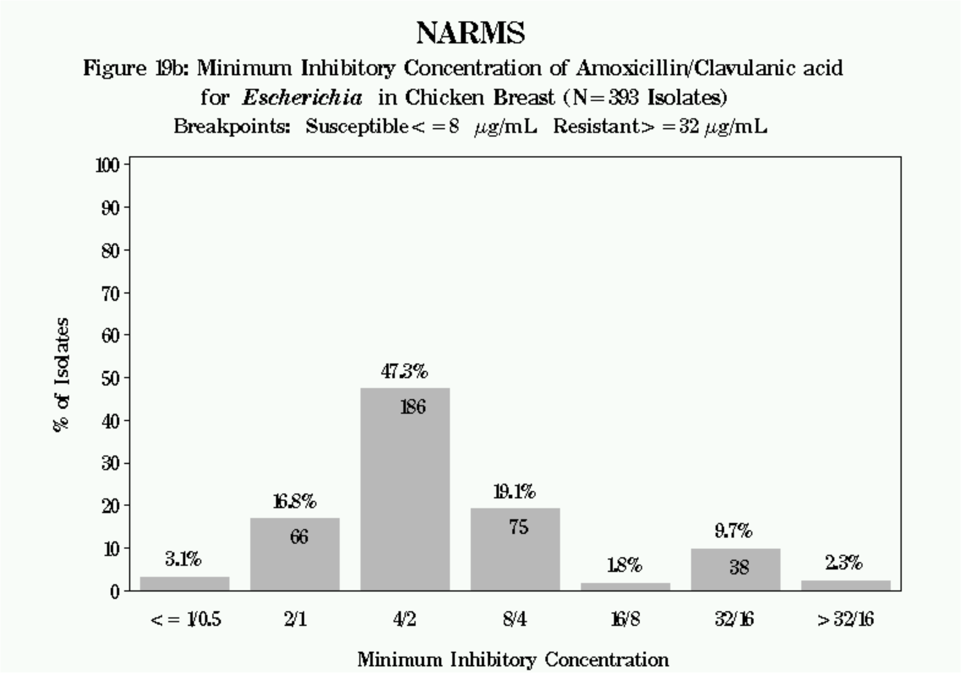


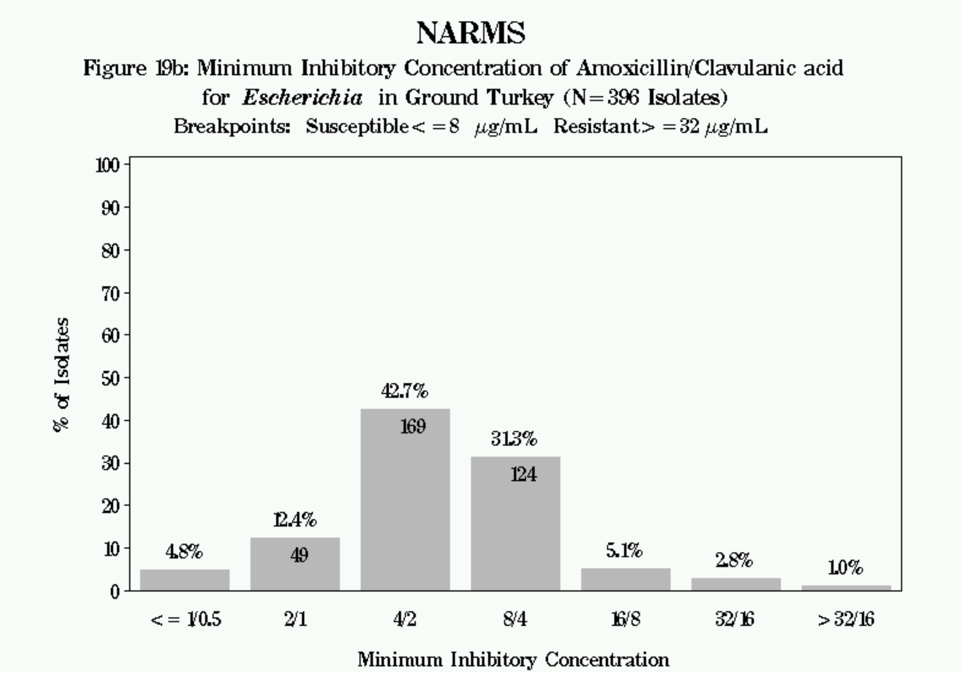
NARMS

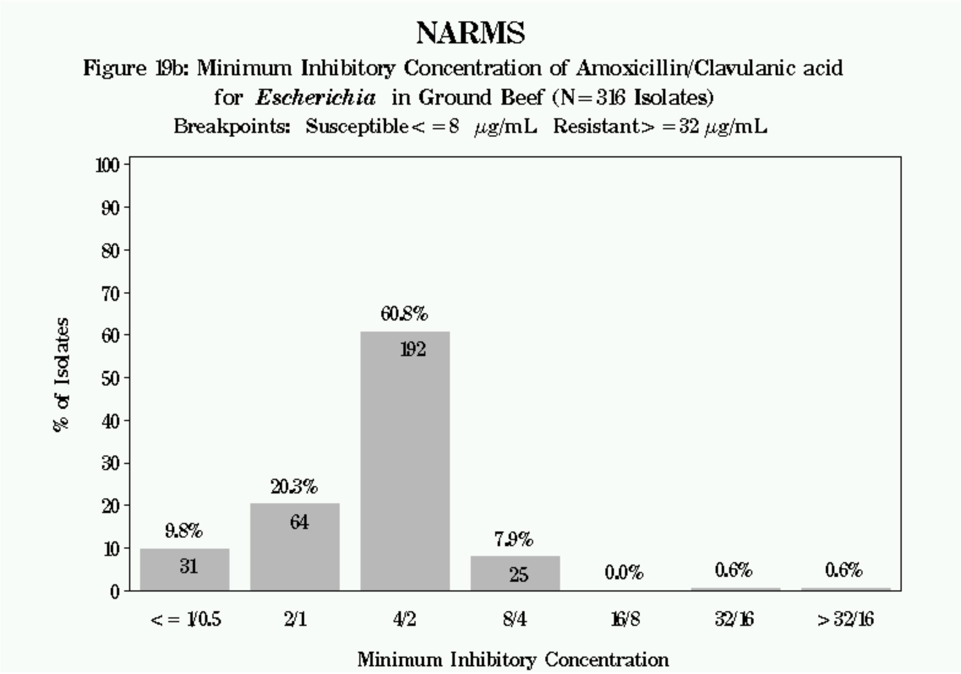
Figure 19a: Minimum Inhibitory Concentration of Amikacin for *Escherichia* in Pork Chop (N=205 Isolates)

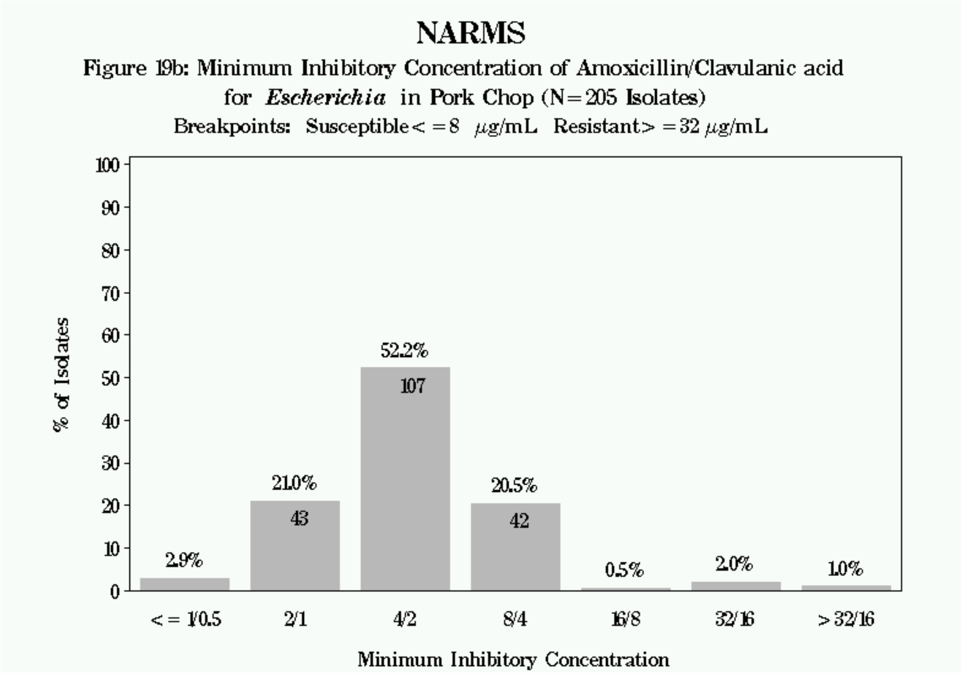
Breakpoints: Susceptible<=16 $\mu g/mL$ Resistant>=64 $\mu g/mL$

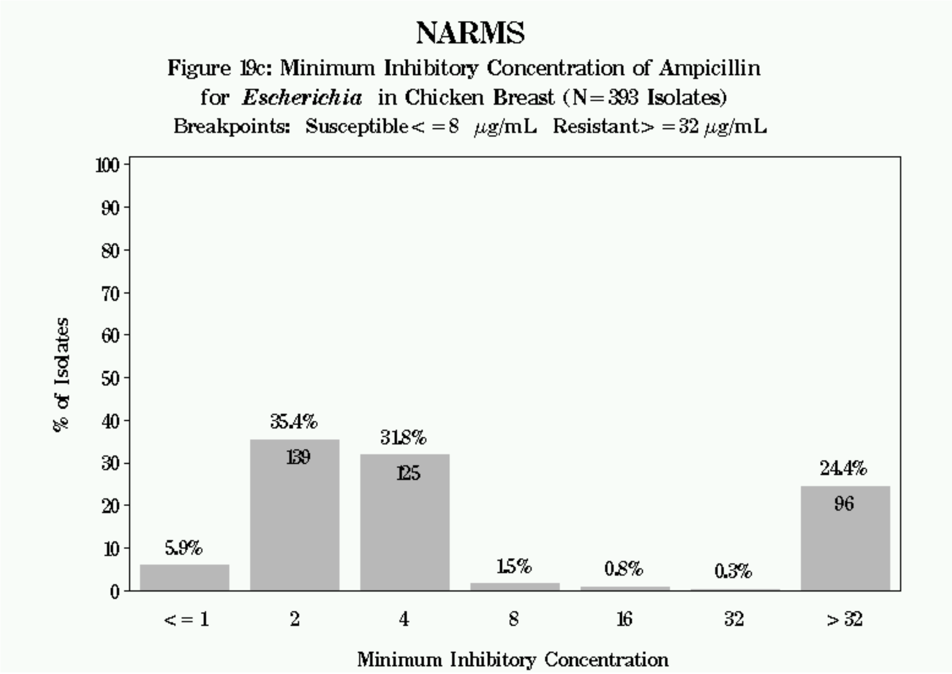


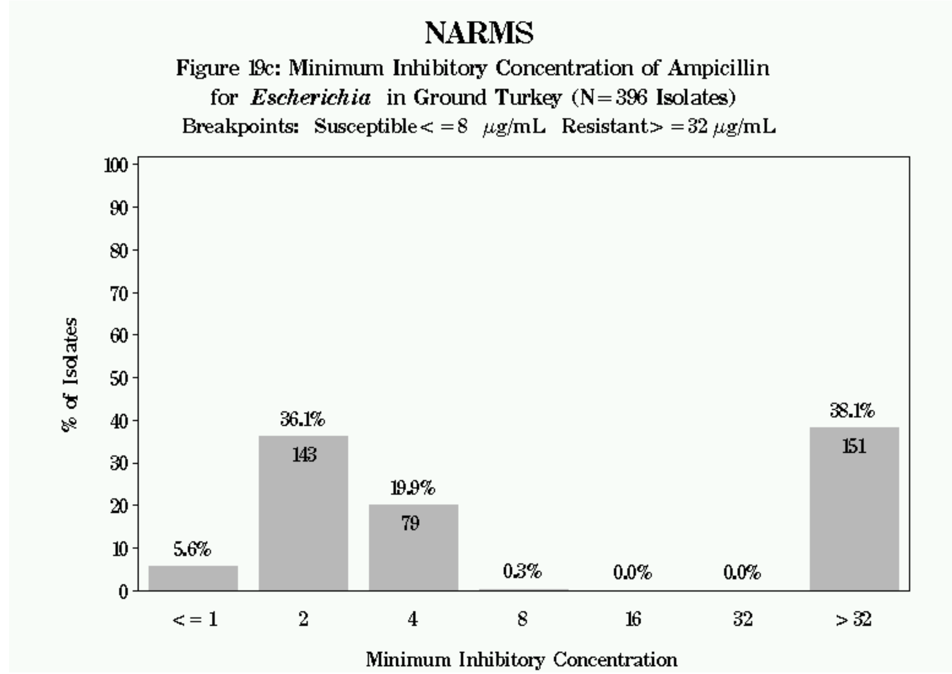

NARMS
Figure 19b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid
for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
3.1%
16.8%
66
47.3%
186
19.1%
75
1.8%
9.7%
38
2.3%
<=1/0.5
2/1
4/2
8/4
16/8
32/16
>32/16
Minimum Inhibitory Concentration

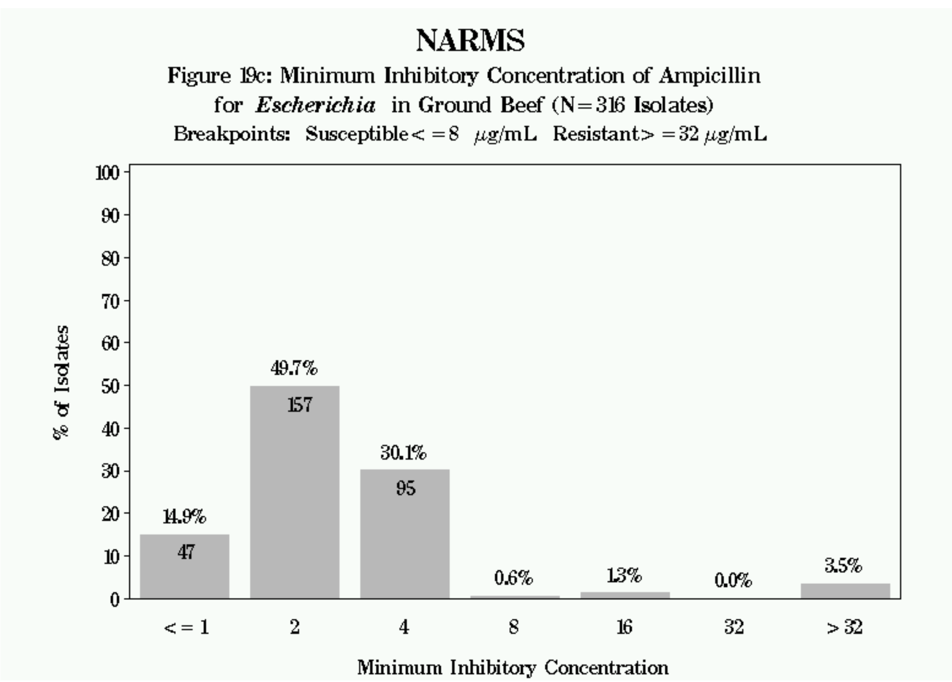

NARMS
Figure 19b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid
for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
4.8%
12.4%
49
42.7%
169
31.3%
124
5.1%
2.8%
1.0%
<=1/0.5
2/1
4/2
8/4
16/8
32/16
>32/16
Minimum Inhibitory Concentration

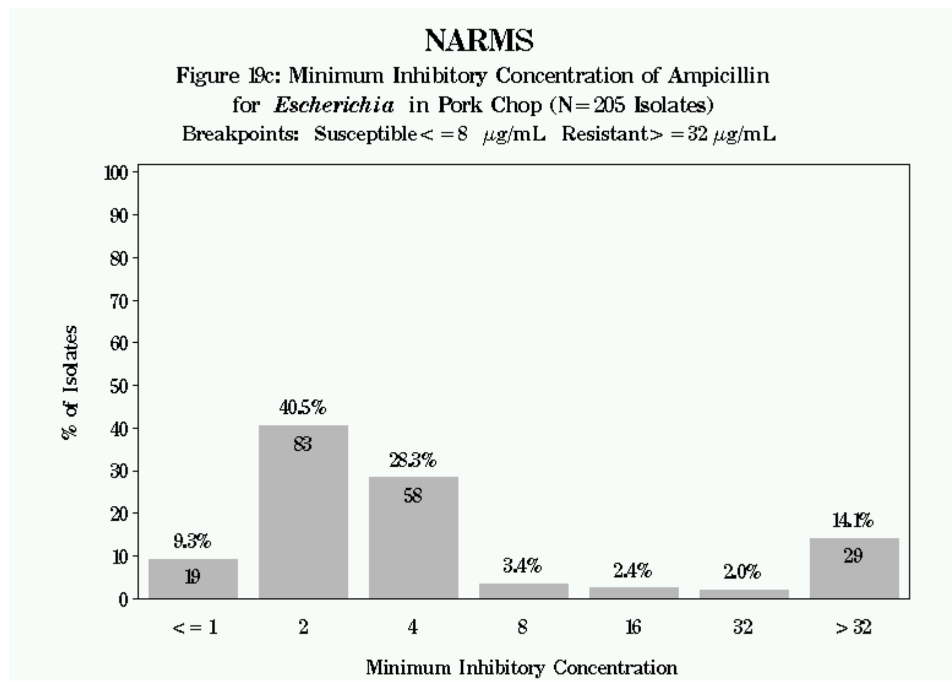

NARMS
Figure 19b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid
for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
9.8%
31
20.3%
64
60.8%
192
7.9%
25
0.0%
0.6%
0.6%
<=1/0.5
2/1
4/2
8/4
16/8
32/16
>32/16
Minimum Inhibitory Concentration

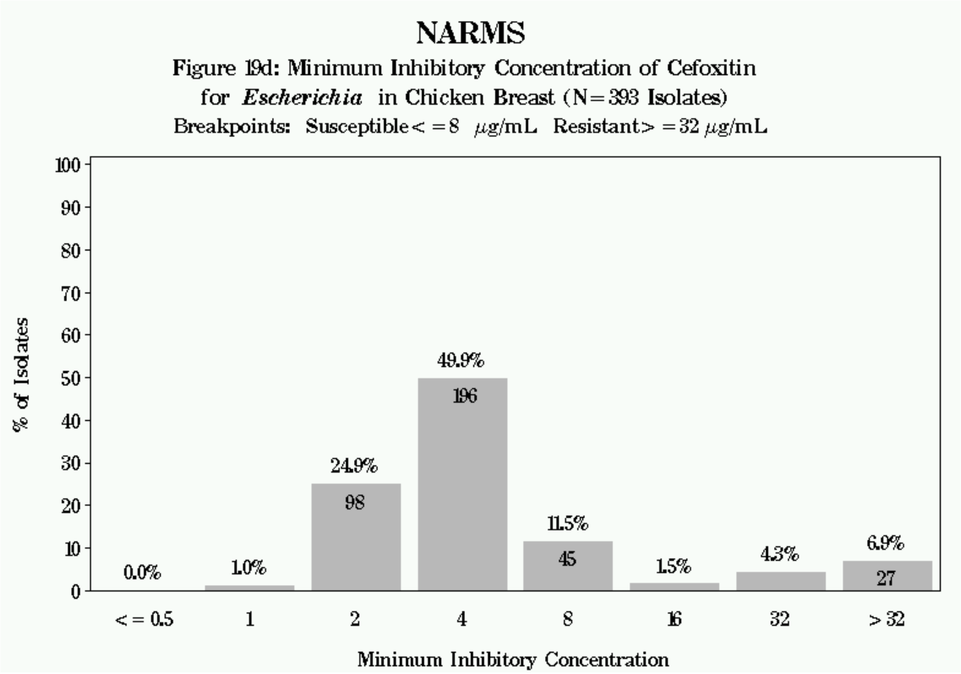

NARMS
Figure 19b: Minimum Inhibitory Concentration of Amoxicillin/Clavulanic acid
for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
2.9%
21.0%
43
52.2%
107
20.5%
42
0.5%
2.0%
1.0%
<=1/0.5
2/1
4/2
8/4
16/8
32/16
>32/16
Minimum Inhibitory Concentration

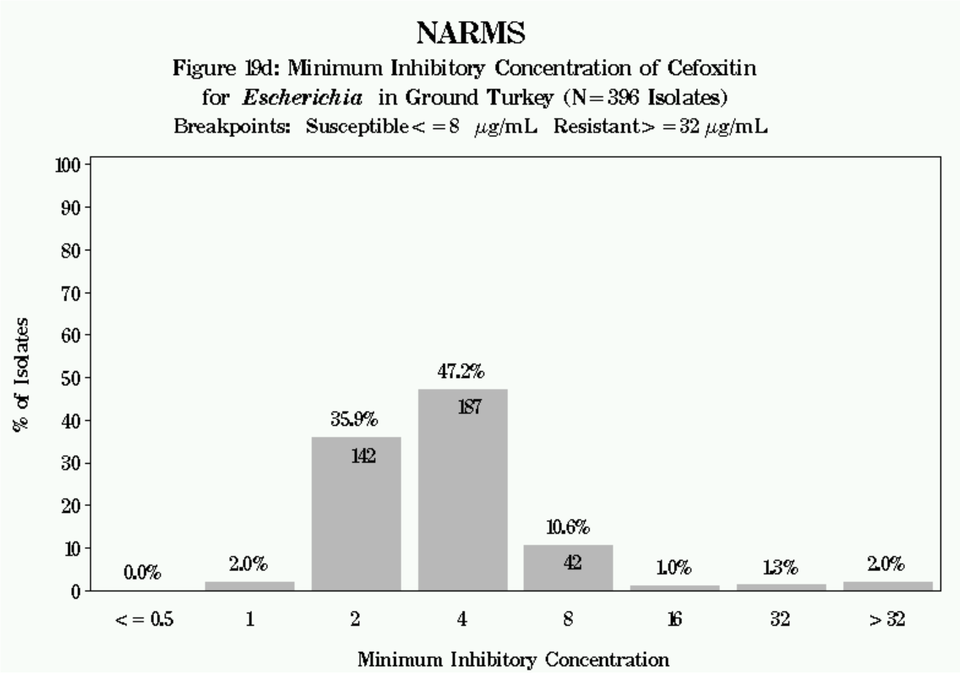

NARMS
Figure 19c: Minimum Inhibitory Concentration of Ampicillin
for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=1
2
4
8
16
32
>32
5.9%
35.4%
139
31.8%
125
1.5%
0.8%
0.3%
24.4%
96

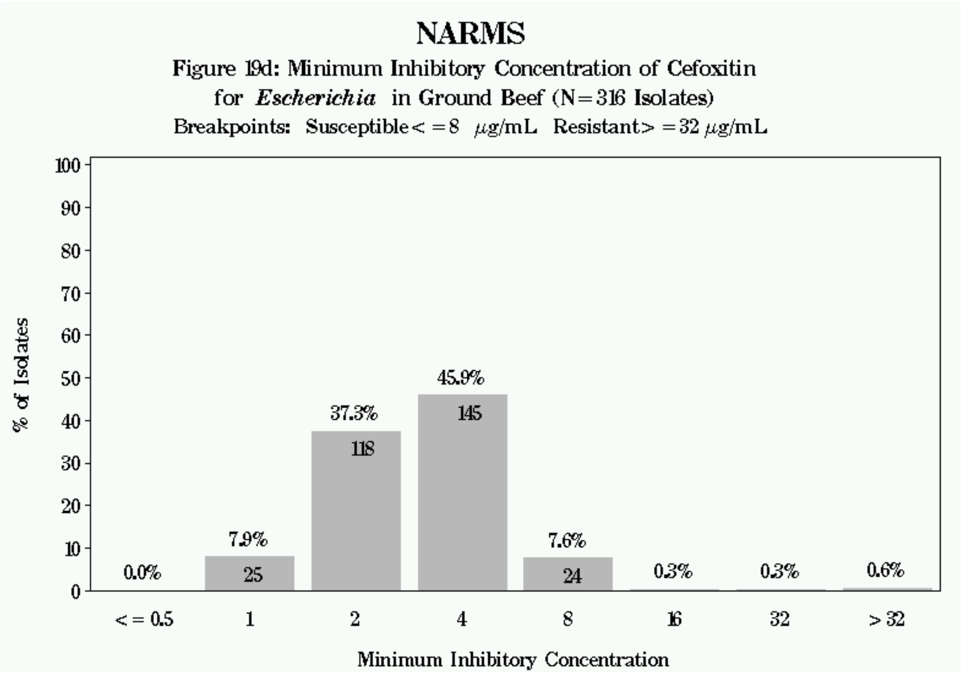

NARMS
Figure 19c: Minimum Inhibitory Concentration of Ampicillin
for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=1
2
4
8
16
32
>32
5.6%
36.1%
143
19.9%
79
0.3%
0.0%
0.0%
38.1%
151

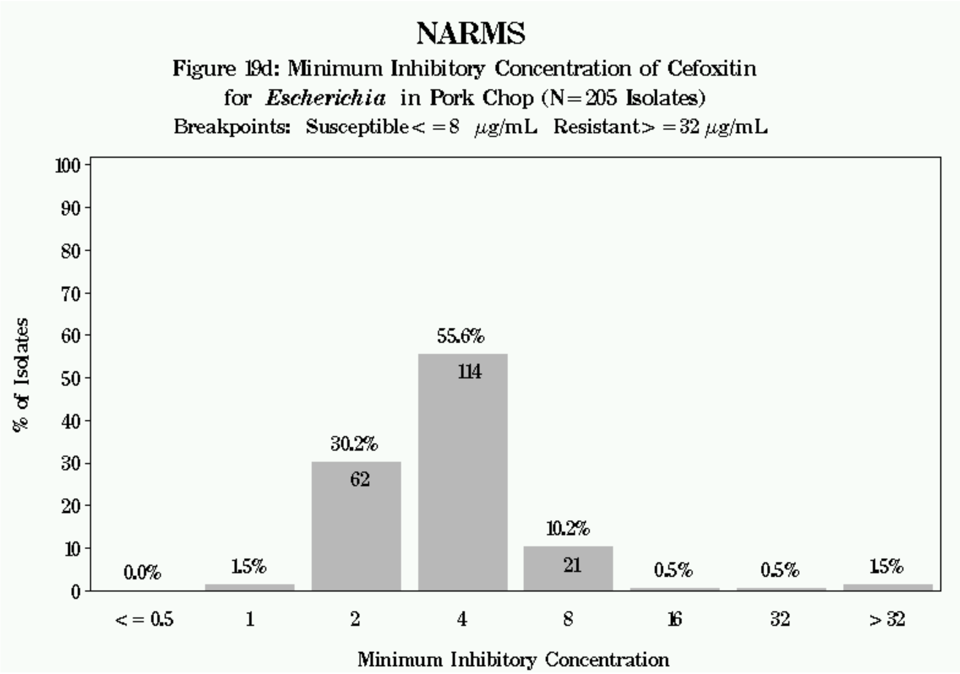

NARMS
Figure 19c: Minimum Inhibitory Concentration of Ampicillin
for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=1
2
4
8
16
32
>32
14.9%
47
49.7%
157
30.1%
95
0.6%
1.3%
0.0%
3.5%

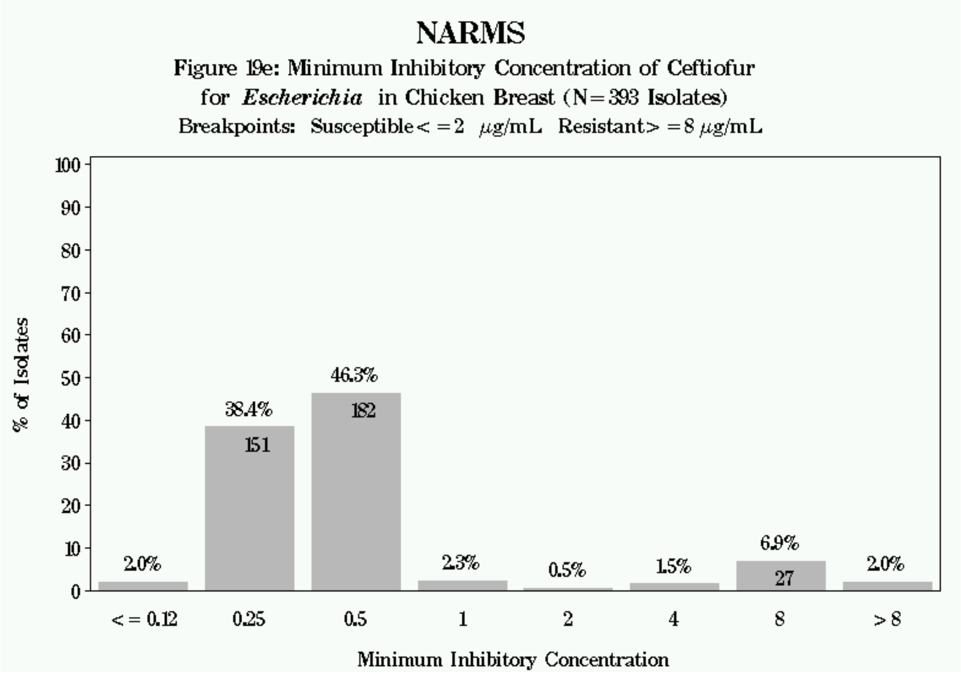

NARMS
Figure 19c: Minimum Inhibitory Concentration of Ampicillin
for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=1
2
4
8
16
32
>32
9.3%
19
40.5%
83
28.3%
58
3.4%
2.4%
2.0%
14.1%
29

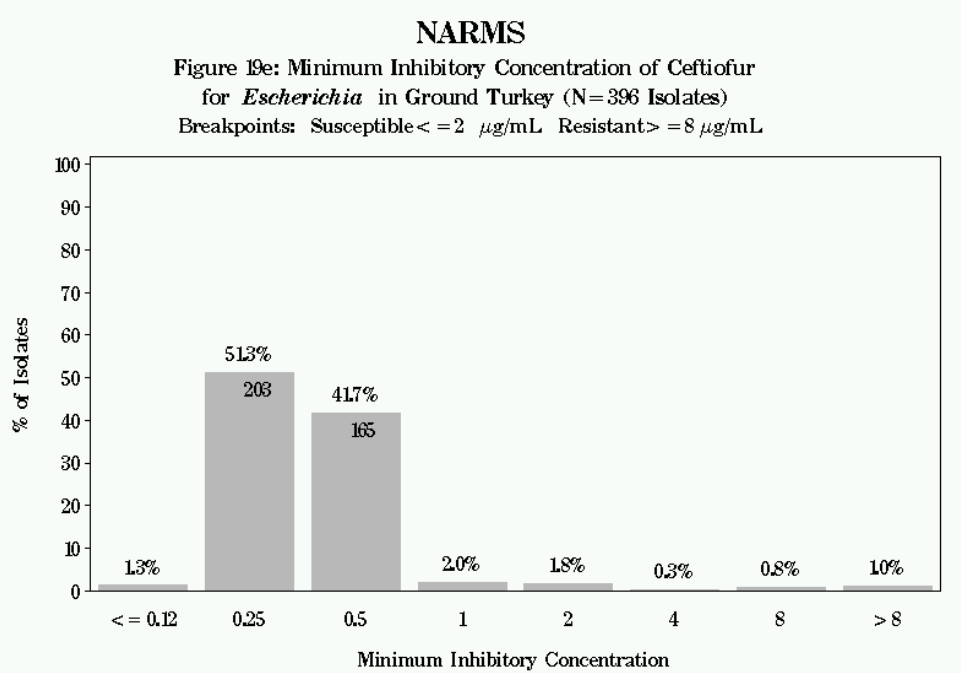

NARMS
Figure 19d: Minimum Inhibitory Concentration of Cefoxitin for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 1.0%
2: 24.9% 98
4: 49.9% 196
8: 11.5% 45
16: 1.5%
32: 4.3%
>32: 6.9% 27

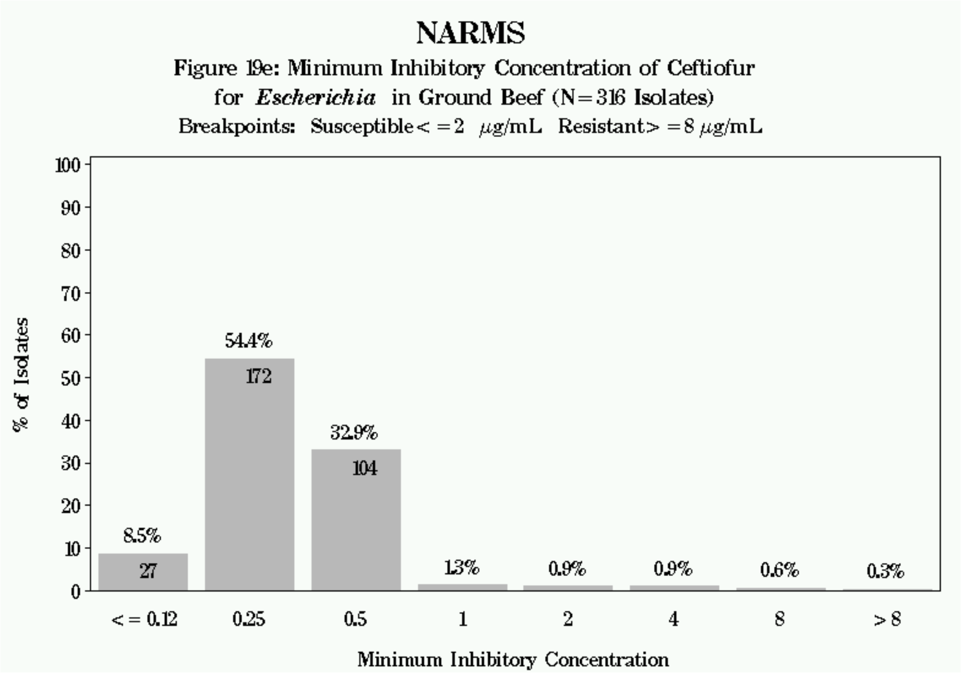

NARMS
Figure 19d: Minimum Inhibitory Concentration of Cefoxitin for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 2.0%
2: 35.9% 142
4: 47.2% 187
8: 10.6% 42
16: 1.0%
32: 1.3%
>32: 2.0%

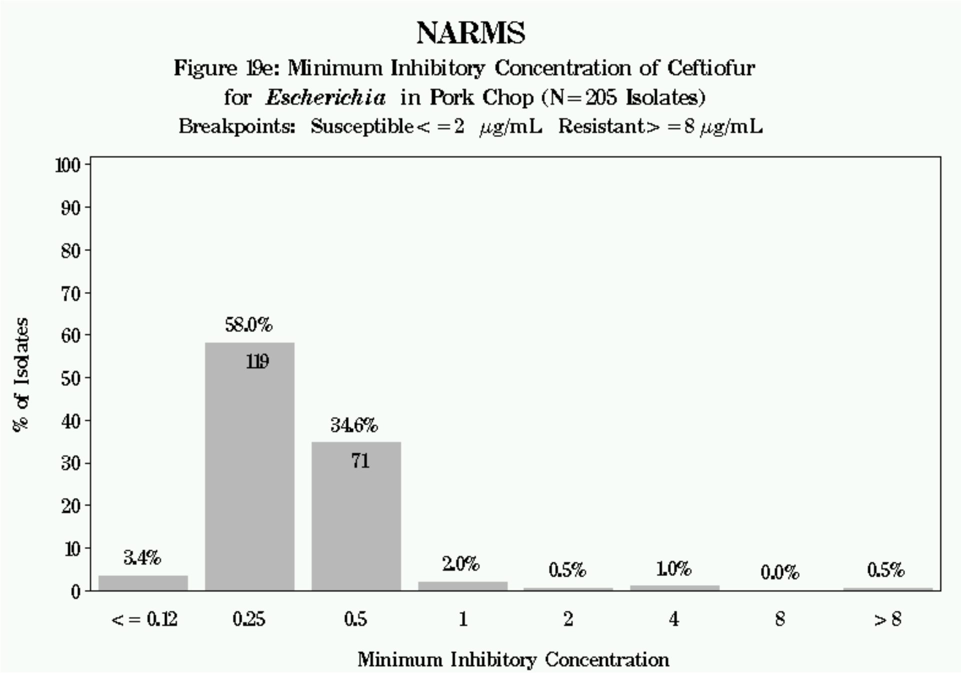

NARMS
Figure 19d: Minimum Inhibitory Concentration of Cefoxitin for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 7.9% 25
2: 37.3% 118
4: 45.9% 145
8: 7.6% 24
16: 0.3%
32: 0.3%
>32: 0.6%


NARMS
Figure 19d: Minimum Inhibitory Concentration of Cefoxitin for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible<=8 μg/mL Resistant>=32 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.5: 0.0%
1: 1.5%
2: 30.2% 62
4: 55.6% 114
8: 10.2% 21
16: 0.5%
32: 0.5%
>32: 1.5%


NARMS
Figure 19e: Minimum Inhibitory Concentration of Ceftiofur
for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.12 0.25 0.5 1 2 4 8 >8
2.0% 38.4% 46.3% 2.3% 0.5% 1.5% 6.9% 2.0%
151 182 27


NARMS
Figure 19e: Minimum Inhibitory Concentration of Ceftiofur
for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.12 0.25 0.5 1 2 4 8 >8
1.3% 51.3% 41.7% 2.0% 1.8% 0.3% 0.8% 1.0%
203 165

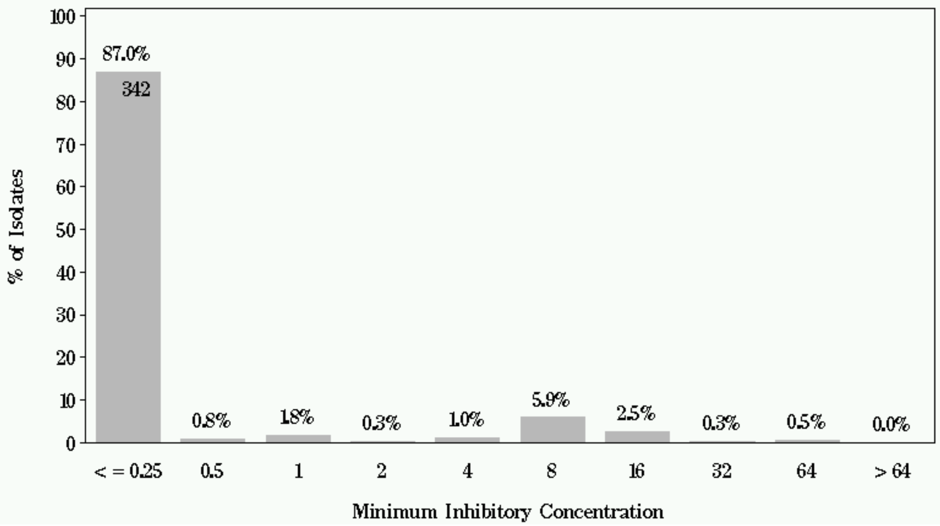

NARMS
Figure 19e: Minimum Inhibitory Concentration of Ceftiofur
for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.12 0.25 0.5 1 2 4 8 >8
8.5% 54.4% 32.9% 1.3% 0.9% 0.9% 0.6% 0.3%
27 172 104


NARMS
Figure 19e: Minimum Inhibitory Concentration of Ceftiofur
for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible<=2 μg/mL Resistant>=8 μg/mL
% of Isolates
Minimum Inhibitory Concentration
<=0.12 0.25 0.5 1 2 4 8 >8
3.4% 58.0% 34.6% 2.0% 0.5% 1.0% 0.0% 0.5%
119 71

NARMS

Figure 19f: Minimum Inhibitory Concentration of Ceftriaxone for *Escherichia* in Chicken Breast (N=393 Isolates)

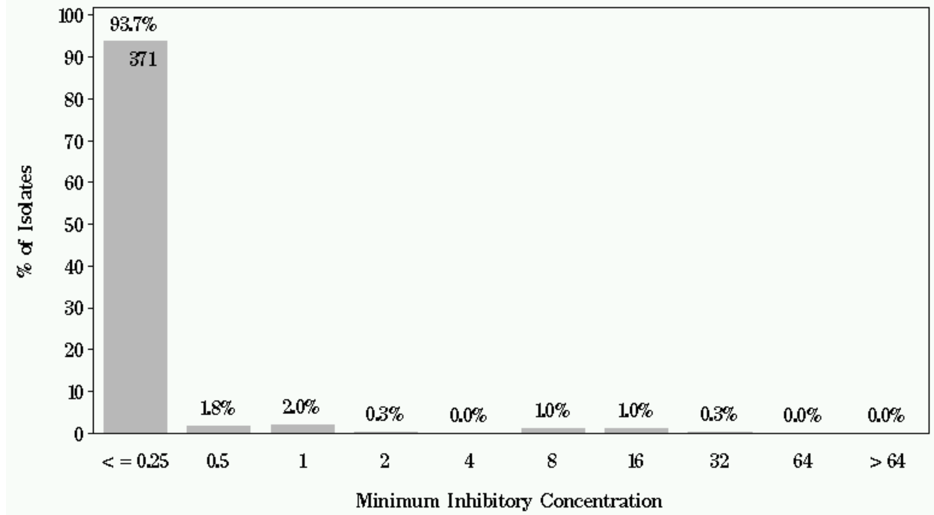
Breakpoints: Susceptible<=8 µg/mL Resistant>=64 µg/mL



NARMS

Figure 19f: Minimum Inhibitory Concentration of Ceftriaxone for *Escherichia* in Ground Turkey (N=396 Isolates)

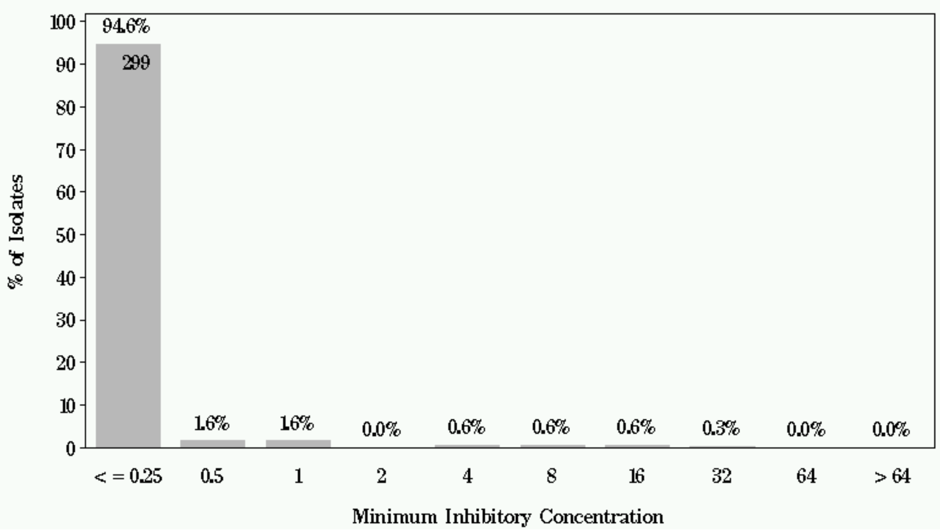
Breakpoints: Susceptible<=8 µg/mL Resistant>=64 µg/mL



NARMS

Figure 19f: Minimum Inhibitory Concentration of Ceftriaxone for *Escherichia* in Ground Beef (N=316 Isolates)

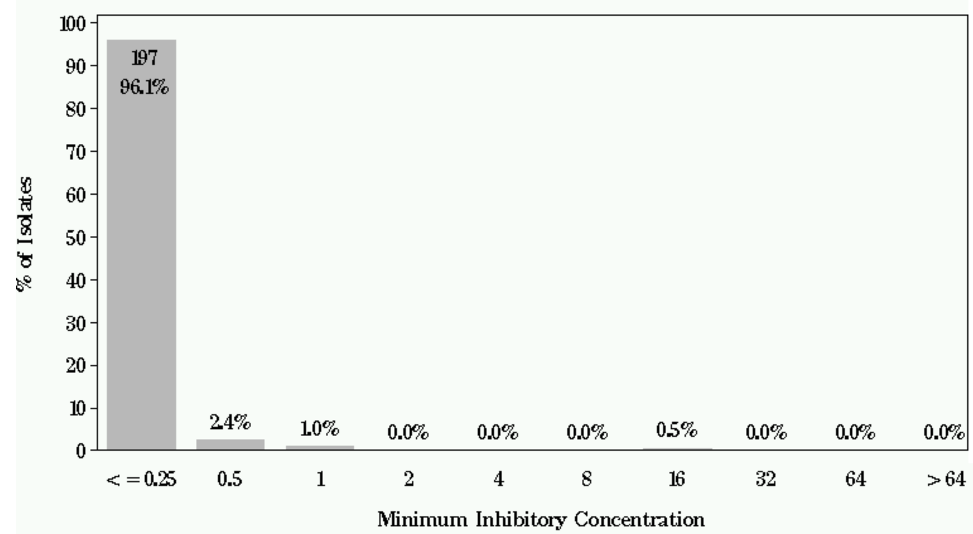
Breakpoints: Susceptible<=8 µg/mL Resistant>=64 µg/mL

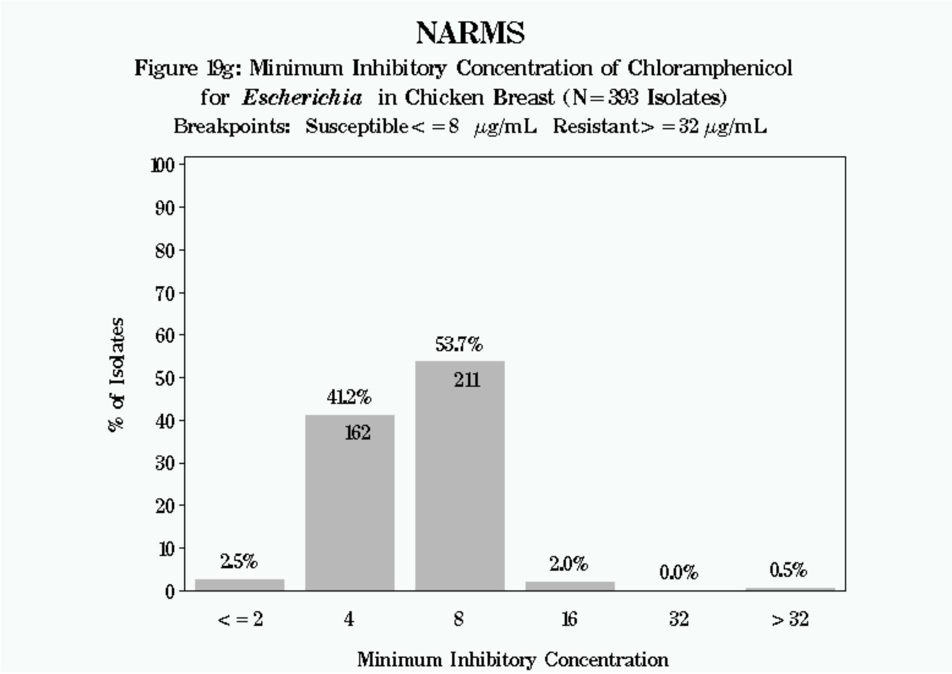


NARMS

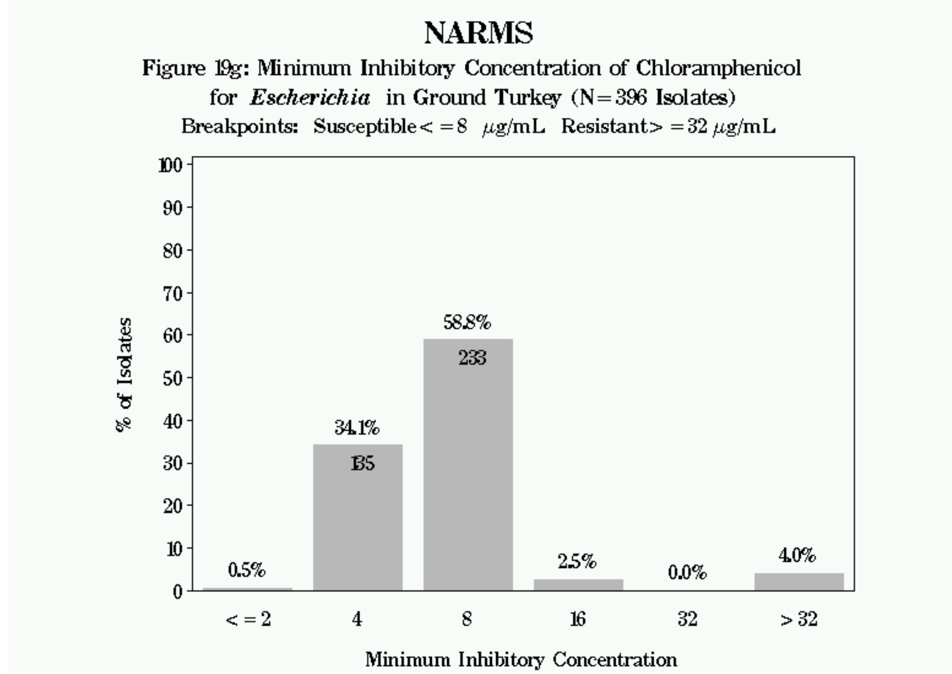
Figure 19f: Minimum Inhibitory Concentration of Ceftriaxone for *Escherichia* in Pork Chop (N=205 Isolates)

Breakpoints: Susceptible<=8 µg/mL Resistant>=64 µg/mL

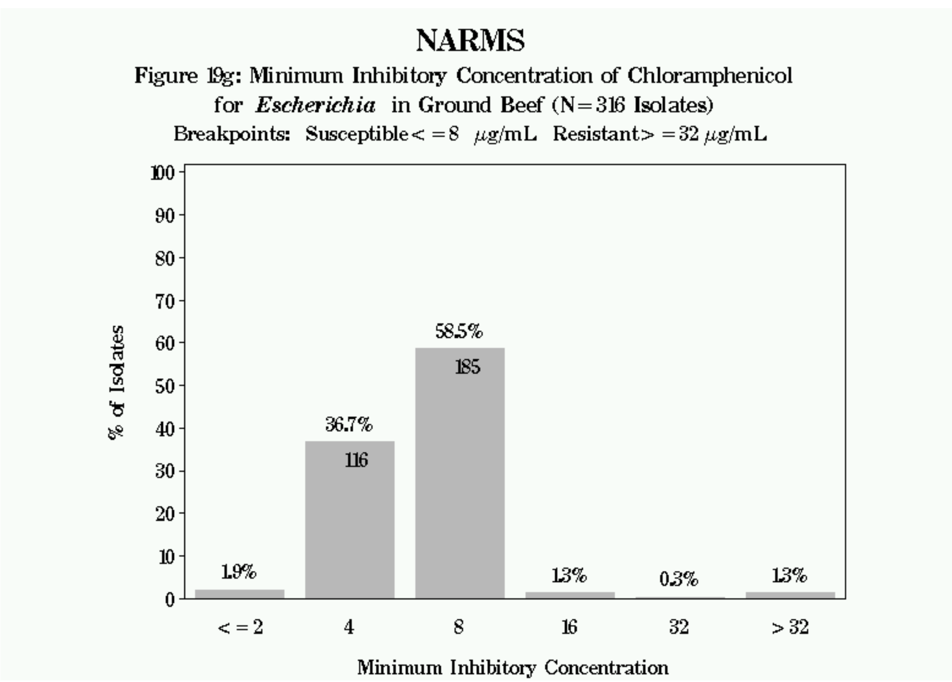




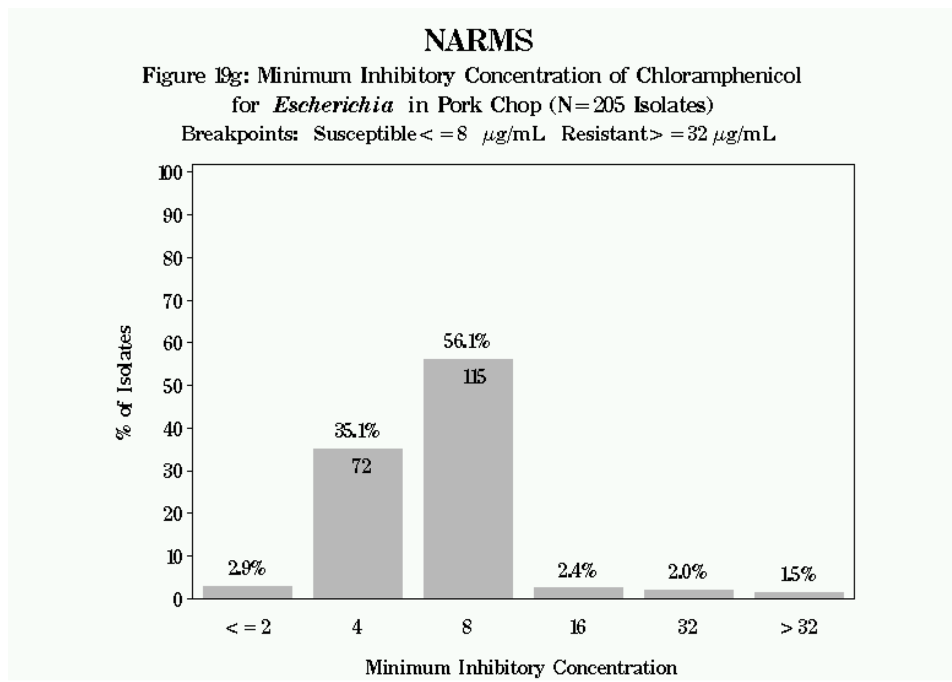
NARMS
Figure 19g: Minimum Inhibitory Concentration of Chloramphenicol
for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
2.5%
41.2%
162
53.7%
211
2.0%
0.0%
0.5%
<=2
4
8
16
32
>32
Minimum Inhibitory Concentration



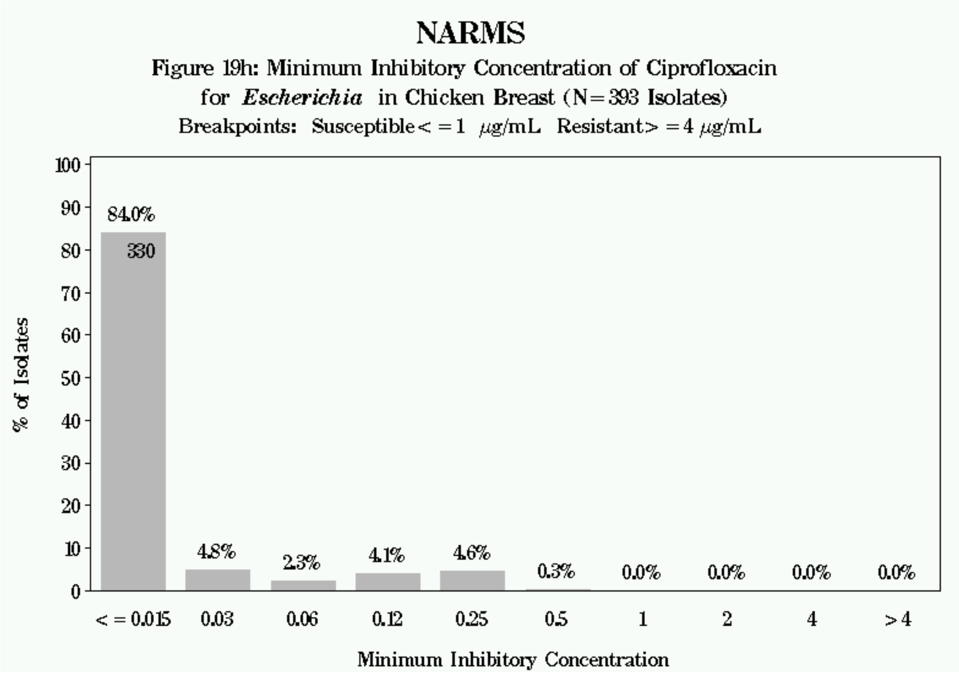
NARMS
Figure 19g: Minimum Inhibitory Concentration of Chloramphenicol
for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
0.5%
34.1%
135
58.8%
233
2.5%
0.0%
4.0%
<=2
4
8
16
32
>32
Minimum Inhibitory Concentration

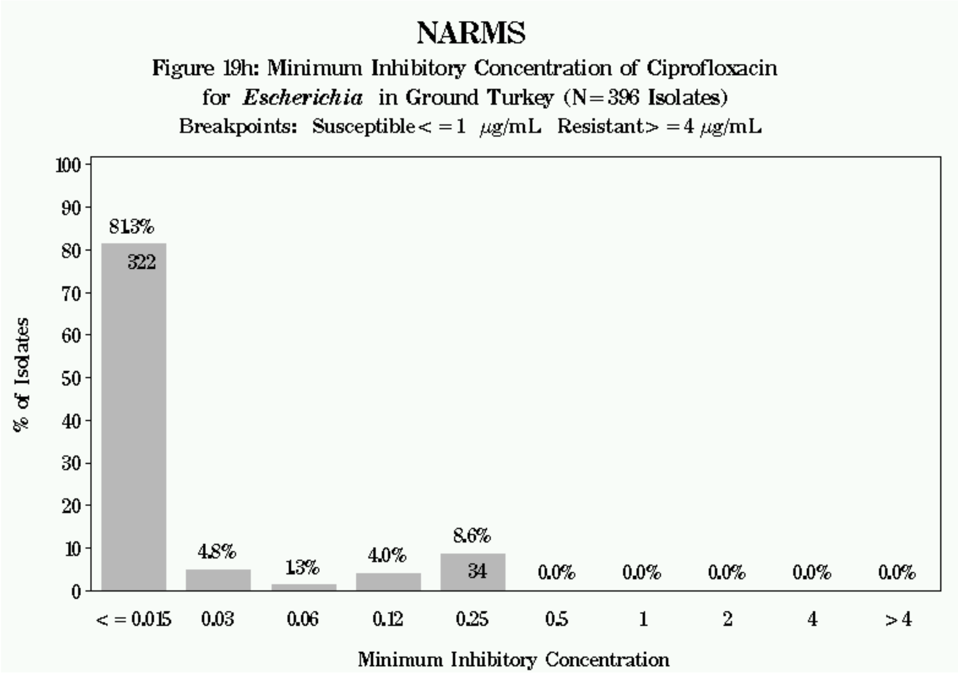


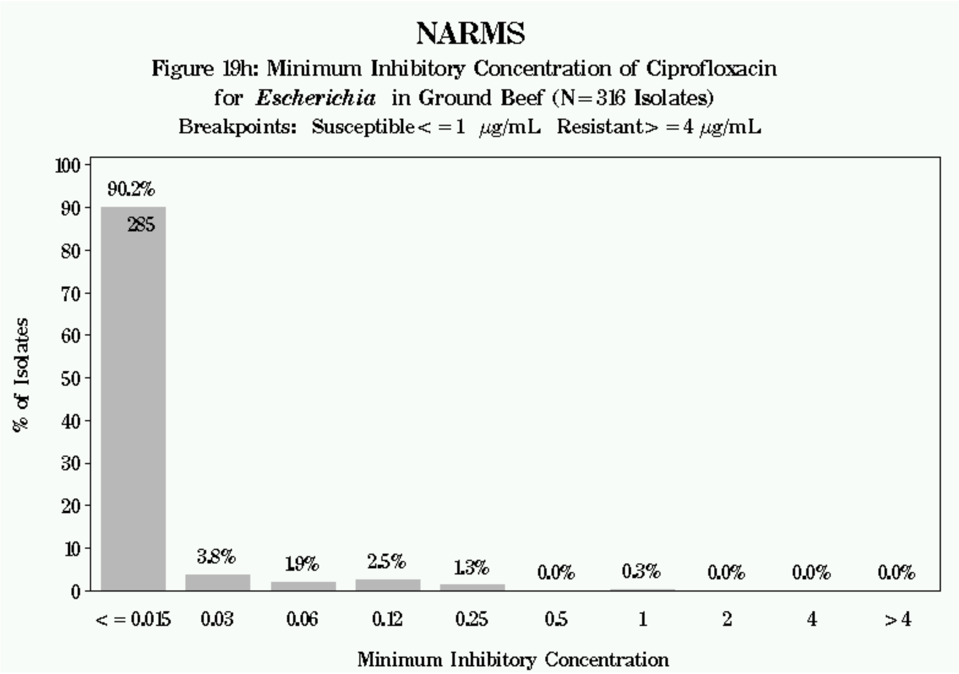
NARMS
Figure 19g: Minimum Inhibitory Concentration of Chloramphenicol
for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
1.9%
36.7%
116
58.5%
185
1.3%
0.3%
1.3%
<=2
4
8
16
32
>32
Minimum Inhibitory Concentration

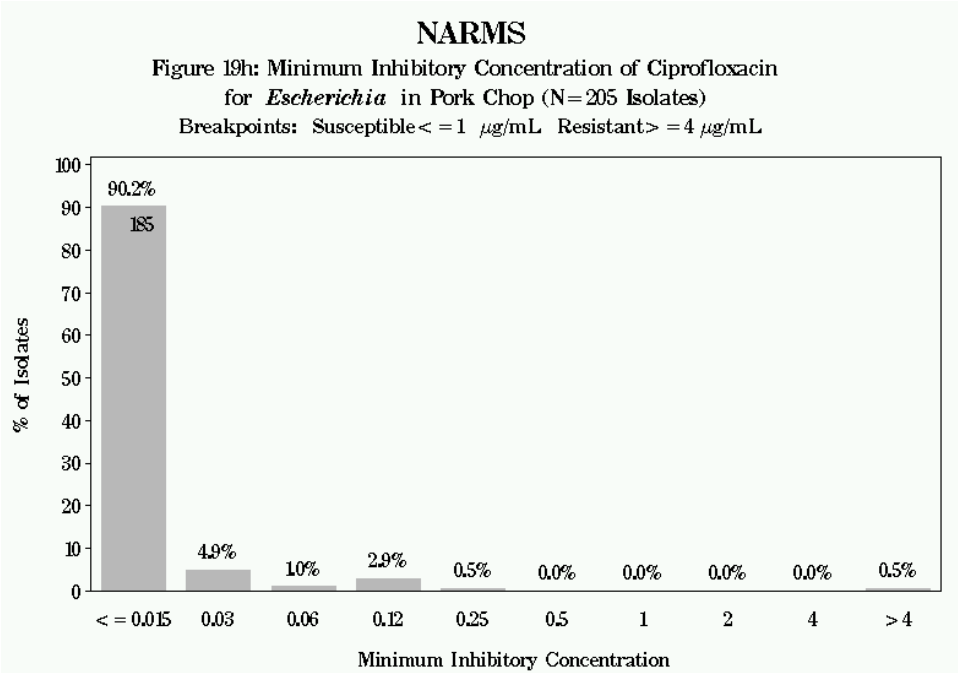


NARMS
Figure 19g: Minimum Inhibitory Concentration of Chloramphenicol
for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible<=8 µg/mL Resistant>=32 µg/mL
% of Isolates
2.9%
35.1%
72
56.1%
115
2.4%
2.0%
1.5%
<=2
4
8
16
32
>32
Minimum Inhibitory Concentration


NARMS
Figure 19h: Minimum Inhibitory Concentration of Ciprofloxacin
for Escherichia in Chicken Breast (N=393 Isolates)
Breakpoints: Susceptible< =1 µg/mL Resistant> =4 µg/mL
% of Isolates
84.0%
330
4.8%
2.3%
4.1%
4.6%
0.3%
0.0%
0.0%
0.0%
0.0%
< = 0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
> 4
Minimum Inhibitory Concentration


NARMS
Figure 19h: Minimum Inhibitory Concentration of Ciprofloxacin
for Escherichia in Ground Turkey (N=396 Isolates)
Breakpoints: Susceptible< =1 µg/mL Resistant> =4 µg/mL
% of Isolates
81.3%
322
4.8%
1.3%
4.0%
8.6%
34
0.0%
0.0%
0.0%
0.0%
0.0%
< = 0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
> 4
Minimum Inhibitory Concentration

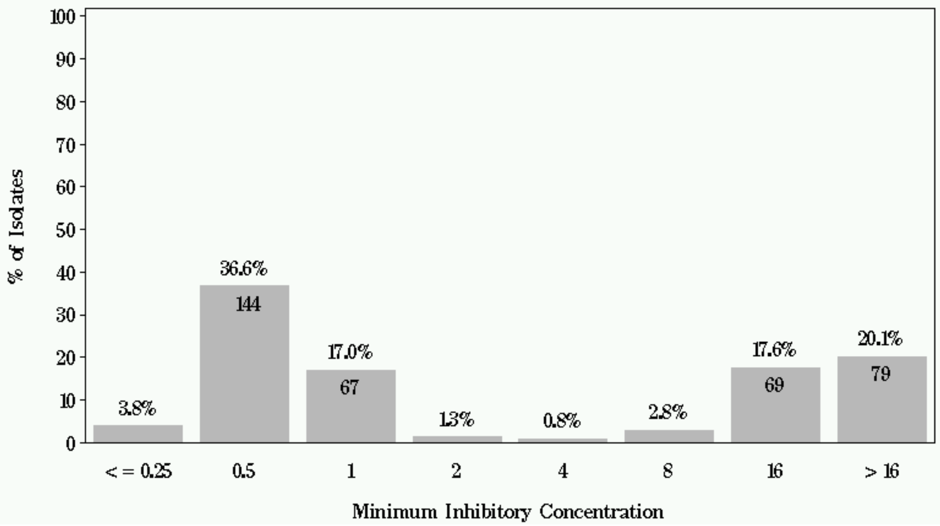

NARMS
Figure 19h: Minimum Inhibitory Concentration of Ciprofloxacin
for Escherichia in Ground Beef (N=316 Isolates)
Breakpoints: Susceptible< =1 µg/mL Resistant> =4 µg/mL
% of Isolates
90.2%
285
3.8%
1.9%
2.5%
1.3%
0.0%
0.3%
0.0%
0.0%
0.0%
< = 0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
> 4
Minimum Inhibitory Concentration


NARMS
Figure 19h: Minimum Inhibitory Concentration of Ciprofloxacin
for Escherichia in Pork Chop (N=205 Isolates)
Breakpoints: Susceptible< =1 µg/mL Resistant> =4 µg/mL
% of Isolates
90.2%
185
4.9%
1.0%
2.9%
0.5%
0.0%
0.0%
0.0%
0.0%
0.5%
< = 0.015
0.03
0.06
0.12
0.25
0.5
1
2
4
> 4
Minimum Inhibitory Concentration

NARMS

Figure 19i: Minimum Inhibitory Concentration of Gentamicin for *Escherichia* in Chicken Breast (N=393 Isolates)

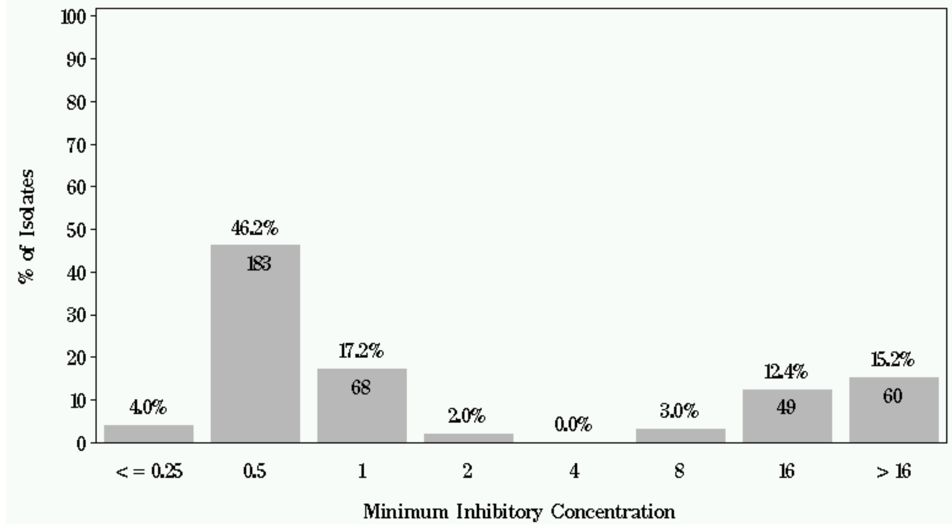
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19i: Minimum Inhibitory Concentration of Gentamicin for *Escherichia* in Ground Turkey (N=396 Isolates)

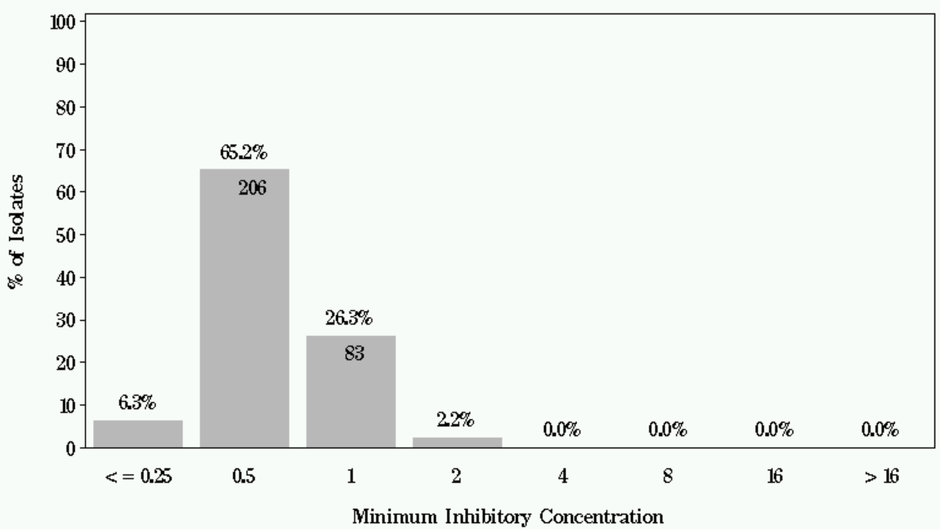
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19i: Minimum Inhibitory Concentration of Gentamicin for *Escherichia* in Ground Beef (N=316 Isolates)

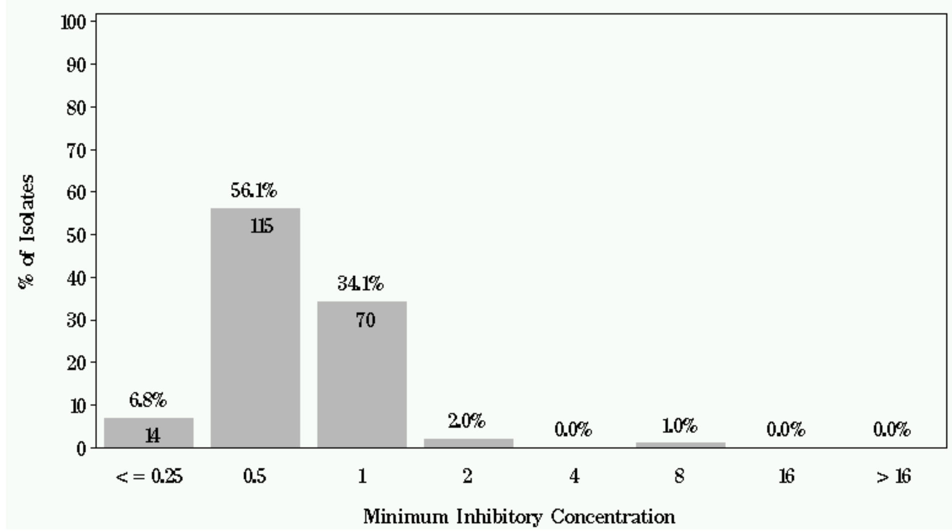
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19i: Minimum Inhibitory Concentration of Gentamicin for *Escherichia* in Pork Chop (N=205 Isolates)

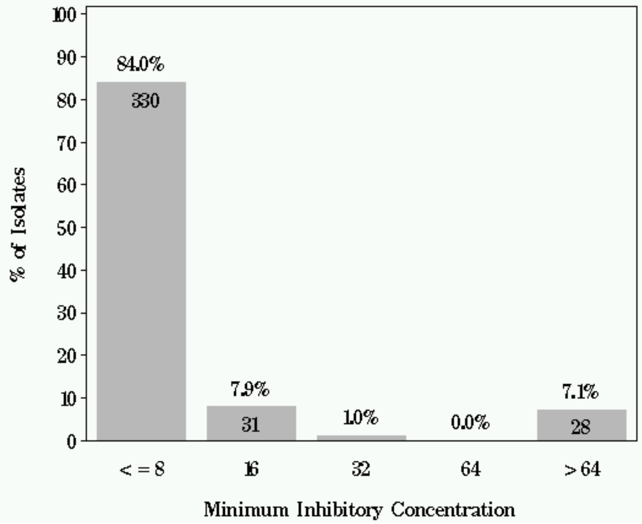
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19j: Minimum Inhibitory Concentration of Kanamycin for *Escherichia* in Chicken Breast (N=393 Isolates)

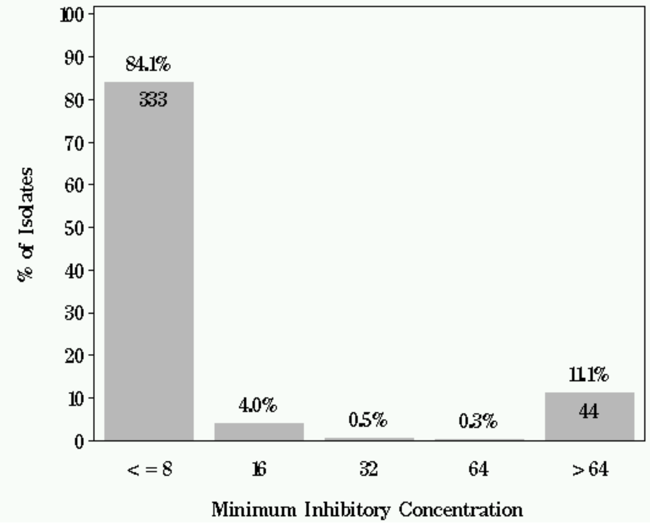
Breakpoints: Susceptible< =16 µg/mL Resistant> =64 µg/mL



NARMS

Figure 19j: Minimum Inhibitory Concentration of Kanamycin for *Escherichia* in Ground Turkey (N=396 Isolates)

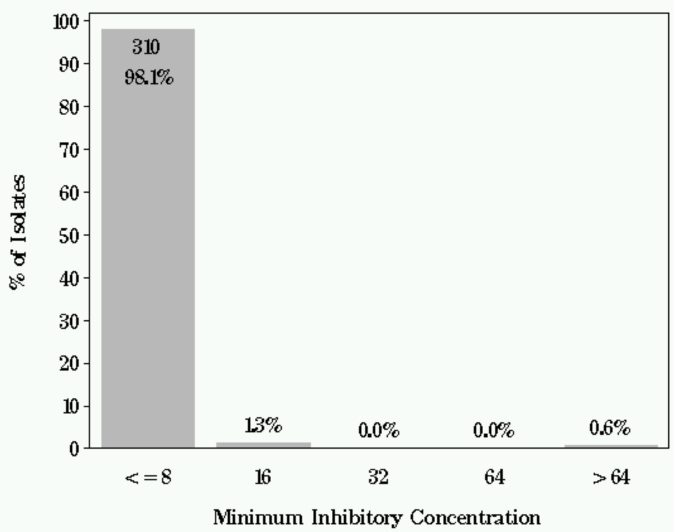
Breakpoints: Susceptible< =16 µg/mL Resistant> =64 µg/mL



NARMS

Figure 19j: Minimum Inhibitory Concentration of Kanamycin for *Escherichia* in Ground Beef (N=316 Isolates)

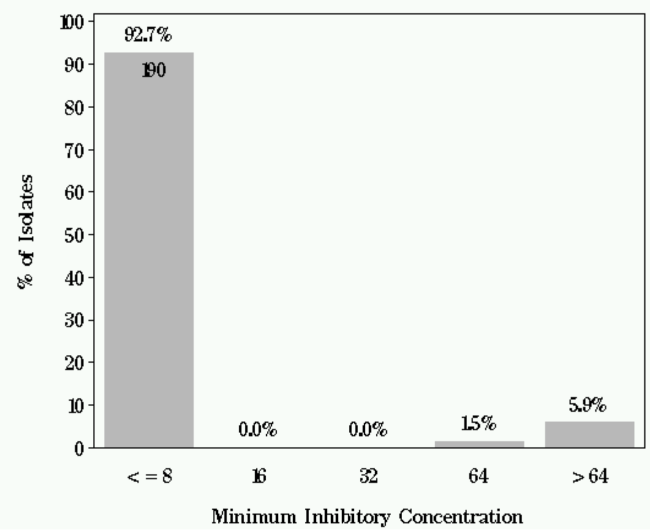
Breakpoints: Susceptible< =16 µg/mL Resistant> =64 µg/mL



NARMS

Figure 19j: Minimum Inhibitory Concentration of Kanamycin for *Escherichia* in Pork Chop (N=205 Isolates)

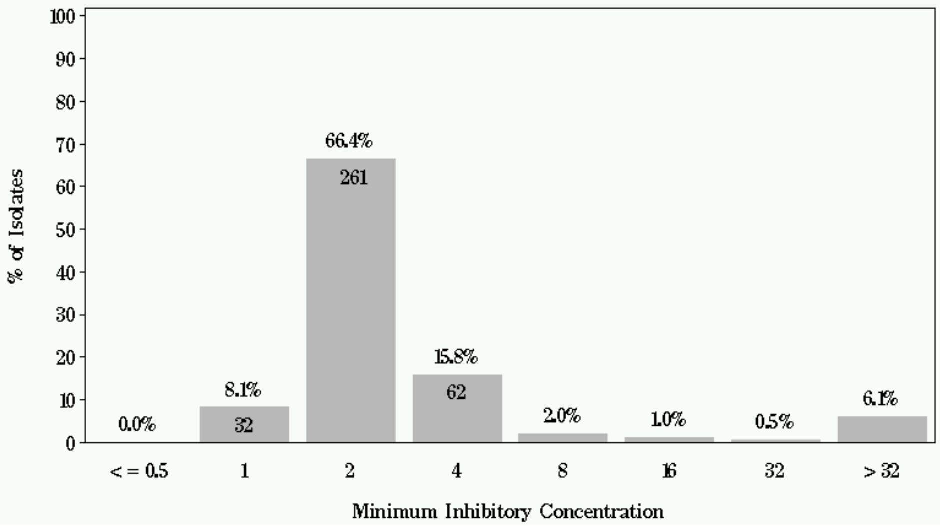
Breakpoints: Susceptible< =16 µg/mL Resistant> =64 µg/mL



NARMS

Figure 19k: Minimum Inhibitory Concentration of Nalidixic acid for ***Escherichia*** in Chicken Breast (N=393 Isolates)

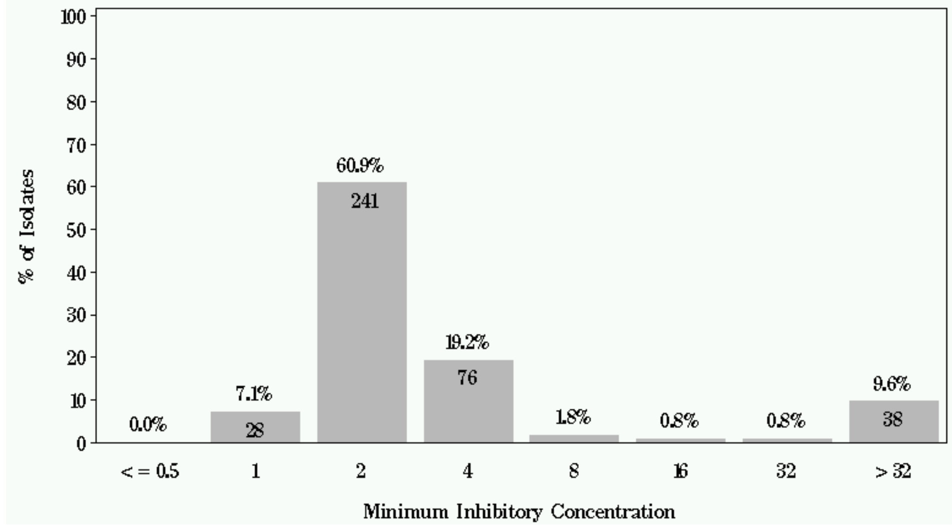
Breakpoints: Susceptible<=16 μg/mL Resistant>=32 μg/mL



NARMS

Figure 19k: Minimum Inhibitory Concentration of Nalidixic acid for ***Escherichia*** in Ground Turkey (N=396 Isolates)

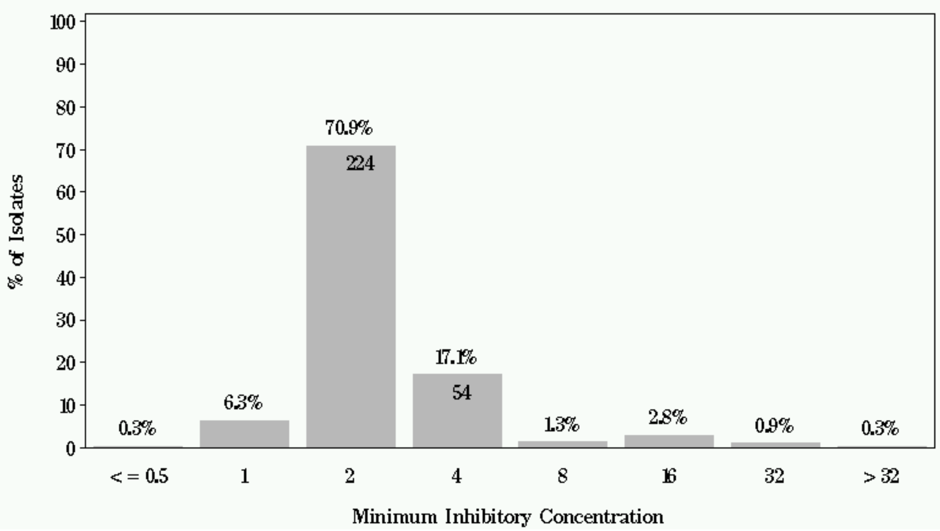
Breakpoints: Susceptible<=16 μg/mL Resistant>=32 μg/mL



NARMS

Figure 19k: Minimum Inhibitory Concentration of Nalidixic acid for ***Escherichia*** in Ground Beef (N=316 Isolates)

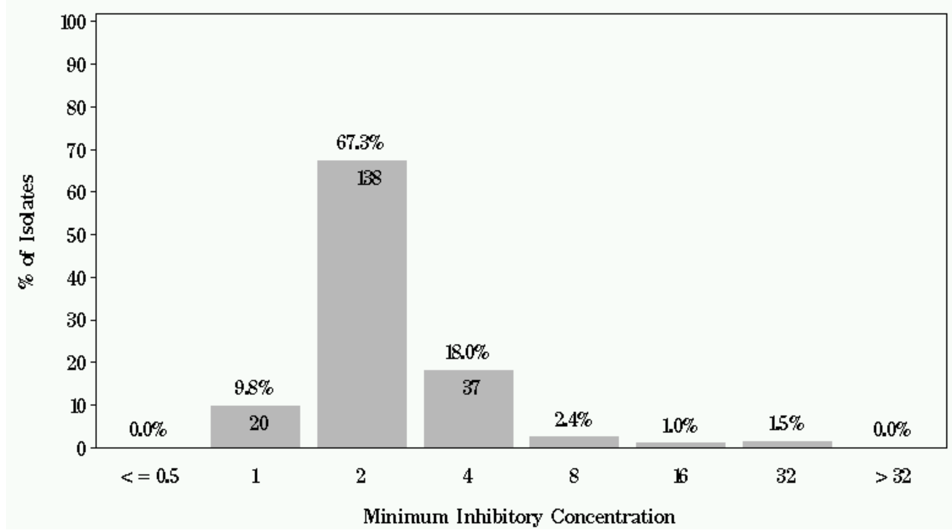
Breakpoints: Susceptible<=16 μg/mL Resistant>=32 μg/mL



NARMS

Figure 19k: Minimum Inhibitory Concentration of Nalidixic acid for ***Escherichia*** in Pork Chop (N=205 Isolates)

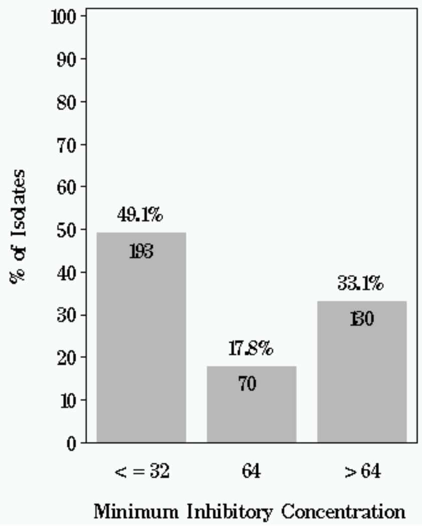
Breakpoints: Susceptible<=16 μg/mL Resistant>=32 μg/mL



NARMS

Figure 191: Minimum Inhibitory Concentration of Streptomycin for *Escherichia* in Chicken Breast (N=393 Isolates)

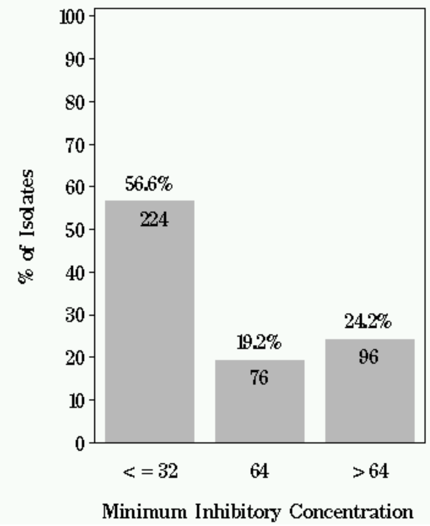
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 191: Minimum Inhibitory Concentration of Streptomycin for *Escherichia* in Ground Turkey (N=396 Isolates)

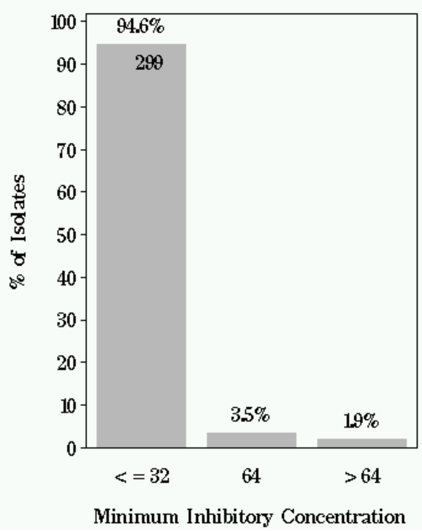
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 191: Minimum Inhibitory Concentration of Streptomycin for *Escherichia* in Ground Beef (N=316 Isolates)

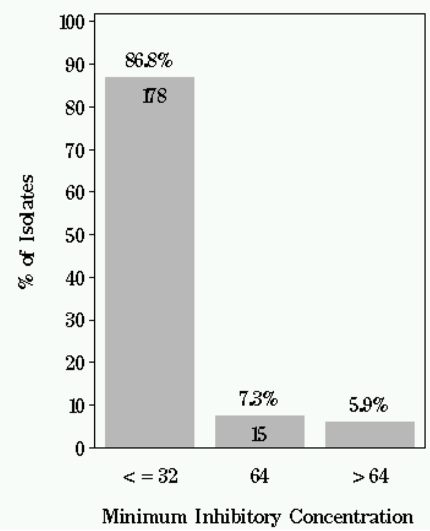
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 191: Minimum Inhibitory Concentration of Streptomycin for *Escherichia* in Pork Chop (N=205 Isolates)

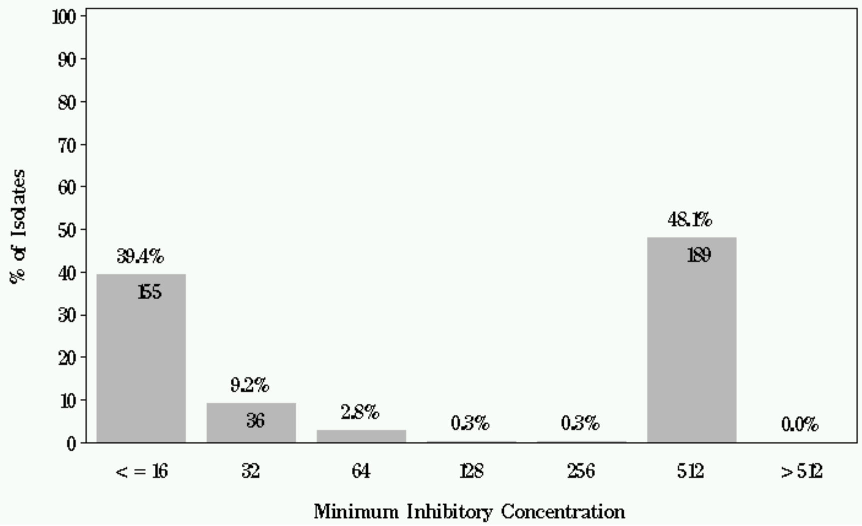
Breakpoints: Susceptible<=32 μg/mL Resistant>=64 μg/mL



NARMS

Figure 19m: Minimum Inhibitory Concentration of Sulfisoxazole for *Escherichia* in Chicken Breast (N=393 Isolates)

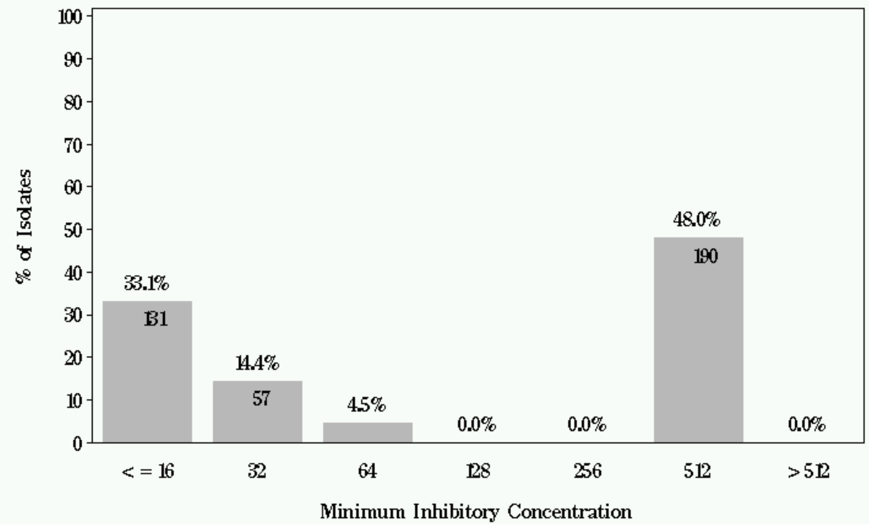
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL



NARMS

Figure 19m: Minimum Inhibitory Concentration of Sulfisoxazole for *Escherichia* in Ground Turkey (N=396 Isolates)

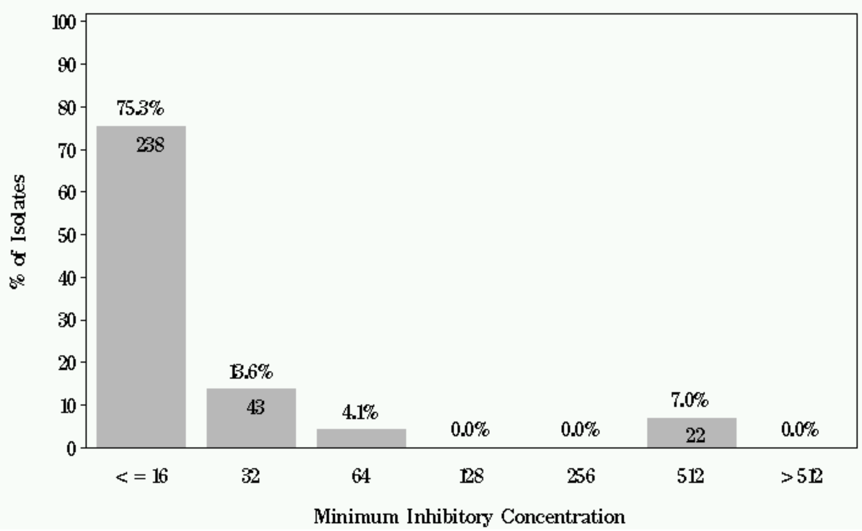
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL



NARMS

Figure 19m: Minimum Inhibitory Concentration of Sulfisoxazole for *Escherichia* in Ground Beef (N=316 Isolates)

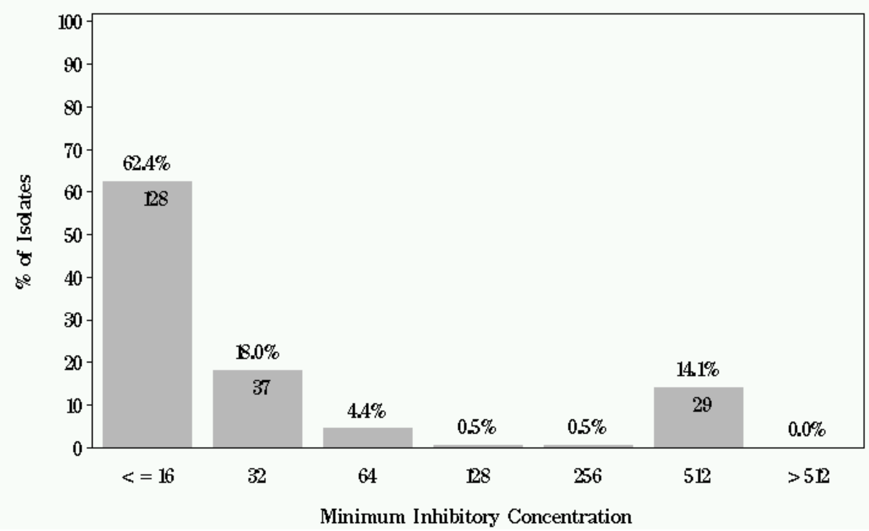
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL



NARMS

Figure 19m: Minimum Inhibitory Concentration of Sulfisoxazole for *Escherichia* in Pork Chop (N=205 Isolates)

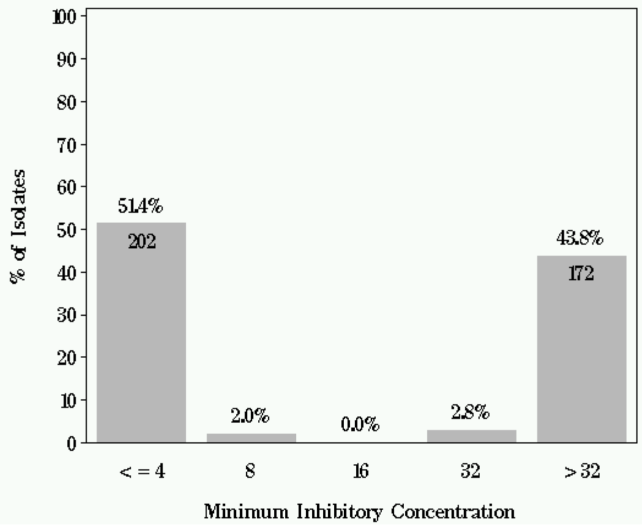
Breakpoints: Susceptible<=256 µg/mL Resistant>=512 µg/mL



NARMS

Figure 19n: Minimum Inhibitory Concentration of Tetracycline for *Escherichia* in Chicken Breast (N=393 Isolates)

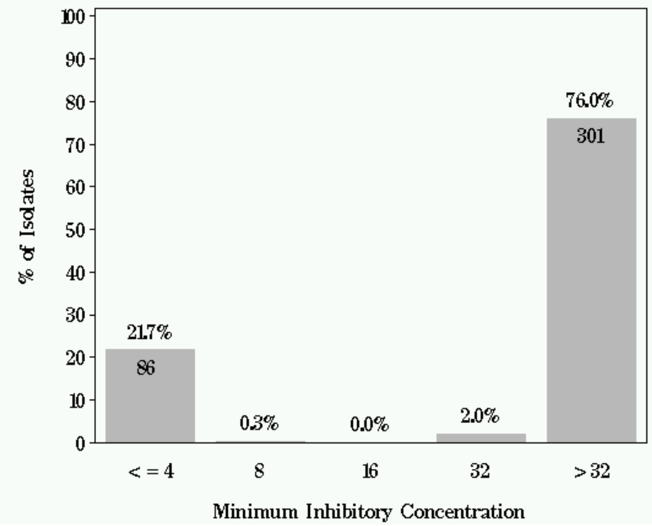
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19n: Minimum Inhibitory Concentration of Tetracycline for *Escherichia* in Ground Turkey (N=396 Isolates)

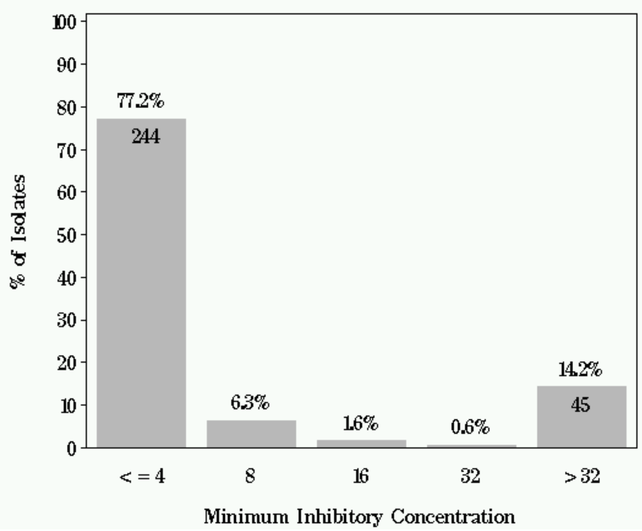
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19n: Minimum Inhibitory Concentration of Tetracycline for *Escherichia* in Ground Beef (N=316 Isolates)

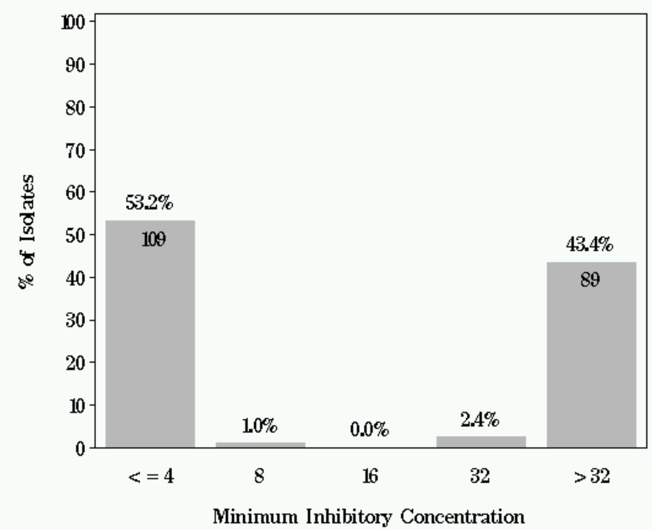
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19n: Minimum Inhibitory Concentration of Tetracycline for *Escherichia* in Pork Chop (N=205 Isolates)

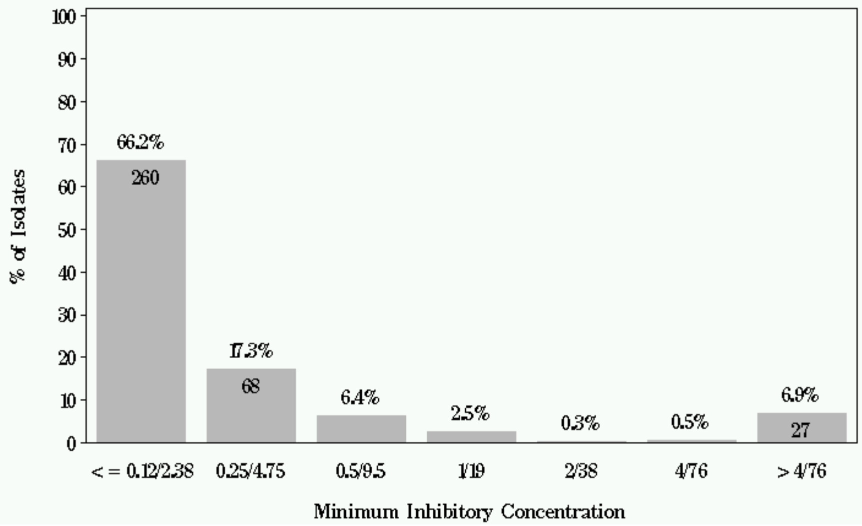
Breakpoints: Susceptible<=4 μg/mL Resistant>=16 μg/mL



NARMS

Figure 19o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Escherichia* in Chicken Breast (N=393 Isolates)

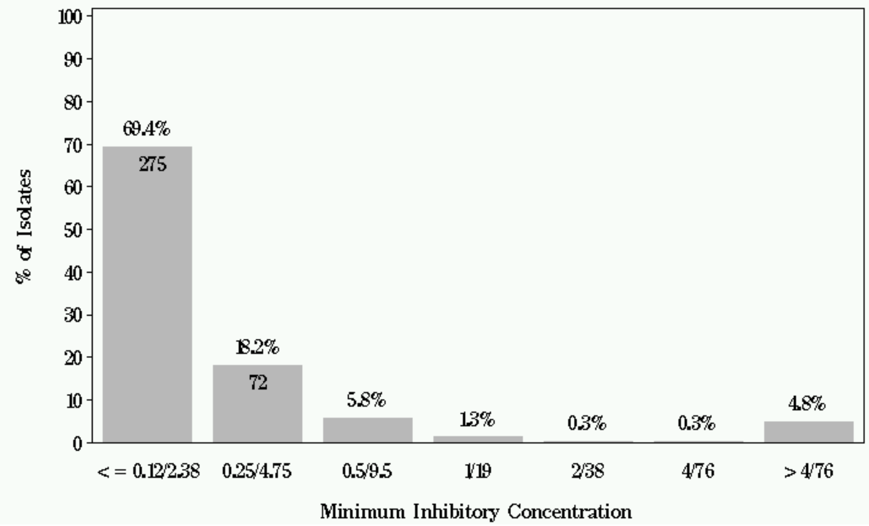
Breakpoints: Susceptible<=2 μg/mL Resistant>=4 μg/mL



NARMS

Figure 19o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Escherichia* in Ground Turkey (N=396 Isolates)

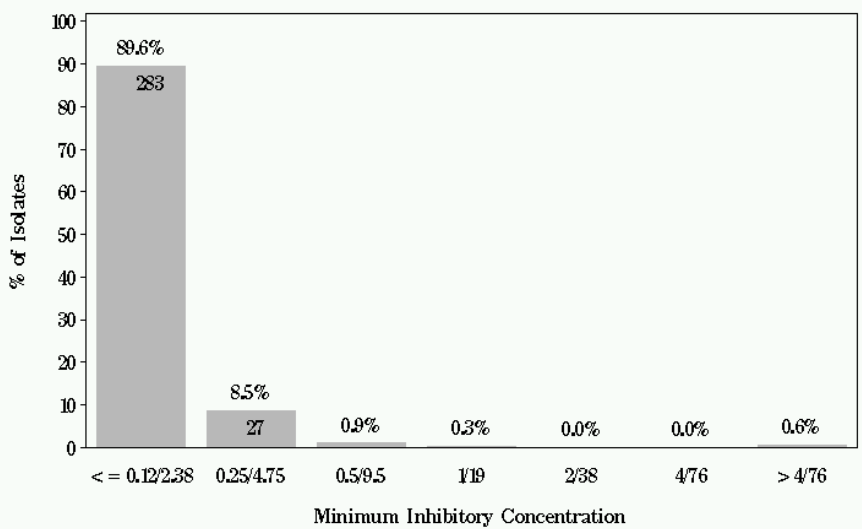
Breakpoints: Susceptible<=2 μg/mL Resistant>=4 μg/mL



NARMS

Figure 19o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Escherichia* in Ground Beef (N=316 Isolates)

Breakpoints: Susceptible<=2 μg/mL Resistant>=4 μg/mL



NARMS

Figure 19o: Minimum Inhibitory Concentration of Trimethoprim/sulfamethoxazole for *Escherichia* in Pork Chop (N=205 Isolates)

Breakpoints: Susceptible<=2 μg/mL Resistant>=4 μg/mL

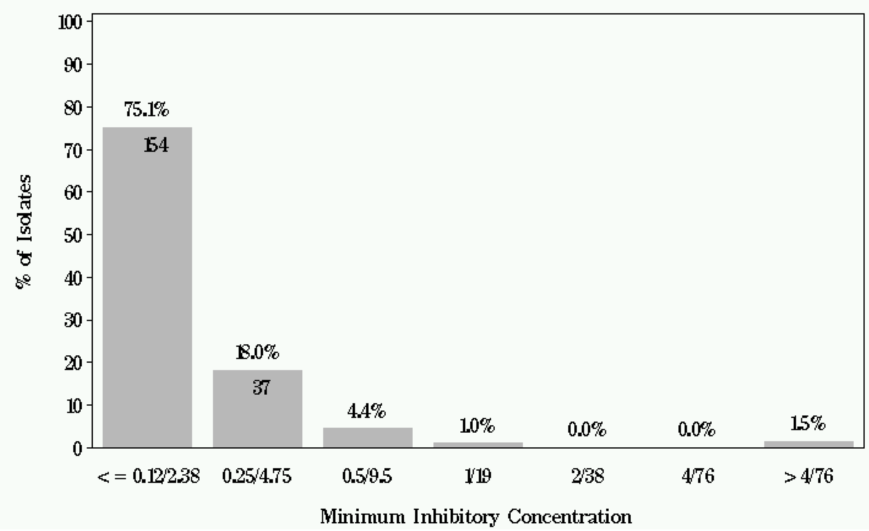


Table 30. Antimicrobial Resistance among *Escherichia coli* by Meat Type, 2002-2005

Meat Type		Antimicrobial Agent																
		Aminoglycosides				Amino-Penicillin	Beta Lactamase Inhibitors	Cephems				Folate Pathway Inhibitors			Pheni-cols	Quinolones		Tetra-cyclines
		AMI	GEN	KAN	STR	AMP	AMC	CEP	TIO	AXO	FOX	COT	FIS	SMX	CHL	CIP	NAL	TET
Chicken Breast	2002 (n=282)	-*	23.0%†	6.0%	49.3%	21.6%	12.1%	21.3%	7.1%	-	11.0%	3.5%			0.7%	-	2.8%	46.1%
	2003 (n=396)	-	29.3%	6.8%	56.1%	25.3%	13.6%	22.0%	7.6%	-	9.3%	7.1%	32.3%		-	-	4.0%	42.9%
	2004 (n=400)	-	30.0%	6.8%	56.8%	17.0%	10.0%	‡	5.8%	-	8.3%	4.3%	41.3%	38.4%		-	7.0%	48.0%
	2005 (n=393)	-	37.7%	7.1%	50.9%	24.7%	12.0%		8.9%	0.5%	11.2%	7.4%	48.1%	1.8%		-	6.6%	46.6%
	Total	-	30.5%	6.7%	53.6%	22.2%	11.9%	21.7%	7.3%	0.1%	9.9%	5.7%	44.6%	35.8%	0.7%	-	5.3%	45.9%
Ground Turkey	2002 (n=304)	-	27.0%	13.2%	57.6%	31.3%	5.6%	14.8%	1.0%	-	3.3%	3.9%		0.5%	0.3%	-	4.3%	77.0%
	2003 (n=333)	-	29.7%	16.8%	54.7%	35.7%	3.0%	18.9%	0.3%	-	1.2%	6.9%	48.0%		3.6%	0.3%	11.7%	77.8%
	2004 (n=376)	-	29.3%	16.0%	49.2%	33.2%	5.3%			-	4.5%	3.7%	48.4%	51.7%		0.8%	10.6%	74.2%
	2005 (n=309)	-	27.5%	11.4%	43.4%	38.1%	3.8%	1.1%		-	3.3%	5.1%	48.0%	0.8%		-	10.4%	78.0%
	Total	-	28.4%	14.3%	50.7%	34.8%	4.4%	17.0%	1.1%	-	3.1%	4.9%	48.2%	49.9%	2.3%	0.3%	9.4%	76.7%
Ground Beef	2002 (n=295)	-	0.3%	2.4%	9.5%	6.1%	2.0%	5.8% 1.8%	-	-	1.4%	0.7%		4.0%	1.0%	-	-	30.8%
	2003 (n=311)	-	1.0%	2.9%	9.0%	5.1%	2.3%	8.0%	0.3%	-	0.3%	0.3%	9.8%		2.3%	-	1.0%	25.1%
	2004 (n=338)	-	0.6%	2.4%	11.8%	5.3%	3.8%			-	1.2%	0.6%	13.0%	10.3%		-	1.5%	22.8%
	2005 (n=316)	-	-	0.6%	5.4%	3.5%	1.3%	0.9%		-	0.9%	0.6%	7.0%	3.6%		-	1.3%	16.5%
	Total	-	0.5%	2.1%	9.0%	5.0%	2.4%	6.9%	0.6%	-	1.0%	0.6%	10.1%	10.1%	2.1%	-	1.0%	23.7%
Pork Chop	2002 (n=184)	-	1.1%	5.4%	22.3%	13.6%	5.4%	10.3% 0.9%	0.5%	-	3.3%	1.1%		1.6%	1.6%	-	0.5%	52.7%
	2003 (n=218)	-	1.4%	8.7%	19.7%	13.3%	5.0%	11.9%	0.9%	-	2.3%	2.8%	12.5%		4.1%	-	0.5%	46.3%
	2004 (n=232)	-	1.3%	8.2%	21.1%	15.1%	5.6%			-	2.2%	3.9%	19.4%	15.1%		-	-	56.0%
	2005 (n=205)	-	-	7.3%	13.2%	16.1%	2.9%	0.4%		-	2.0%	1.5%	14.1%	4.3%		0.5%	1.5%	45.9%
	Total	-	1.0%	7.5%	19.1%	14.5%	4.8%	11.2%	0.6%	-	2.4%	2.4%	16.9%	13.9%	3.5%	0.1%	0.6%	50.3%
	Grand Total	-	17.3%	7.8%	35.6%	20.1%	6.2%	14.7% 0.5%	2.7%	-	4.4%	3.6%	32.6%	29.2% 3.4%	2.0%	0.1%	4.6%	49.7%

* Dashes indicate 0.0% resistance to antimicrobial.
† Where % Resistance = (isolates resistant to antimicrobial) / (total # isolates)
‡ Gray area indicates drug not included in testing that year.

Table 31. Number of *Escherichia coli* Resistant to Multiple Antimicrobial Agents, 2002-2005

Meat Type		Number of Antimicrobials				
		2002	**2003**	**2004**	**2005**	**Total**
Chicken Breast	**0**	69	85	86	80	**320**
	1	50	75	97	55	**277**
	2-4	116	170	190	204	**680**
	5-7	38	52	23	45	**158**
	≥8	9	14	4	9	**36**
	Total	**282**	**396**	**400**	**393**	**1471**
Ground Turkey	**0**	50	51	74	64	**239**
	1	40	44	61	54	**199**
	2-4	153	157	212	201	**723**
	5-7	54	74	24	73	**225**
	≥8	7	7	5	4	**23**
	Total	**304**	**333**	**376**	**396**	**1409**
Ground Beef	**0**	184	218	249	256	**907**
	1	62	45	45	30	**182**
	2-4	47	39	36	26	**148**
	5-7	1	8	7	2	**18**
	≥8	1	1	1	2	**5**
	Total	**295**	**311**	**338**	**316**	**1260**
Pork Chop	**0**	76	102	90	101	**369**
	1	42	40	72	46	**200**
	2-4	59	64	64	53	**240**
	5-7	5	8	6	5	**24**
	≥8	2	4	0	0	**6**
	Total	**184**	**218**	**232**	**205**	**839**

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APPENDICES

Appendix A-1. Percent Positive* Samples by Month, Meat Type, and Bacterium, 2005

Month: January

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	98	45	45.9%
Salmonella	98	14	14.3%
Enterococcus	40	39	97.5%
Escherichia coli	40	37	92.5%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	6	6.0%
Salmonella	100	11	11.0%
Enterococcus	40	40	100.0%
Escherichia coli	40	36	90.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	39	97.5%
Escherichia coli	39	25	64.1%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	2	2.0%
Salmonella	100	1	1.0%
Enterococcus	40	35	87.5%
Escherichia coli	40	20	50.0%

** Where % Positive= (# isolates of isolates / # of samples).

Month: **February**

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	60	60.0%
Salmonella	100	16	16.0%
Enterococcus	40	40	100.0%
Escherichia coli	40	36	90.0%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	99	0	0.0%
Salmonella	99	11	11.1%
Enterococcus	40	38	95.0%
Escherichia coli	40	30	75.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	1	1.0%
Enterococcus	40	37	92.5%
Escherichia coli	40	26	65.0%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	35	87.5%
Escherichia coli	35	13	37.1%

Month: **March**

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	46	46.0%
Salmonella	100	17	17.0%
Enterococcus	40	37	92.5%
Escherichia coli	40	32	80.0%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	1	1.0%
Salmonella	100	18	18.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	37	92.5%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	34	85.0%
Escherichia coli	40	30	75.0%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	1	1.0%
Enterococcus	40	35	87.5%
Escherichia coli	40	20	50.0%

Month: April

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	42	42.0%
Salmonella	100	11	11.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	35	87.5%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	2	2.0%
Salmonella	100	12	12.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	32	80.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	36	90.0%
Escherichia coli	40	16	40.0%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	36	90.0%
Escherichia coli	40	18	45.0%

Month: May

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	47	47.0%
Salmonella	100	10	10.0%
Enterococcus	40	39	97.5%
Escherichia coli	39	34	87.2%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	1	1.0%
Salmonella	100	15	15.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	33	82.5%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	23	57.5%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	19	47.5%

Month: June

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	45	45.0%
Salmonella	100	10	10.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	34	85.0%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	14	14.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	40	100.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	25	62.5%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	1	1.0%
Enterococcus	40	34	85.0%
Escherichia coli	40	10	25.0%

Month: July

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	16	16.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	31	77.5%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	16	16.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	31	77.5%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	16	16.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	31	77.5%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	5	5.0%
Enterococcus	40	36	90.0%
Escherichia coli	40	17	42.5%

Month: August

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	99	47	47.5%
Salmonella	100	13	13.0%
Enterococcus	40	40	100.0%
Escherichia coli	40	34	85.0%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	2	2.0%
Salmonella	100	27	27.0%
Enterococcus	40	40	100.0%
Escherichia coli	40	37	92.5%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	2	2.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	30	75.0%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	37	92.5%
Escherichia coli	40	18	45.0%

Month: September

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	95	35	36.8%
Salmonella	96	12	12.5%
Enterococcus	40	36	90.0%
Escherichia coli	40	31	77.5%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	96	2	2.1%
Salmonella	96	15	15.6%
Enterococcus	40	37	92.5%
Escherichia coli	40	30	75.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	96	0	0.0%
Salmonella	96	2	2.1%
Enterococcus	40	40	100.0%
Escherichia coli	39	25	64.1%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	96	0	0.0%
Salmonella	96	0	0.0%
Enterococcus	40	31	77.5%
Escherichia coli	40	27	67.5%

Month: October

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	47	47.0%
Salmonella	100	10	10.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	35	87.5%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	2	2.0%
Salmonella	100	9	9.0%
Enterococcus	40	37	92.5%
Escherichia coli	40	30	75.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	1	1.0%
Enterococcus	40	39	97.5%
Escherichia coli	40	33	82.5%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	40	32	80.0%
Escherichia coli	40	19	47.5%

Month: November

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	42	42.0%
Salmonella	100	14	14.0%
Enterococcus	40	40	100.0%
Escherichia coli	39	35	89.7%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	3	3.0%
Salmonella	100	16	16.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	36	90.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	2	2.0%
Enterococcus	40	38	95.0%
Escherichia coli	40	31	77.5%

Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	1	1.0%
Enterococcus	40	35	87.5%
Escherichia coli	40	14	35.0%

Month: December

Meat Type: Chicken Breast

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	47	47.0%
Salmonella	100	14	14.0%
Enterococcus	30	30	100.0%
Escherichia coli	30	24	80.0%

Meat Type: Ground Turkey

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	1	1.0%
Salmonella	100	19	19.0%
Enterococcus	30	28	93.3%
Escherichia coli	30	24	80.0%

Meat Type: Ground Beef

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	30	29	96.7%
Escherichia coli	30	21	70.0%

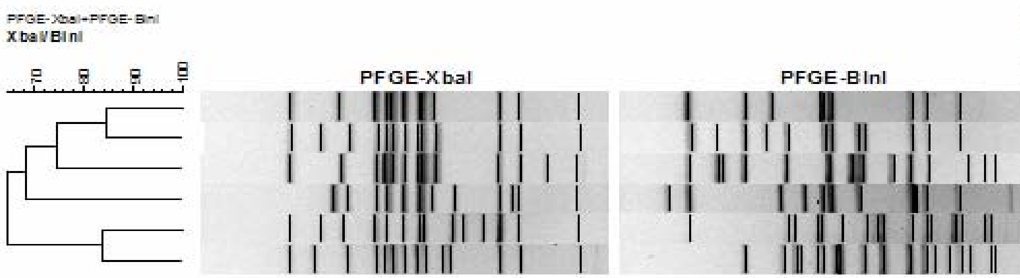
Meat Type: Pork Chop

Bacterium	# of Samples	# of Isolates	Positive (%)
Campylobacter	100	0	0.0%
Salmonella	100	0	0.0%
Enterococcus	30	24	80.0%
Escherichia coli	30	10	33.3%

Appendix A-2. Percent Positive Samples by Meat Type, Bacterium, and Site, 2005

Meat Type	Site	*Campylobacter*			*Salmonella*			*Enterococcus*			*Escherichia coli*		
		N	# Isolates	%Positive	N	# Isolates	%Positive	N	# Isolates	%Positive	N	# Isolates	%Positive
Chicken Breast	CA	118	83	70.3%	118	21	17.8%						
	CO	116	38	32.8%	116	12	10.3%						
	CT	120	85	70.8%	120	19	15.8%						
	GA	120	62	51.7%	120	10	8.3%	120	120	100.0%	120	119	99.2%
	MD	120	85	70.8%	120	22	18.3%	120	110	91.7%	120	100	83.3%
	MN	120	24	20.0%	120	24	20.0%						
	NM	120	31	25.8%	120	5	4.2%						
	NY	116	50	43.1%	120	17	14.2%						
	OR	120	37	30.8%	120	16	13.3%	110	109	99.1%	120	76	63.3%
	TN	120	59	49.2%	120	7	5.8%	120	118	98.3%	108	98	90.7%
	Total	**1190**	**554**	**46.6%**	**1194**	**153**	**12.8%**	**470**	**457**	**97.2%**	**468**	**393**	**84.0%**
Ground Turkey	CA	119	1	0.8%	119	15	12.6%						
	CO	116	0	0.0%	116	17	14.7%						
	CT	120	3	2.5%	120	12	10.0%						
	GA	120	5	4.2%	120	32	26.7%	120	120	100.0%	120	117	97.5%
	MD	120	3	2.5%	120	12	10.0%	120	111	92.5%	120	105	87.5%
	MN	120	4	3.3%	120	28	23.3%						
	NM	120	2	1.7%	120	20	16.7%						
	NY	120	1	0.8%	120	12	10.0%						
	OR	120	0	0.0%	120	16	13.3%	110	103	93.6%	120	72	60.0%
	TN	120	1	0.8%	120	19	15.8%	120	118	98.3%	110	102	92.7%
	Total	**1195**	**20**	**1.7%**	**1195**	**183**	**15.3%**	**470**	**452**	**96.2%**	**470**	**396**	**84.3%**
Ground Beef	CA	120	0	0.0%	120	1	0.8%						
	CO	116	0	0.0%	116	0	0.0%						
	CT	120	0	0.0%	120	3	2.5%						
	GA	120	0	0.0%	120	0	0.0%	120	118	98.3%	120	102	85.0%
	MD	120	0	0.0%	120	0	0.0%	120	113	94.2%	120	78	65.0%
	MN	120	0	0.0%	120	1	0.8%						
	NM	120	0	0.0%	120	1	0.8%						
	NY	120	0	0.0%	120	0	0.0%						
	OR	120	0	0.0%	120	1	0.8%	110	98	89.1%	120	61	50.8%
	TN	120	0	0.0%	120	1	0.8%	120	118	98.3%	108	75	69.4%
	Total	**1196**	**0**	**0.0%**	**1196**	**8**	**0.7%**	**470**	**447**	**95.1%**	**468**	**316**	**67.5%**
Pork Chop	CA	120	0	0.0%	120	2	1.7%						
	CO	116	0	0.0%	116	0	0.0%						
	CT	120	1	0.8%	120	1	0.8%						
	GA	120	0	0.0%	120	2	1.7%	120	117	97.5%	120	71	59.2%
	MD	120	1	0.8%	120	3	2.5%	120	86	71.7%	120	58	48.3%
	MN	120	0	0.0%	120	0	0.0%						
	NM	120	0	0.0%	120	0	0.0%						
	NY	120	0	0.0%	120	1	0.8%						
	OR	120	0	0.0%	120	0	0.0%	110	95	86.4%	120	31	25.8%
	TN	120	0	0.0%	120	0	0.0%	120	111	92.5%	105	45	42.9%
	Total	**1196**	**2**	**0.2%**	**1196**	**9**	**0.8%**	**470**	**409**	**87.0%**	**465**	**205**	**44.1%**
Total		**4777**	**576**	**12.1%**	**4781**	**353**	**7.4%**	**1880**	**1765**	**93.9%**	**1871**	**1310**	**70.0%**

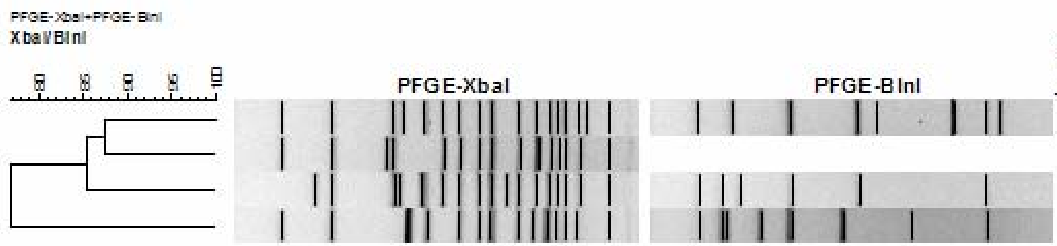
A-3a. PFGE Profiles for *Salmonella* Agona



Antibiogram

GEN	STR	FIS	TET	CVM #	State	Source	Date Isolated	Serotype
				N4551	CT	Ground Turkey	08/05	Agona
		■	■	N7299	CO	Ground Turkey	11/05	Agona
		■	■	N4423	CA	Pork Chop	07/05	Agona
■	■	■	■	N6423	NY	Ground Turkey	01/05	Agona
■				N6501	OR	Ground Turkey	03/05	Agona
			■	N7344	GA	Ground Turkey	10/05	Agona

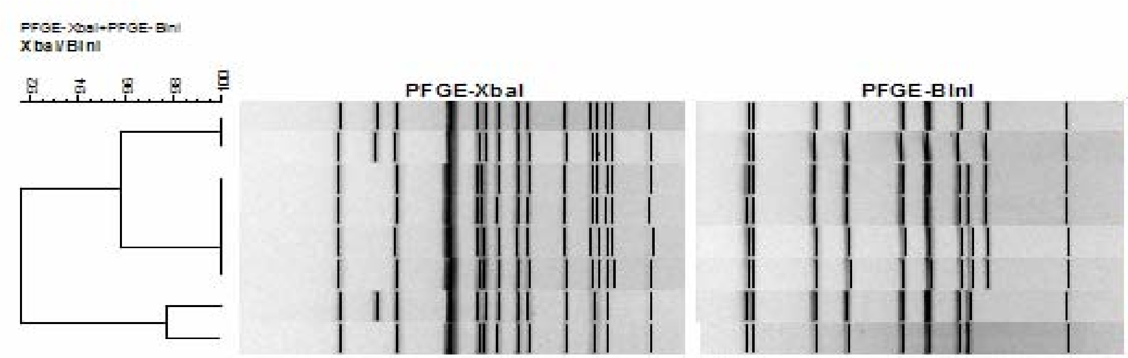
A-3b. PFGE Profiles for *Salmonella* Anatum



Antibiogram

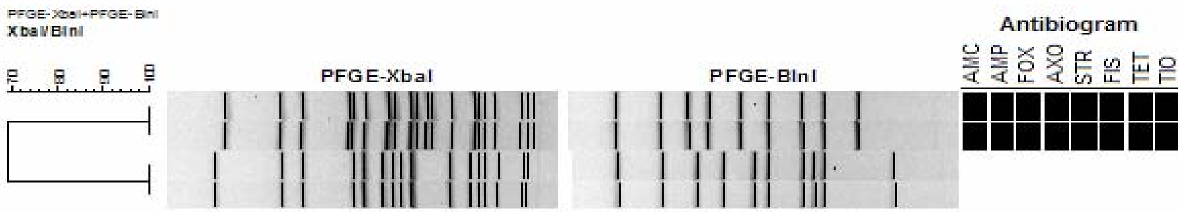
AMC	AMP	FOX	STR	TET	TIO	CVM #	State	Source	Date Isolated	Serotype
■	■	■	■	■	■	N5396	MD	Chicken Breast	11/05	Anatum
				■		N6332	MN	Ground Turkey	12/05	Anatum
						N7312	CT	Pork Chop	11/05	Anatum
				■		N4638	GA	Pork Chop	07/05	Anatum

A-3c. PFGE Profiles for *Salmonella* Brandenburg



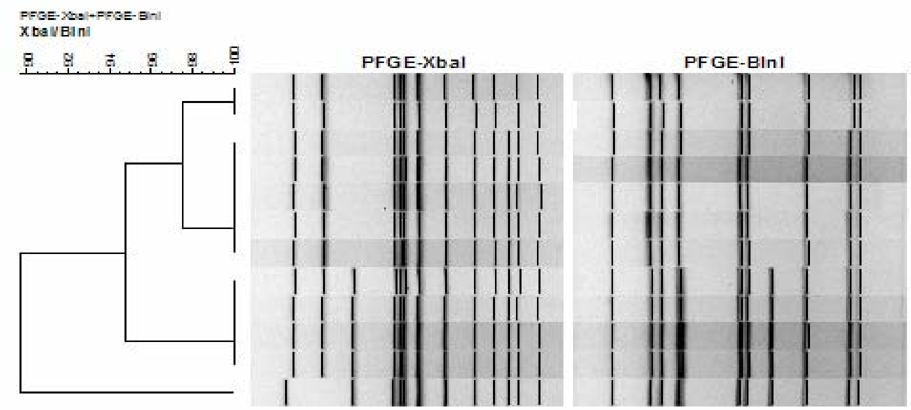
CVM #	State	Source	Date Isolated	Serotype
N6368	NM	Ground Turkey	02/05	Brandenburg
N7324	TN	Ground Turkey	04/05	Brandenburg
N4433	CA	Ground Turkey	09/05	Brandenburg
N4434	CA	Ground Turkey	09/05	Brandenburg
N6316	MN	Ground Turkey	09/05	Brandenburg
N6318	MN	Ground Turkey	09/05	Brandenburg
N6286	MN	Ground Turkey	01/05	Brandenburg
N6311	MN	Ground Turkey	08/05	Brandenburg

A-3d. PFGE Profiles for *Salmonella* Bredeney



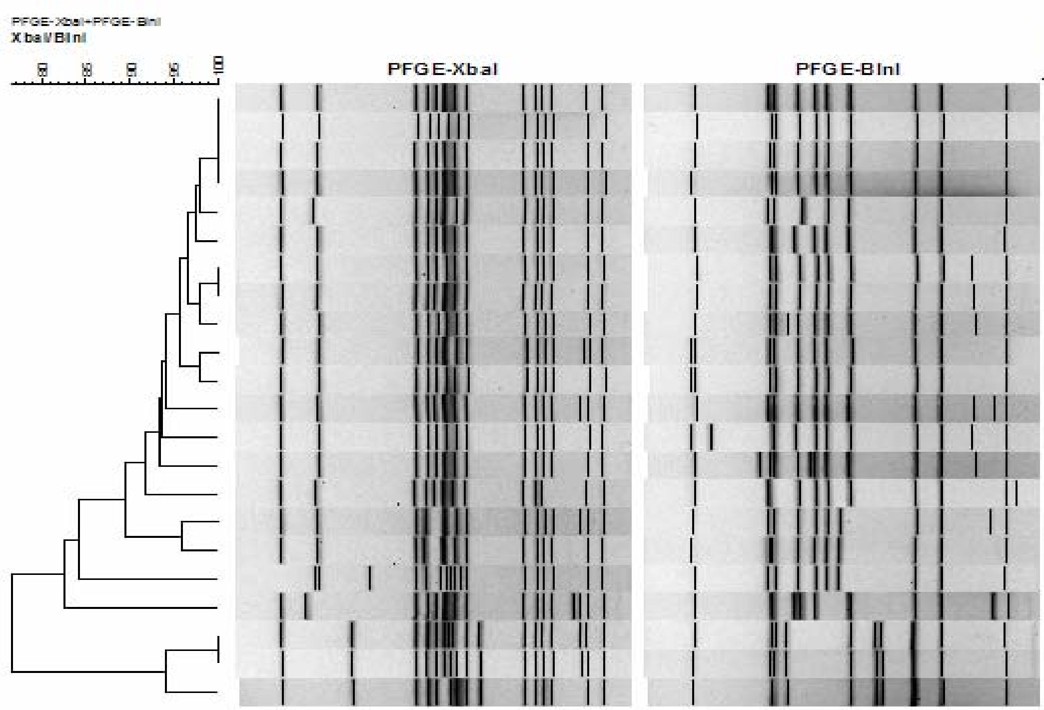
CVM #	State	Source	Date Isolated	Serotype
N6328	MN	Ground Turkey	11/05	Bredeney
N6329	MN	Ground Turkey	11/05	Bredeney
N6325	MN	Chicken Breast	11/05	Bredeney
N6326	MN	Chicken Breast	11/05	Bredeney

A-3e. PFGE Profiles for *Salmonella* Enteritidis



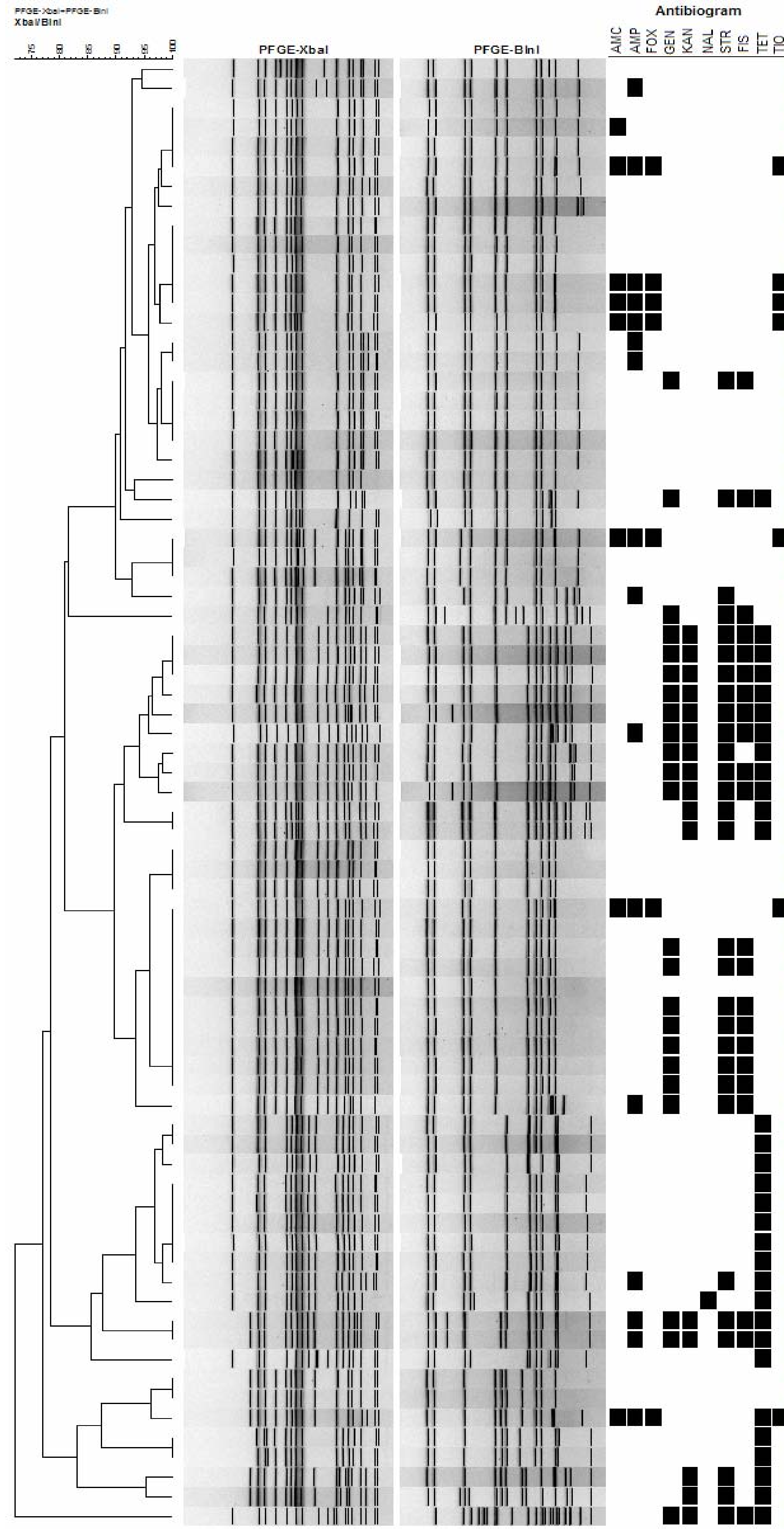
CVM #	State	Source	Date Isolated	Serotype
N5373	MD	Chicken Breast	03/05	Enteritidis
N6324	MN	Chicken Breast	11/05	Enteritidis
N4553	CT	Chicken Breast	09/05	Enteritidis
N4639	GA	Chicken Breast	08/05	Enteritidis
N5365	MD	Chicken Breast	01/05	Enteritidis
N5372	MD	Chicken Breast	03/05	Enteritidis
N5400	MD	Chicken Breast	12/05	Enteritidis
N4529	CT	Chicken Breast	02/05	Enteritidis
N4533	CT	Chicken Breast	03/05	Enteritidis
N7361	NM	Chicken Breast	12/05	Enteritidis
N7362	NM	Chicken Breast	12/05	Enteritidis
N7327	TN	Chicken Breast	06/05	Enteritidis

A-3f. PFGE Profiles for *Salmonella* Hadar



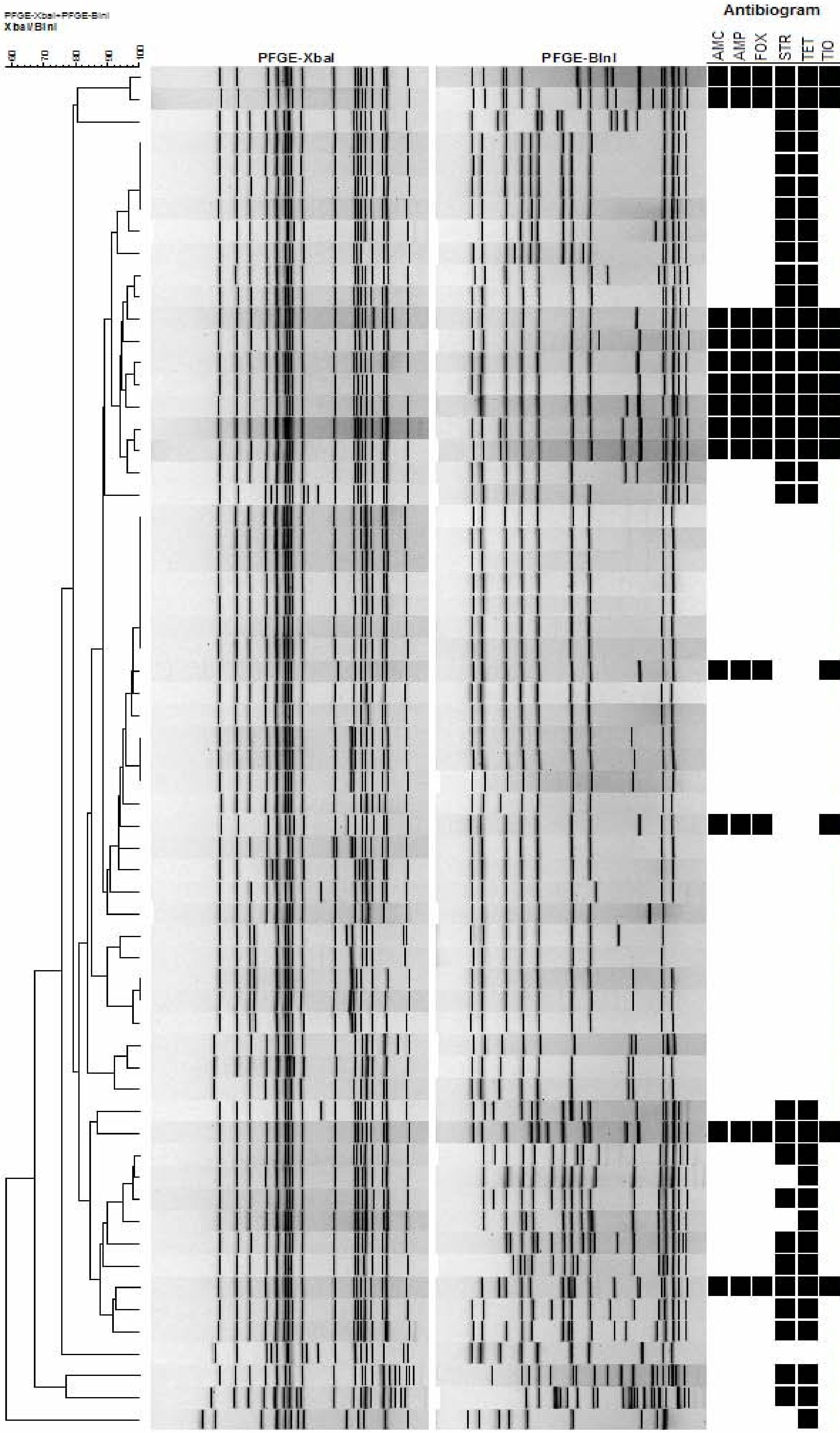
Antibiogram AMC	AMP	KAN	STR	FIS	TET	CVM #	State	Source	Date Isolated	Serotype
			■		■	N6499	OR	Chicken Breast	03/05	Hadar
			■		■	N6505	OR	Chicken Breast	05/05	Hadar
			■		■	N7289	CO	Ground Turkey	07/05	Hadar
			■		■	N7295	CO	Chicken Breast	10/05	Hadar
						N7365	NM	Ground Turkey	12/05	Hadar
			■		■	N4531	CT	Chicken Breast	02/05	Hadar
			■		■	N6373	NM	Ground Turkey	05/05	Hadar
			■		■	N6512	OR	Ground Turkey	06/05	Hadar
			■		■	N6304	MN	Ground Turkey	06/05	Hadar
	■		■		■	N4405	CA	Chicken Breast	03/05	Hadar
			■		■	N6504	OR	Chicken Breast	05/05	Hadar
			■		■	N6386	NM	Ground Turkey	11/05	Hadar
			■		■	N4530	CT	Chicken Breast	02/05	Hadar
			■		■	N6385	NM	Ground Turkey	11/05	Hadar
			■		■	N6295	MN	Ground Turkey	03/05	Hadar
	■				■	N6330	MN	Chicken Breast	12/05	Hadar
	■		■		■	N6521	OR	Chicken Breast	12/05	Hadar
			■		■	N6336	MN	Ground Turkey	12/05	Hadar
■	■	■	■	■	■	N4626	GA	Ground Turkey	03/05	Hadar
	■		■		■	N4631	GA	Ground Turkey	06/05	Hadar
	■		■		■	N4632	GA	Ground Turkey	06/05	Hadar
			■		■	N6447	NY	Ground Turkey	09/05	Hadar

A-3g. PFGE Profiles for *Salmonella* Heidelberg



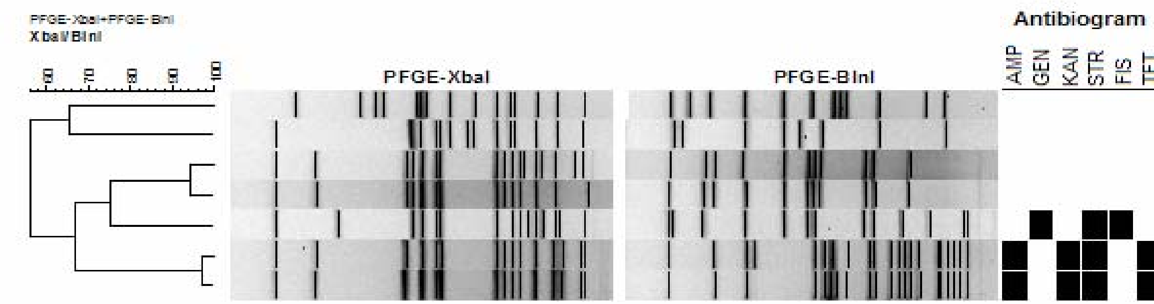
CVM #	State	Source	Date Isolated	Serotype
N5366	MD	Chicken Breast	01/05	Heidelberg
N7296	CO	Chicken Breast	11/05	Heidelberg
N6495	OR	Chicken Breast	02/05	Heidelberg
N6496	OR	Chicken Breast	02/05	Heidelberg
N6513	OR	Chicken Breast	07/05	Heidelberg
N7323	TN	Chicken Breast	03/05	Heidelberg
N6320	MN	Ground Turkey	10/05	Heidelberg
N6383	NM	Chicken Breast	10/05	Heidelberg
N4532	CT	Ground Turkey	02/05	Heidelberg
N5390	MD	Ground Turkey	08/05	Heidelberg
N6303	MN	Ground Turkey	06/05	Heidelberg
N7328	TN	Ground Turkey	06/05	Heidelberg
N7329	TN	Ground Turkey	06/05	Heidelberg
N7315	CT	Ground Turkey	12/05	Heidelberg
N6305	MN	Chicken Breast	07/05	Heidelberg
N6306	MN	Chicken Breast	07/05	Heidelberg
N4403	CA	Chicken Breast	02/05	Heidelberg
N4496	CO	Chicken Breast	02/05	Heidelberg
N4541	CT	Chicken Breast	05/05	Heidelberg
N7363	NM	Ground Turkey	12/05	Heidelberg
N4627	GA	Chicken Breast	04/05	Heidelberg
N5386	MD	Ground Turkey	07/05	Heidelberg
N6288	MN	Chicken Breast	02/05	Heidelberg
N7320	TN	Ground Turkey	01/05	Heidelberg
N6493	OR	Chicken Breast	01/05	Heidelberg
N6498	OR	Chicken Breast	02/05	Heidelberg
N7306	CA	Chicken Breast	12/05	Heidelberg
N4494	CO	Chicken Breast	01/05	Heidelberg
N6327	MN	Chicken Breast	11/05	Heidelberg
N6310	MN	Ground Turkey	08/05	Heidelberg
N6445	NY	Ground Turkey	08/05	Heidelberg
N7288	CO	Ground Turkey	07/05	Heidelberg
N7292	CO	Ground Turkey	08/05	Heidelberg
N6444	NY	Ground Turkey	08/05	Heidelberg
N6301	MN	Ground Turkey	05/05	Heidelberg
N4503	CO	Ground Turkey	03/05	Heidelberg
N6319	MN	Ground Turkey	10/05	Heidelberg
N6443	NY	Ground Turkey	08/05	Heidelberg
N4621	GA	Ground Turkey	02/05	Heidelberg
N4622	GA	Ground Turkey	02/05	Heidelberg
N5369	MD	Chicken Breast	02/05	Heidelberg
N6434	NY	Chicken Breast	06/05	Heidelberg
N7287	CO	Chicken Breast	07/05	Heidelberg
N4504	CO	Ground Turkey	04/05	Heidelberg
N4628	GA	Ground Turkey	04/05	Heidelberg
N4630	GA	Ground Turkey	04/05	Heidelberg
N5395	MD	Ground Turkey	09/05	Heidelberg
N6290	MN	Ground Turkey	02/05	Heidelberg
N6377	NM	Ground Turkey	07/05	Heidelberg
N7335	TN	Ground Turkey	08/05	Heidelberg
N7336	TN	Ground Turkey	08/05	Heidelberg
N7341	TN	Ground Turkey	10/05	Heidelberg
N7342	TN	Ground Turkey	10/05	Heidelberg
N4620	GA	Ground Turkey	01/05	Heidelberg
N4629	GA	Ground Turkey	04/05	Heidelberg
N5399	MD	Ground Turkey	11/05	Heidelberg
N6287	MN	Ground Turkey	01/05	Heidelberg
N4499	CO	Ground Turkey	03/05	Heidelberg
N4645	GA	Ground Turkey	09/05	Heidelberg
N6435	NY	Ground Turkey	06/05	Heidelberg
N7331	TN	Ground Turkey	08/05	Heidelberg
N7334	TN	Ground Turkey	08/05	Heidelberg
N6334	MN	Ground Turkey	12/05	Heidelberg
N5383	MD	Ground Turkey	06/05	Heidelberg
N6378	NM	Ground Turkey	08/05	Heidelberg
N6379	NM	Ground Turkey	08/05	Heidelberg
N7332	TN	Ground Turkey	08/05	Heidelberg
N4634	GA	Ground Turkey	07/05	Heidelberg
N4635	GA	Ground Turkey	07/05	Heidelberg
N4539	CT	Ground Turkey	03/05	Heidelberg
N7321	TN	Ground Turkey	02/05	Heidelberg
N7322	TN	Ground Turkey	02/05	Heidelberg
N4636	GA	Ground Turkey	07/05	Heidelberg
N5398	MD	Ground Turkey	11/05	Heidelberg
N6333	MN	Ground Turkey	12/05	Heidelberg

A-3h. PFGE Profiles for *Salmonella* Kentucky



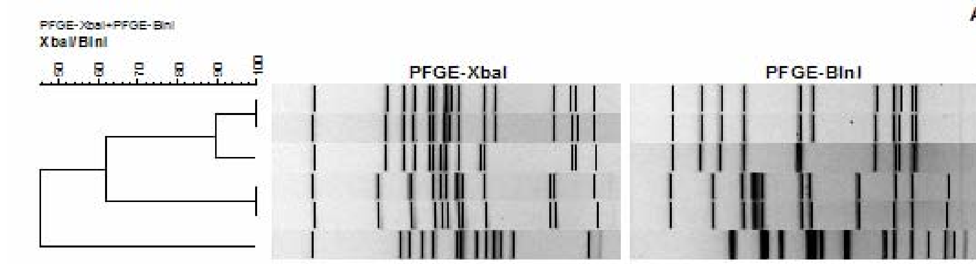
CVM #	State	Source	Date Isolated	Serotype
N6440	NY	Chicken Breast	08/05	Kentucky
N6442	NY	Chicken Breast	08/05	Kentucky
N4429	CA	Chicken Breast	09/05	Kentucky
N6298	MN	Chicken Breast	04/05	Kentucky
N6299	MN	Chicken Breast	04/05	Kentucky
N6300	MN	Chicken Breast	05/05	Kentucky
N7304	CA	Chicken Breast	11/05	Kentucky
N6292	MN	Chicken Breast	03/05	Kentucky
N6314	MN	Chicken Breast	09/05	Kentucky
N4545	CT	Chicken Breast	06/05	Kentucky
N5367	MD	Chicken Breast	01/05	Kentucky
N5388	MD	Chicken Breast	08/05	Kentucky
N6421	NY	Chicken Breast	01/05	Kentucky
N5377	MD	Chicken Breast	04/05	Kentucky
N5384	MD	Chicken Breast	07/05	Kentucky
N7358	NY	Chicken Breast	10/05	Kentucky
N6427	NY	Chicken Breast	03/05	Kentucky
N6446	NY	Chicken Breast	09/05	Kentucky
N5394	MD	Ground Turkey	09/05	Kentucky
N6313	MN	Chicken Breast	09/05	Kentucky
N4407	CA	Chicken Breast	04/05	Kentucky
N4408	CA	Chicken Breast	04/05	Kentucky
N4409	CA	Chicken Breast	04/05	Kentucky
N4418	CA	Chicken Breast	07/05	Kentucky
N4419	CA	Chicken Breast	07/05	Kentucky
N6370	NM	Chicken Breast	05/05	Kentucky
N7326	TN	Chicken Breast	06/05	Kentucky
N5374	MD	Chicken Breast	03/05	Kentucky
N4426	CA	Chicken Breast	08/05	Kentucky
N7290	CO	Chicken Breast	08/05	Kentucky
N4549	CT	Chicken Breast	08/05	Kentucky
N4550	CT	Chicken Breast	08/05	Kentucky
N6315	MN	Chicken Breast	09/05	Kentucky
N4415	CA	Chicken Breast	05/05	Kentucky
N6322	MN	Chicken Breast	10/05	Kentucky
N6369	NM	Chicken Breast	03/05	Kentucky
N7301	CA	Chicken Breast	10/05	Kentucky
N7302	CA	Chicken Breast	10/05	Kentucky
N7297	CO	Chicken Breast	11/05	Kentucky
N6518	OR	Chicken Breast	10/05	Kentucky
N6519	OR	Chicken Breast	10/05	Kentucky
N4548	CT	Chicken Breast	07/05	Kentucky
N6297	MN	Chicken Breast	04/05	Kentucky
N6506	OR	Chicken Breast	05/05	Kentucky
N6502	OR	Chicken Breast	04/05	Kentucky
N6514	OR	Chicken Breast	07/05	Kentucky
N4431	CA	Chicken Breast	09/05	Kentucky
N4643	GA	Chicken Breast	09/05	Kentucky
N7359	NY	Chicken Breast	11/05	Kentucky
N5393	MD	Chicken Breast	09/05	Kentucky
N5397	MD	Chicken Breast	11/05	Kentucky
N5401	MD	Chicken Breast	12/05	Kentucky
N7345	GA	Chicken Breast	11/05	Kentucky
N6309	MN	Chicken Breast	08/05	Kentucky
N6289	MN	Chicken Breast	02/05	Kentucky
N5375	MD	Chicken Breast	03/05	Kentucky
N7314	CT	Chicken Breast	12/05	Kentucky
N7318	TN	Chicken Breast	01/05	Kentucky
N4430	CA	Chicken Breast	09/05	Kentucky
N6497	OR	Chicken Breast	02/05	Kentucky
N6510	OR	Chicken Breast	06/05	Kentucky
N6523	OR	Ground Turkey	12/05	Kentucky

A-3i. PFGE Profiles for *Salmonella* Montevideo



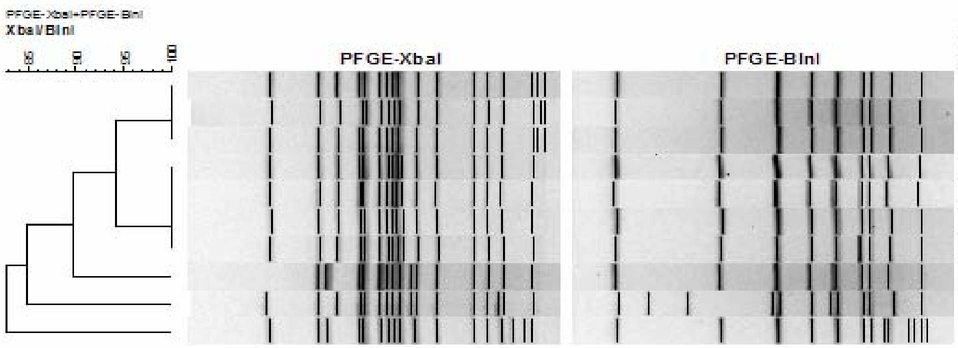
CVM #	State	Source	Date Isolated	Serotype
N6323	MN	Ground Beef	10/05	Montevideo
N6517	OR	Ground Beef	08/05	Montevideo
N4640	GA	Ground Turkey	08/05	Montevideo
N6371	NM	Ground Turkey	05/05	Montevideo
N4425	CA	Chicken Breast	08/05	Montevideo
N7348	GA	Ground Turkey	11/05	Montevideo
N7351	GA	Ground Turkey	11/05	Montevideo

A-3j. PFGE Profiles for *Salmonella* Muenster



Antibiograms								
AMP	KAN	NAL	STR	CVM #	State	Source	Date Isolated	Serotype
				N7310	CT	Ground Beef	11/05	Muenster
				N7311	CT	Ground Beef	11/05	Muenster
				N6382	NM	Ground Beef	09/05	Muenster
				N6380	NM	Ground Turkey	09/05	Muenster
				N6381	NM	Ground Turkey	09/05	Muenster
■	■	■	■	N7360	NY	Ground Turkey	12/05	Muenster

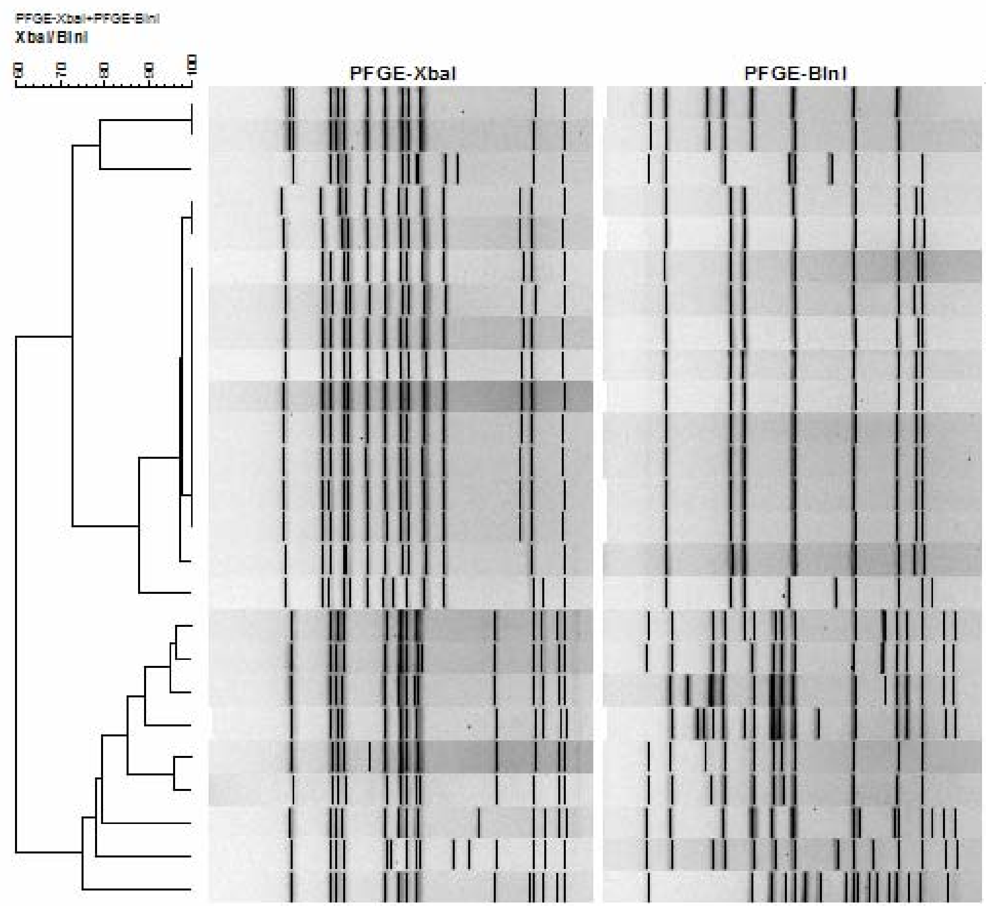
A-3k. PFGE Profiles for *Salmonella* Reading



Antibiogram

AMC	AMP	FOX	AXO	KAN	FIS	TET	COT	TIO	CVM #	State	Source	Date Isolated	Serotype
									N6307	MN	Ground Turkey	07/05	Reading
									N6494	OR	Ground Turkey	01/05	Reading
									N6500	OR	Ground Turkey	03/05	Reading
■	■	■	■					■	N4421	CA	Ground Turkey	07/05	Reading
■	■	■	■					■	N4427	CA	Ground Turkey	08/05	Reading
									N4428	CA	Ground Turkey	08/05	Reading
■	■	■	■					■	N4540	CT	Ground Turkey	04/05	Reading
									N4411	CA	Ground Turkey	04/05	Reading
	■					■			N7343	TN	Ground Turkey	11/05	Reading
	■			■	■	■	■		N4416	CA	Ground Turkey	05/05	Reading

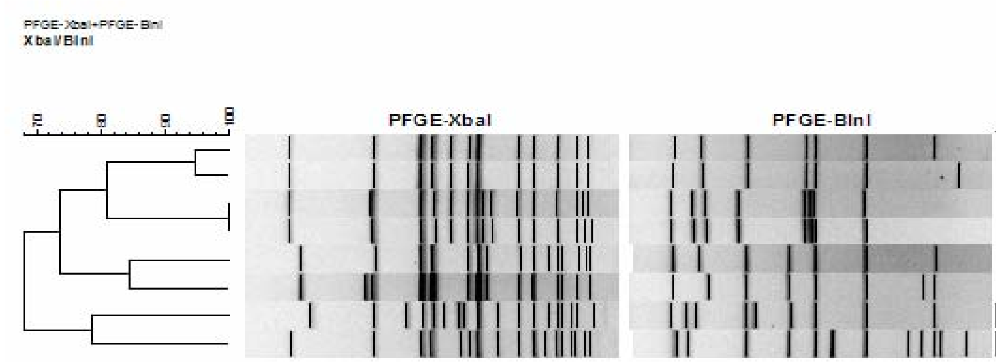
A-3l. PFGE Profiles for *Salmonella* Saintpaul



Antibiogram

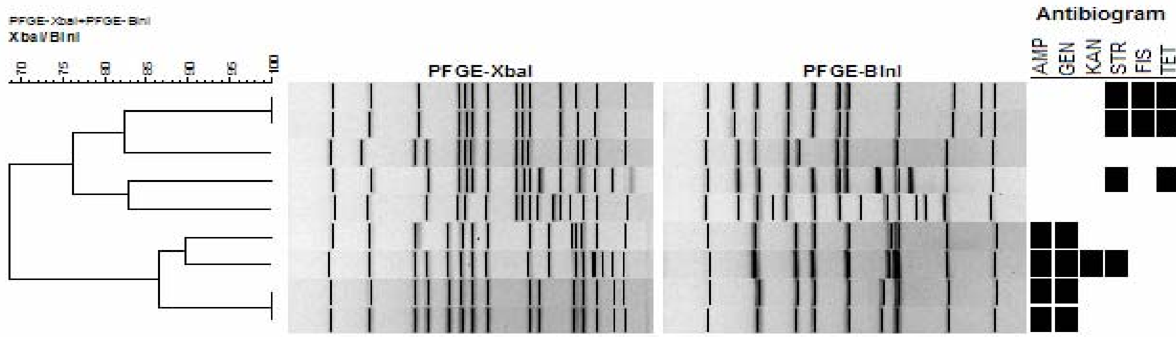
AMC	AMP	GEN	KAN	STR	FIS	TET	CVM #	State	Source	Date Isolated	Serotype
							N5381	MD	Ground Turkey	06/05	Saintpaul
							N6432	NY	Ground Turkey	05/05	Saintpaul
			■		■	■	N6317	MN	Ground Turkey	09/05	Saintpaul
	■		■		■		N6296	MN	Ground Turkey	03/05	Saintpaul
	■		■		■		N6376	NM	Ground Turkey	07/05	Saintpaul
	■	■	■	■	■		N4508	CO	Ground Turkey	06/05	Saintpaul
	■		■		■		N6285	MN	Ground Turkey	01/05	Saintpaul
■	■		■	■	■		N6367	NM	Ground Turkey	01/05	Saintpaul
	■	■	■		■		N6372	NM	Ground Turkey	05/05	Saintpaul
	■		■	■	■		N6375	NM	Ground Turkey	07/05	Saintpaul
	■		■	■	■		N7337	TN	Ground Turkey	09/05	Saintpaul
	■		■	■	■		N7338	TN	Ground Turkey	09/05	Saintpaul
	■	■	■	■	■		N7339	TN	Ground Beef	09/05	Saintpaul
	■	■	■	■	■		N7340	TN	Ground Turkey	10/05	Saintpaul
	■		■	■	■		N7357	GA	Ground Turkey	12/05	Saintpaul
	■		■	■	■		N4498	CO	Ground Turkey	02/05	Saintpaul
	■	■		■	■	■	N7347	GA	Ground Turkey	11/05	Saintpaul
	■	■			■	■	N7352	GA	Ground Turkey	11/05	Saintpaul
						■	N4624	GA	Ground Turkey	02/05	Saintpaul
						■	N7298	CO	Ground Turkey	11/05	Saintpaul
							N6438	NY	Ground Turkey	07/05	Saintpaul
							N6439	NY	Ground Turkey	07/05	Saintpaul
						■	N4500	CO	Ground Turkey	03/05	Saintpaul
						■	N4633	GA	Ground Turkey	07/05	Saintpaul
						■	N6291	MN	Ground Turkey	02/05	Saintpaul

A-3m. PFGE Profiles for *Salmonella* Schwarzengrund



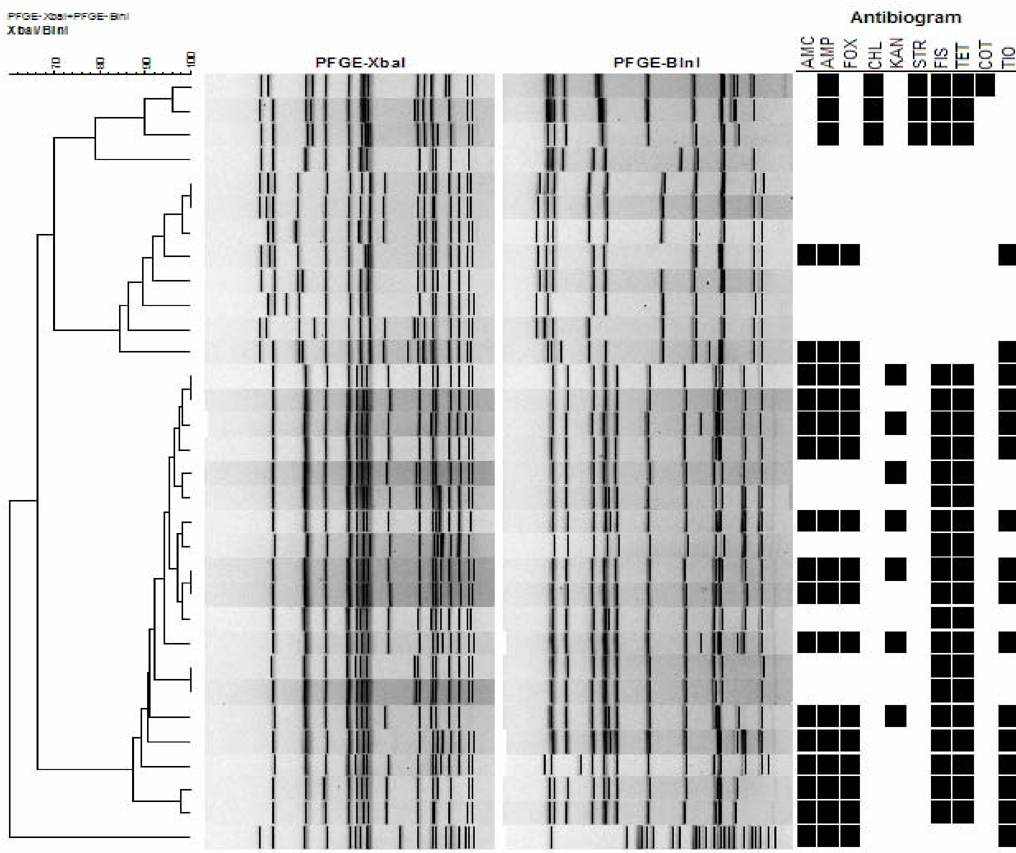
Antibiogram: AMP	KAN	STR	FIS	TET	CVM #	State	Source	Date Isolated	Serotype
					N4641	GA	Ground Turkey	08/05	Schwarzengrund
					N4642	GA	Ground Turkey	08/05	Schwarzengrund
					N4406	CA	Ground Turkey	03/05	Schwarzengrund
					N4422	CA	Ground Turkey	07/05	Schwarzengrund
					N6384	NM	Ground Turkey	10/05	Schwarzengrund
					N6433	NY	Ground Turkey	05/05	Schwarzengrund
■		■			N4501	CO	Ground Turkey	03/05	Schwarzengrund
■	■	■	■	■	N6374	NM	Ground Turkey	06/05	Schwarzengrund

A-3n. PFGE Profiles for *Salmonella* Senftenberg



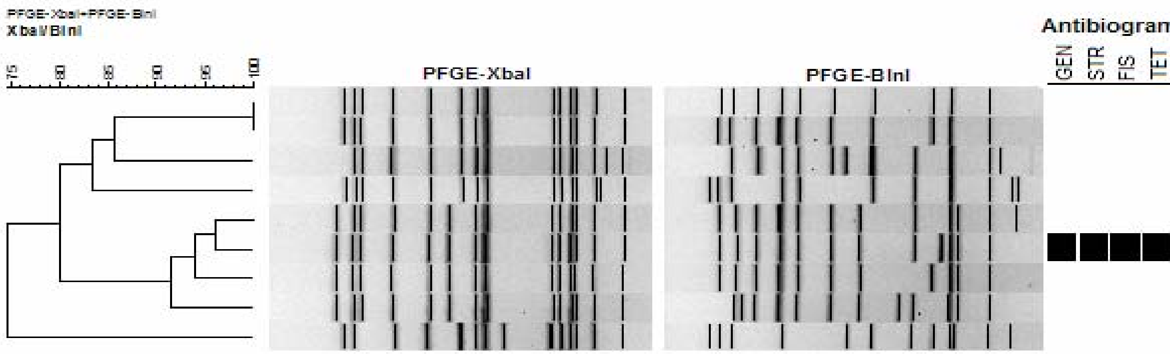
CVM #	State	Source	Date Isolated	Serotype
N6335	MN	Ground Turkey	12/05	Senftenberg
N6522	OR	Ground Turkey	12/05	Senftenberg
N4413	CA	Ground Turkey	04/05	Senftenberg
N4424	CA	Pork Chop	07/05	Senftenberg
N6294	MN	Ground Turkey	03/05	Senftenberg
N4644	GA	Ground Turkey	09/05	Senftenberg
N7356	GA	Ground Turkey	12/05	Senftenberg
N7349	GA	Ground Turkey	11/05	Senftenberg
N7350	GA	Ground Turkey	11/05	Senftenberg

A-3o. PFGE Profiles for *Salmonella* Typhimurium



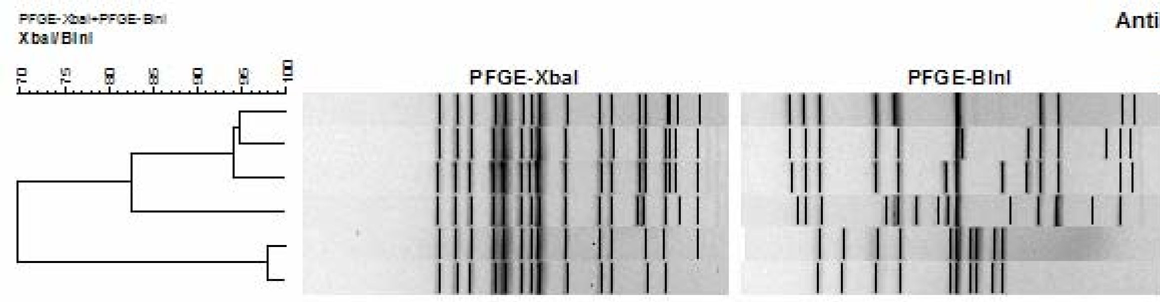
CVM #	State	Source	Date Isolated	Serotype
N4637	GA	Pork Chop	07/05	Typhimurium var. O 5 - (Copenhagen)
N5376	MD	Pork Chop	03/05	Typhimurium var. O 5 - (Copenhagen)
N6431	NY	Chicken Breast	04/05	Typhimurium
N4617	GA	Chicken Breast	01/05	Typhimurium
N6321	MN	Chicken Breast	10/05	Typhimurium
N7294	CO	Chicken Breast	10/05	Typhimurium
N4544	CT	Chicken Breast	06/05	Typhimurium
N4646	GA	Ground Turkey	09/05	Typhimurium
N4618	GA	Chicken Breast	01/05	Typhimurium
N7300	CO	Chicken Breast	12/05	Typhimurium
N4432	CA	Chicken Breast	09/05	Typhimurium
N7305	CA	Chicken Breast	11/05	Typhimurium
N4528	CT	Chicken Breast	01/05	Typhimurium
N6437	NY	Chicken Breast	07/05	Typhimurium var. O 5 - (Copenhagen)
N6430	NY	Chicken Breast	04/05	Typhimurium var. O 5 - (Copenhagen)
N4547	CT	Chicken Breast	07/05	Typhimurium
N6425	NY	Chicken Breast	02/05	Typhimurium var. O 5 - (Copenhagen)
N7346	GA	Chicken Breast	11/05	Typhimurium var. O 5 - (Copenhagen)
N4535	CT	Chicken Breast	03/05	Typhimurium
N6441	NY	Chicken Breast	08/05	Typhimurium var. O 5 - (Copenhagen)
N6424	NY	Chicken Breast	02/05	Typhimurium var. O 5 - (Copenhagen)
N6426	NY	Chicken Breast	03/05	Typhimurium var. O 5 - (Copenhagen)
N4536	CT	Chicken Breast	03/05	Typhimurium
N5380	MD	Chicken Breast	06/05	Typhimurium var. O 5 - (Copenhagen)
N6422	NY	Chicken Breast	01/05	Typhimurium
N6428	NY	Chicken Breast	03/05	Typhimurium
N5385	MD	Chicken Breast	07/05	Typhimurium var. O 5 - (Copenhagen)
N5379	MD	Chicken Breast	05/05	Typhimurium var. O 5 - (Copenhagen)
N5370	MD	Chicken Breast	02/05	Typhimurium var. O 5 - (Copenhagen)
N4546	CT	Chicken Breast	06/05	Typhimurium
N7313	CT	Chicken Breast	12/05	Typhimurium
N5371	MD	Chicken Breast	03/05	Typhimurium var. O 5 - (Copenhagen)

A-3p. PFGE Profiles for *Salmonella* 4,5,12:i:-



CVM #	State	Source	Date Isolated	Serotype
N7319	TN	Chicken Breast	01/05	I 4,[5],12:i:-
N7325	TN	Chicken Breast	05/05	I 4,[5],12:i:-
N6331	MN	Chicken Breast	12/05	I 4,[5],12:i:-
N6302	MN	Chicken Breast	06/05	I 4,[5],12:i:-
N6308	MN	Chicken Breast	08/05	I 4,[5],12:i:-
N7317	TN	Chicken Breast	01/05	I 4,[5],12:i:-
N7291	CO	Chicken Breast	08/05	I 4,[5],12:i:-
N4414	CA	Chicken Breast	05/05	I 4,[5],12:i:-
N7303	CA	Chicken Breast	11/05	I 4,[5],12:i:-

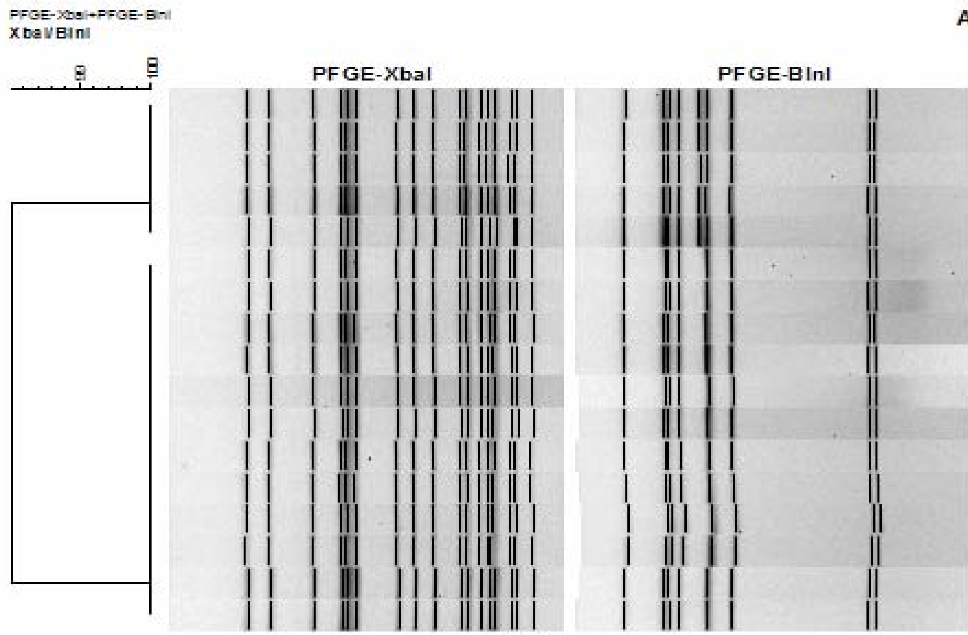
A-3q. PFGE Profiles for *Salmonella* 4,12:d:-



Antibiogram

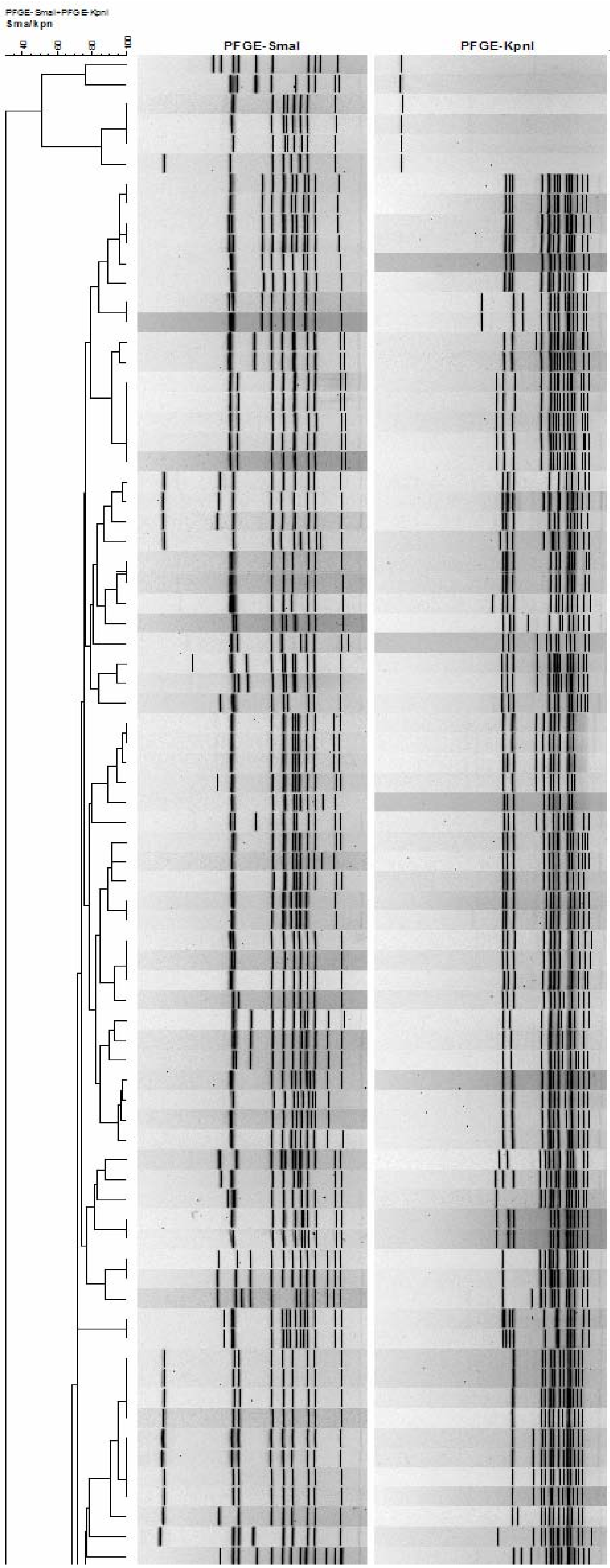
TET	CVM #	State	Source	Date Isolated	Serotype
■	N5378	MD	Ground Turkey	04/05	I 4,12:d:-
■	N4542	CT	Ground Turkey	05/05	I 4,[5],12:d:-
■	N4543	CT	Ground Turkey	05/05	I 4,[5],12:d:-
	N7316	CT	Ground Turkey	12/05	I 4,12:d:-
	N5392	MD	Chicken Breast	09/05	I 4,12:d:-
	N8132	MD	Ground Turkey	12/05	I 4,12:d:-

A-3r. PFGE Profiles for *Salmonella* IIIa 18:z4,z23:-

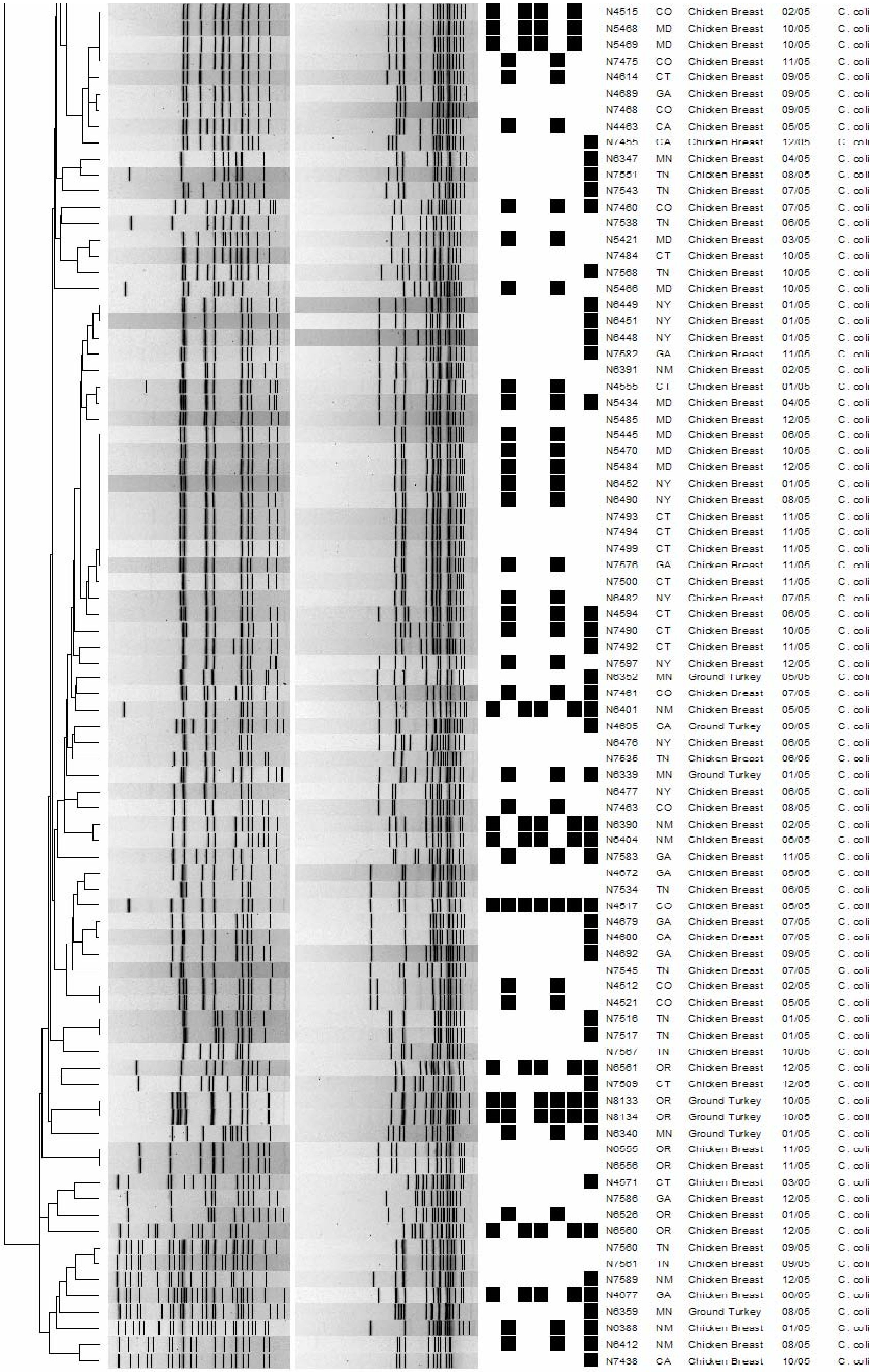


Antibiogram							
GEN	STR	FIS	CVM #	State	Source	Date Isolated	Serotype
			N6520	OR	Ground Turkey	11/05	IIIa 18:z4,z23:-
			N6524	OR	Ground Turkey	12/05	IIIa 18:z4,z23:-
			N6525	OR	Ground Turkey	12/05	IIIa 18:z4,z23:-
			N7307	CA	Ground Turkey	12/05	IIIa 18:z4,z23:-
			N7364	NM	Ground Turkey	12/05	IIIa 18:z4,z23:-
			N4410	CA	Ground Turkey	04/05	IIIa 18:z4,z23:-
			N4412	CA	Ground Turkey	04/05	IIIa 18:z4,z23:-
			N4417	CA	Ground Turkey	05/05	IIIa 18:z4,z23:-
			N4420	CA	Ground Turkey	07/05	IIIa 18:z4,z23:-
			N6365	NM	Ground Turkey	01/05	IIIa 18:z4,z23:-
			N6503	OR	Ground Turkey	04/05	IIIa 18:z4,z23:-
			N6507	OR	Ground Turkey	05/05	IIIa 18:z4,z23:-
			N6508	OR	Ground Turkey	05/05	IIIa 18:z4,z23:-
			N6509	OR	Ground Turkey	05/05	IIIa 18:z4,z23:-
			N6511	OR	Ground Turkey	06/05	IIIa 18:z4,z23:-
			N6515	OR	Ground Turkey	08/05	IIIa 18:z4,z23:-
			N6516	OR	Ground Turkey	08/05	IIIa 18:z4,z23:-

A-3s. PFGE Profiles for *Campylobacter* coli

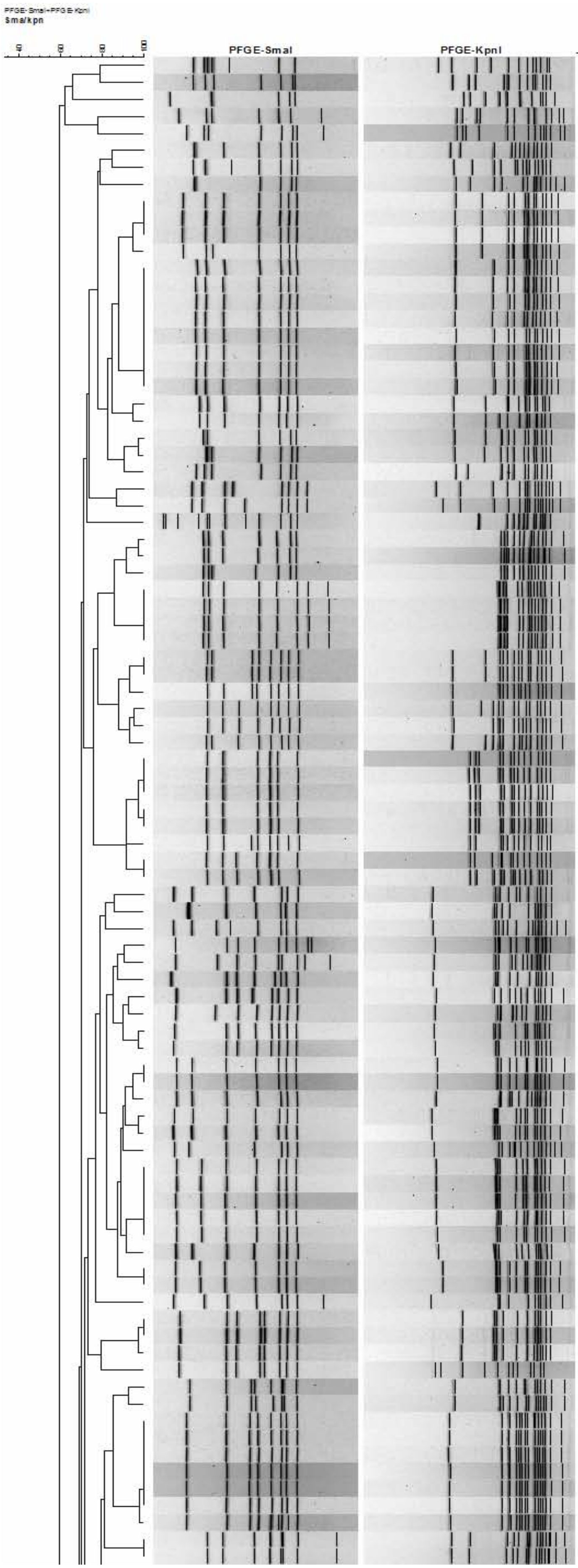


AZI	CIP	CLI	ERY	NAL	TEL	TET	CVM #	State	Source	Date Isolated	Species
■	■		■	■	■		N5441	MD	Chicken Breast	06/05	C. coli
							N6363	MN	Chicken Breast	11/05	C. coli
	■			■		■	N7451	CA	Chicken Breast	12/05	C. coli
	■			■		■	N7454	CA	Chicken Breast	12/05	C. coli
	■			■		■	N7459	CA	Chicken Breast	12/05	C. coli
							N6351	MN	Chicken Breast	05/05	C. coli
							N6398	NM	Chicken Breast	04/05	C. coli
							N6399	NM	Chicken Breast	04/05	C. coli
							N4510	CO	Chicken Breast	01/05	C. coli
							N4523	CO	Chicken Breast	06/05	C. coli
							N6392	NM	Chicken Breast	02/05	C. coli
							N6394	NM	Chicken Breast	02/05	C. coli
	■			■		■	N5415	MD	Chicken Breast	02/05	C. coli
	■			■		■	N6460	NY	Chicken Breast	02/05	C. coli
							N4578	CT	Chicken Breast	04/05	C. coli
							N4579	CT	Chicken Breast	04/05	C. coli
	■			■			N5418	MD	Chicken Breast	03/05	C. coli
	■			■			N5419	MD	Chicken Breast	03/05	C. coli
	■			■		■	N7487	CT	Chicken Breast	10/05	C. coli
	■			■			N7540	TN	Chicken Breast	06/05	C. coli
	■			■			N7547	TN	Chicken Breast	07/05	C. coli
						■	N4595	CT	Chicken Breast	06/05	C. coli
	■			■		■	N7564	TN	Chicken Breast	10/05	C. coli
	■			■		■	N5464	MD	Chicken Breast	09/05	C. coli
	■			■			N7489	CT	Chicken Breast	10/05	C. coli
						■	N7512	TN	Chicken Breast	01/05	C. coli
						■	N7513	TN	Chicken Breast	01/05	C. coli
						■	N4589	CT	Chicken Breast	05/05	C. coli
						■	N7548	TN	Chicken Breast	07/05	C. coli
						■	N4445	CA	Chicken Breast	02/05	C. coli
	■			■			N4654	GA	Chicken Breast	02/05	C. coli
	■			■			N4665	GA	Chicken Breast	04/05	C. coli
	■			■		■	N7588	NM	Chicken Breast	12/05	C. coli
						■	N4441	CA	Chicken Breast	02/05	C. coli
						■	N4442	CA	Chicken Breast	02/05	C. coli
						■	N4443	CA	Chicken Breast	02/05	C. coli
						■	N4458	CA	Chicken Breast	04/05	C. coli
							N4465	CA	Chicken Breast	05/05	C. coli
							N6539	OR	Chicken Breast	04/05	C. coli
							N4460	CA	Chicken Breast	04/05	C. coli
							N4520	CO	Chicken Breast	05/05	C. coli
							N4467	CA	Chicken Breast	06/05	C. coli
							N4566	CT	Chicken Breast	02/05	C. coli
							N7572	GA	Chicken Breast	10/05	C. coli
						■	N6348	MN	Chicken Breast	05/05	C. coli
						■	N7519	TN	Chicken Breast	02/05	C. coli
						■	N7569	TN	Chicken Breast	12/05	C. coli
						■	N7518	TN	Chicken Breast	02/05	C. coli
							N6343	MN	Chicken Breast	03/05	C. coli
							N7483	CT	Chicken Breast	10/05	C. coli
							N4694	GA	Ground Turkey	09/05	C. coli
							N4557	CT	Chicken Breast	01/05	C. coli
						■	N6409	NM	Chicken Breast	07/05	C. coli
						■	N7542	TN	Chicken Breast	07/05	C. coli
						■	N7594	NY	Chicken Breast	12/05	C. coli
	■			■			N4678	GA	Chicken Breast	06/05	C. coli
■			■		■		N6353	MN	Chicken Breast	06/05	C. coli
						■	N6345	MN	Chicken Breast	04/05	C. coli
■		■	■		■	■	N7464	CO	Chicken Breast	08/05	C. coli
■		■	■		■	■	N7465	CO	Chicken Breast	08/05	C. coli
							N6354	MN	Chicken Breast	06/05	C. coli
							N6355	MN	Chicken Breast	07/05	C. coli
						■	N7575	GA	Chicken Breast	10/05	C. coli
							N7565	TN	Chicken Breast	10/05	C. coli
							N7566	TN	Chicken Breast	10/05	C. coli
							N4661	GA	Chicken Breast	03/05	C. coli
							N4662	GA	Chicken Breast	03/05	C. coli
							N6389	NM	Chicken Breast	01/05	C. coli
							N7573	GA	Chicken Breast	10/05	C. coli
							N4598	CT	Chicken Breast	07/05	C. coli
							N4599	CT	Chicken Breast	07/05	C. coli
■		■	■		■		N6395	NM	Chicken Breast	03/05	C. coli
							N6407	NM	Chicken Breast	07/05	C. coli
							N7485	CT	Chicken Breast	10/05	C. coli
							N5408	MD	Chicken Breast	01/05	C. coli
						■	N4449	CA	Chicken Breast	03/05	C. coli

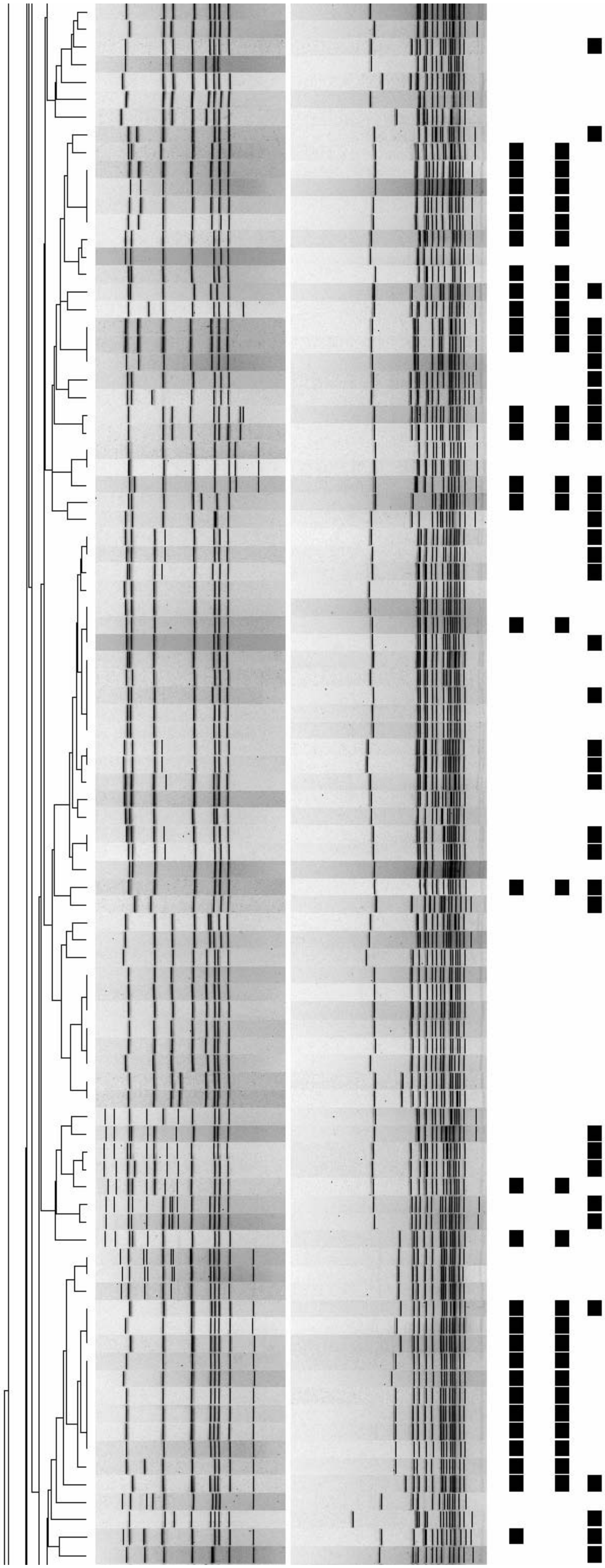


N4515 CO Chicken Breast 02/05 C. coli
N5468 MD Chicken Breast 10/05 C. coli
N5469 MD Chicken Breast 10/05 C. coli
N7475 CO Chicken Breast 11/05 C. coli
N4614 CT Chicken Breast 09/05 C. coli
N4689 GA Chicken Breast 09/05 C. coli
N7468 CO Chicken Breast 09/05 C. coli
N4463 CA Chicken Breast 05/05 C. coli
N7455 CA Chicken Breast 12/05 C. coli
N6347 MN Chicken Breast 04/05 C. coli
N7551 TN Chicken Breast 08/05 C. coli
N7543 TN Chicken Breast 07/05 C. coli
N7460 CO Chicken Breast 07/05 C. coli
N7538 TN Chicken Breast 06/05 C. coli
N5421 MD Chicken Breast 03/05 C. coli
N7484 CT Chicken Breast 10/05 C. coli
N7568 TN Chicken Breast 10/05 C. coli
N5466 MD Chicken Breast 10/05 C. coli
N6449 NY Chicken Breast 01/05 C. coli
N6451 NY Chicken Breast 01/05 C. coli
N6448 NY Chicken Breast 01/05 C. coli
N7582 GA Chicken Breast 11/05 C. coli
N6391 NM Chicken Breast 02/05 C. coli
N4555 CT Chicken Breast 01/05 C. coli
N5434 MD Chicken Breast 04/05 C. coli
N5485 MD Chicken Breast 12/05 C. coli
N5445 MD Chicken Breast 06/05 C. coli
N5470 MD Chicken Breast 10/05 C. coli
N5484 MD Chicken Breast 12/05 C. coli
N6452 NY Chicken Breast 01/05 C. coli
N6490 NY Chicken Breast 08/05 C. coli
N7493 CT Chicken Breast 11/05 C. coli
N7494 CT Chicken Breast 11/05 C. coli
N7499 CT Chicken Breast 11/05 C. coli
N7576 GA Chicken Breast 11/05 C. coli
N7500 CT Chicken Breast 11/05 C. coli
N6482 NY Chicken Breast 07/05 C. coli
N4594 CT Chicken Breast 06/05 C. coli
N7490 CT Chicken Breast 10/05 C. coli
N7492 CT Chicken Breast 11/05 C. coli
N7597 NY Chicken Breast 12/05 C. coli
N6352 MN Ground Turkey 05/05 C. coli
N7461 CO Chicken Breast 07/05 C. coli
N6401 NM Chicken Breast 05/05 C. coli
N4695 GA Ground Turkey 09/05 C. coli
N6476 NY Chicken Breast 06/05 C. coli
N7535 TN Chicken Breast 06/05 C. coli
N6339 MN Ground Turkey 01/05 C. coli
N6477 NY Chicken Breast 06/05 C. coli
N7463 CO Chicken Breast 08/05 C. coli
N6390 NM Chicken Breast 02/05 C. coli
N6404 NM Chicken Breast 06/05 C. coli
N7583 GA Chicken Breast 11/05 C. coli
N4672 GA Chicken Breast 05/05 C. coli
N7534 TN Chicken Breast 06/05 C. coli
N4517 CO Chicken Breast 05/05 C. coli
N4679 GA Chicken Breast 07/05 C. coli
N4680 GA Chicken Breast 07/05 C. coli
N4692 GA Chicken Breast 09/05 C. coli
N7545 TN Chicken Breast 07/05 C. coli
N4512 CO Chicken Breast 02/05 C. coli
N4521 CO Chicken Breast 05/05 C. coli
N7516 TN Chicken Breast 01/05 C. coli
N7517 TN Chicken Breast 01/05 C. coli
N7567 TN Chicken Breast 10/05 C. coli
N6561 OR Chicken Breast 12/05 C. coli
N7509 CT Chicken Breast 12/05 C. coli
N8133 OR Ground Turkey 10/05 C. coli
N8134 OR Ground Turkey 10/05 C. coli
N6340 MN Ground Turkey 01/05 C. coli
N6555 OR Chicken Breast 11/05 C. coli
N6556 OR Chicken Breast 11/05 C. coli
N4571 CT Chicken Breast 03/05 C. coli
N7586 GA Chicken Breast 12/05 C. coli
N6526 OR Chicken Breast 01/05 C. coli
N6560 OR Chicken Breast 12/05 C. coli
N7560 TN Chicken Breast 09/05 C. coli
N7561 TN Chicken Breast 09/05 C. coli
N7589 NM Chicken Breast 12/05 C. coli
N4677 GA Chicken Breast 06/05 C. coli
N6359 MN Ground Turkey 08/05 C. coli
N6388 NM Chicken Breast 01/05 C. coli
N6412 NM Chicken Breast 08/05 C. coli
N7438 CA Chicken Breast 10/05 C. coli

A-3t. PFGE Profiles for *Campylobacter* jejuni



AZI	CIP	CLI	ERY	NAL	TEL	TET	CVM #	State	Source	Date Isolated	Species
						■	N6537	OR	Chicken Breast	03/05	C. jejuni
						■	N7546	TN	Chicken Breast	07/05	C. jejuni
						■	N6350	MN	Chicken Breast	05/05	C. jejuni
							N4437	CA	Ground Turkey	01/05	C. jejuni
						■	N4456	CA	Chicken Breast	04/05	C. jejuni
							N6349	MN	Chicken Breast	05/05	C. jejuni
						■	N7541	TN	Chicken Breast	06/05	C. jejuni
						■	N5435	MD	Ground Turkey	04/05	C. jejuni
						■	N4486	CA	Chicken Breast	08/05	C. jejuni
						■	N4487	CA	Chicken Breast	08/05	C. jejuni
						■	N4488	CA	Chicken Breast	08/05	C. jejuni
						■	N7458	CA	Chicken Breast	12/05	C. jejuni
						■	N4473	CA	Chicken Breast	07/05	C. jejuni
						■	N4480	CA	Chicken Breast	07/05	C. jejuni
						■	N4490	CA	Chicken Breast	09/05	C. jejuni
						■	N4491	CA	Chicken Breast	09/05	C. jejuni
						■	N4492	CA	Chicken Breast	09/05	C. jejuni
						■	N4493	CA	Chicken Breast	09/05	C. jejuni
						■	N7436	CA	Chicken Breast	10/05	C. jejuni
						■	N7447	CA	Chicken Breast	11/05	C. jejuni
						■	N4663	GA	Chicken Breast	03/05	C. jejuni
						■	N6337	MN	Chicken Breast	01/05	C. jejuni
						■	N4660	GA	Chicken Breast	03/05	C. jejuni
						■	N7488	CT	Chicken Breast	10/05	C. jejuni
							N6533	OR	Chicken Breast	02/05	C. jejuni
						■	N4519	CO	Chicken Breast	05/05	C. jejuni
						■	N7470	CO	Chicken Breast	09/05	C. jejuni
						■	N6479	NY	Chicken Breast	06/05	C. jejuni
							N4511	CO	Chicken Breast	01/05	C. jejuni
							N7469	CO	Chicken Breast	09/05	C. jejuni
	■			■			N7442	CA	Chicken Breast	10/05	C. jejuni
						■	N6527	OR	Chicken Breast	01/05	C. jejuni
						■	N6540	OR	Chicken Breast	05/05	C. jejuni
						■	N6541	OR	Chicken Breast	05/05	C. jejuni
						■	N6542	OR	Chicken Breast	05/05	C. jejuni
							N7479	CO	Chicken Breast	12/05	C. jejuni
							N7480	CO	Chicken Breast	12/05	C. jejuni
							N7462	CO	Chicken Breast	08/05	C. jejuni
							N4652	GA	Chicken Breast	01/05	C. jejuni
				■			N5465	MD	Chicken Breast	10/05	C. jejuni
							N6551	OR	Chicken Breast	07/05	C. jejuni
	■			■			N4457	CA	Chicken Breast	04/05	C. jejuni
	■			■			N4484	CA	Chicken Breast	08/05	C. jejuni
	■			■			N4485	CA	Chicken Breast	08/05	C. jejuni
	■			■			N4452	CA	Chicken Breast	04/05	C. jejuni
	■			■			N4454	CA	Chicken Breast	04/05	C. jejuni
						■	N7452	CA	Chicken Breast	12/05	C. jejuni
	■			■			N4455	CA	Chicken Breast	04/05	C. jejuni
	■			■			N6552	OR	Chicken Breast	08/05	C. jejuni
							N4597	CT	Chicken Breast	07/05	C. jejuni
						■	N4671	GA	Chicken Breast	05/05	C. jejuni
						■	N7555	TN	Chicken Breast	08/05	C. jejuni
						■	N4693	GA	Chicken Breast	09/05	C. jejuni
							N7591	NY	Chicken Breast	10/05	C. jejuni
	■			■		■	N4675	GA	Chicken Breast	05/05	C. jejuni
	■			■		■	N4516	CO	Chicken Breast	03/05	C. jejuni
						■	N5417	MD	Chicken Breast	02/05	C. jejuni
						■	N4647	GA	Chicken Breast	01/05	C. jejuni
						■	N5416	MD	Chicken Breast	02/05	C. jejuni
						■	N4574	CT	Chicken Breast	03/05	C. jejuni
						■	N5480	MD	Chicken Breast	11/05	C. jejuni
							N4524	CO	Chicken Breast	06/05	C. jejuni
	■			■		■	N4582	CT	Chicken Breast	04/05	C. jejuni
	■			■		■	N4583	CT	Chicken Breast	04/05	C. jejuni
						■	N7522	TN	Chicken Breast	02/05	C. jejuni
						■	N4576	CT	Chicken Breast	03/05	C. jejuni
						■	N4591	CT	Chicken Breast	06/05	C. jejuni
						■	N5428	MD	Chicken Breast	04/05	C. jejuni
						■	N5448	MD	Chicken Breast	07/05	C. jejuni
						■	N7503	CT	Chicken Breast	12/05	C. jejuni
						■	N4681	GA	Chicken Breast	08/05	C. jejuni
						■	N5426	MD	Chicken Breast	04/05	C. jejuni
						■	N5427	MD	Chicken Breast	04/05	C. jejuni
						■	N5403	MD	Chicken Breast	01/05	C. jejuni
						■	N4472	CA	Chicken Breast	06/05	C. jejuni
						■	N4483	CA	Chicken Breast	08/05	C. jejuni
						■	N4471	CA	Chicken Breast	06/05	C. jejuni
						■	N7456	CA	Chicken Breast	12/05	C. jejuni
	■			■		■	N4588	CT	Chicken Breast	05/05	C. jejuni
	■			■		■	N7523	TN	Chicken Breast	02/05	C. jejuni
						■	N6461	NY	Chicken Breast	03/05	C. jejuni
						■	N6462	NY	Chicken Breast	03/05	C. jejuni
						■	N6463	NY	Chicken Breast	03/05	C. jejuni
						■	N6464	NY	Chicken Breast	03/05	C. jejuni
						■	N6465	NY	Chicken Breast	03/05	C. jejuni
						■	N6469	NY	Chicken Breast	03/05	C. jejuni
						■	N6468	NY	Chicken Breast	03/05	C. jejuni
							N6393	NM	Chicken Breast	02/05	C. jejuni
							N6420	NM	Chicken Breast	11/05	C. jejuni



N5405	MD	Chicken Breast	01/05	C. jejuni
N5437	MD	Chicken Breast	05/05	C. jejuni
N5467	MD	Chicken Breast	10/05	C. jejuni
N5486	MD	Chicken Breast	12/05	C. jejuni
N4572	CT	Chicken Breast	03/05	C. jejuni
N5412	MD	Chicken Breast	02/05	C. jejuni
N6455	NY	Chicken Breast	02/05	C. jejuni
N4569	CT	Chicken Breast	02/05	C. jejuni
N5483	MD	Chicken Breast	12/05	C. jejuni
N4560	CT	Pork Chop	01/05	C. jejuni
N5414	MD	Chicken Breast	02/05	C. jejuni
N6481	NY	Chicken Breast	07/05	C. jejuni
N6492	NY	Chicken Breast	08/05	C. jejuni
N5413	MD	Chicken Breast	02/05	C. jejuni
N6453	NY	Chicken Breast	01/05	C. jejuni
N6484	NY	Chicken Breast	07/05	C. jejuni
N5423	MD	Chicken Breast	03/05	C. jejuni
N5443	MD	Chicken Breast	06/05	C. jejuni
N4561	CT	Chicken Breast	02/05	C. jejuni
N4562	CT	Chicken Breast	02/05	C. jejuni
N5487	MD	Chicken Breast	12/05	C. jejuni
N4608	CT	Chicken Breast	08/05	C. jejuni
N6450	NY	Chicken Breast	01/05	C. jejuni
N4674	GA	Chicken Breast	05/05	C. jejuni
N5460	MD	Chicken Breast	09/05	C. jejuni
N5488	MD	Chicken Breast	12/05	C. jejuni
N5490	MD	Chicken Breast	12/05	C. jejuni
N4650	GA	Chicken Breast	01/05	C. jejuni
N5449	MD	Chicken Breast	07/05	C. jejuni
N7505	CT	Chicken Breast	12/05	C. jejuni
N5447	MD	Chicken Breast	07/05	C. jejuni
N6456	NY	Chicken Breast	02/05	C. jejuni
N6488	NY	Chicken Breast	08/05	C. jejuni
N7504	CT	Chicken Breast	12/05	C. jejuni
N4568	CT	Chicken Breast	02/05	C. jejuni
N5472	MD	Chicken Breast	10/05	C. jejuni
N6459	NY	Chicken Breast	02/05	C. jejuni
N4554	CT	Chicken Breast	01/05	C. jejuni
N5471	MD	Chicken Breast	10/05	C. jejuni
N6491	NY	Chicken Breast	08/05	C. jejuni
N7506	CT	Chicken Breast	12/05	C. jejuni
N7507	CT	Chicken Breast	12/05	C. jejuni
N6471	NY	Chicken Breast	04/05	C. jejuni
N6472	NY	Chicken Breast	04/05	C. jejuni
N4604	CT	Chicken Breast	08/05	C. jejuni
N4567	CT	Chicken Breast	02/05	C. jejuni
N4577	CT	Chicken Breast	04/05	C. jejuni
N4573	CT	Chicken Breast	03/05	C. jejuni
N5402	MD	Chicken Breast	01/05	C. jejuni
N5407	MD	Chicken Breast	01/05	C. jejuni
N5479	MD	Chicken Breast	11/05	C. jejuni
N7446	CA	Chicken Breast	11/05	C. jejuni
N5446	MD	Chicken Breast	07/05	C. jejuni
N5451	MD	Chicken Breast	07/05	C. jejuni
N4596	CT	Chicken Breast	06/05	C. jejuni
N5425	MD	Chicken Breast	03/05	C. jejuni
N6485	NY	Chicken Breast	07/05	C. jejuni
N7495	CT	Chicken Breast	11/05	C. jejuni
N5424	MD	Chicken Breast	03/05	C. jejuni
N6457	NY	Chicken Breast	02/05	C. jejuni
N6480	NY	Chicken Breast	06/05	C. jejuni
N5473	MD	Chicken Breast	11/05	C. jejuni
N5481	MD	Ground Turkey	11/05	C. jejuni
N5440	MD	Chicken Breast	05/05	C. jejuni
N6466	NY	Chicken Breast	03/05	C. jejuni
N4580	CT	Chicken Breast	04/05	C. jejuni
N4581	CT	Chicken Breast	04/05	C. jejuni
N6467	NY	Chicken Breast	03/05	C. jejuni
N5439	MD	Chicken Breast	05/05	C. jejuni
N7577	GA	Chicken Breast	11/05	C. jejuni
N7498	CT	Chicken Breast	11/05	C. jejuni
N7579	GA	Chicken Breast	11/05	C. jejuni
N7580	GA	Chicken Breast	11/05	C. jejuni
N6483	NY	Chicken Breast	07/05	C. jejuni
N5404	MD	Chicken Breast	01/05	C. jejuni
N7570	GA	Chicken Breast	10/05	C. jejuni
N7491	CT	Chicken Breast	11/05	C. jejuni
N4601	CT	Chicken Breast	07/05	C. jejuni
N5444	MD	Chicken Breast	06/05	C. jejuni
N5454	MD	Chicken Breast	08/05	C. jejuni
N6486	NY	Chicken Breast	08/05	C. jejuni
N6487	NY	Chicken Breast	08/05	C. jejuni
N6489	NY	Chicken Breast	08/05	C. jejuni
N6473	NY	Chicken Breast	04/05	C. jejuni
N6470	NY	Chicken Breast	04/05	C. jejuni
N7525	TN	Chicken Breast	03/05	C. jejuni
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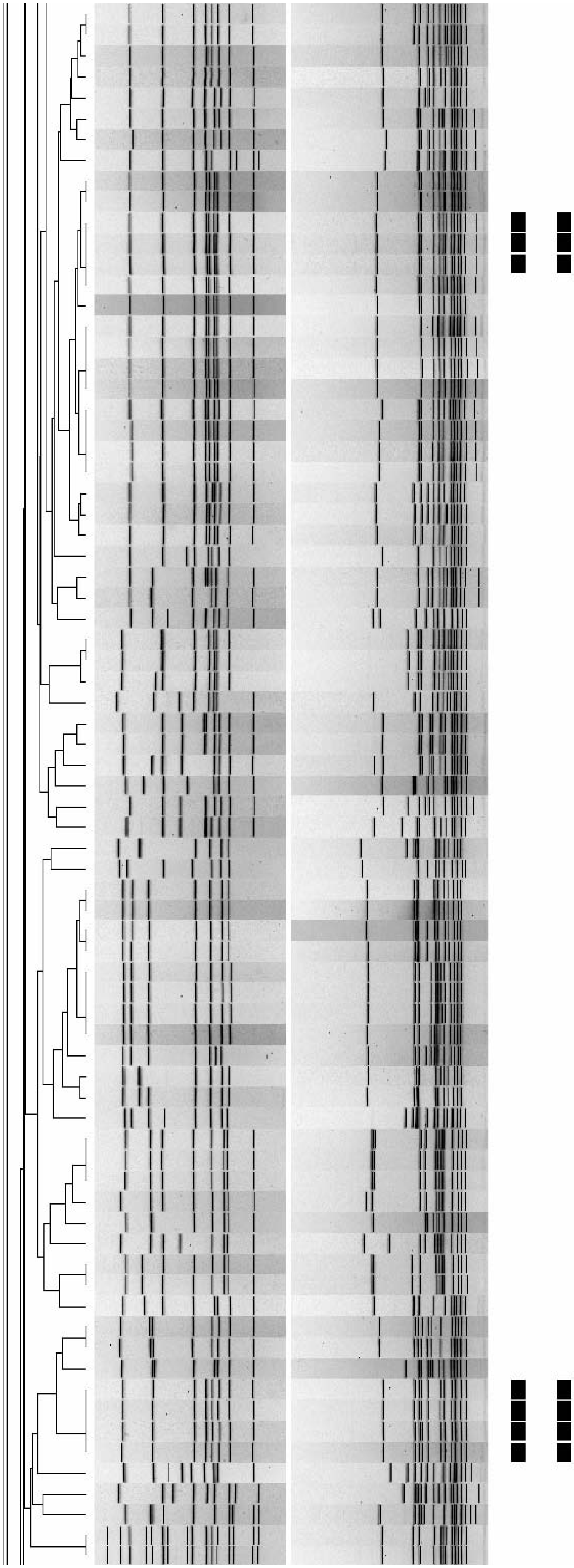

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N4461	CA	Chicken Breast	05/05	C. jejuni
N5422	MD	Chicken Breast	03/05	C. jejuni
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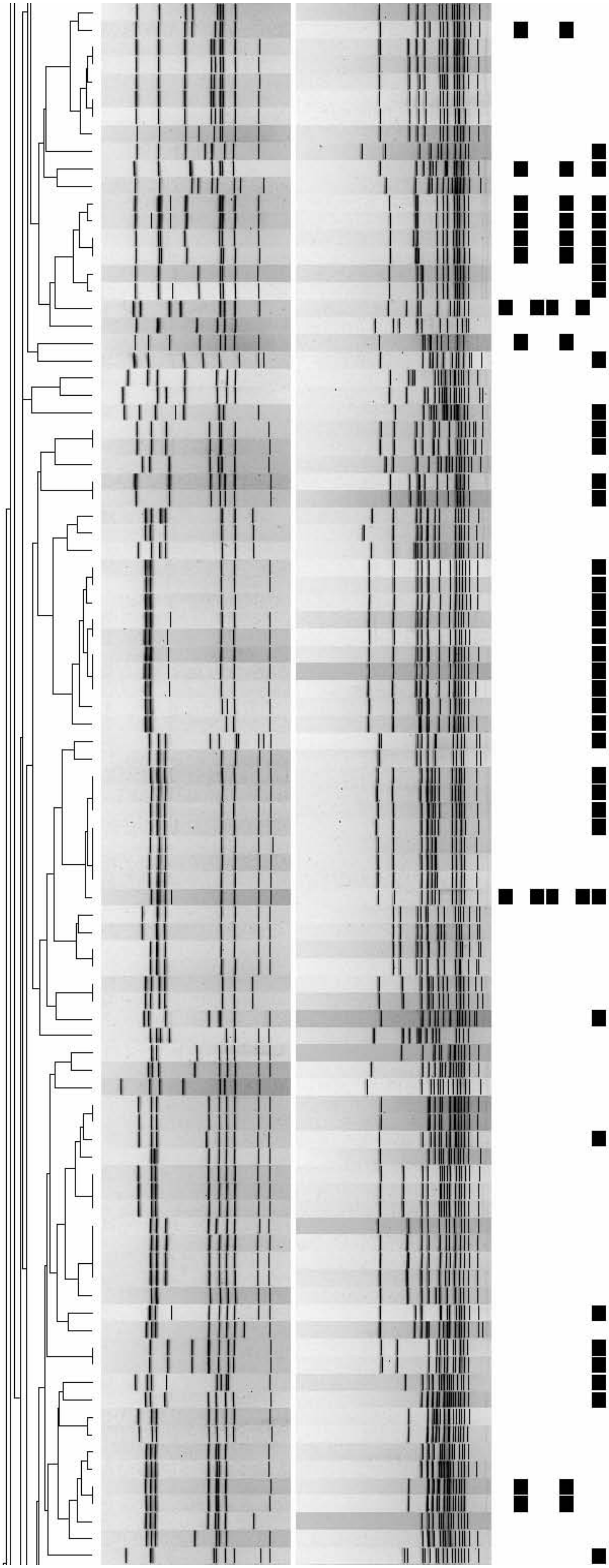
N6403	NM	Chicken Breast	06/05	C. jejuni
N5477	MD	Chicken Breast	11/05	C. jejuni
N5478	MD	Chicken Breast	11/05	C. jejuni
N4593	CT	Chicken Breast	06/05	C. jejuni
N4610	CT	Chicken Breast	09/05	C. jejuni
N4611	CT	Chicken Breast	09/05	C. jejuni
N4648	GA	Chicken Breast	01/05	C. jejuni
N6458	NY	Chicken Breast	02/05	C. jejuni
N4658	GA	Chicken Breast	03/05	C. jejuni
N5420	MD	Chicken Breast	03/05	C. jejuni
N5475	MD	Chicken Breast	11/05	C. jejuni
N5476	MD	Chicken Breast	11/05	C. jejuni
N4586	CT	Chicken Breast	05/05	C. jejuni
N5429	MD	Chicken Breast	04/05	C. jejuni
N5455	MD	Chicken Breast	08/05	C. jejuni
N7596	NY	Chicken Breast	12/05	C. jejuni
N4556	CT	Chicken Breast	01/05	C. jejuni
N7450	CA	Chicken Breast	11/05	C. jejuni
N7497	CT	Chicken Breast	11/05	C. jejuni
N7585	GA	Chicken Breast	12/05	C. jejuni
N4558	CT	Chicken Breast	01/05	C. jejuni
N7578	GA	Chicken Breast	11/05	C. jejuni
N6559	OR	Chicken Breast	12/05	C. jejuni
N7557	TN	Chicken Breast	09/05	C. jejuni
N7559	TN	Chicken Breast	09/05	C. jejuni
N7558	TN	Chicken Breast	09/05	C. jejuni
N4691	GA	Chicken Breast	09/05	C. jejuni
N5436	MD	Chicken Breast	05/05	C. jejuni
N5438	MD	Chicken Breast	05/05	C. jejuni
N5411	MD	Chicken Breast	02/05	C. jejuni
N4527	CO	Chicken Breast	06/05	C. jejuni
N4509	CO	Chicken Breast	01/05	C. jejuni
N6402	NM	Chicken Breast	05/05	C. jejuni
N4438	CA	Chicken Breast	02/05	C. jejuni
N7476	CO	Chicken Breast	12/05	C. jejuni
N6534	OR	Chicken Breast	02/05	C. jejuni
N6557	OR	Chicken Breast	11/05	C. jejuni
N4459	CA	Chicken Breast	04/05	C. jejuni
N4676	GA	Chicken Breast	06/05	C. jejuni
N7531	TN	Chicken Breast	05/05	C. jejuni
N7532	TN	Chicken Breast	05/05	C. jejuni
N7533	TN	Chicken Breast	05/05	C. jejuni
N7550	TN	Chicken Breast	07/05	C. jejuni
N6342	MN	Chicken Breast	03/05	C. jejuni
N4612	CT	Chicken Breast	09/05	C. jejuni
N6536	OR	Chicken Breast	03/05	C. jejuni
N6475	NY	Chicken Breast	05/05	C. jejuni
N5452	MD	Chicken Breast	07/05	C. jejuni
N7501	CT	Chicken Breast	12/05	C. jejuni
N7502	CT	Chicken Breast	12/05	C. jejuni
N7524	TN	Chicken Breast	03/05	C. jejuni
N5450	MD	Chicken Breast	07/05	C. jejuni
N6454	NY	Ground Turkey	01/05	C. jejuni
N7520	TN	Chicken Breast	02/05	C. jejuni
N7521	TN	Chicken Breast	02/05	C. jejuni
N5442	MD	Chicken Breast	06/05	C. jejuni
N7552	TN	Chicken Breast	08/05	C. jejuni
N7553	TN	Chicken Breast	08/05	C. jejuni
N4526	CO	Chicken Breast	06/05	C. jejuni
N4683	GA	Chicken Breast	08/05	C. jejuni
N4684	GA	Chicken Breast	08/05	C. jejuni
N4687	GA	Chicken Breast	08/05	C. jejuni
N4688	GA	Chicken Breast	08/05	C. jejuni
N6338	MN	Chicken Breast	01/05	C. jejuni
N6419	NM	Chicken Breast	11/05	C. jejuni
N7443	CA	Chicken Breast	10/05	C. jejuni
N7536	TN	Chicken Breast	06/05	C. jejuni
N7539	TN	Chicken Breast	06/05	C. jejuni



N4525	CO	Chicken Breast	06/05	C. jejuni
N6416	NM	Chicken Breast	10/05	C. jejuni
N4522	CO	Chicken Breast	06/05	C. jejuni
N7473	CO	Chicken Breast	10/05	C. jejuni
N4518	CO	Chicken Breast	05/05	C. jejuni
N4513	CO	Chicken Breast	02/05	C. jejuni
N7474	CO	Chicken Breast	10/05	C. jejuni
N4651	GA	Chicken Breast	01/05	C. jejuni
N5461	MD	Chicken Breast	09/05	C. jejuni
N4655	GA	Chicken Breast	02/05	C. jejuni
N7581	GA	Chicken Breast	11/05	C. jejuni
N4481	CA	Chicken Breast	08/05	C. jejuni
N4482	CA	Chicken Breast	08/05	C. jejuni
N4453	CA	Chicken Breast	04/05	C. jejuni
N4468	CA	Chicken Breast	06/05	C. jejuni
N4615	CT	Chicken Breast	09/05	C. jejuni
N4616	CT	Chicken Breast	09/05	C. jejuni
N4475	CA	Chicken Breast	07/05	C. jejuni
N4606	CT	Chicken Breast	08/05	C. jejuni
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N6356	MN	Chicken Breast	07/05	C. jejuni
N4664	GA	Chicken Breast	04/05	C. jejuni
N6341	MN	Chicken Breast	02/05	C. jejuni
N6358	MN	Chicken Breast	08/05	C. jejuni
N7445	CA	Chicken Breast	11/05	C. jejuni
N7449	CA	Chicken Breast	11/05	C. jejuni
N5431	MD	Chicken Breast	04/05	C. jejuni
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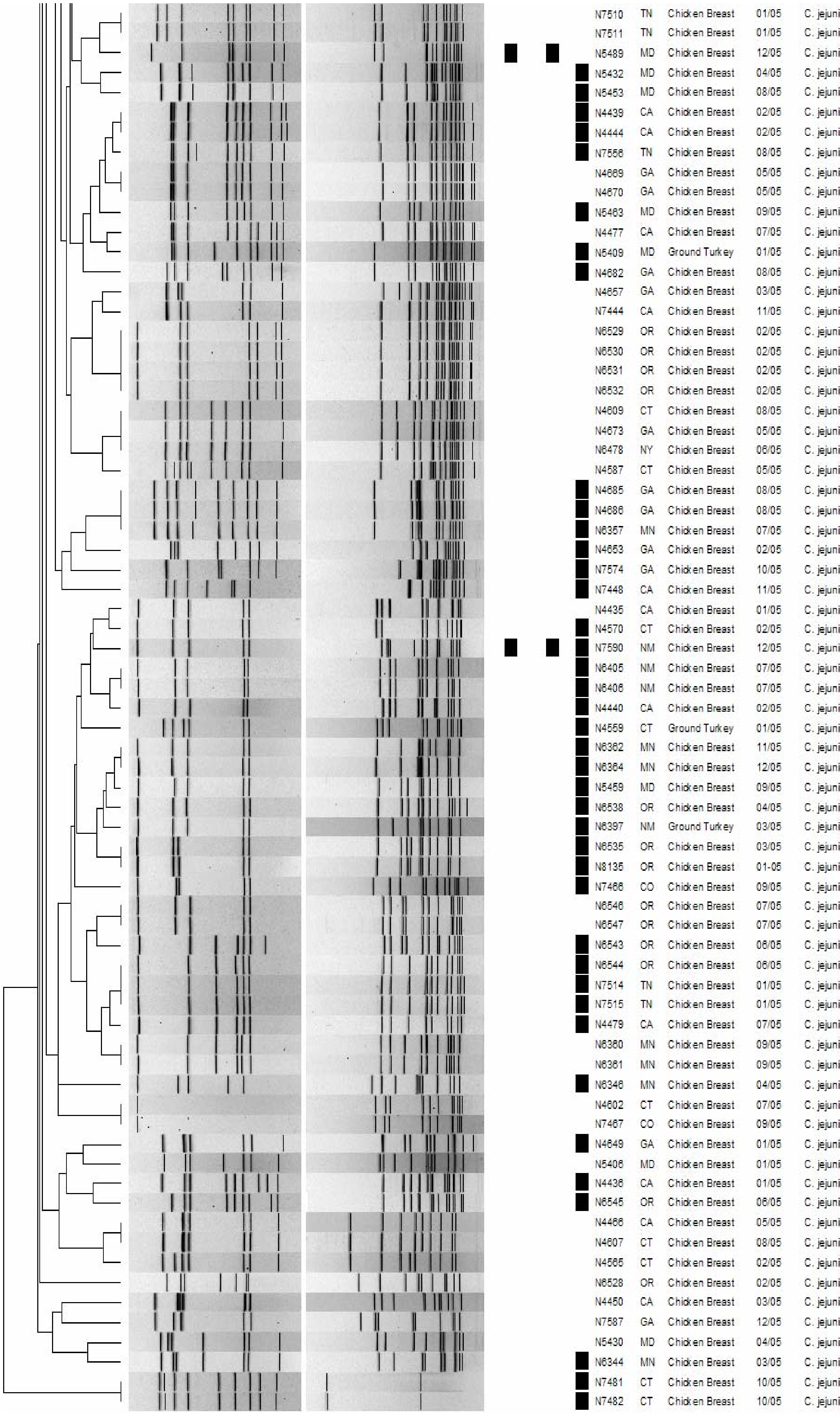
N6413	NM	Chicken Breast	08/05	C. jejuni
N6387	NM	Chicken Breast	01/05	C. jejuni
N4470	CA	Chicken Breast	06/05	C. jejuni
N7435	CA	Chicken Breast	10/05	C. jejuni
N4478	CA	Chicken Breast	07/05	C. jejuni
N4469	CA	Chicken Breast	06/05	C. jejuni
N7439	CA	Chicken Breast	10/05	C. jejuni
N4446	CA	Chicken Breast	02/05	C. jejuni
N4451	CA	Chicken Breast	03/05	C. jejuni
N6396	NM	Chicken Breast	03/05	C. jejuni
N7453	CA	Chicken Breast	12/05	C. jejuni
N7457	CA	Chicken Breast	12/05	C. jejuni
N4659	GA	Chicken Breast	03/05	C. jejuni
N7486	CT	Chicken Breast	10/05	C. jejuni
N6548	OR	Chicken Breast	07/05	C. jejuni
N6549	OR	Chicken Breast	07/05	C. jejuni
N6550	OR	Chicken Breast	07/05	C. jejuni
N4690	GA	Chicken Breast	09/05	C. jejuni
N6417	NM	Chicken Breast	11/05	C. jejuni
N6418	NM	Chicken Breast	11/05	C. jejuni
N7537	TN	Chicken Breast	06/05	C. jejuni
N6558	OR	Chicken Breast	11/05	C. jejuni
N7472	CO	Chicken Breast	10/05	C. jejuni
N7554	TN	Chicken Breast	08/05	C. jejuni
N7508	CT	Chicken Breast	12/05	C. jejuni
N7598	NY	Chicken Breast	12/05	C. jejuni
N4666	GA	Chicken Breast	04/05	C. jejuni
N4667	GA	Chicken Breast	04/05	C. jejuni
N6411	NM	Chicken Breast	08/05	C. jejuni
N4590	CT	Chicken Breast	05/05	C. jejuni
N4464	CA	Chicken Breast	05/05	C. jejuni
N6554	OR	Chicken Breast	09/05	C. jejuni
N7549	TN	Chicken Breast	07/05	C. jejuni
N5456	MD	Chicken Breast	08/05	C. jejuni
N5457	MD	Chicken Breast	08/05	C. jejuni
N7437	CA	Chicken Breast	10/05	C. jejuni
N6400	NM	Chicken Breast	04/05	C. jejuni
N7527	TN	Chicken Breast	05/05	C. jejuni
N7528	TN	Chicken Breast	05/05	C. jejuni
N7530	TN	Chicken Breast	05/05	C. jejuni
N4447	CA	Chicken Breast	02/05	C. jejuni
N4489	CA	Chicken Breast	09/05	C. jejuni
N4584	CT	Chicken Breast	05/05	C. jejuni
N4585	CT	Chicken Breast	05/05	C. jejuni
N6553	OR	Chicken Breast	09/05	C. jejuni
N5458	MD	Chicken Breast	09/05	C. jejuni
N7529	TN	Chicken Breast	05/05	C. jejuni
N7440	CA	Chicken Breast	10/05	C. jejuni
N7441	CA	Chicken Breast	10/05	C. jejuni
N4462	CA	Chicken Breast	05/05	C. jejuni
N6474	NY	Chicken Breast	04/05	C. jejuni
N7526	TN	Chicken Breast	03/05	C. jejuni
N7571	GA	Chicken Breast	10/05	C. jejuni
N4474	CA	Chicken Breast	07/05	C. jejuni
N4476	CA	Chicken Breast	07/05	C. jejuni
N5433	MD	Chicken Breast	04/05	C. jejuni
N7595	NY	Chicken Breast	12/05	C. jejuni
N4448	CA	Chicken Breast	03/05	C. jejuni
N7477	CO	Chicken Breast	12/05	C. jejuni
N7584	GA	Chicken Breast	11/05	C. jejuni



N7510 TN Chicken Breast 01/05 C. jejuni
N7511 TN Chicken Breast 01/05 C. jejuni
N5489 MD Chicken Breast 12/05 C. jejuni
N5432 MD Chicken Breast 04/05 C. jejuni
N5453 MD Chicken Breast 08/05 C. jejuni
N4439 CA Chicken Breast 02/05 C. jejuni
N4444 CA Chicken Breast 02/05 C. jejuni
N7556 TN Chicken Breast 08/05 C. jejuni
N4669 GA Chicken Breast 05/05 C. jejuni
N4670 GA Chicken Breast 05/05 C. jejuni
N5463 MD Chicken Breast 09/05 C. jejuni
N4477 CA Chicken Breast 07/05 C. jejuni
N5409 MD Ground Turkey 01/05 C. jejuni
N4682 GA Chicken Breast 08/05 C. jejuni
N4657 GA Chicken Breast 03/05 C. jejuni
N7444 CA Chicken Breast 11/05 C. jejuni
N6529 OR Chicken Breast 02/05 C. jejuni
N6530 OR Chicken Breast 02/05 C. jejuni
N6531 OR Chicken Breast 02/05 C. jejuni
N6532 OR Chicken Breast 02/05 C. jejuni
N4609 CT Chicken Breast 08/05 C. jejuni
N4673 GA Chicken Breast 05/05 C. jejuni
N6478 NY Chicken Breast 06/05 C. jejuni
N4587 CT Chicken Breast 05/05 C. jejuni
N4685 GA Chicken Breast 08/05 C. jejuni
N4686 GA Chicken Breast 08/05 C. jejuni
N6357 MN Chicken Breast 07/05 C. jejuni
N4653 GA Chicken Breast 02/05 C. jejuni
N7574 GA Chicken Breast 10/05 C. jejuni
N7448 CA Chicken Breast 11/05 C. jejuni
N4435 CA Chicken Breast 01/05 C. jejuni
N4570 CT Chicken Breast 02/05 C. jejuni
N7590 NM Chicken Breast 12/05 C. jejuni
N6405 NM Chicken Breast 07/05 C. jejuni
N6406 NM Chicken Breast 07/05 C. jejuni
N4440 CA Chicken Breast 02/05 C. jejuni
N4559 CT Ground Turkey 01/05 C. jejuni
N6362 MN Chicken Breast 11/05 C. jejuni
N6364 MN Chicken Breast 12/05 C. jejuni
N5459 MD Chicken Breast 09/05 C. jejuni
N6538 OR Chicken Breast 04/05 C. jejuni
N6397 NM Ground Turkey 03/05 C. jejuni
N6535 OR Chicken Breast 03/05 C. jejuni
N8135 OR Chicken Breast 01-05 C. jejuni
N7466 CO Chicken Breast 09/05 C. jejuni
N6546 OR Chicken Breast 07/05 C. jejuni
N6547 OR Chicken Breast 07/05 C. jejuni
N6543 OR Chicken Breast 06/05 C. jejuni
N6544 OR Chicken Breast 06/05 C. jejuni
N7514 TN Chicken Breast 01/05 C. jejuni
N7515 TN Chicken Breast 01/05 C. jejuni
N4479 CA Chicken Breast 07/05 C. jejuni
N6360 MN Chicken Breast 09/05 C. jejuni
N6361 MN Chicken Breast 09/05 C. jejuni
N6346 MN Chicken Breast 04/05 C. jejuni
N4602 CT Chicken Breast 07/05 C. jejuni
N7467 CO Chicken Breast 09/05 C. jejuni
N4649 GA Chicken Breast 01/05 C. jejuni
N5406 MD Chicken Breast 01/05 C. jejuni
N4436 CA Chicken Breast 01/05 C. jejuni
N6545 OR Chicken Breast 06/05 C. jejuni
N4466 CA Chicken Breast 05/05 C. jejuni
N4607 CT Chicken Breast 08/05 C. jejuni
N4565 CT Chicken Breast 02/05 C. jejuni
N6528 OR Chicken Breast 02/05 C. jejuni
N4450 CA Chicken Breast 03/05 C. jejuni
N7587 GA Chicken Breast 12/05 C. jejuni
N5430 MD Chicken Breast 04/05 C. jejuni
N6344 MN Chicken Breast 03/05 C. jejuni
N7481 CT Chicken Breast 10/05 C. jejuni
N7482 CT Chicken Breast 10/05 C. jejuni

Figure A-4. Antimicrobial Resistance among *Salmonella* by Meat Type, 2005

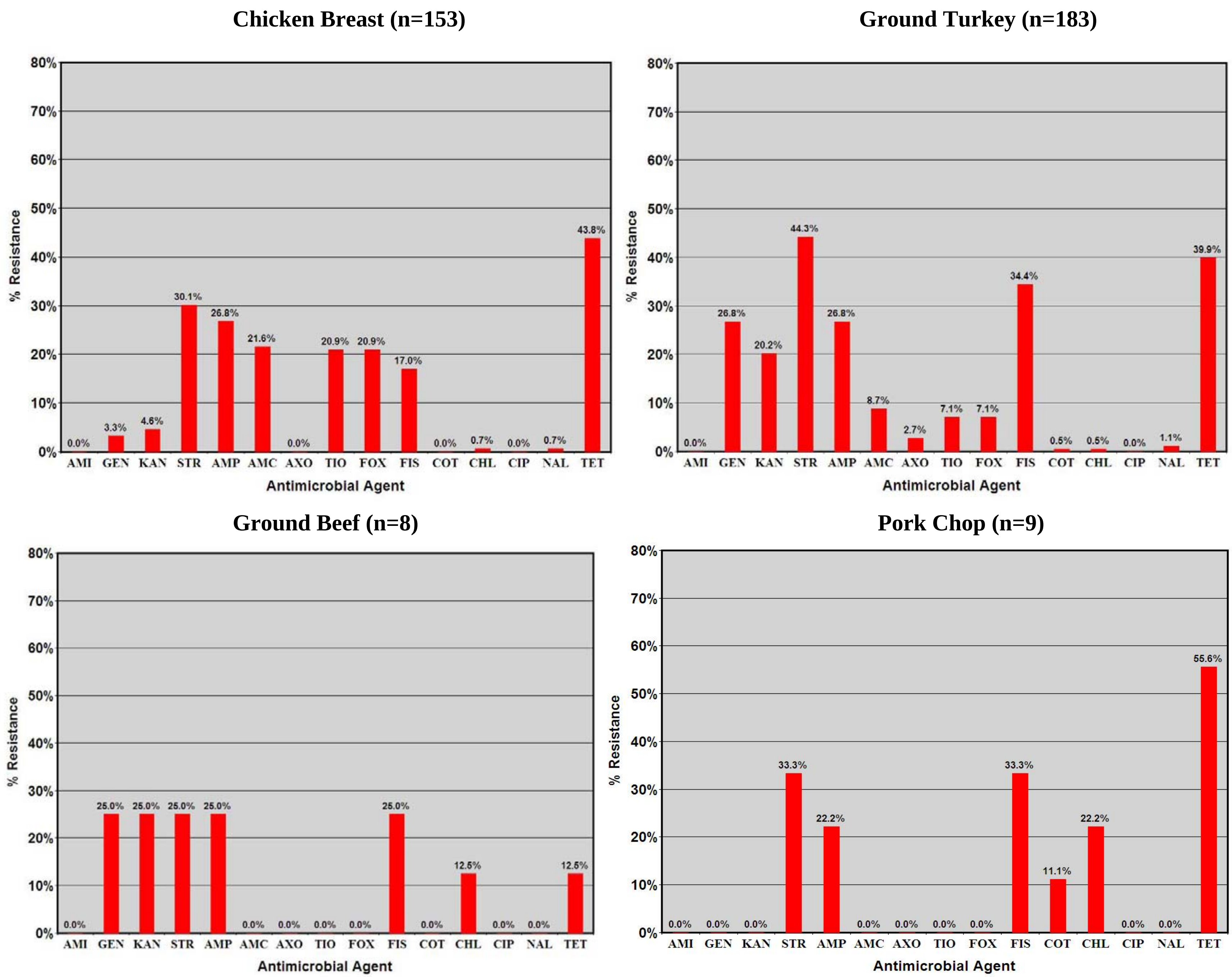
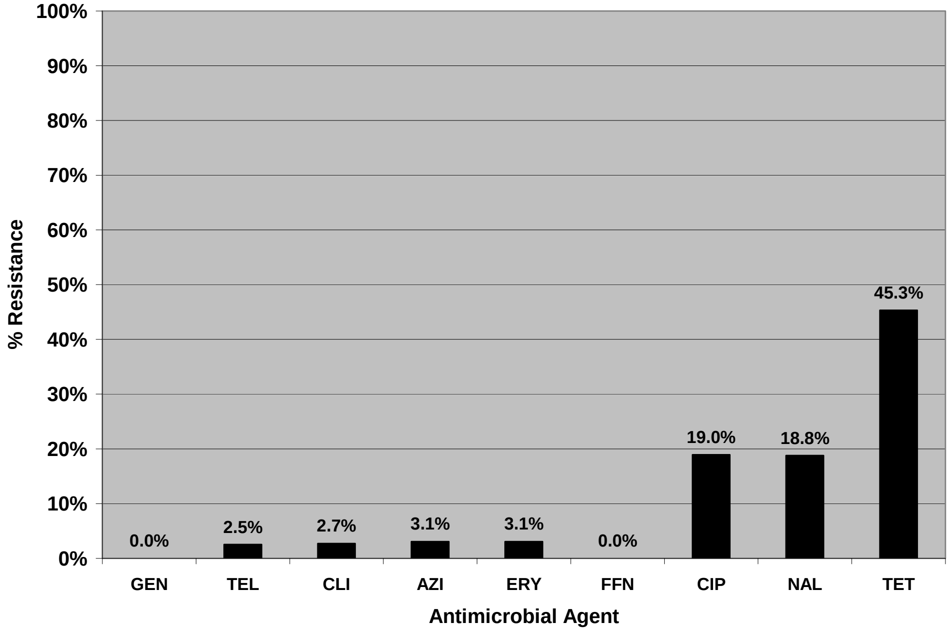
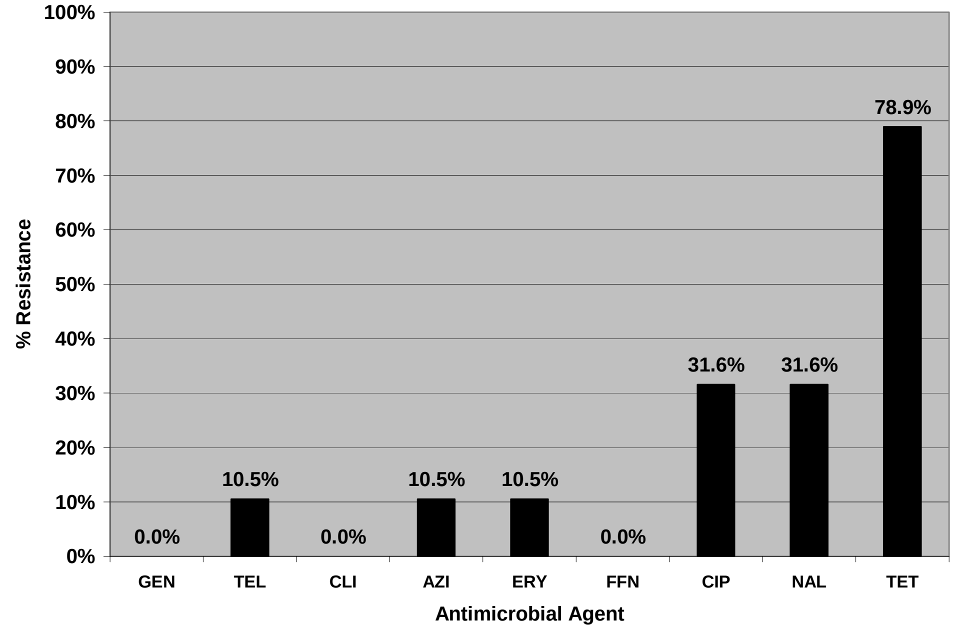


Figure A-5. Antimicrobial Resistance among *Campylobacter* by Meat Type, 2005

Chicken Breast (n=554)

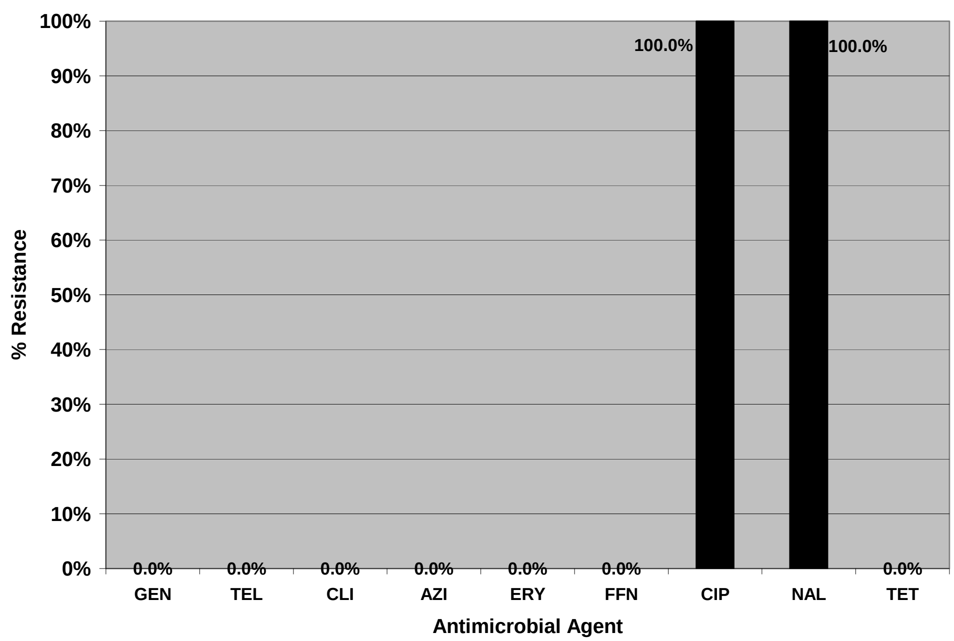


Ground Turkey (n=19)



Presented for all species except *C. lari* in CIP and NAL (n=20-1= 19 non *C. lari*)

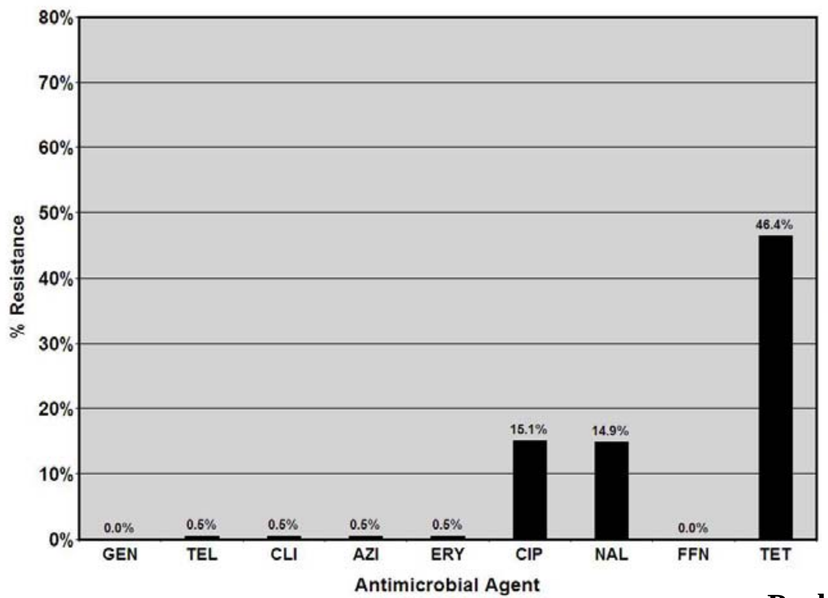
Pork Chop (n=1)



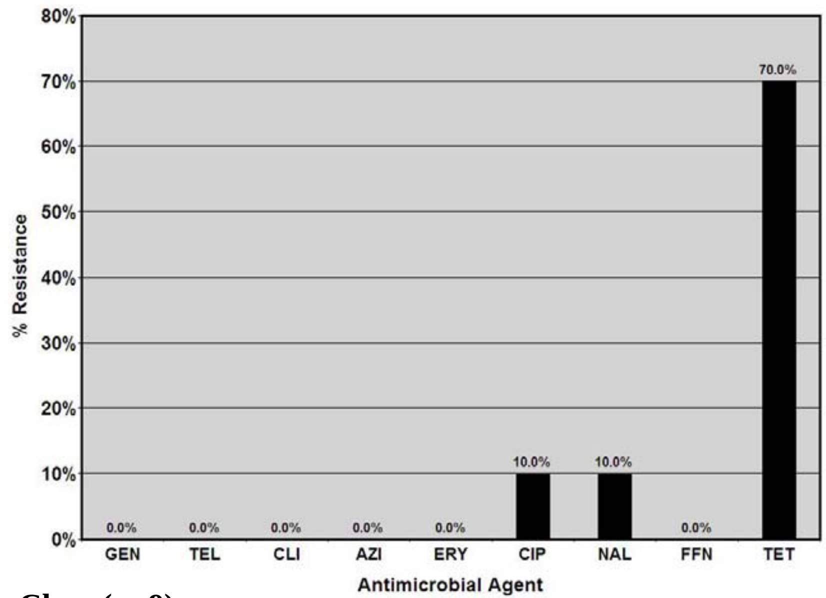
Presented for all species except *C. lari* in NAL (n=2-1= 1 non *C. lari*)

Figure A-5a. Antimicrobial Resistance among *Campylobacter jejuni* Meat Type, 2005

Chicken Breast (n=403)



Ground Turkey (n=10)



Pork Chop (n=9)

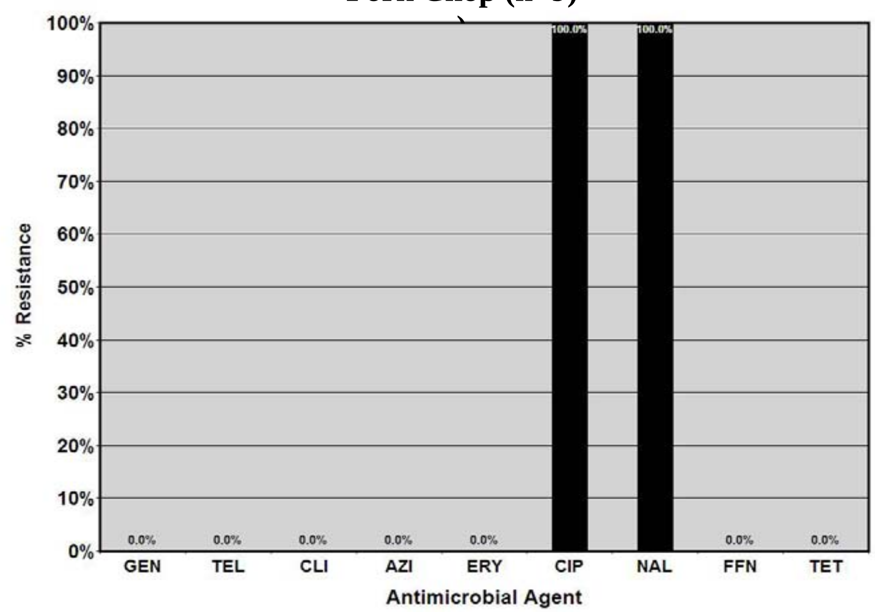
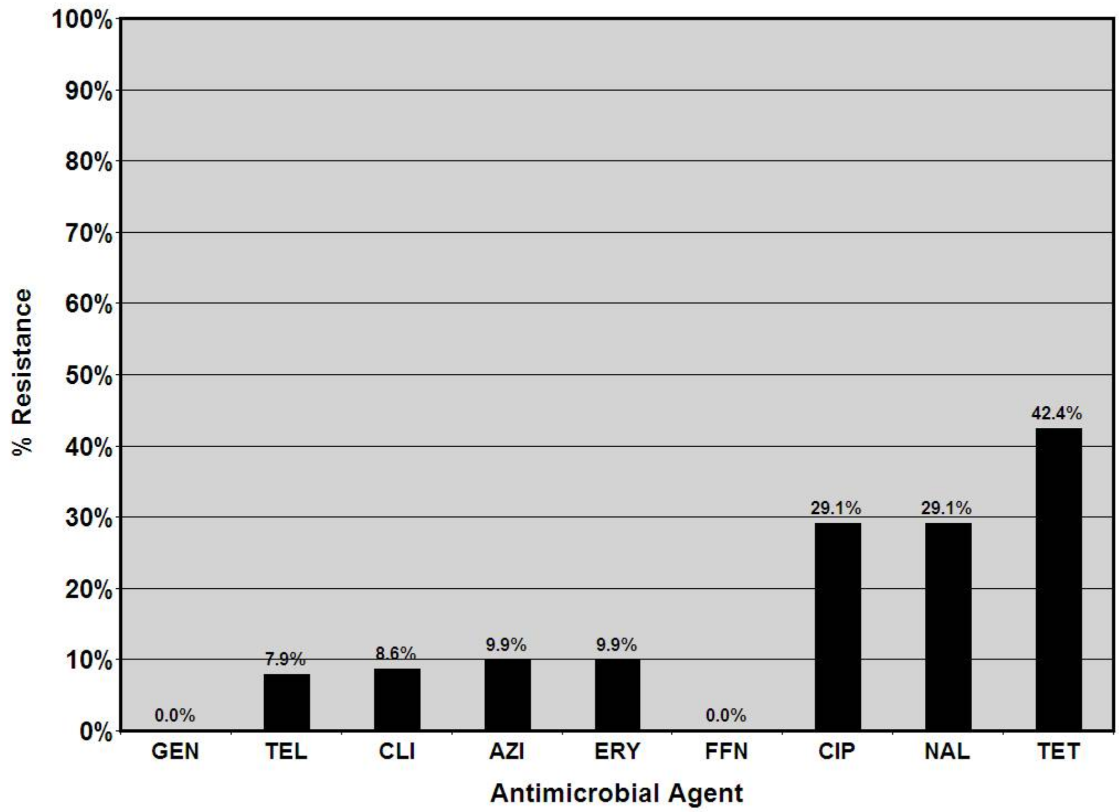


Figure A-5b. Antimicrobial Resistance among *Campylobacter coli* by Meat Type, 2005

Chicken Breast (n=151)



Ground Turkey (n=9)

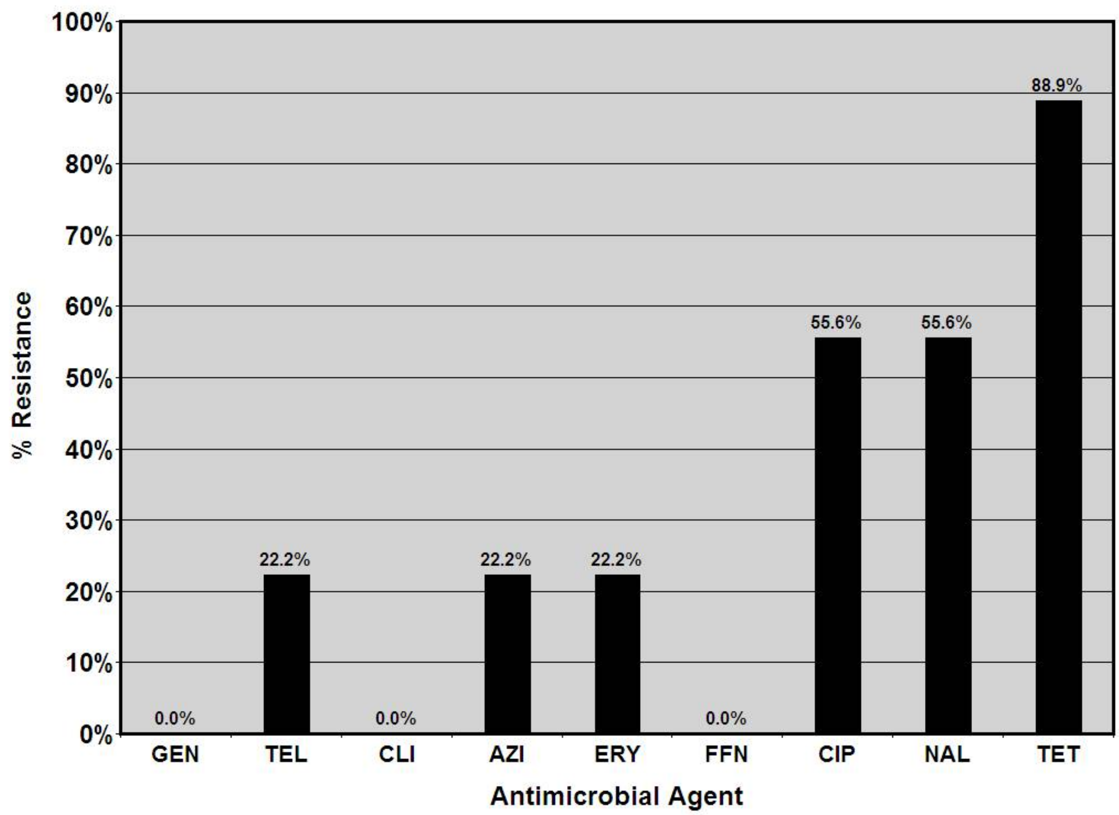
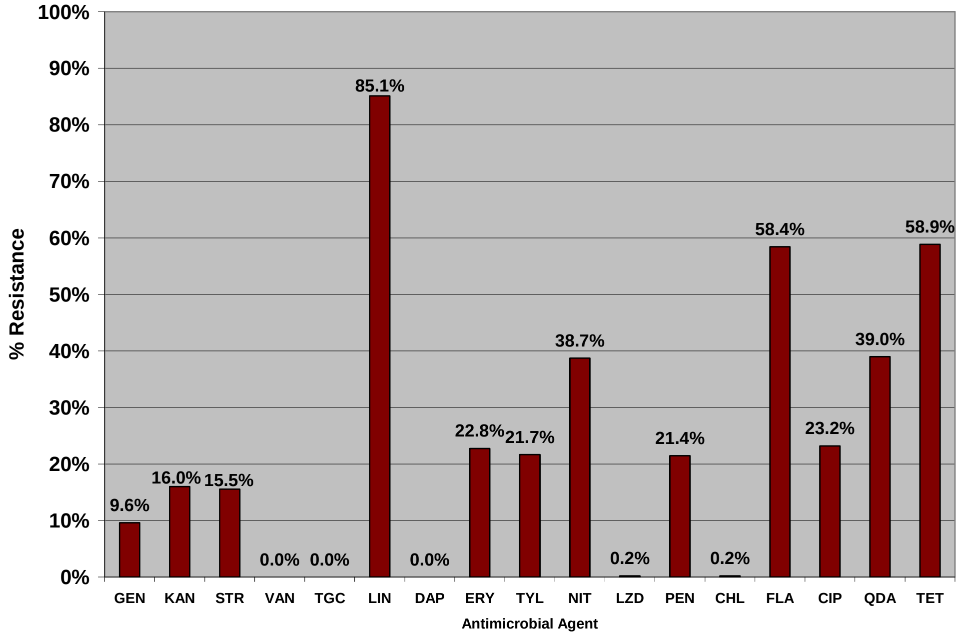


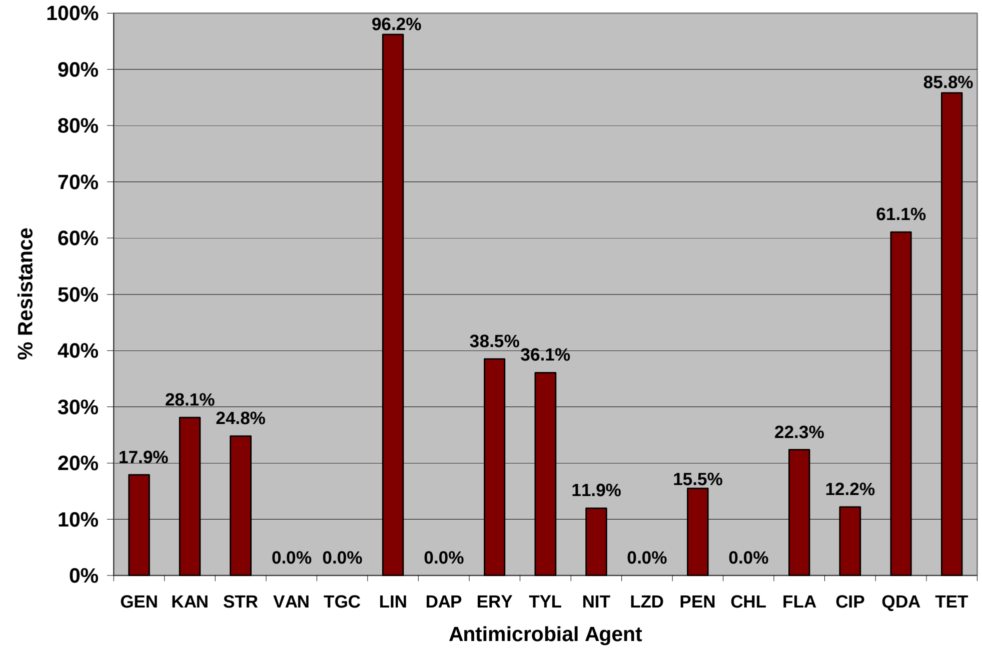
Figure A-6. Antimicrobial Resistance among *Enterococcus* by Meat Type, 2005

Chicken Breast (n=457)



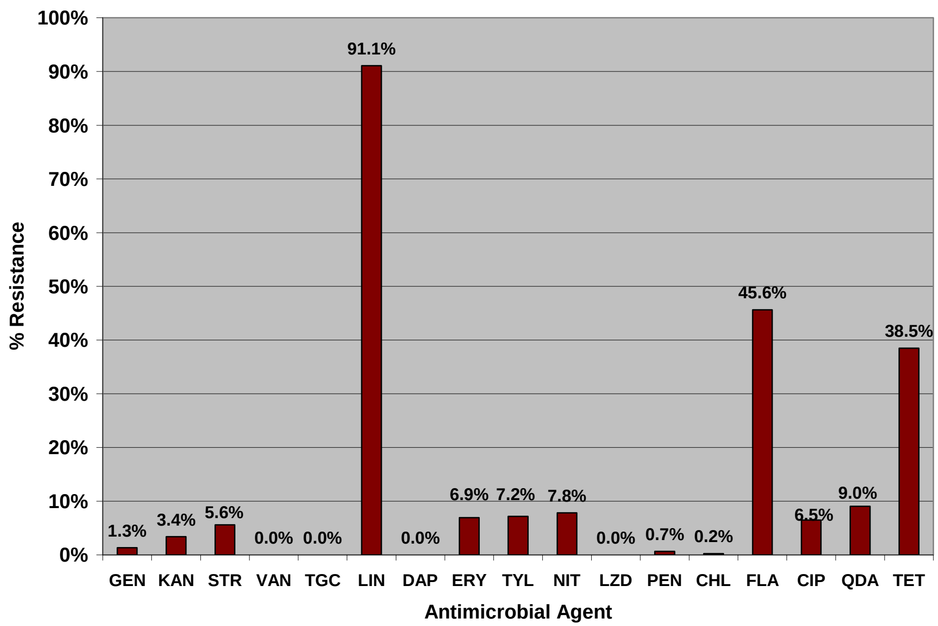
Presented for all species except *E. faecalis* in QDA (n=457-116= 341 non *E. faecalis*)

Ground Turkey (n=452)



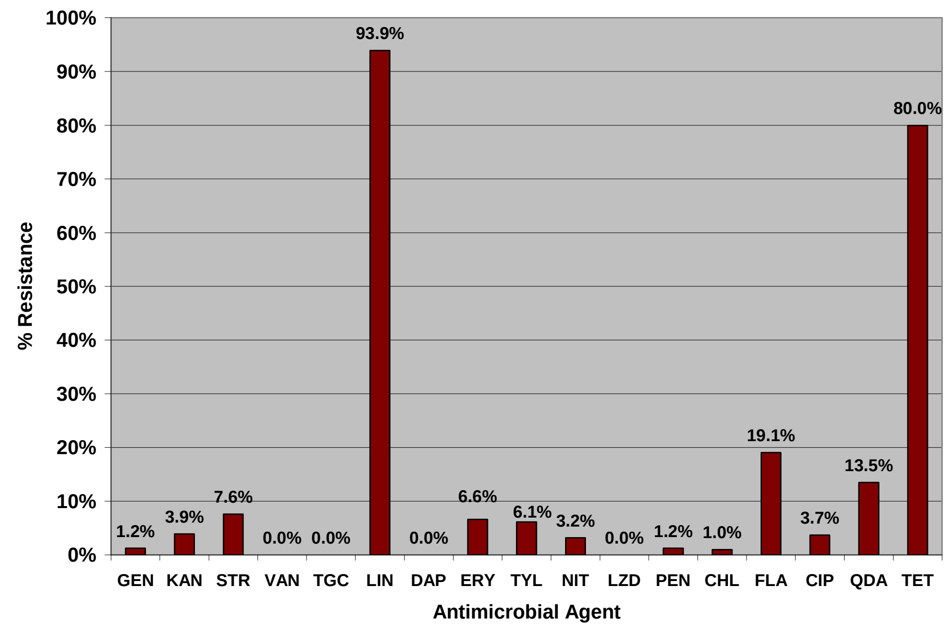
Presented for all species except *E. faecalis* in QDA (n=452-339= 113 non *E. faecalis*)

Ground Beef (n=447)



Presented for all species except *E. faecalis* in QDA (n=447-226= 221 non *E. faecalis*)

Pork Chop (n=409)



Presented for all species except *E. faecalis* in QDA (n=409-320= 89 non *E. faecalis*)

Figure A-6a. Antimicrobial Resistance among *Enterococcus faecium* by Meat Type, 2005

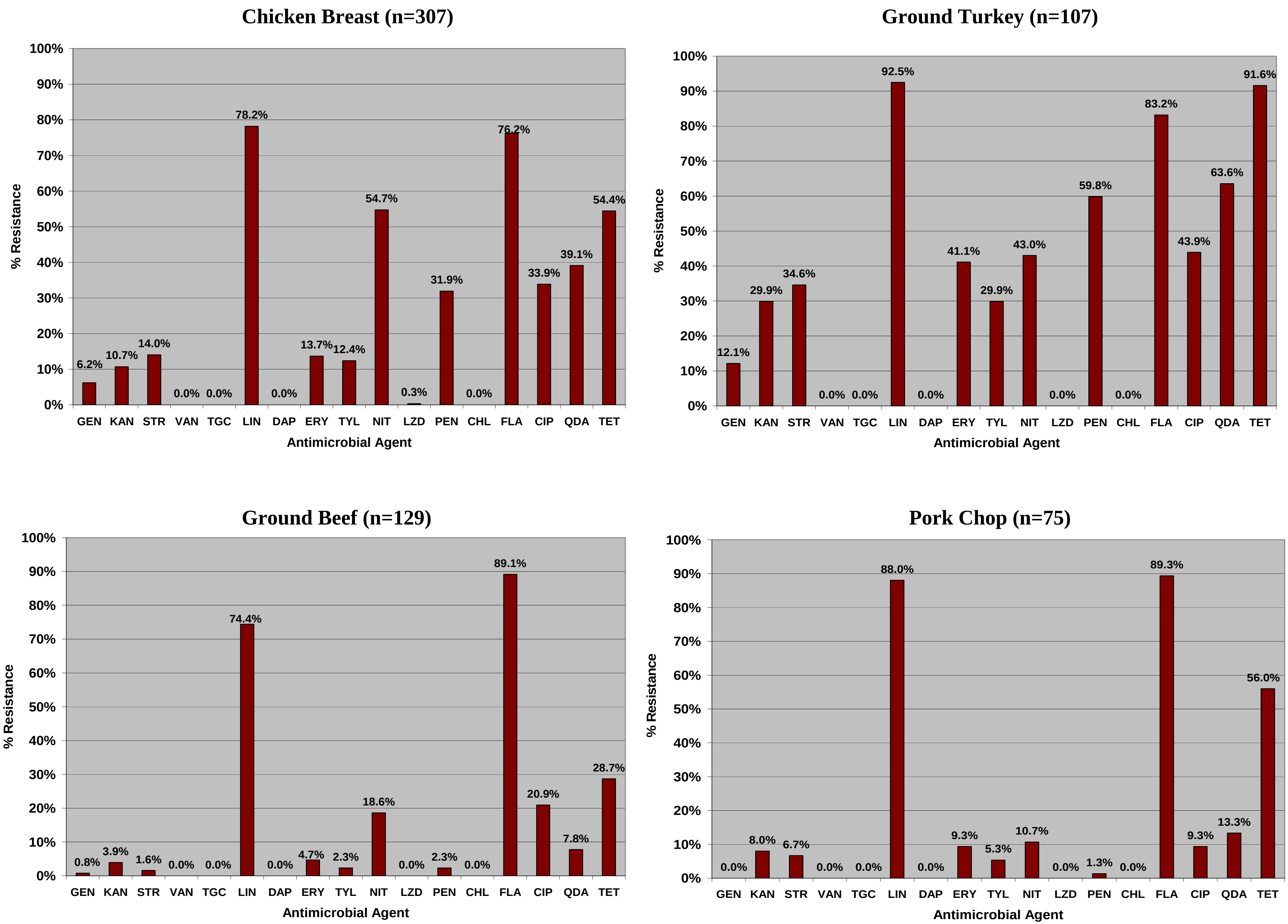
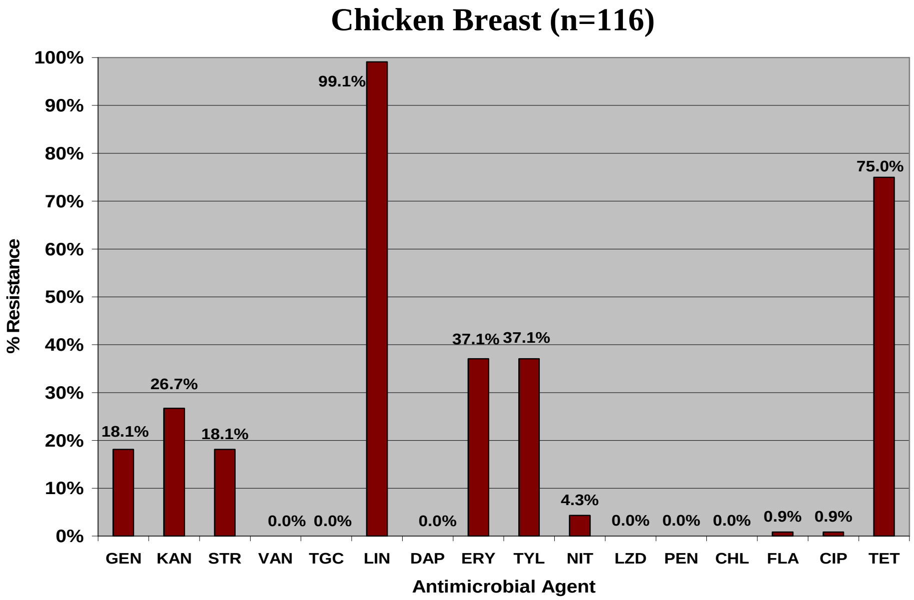
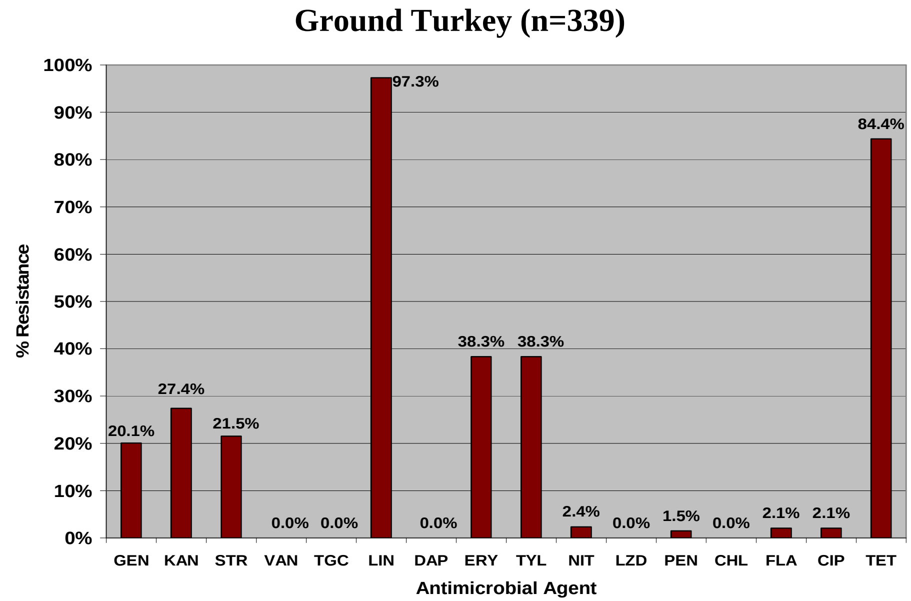
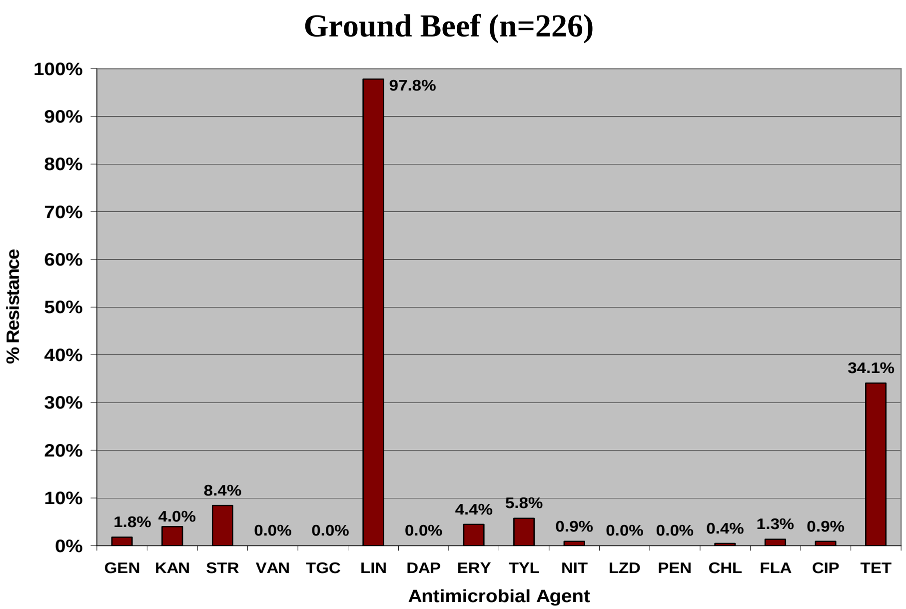
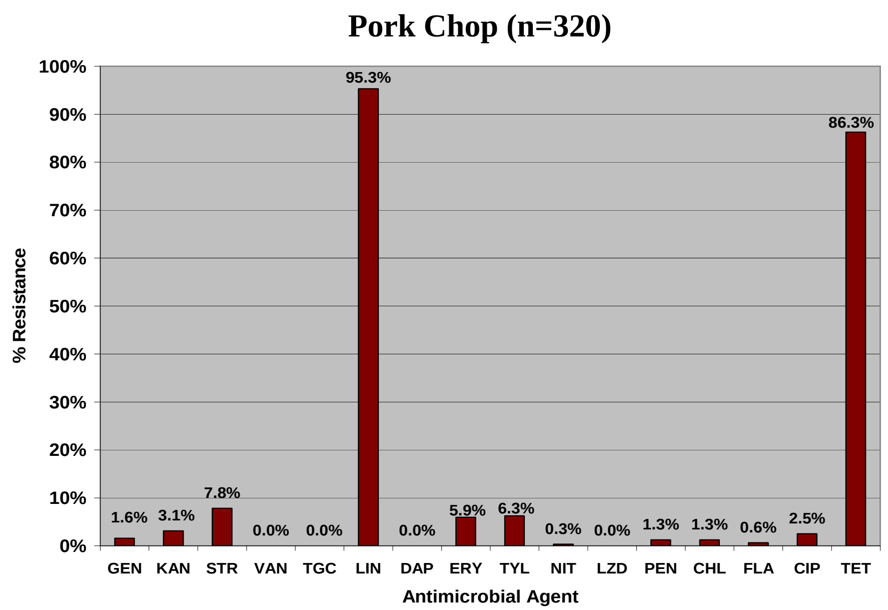


Figure A-6b. Antimicrobial Resistance among *Enterococcus faecalis*[*] by Meat Type, 2005









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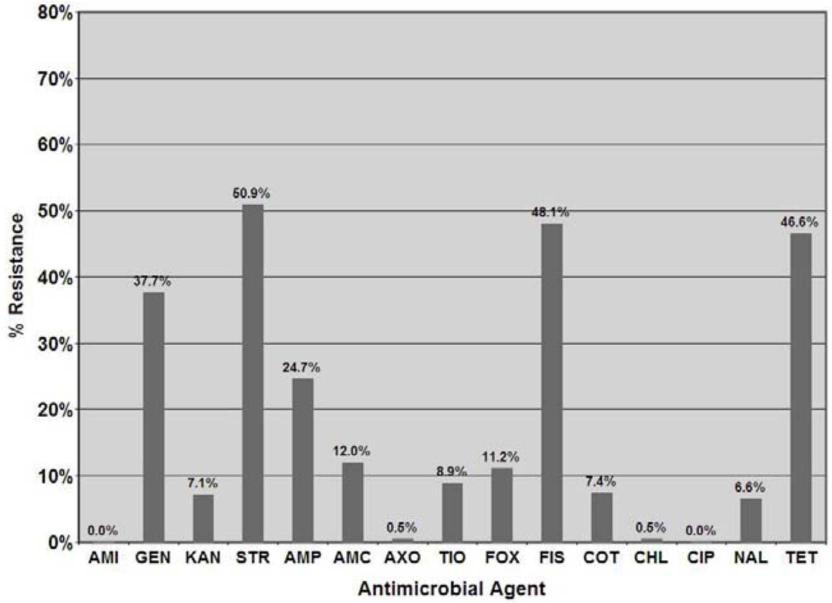
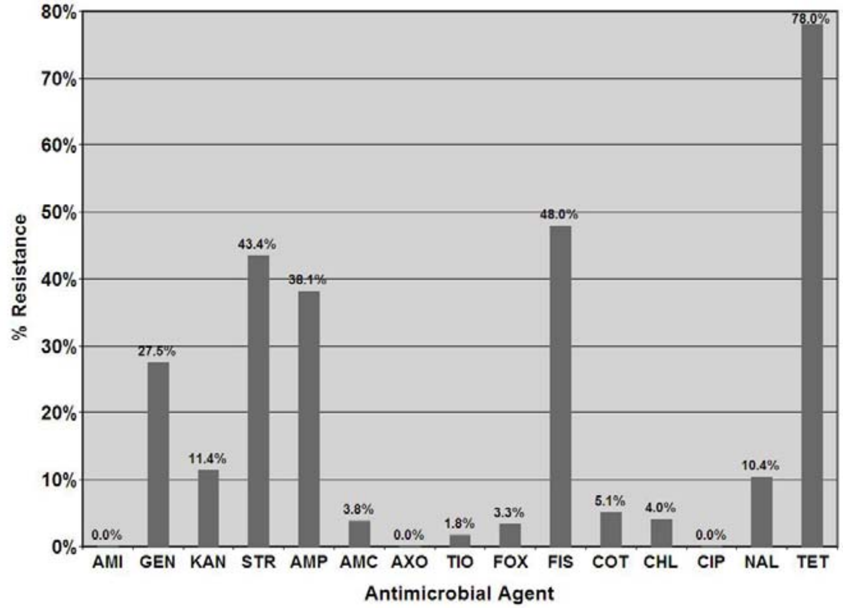
[*] Data does not include QDA, as *E. faecalis* is considered intrinsically resistant

Figure A-7. Antimicrobial Resistance among *E. coli* by Meat Type, 2005

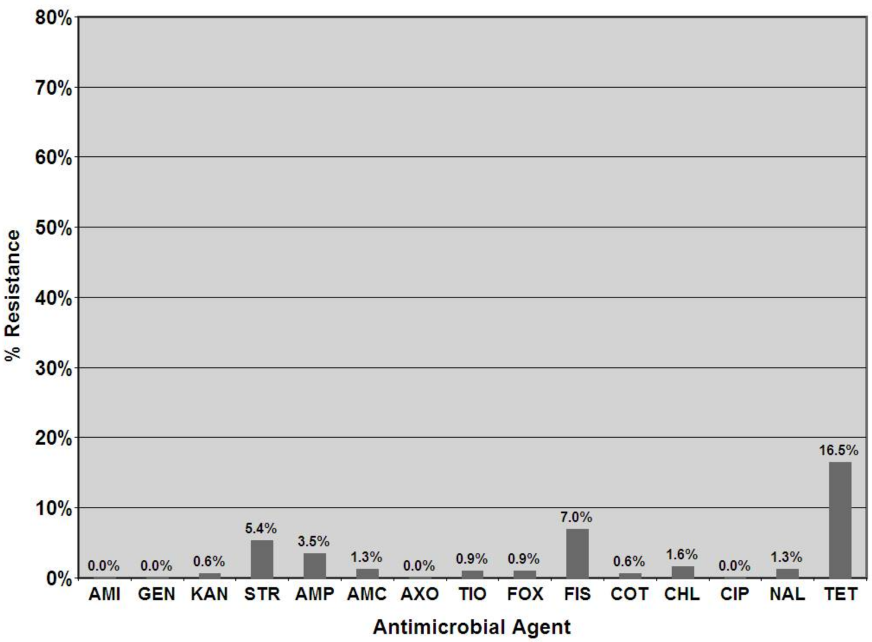
Chicken Breast (n=393)



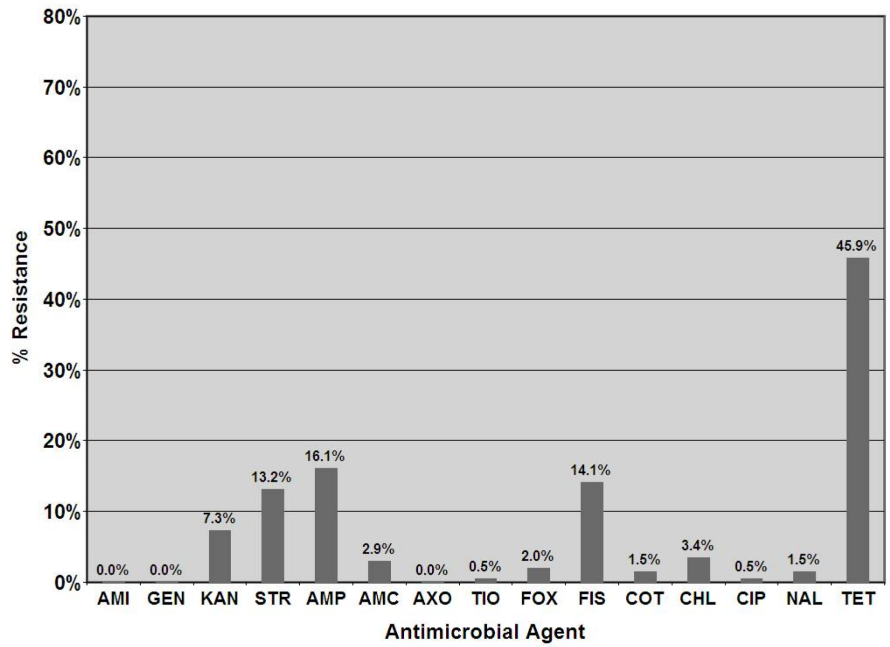
Ground Turkey (n=396)



Ground Beef (n=316)



Pork Chop (n=205)



Appendix A-8

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

STATE_______ MONTH______ YEAR______

Completed By (Initials):__________

Circle One → (CHICKEN BREAST) GROUND TURKEY GROUND BEEF PORK CHOP

PART I

	Sample ID Number	Store Name	Address	Organic Product (√ One) Y	N	Cut/Ground IN-STORE (√ One) Y	N	Sell by Date (M / D / Y)	Purchase Date (M / D / Y)	Lab Process Date (M / D / Y)	Brand Code	Brand Name	Establishment Number

↓

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

E-mail log sheet to lstancik@cdc.gov (404-371-5404), sayers@cvm.fda.gov (301-210-4268), and erobinso@cvm.fda.gov (301-210-4214); send original log sheet with isolates to FDA-CVM and keep a copy for your records.

NARMS Retail Meat, 2005

Experimental Design and Procedures:

Microbiological analysis:

In the laboratory, samples were refrigerated at 4°C and processed no later than 96 hours after purchase. After microbiological examination, recordings were made on the log sheets whether or not the meat and poultry samples were presumptively positive for *Salmonella*, *Campylobacter*, *E. coli*, and *Enterococcus*. Each laboratory used essentially the same procedure for sample collection. Retail meat and poultry packages were kept intact until they were aseptically opened in the laboratory at the start of examination. For chicken and pork samples, one piece of meat was examined, whereas, 25 g of ground product was examined for ground beef and ground turkey samples. The analytical portions from each sample were placed in separate sterile plastic bags, 250 mL of buffered peptone water was added to each bag, and the bags were vigorously shaken. Fifty mL of the rinsate from each sample was transferred to separate sterile flasks (or other suitable sterile containers) for isolation and identification of *Salmonella*, *Campylobacter*, *E. coli*, or *Enterococcus* using standard microbiological procedures. Once isolated and identified, bacterial isolates were sent to FDA's CVM Office of Research for further characterization including species confirmation, antimicrobial susceptibility testing and PFGE analysis (S*almonella* and *Campylobacter* only).

Salmonella isolation:

Fifty mL of double strength lactose broth was added to each flask containing the 50 mL of rinsate to be used for *Salmonella* isolation. The contents were mixed thoroughly and incubated at 35°C for 24 hours. From each flask, 0.1 ml was then 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 one 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, one ml was heated at 100°C for 15 minutes, and the remaining portion was refrigerated. The heated portion from each culture was cooled to room temperature and 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 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 and the appropriate documentation was made on the log sheet accompanying the sample. When *Salmonella* like growth was observed, one well-isolated colony was streaked for isolation 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 -60 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA-CVM. Upon arrival at CVM, every isolate was streaked for purity on a BAP before being confirmed as *Salmonella* using the Vitek 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) or CDC antisera.

Campylobacter isolation:

Fifty mL of double strength Bolton broth was added to each flask containing the 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. Using a swab, the first quadrant of a CCA Plate was inoculated with the incubated Bolton broth culture. The remainder of each plate was then streaked with a loop to obtain isolated colonies, and the CCA plates were 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 and the appropriate documentation was made on the log sheet accompanying the sample. When *Campylobacter* like growth was observed, one typical well-isolated *Campylobacter* like colony from each positive CCA plate was sub-cultured to a BAP and incubated as described for the CCA plates. Following incubation, one typical well-isolated *Campylobacter* like colony was gram stained and tested using a smear catalase, oxidase, hippurate and/or motility test. If the Gram stain showed small, Gram- negative, curved rods, and the isolate was positive with the other test(s) that were conducted, a sample was considered presumptively positive for *Campylobacter*. If the CCA plates or BAPs had no typical colonies or isolate testing was inconsistent with Campylobacter, a sample was considered negative. All isolates presumptively identified as *Campylobacter* were frozen at -60 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA-CVM. Upon arrival at CVM, isolates were twice streaked for purity on a BAP before being identified to the species level using PCR assays previously described (2, 6).

E. coli isolation (Georgia, Maryland, Oregon and Tennessee)

Fifty mL of double strength MacConkey broth was added to each flask containing the 50 mL of rinsate to be used for *E. coli* isolation. The contents were mixed thoroughly and incubated at 35°C for 24 hours. One loopful from each flask was then transferred to an EMB agar plate and streaked for isolation. Agar plates were then incubated at 35°C for 24 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 BAPs were incubated at 35°C for 24 hours in ambient air and examined for purity. One typical, well-isolated colony was subcultured for indole and oxidase tests. Indole positive and oxidase negative isolates were considered presumptively positive as *E. coli*. Presumptive *E. coli* isolates were subsequently frozen at -60 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA-CVM. Upon arrival at CVM, every isolate was streaked for purity on a BAP before being confirmed as *E. coli* using the Vitek microbial identification system (bioMérieux, Hazelwood, MO).

Enterococcus isolation (Georgia, Maryland, Oregon and Tennessee)

Fifty mL of double strength Enterococcosel broth was added to each flask containing the 50 ml of rinsate to be used for *Enterococcus* isolation. The contents were mixed thoroughly and incubated at 45°C for 24 hours in ambient air. If no typical growth or blackening was observed in the flask, the sample was considered negative and the appropriate documentation was made on the log sheet accompanying the sample. If blackening of the broth was observed, a loopful was streaked for isolation onto an EA plate. The plates were then incubated at 35°C for 24 hours in ambient air and examined for enterococcal-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 and the appropriate documentation was made on the log sheet accompanying the sample. If enterococcal-like growth was present, one well-isolated colony was streaked for isolation onto a BAP, and incubated at 35°C for 24 hours in ambient air. Presumptive *Enterococcus* isolates were subsequently frozen at -60 to -80°C in Brucella broth with 20% glycerol and shipped in cryo-vials on dry ice to FDA-CVM. Upon arrival at CVM, every isolate was streaked for purity on a BAP before being confirmed as *Enterococcus* using the Vitek microbial identification system (bioMérieux, Hazelwood, MO).

Antimicrobial Susceptibility Testing:

Antimicrobial MICs were determined using a 96 well broth microdilution method (Sensititre, Trek Diagnostic Systems, Westlake, OH) according to CLSI standards (3, 4, 5). *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*, catalog # CAMPY (Table 1). CLSI recommended QC organisms were used each time that antimicrobial susceptibility testing was performed. The QC 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 tentative NARMS breakpoints were used (Table 1). All antimicrobial susceptibility testing was conducted in the laboratories of the Division of Animal and Food Microbiology, CVM-FDA, Laurel, MD.

Pulsed Field Gel Electrophoresis (PFGE):

Pulsed-field gel electrophoresis was used to assess genetic relatedness among *Salmonella* and *Campylobacter* isolates. The PFGE was performed according to protocols developed by CDC (1). Agarose-embedded DNA was digested with the enzyme *Xba*I for *Salmonella* isolates and *Sma*I 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. PFGE analysis was conducted in the laboratories of the Division of Animal and Food Microbiology, CVM-FDA, Laurel, MD.

References

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

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

3. Clinical Laboratory Standards Institute. Performance Standards for Antimicrobial Disk and Dilution Susceptibility Tests for Bacteria Isolated from Animals;

Approved Standard – Second Edition (M31-A2). 2002. CLSI, Wayne, Pa.

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

5. Clinical Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Sixteenth Informational Supplement (M100-S16). 2006. CLSI, Wayne, Pa.

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