Guidance for Readers

Organization of data tables

The data tables are sectioned according to the organism tested.

Non-typhoidal *Salmonella*: (Tables 5 through 50): Antimicrobial susceptibility data are first presented for all non-typhoidal *Salmonella enterica* serotypes. Data are then presented for the top non-typhoidal *Salmonella enterica* serotypes in humans, which vary slightly year-to-year, followed by the overall top serotypes in chickens, turkeys, cattle, and swine.

Please note: Although Javiana is typically one of the most common non-typhoidal Salmonella serotypes in humans, it is not presented separately in the Integrated Report because isolates of this serotype have not been recovered from retail meats and very few are recovered from food animals. Salmonella serotype I 4,[5]12:i:- includes Salmonella enterica strains with the antigenic formulas I 4,12:i:- and I 4,5,12:i:-. Food animal data for Salmonella enterica serotype I 4,[5],12:i:- are not available before 2004 because the National Veterinary Services Laboratory, which conducted the serotyping, did not report antigenic formulae for most monophasic serotypes.

Campylobacter (Tables 51 through 59): Antimicrobial susceptibility data are presented for *Campylobacter* recovered from humans, retail poultry and food animals. Date for *C. jejuni* and *C. coli* are presented separately.

Please note: Due to low recovery of *Campylobacter* from retail ground beef and pork chops, this testing was discontinued in 2008. All NARMS data on *Campylobacter* isolated from ground beef and pork chops can be found in reports of data collected before 2008.

E. coli (Tables 60 through 65): Antimicrobial susceptibility data are presented for *E. coli* from retail meats and food animals.

Enterococcus (Tables 66 through 77): Antimicrobial susceptibility data are presented for Enterococcus recovered from retail meats and food animals. Antimicrobial susceptibility data for *E. faecalis*, *E. faecium*, and *E. hirae* are presented separately.

Each section is divided into:

Number if isolates tested by source and year

Isolation from retail meats

Antimicrobial resistance (including multidrug resistance)

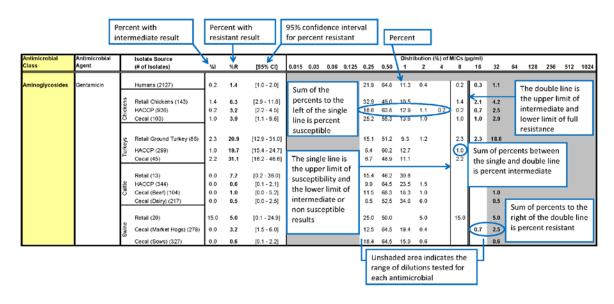
Due to space constraints, only data collected since 2003 are shown in the resistance tables. Data from 1996-2002 can be found in previous reports. The total number of isolates tested per year for each source is listed at the top of each table. An empty cell indicates that surveillance was not conducted for that particular source, whereas a zero indicates that surveillance was conducted, but no isolates were available for testing. Below the section containing the number of isolates tested, empty shaded boxes indicate that there are no data to report, because surveillance was not conducted or isolates were not available for testing.

Historical data contained in this report differ in a few cases from those is previous NARMS reports. These differences may be due to changes in breakpoints, reporting of non-typhoidal *Salmonella* rather than non-Typhi *Salmonella*, and the dynamic nature of the data, which are updated if new information is obtained about the bacterial isolates or when specific isolates are retested. In a few cases, differences may be due to other reasons. For example, *Salmonella* variants are grouped together in this report (e.g., Typhimurium var. 5- is grouped with Typhimurium, and Anatum var. 15+ is grouped with Anatum), whereas USDA's annual report lists these *Salmonella* variants separately.

How to read Minimum Inhibitory Concentration (MIC) Tables

An explanation of MIC tables is provided below. These tables contain a great deal of helpful information in one place. By comparing MICs distributions over time, emerging resistances may be detected before strains become categorically resistant. This data display also permits other surveillance programs to directly compare results regardless of different criteria for interpretation. For most antimicrobial agents, three categories (susceptible, intermediate, and resistant) are used to interpret MICs.

How to read MIC tables



Interpreting Results

Isolates of indicator bacteria and *Salmonella* are classified as *susceptible, intermediate,* or *resistant* using clinical breakpoints established by the Food and Drug Administration and published by the Clinical Laboratory Standards Institute (CLSI) where available (See CLSI documents M45-A2, M31-A3, and M100-S26. ^{1, 2, 3}). The breakpoints used are shown in the Breakpoints section (Table 1) of the report.

For Salmonella and E. coli, CLSI breakpoints were available for all antimicrobial agents tested except streptomycin and azithromycin. For Enterococcus, CLSI breakpoints were available for all agents except kanamycin, tigecycline, lincomycin, daptomycin for E. faecium and tylosin. Beginning in 2012, NARMS began using epidemiological cut-off values (ECVs) for Campylobacter isolates. For more information on ECOFFs, see Interpreting Antimicrobial Susceptibility Data below.

Interpreting Antimicrobial Susceptibility Data

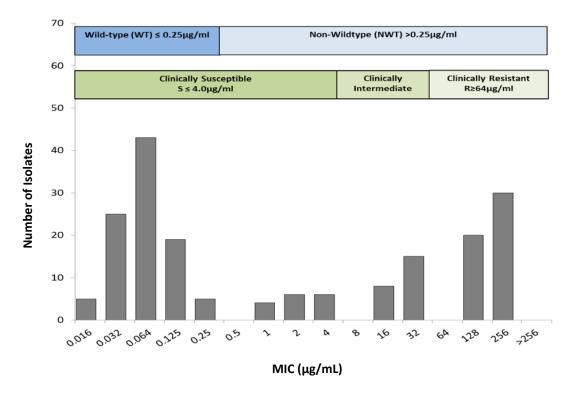
An integral part of antimicrobial susceptibility testing is interpreting the results in order to categorize bacteria as *susceptible* or *resistant*. The most commonly used criteria for interpreting lab results are *clinical breakpoints*. These are used to guide the selection of antibiotics most likely to successfully treat infections. Several standards organizations determine clinical breakpoints. In the United States, clinical breakpoints are set by the Food and Drug Administration (FDA) and the Clinical and Laboratory Standards Institute (CLSI). In Europe, this role is played by the European Committee on Antimicrobial Susceptibility Testing (EUCAST).

When determining clinical breakpoints, three major kinds of data are considered: 1) minimum inhibitory concentration (MIC) data for clinical isolates; 2) clinical outcome data; and 3) pharmacological properties of the drug at the site of infection, and how different dosing regimens may affect outcome. Since the primary purpose of clinical breakpoints is to guide therapy and predict clinical efficacy, they can have limitations for other purposes, such as detecting emerging resistance in laboratory based surveillance programs.

In contrast to clinical breakpoints, ECVs distinguish bacteria without resistance mechanisms ("wild type; (WT)") from those with an acquired resistance mechanism ("non-wild type; NWT"). ECV determinations are based on the testing of large numbers of strains from different institutions to determine the MIC range of WT populations. The ECV is defined as the highest MIC value of the susceptible population. The ECVs for a certain organism/drug combination is expressed as WT ≤ X mg/L. Thus, while the clinical breakpoint is set to guide therapy, ECVs are useful for detecting isolates with acquired resistance. ECVs do not take into consideration any data on dosages or clinical efficacy. Therefore, an isolate that is considered non-wild type using ECVs may still be considered susceptible using clinical breakpoints (Figure 1). ECVs have been determined for a large number of organisms and drugs. Information on ECVs can be found on the EUCAST webpage (http://www.eucast.org/♣).

In this report NARMS has adopted ECVs to interpret results for *Campylobacter*. To highlight the fact that wild type isolates are "microbiologically susceptible" and non-wild type isolates "microbiologically resistant" isolates are being reported as "susceptible" or "resistant" (rather than "wild type" or "non-wild type") in the present report. Thus, tables in this report that describe number and percentage resistant, resistance patterns and MIC distributions for *Campylobacter* all reflect the use of ECVs (as determined by EUCAST).

Figure 1. Constructed example illustrating the difference between clinical breakpoints and epidemiological cut-off values (ECVs)



Limitations to the Report

The results on meats samples cannot be generalized at the state or at the country level due the limitation on the sampling scheme. It should be noted that due to sampling and design limitations, the temporal data comparisons made in the narrative for some food commodities and sampling points are more meaningful than for others. Resistance trends that are similar among human, retail and food sources may indicate causal correlations, but more information is needed to confirm this. Additional information on temporal analysis can be found in the NARMS Methodology section.

¹CLSI. 2010. Methods for Antimicrobial Dilution and Disk Susceptibility Testing of Infrequently Isolated or Fastidious Bacteria; Approved Guideline- Second Edition. CLSI document M45-A2. CLSI, Wayne, PA.

²CLSI. 2008. Performance Standards for Antimicrobial Disk and Dilution Susceptibility Tests for Bacteria Isolated from Animals; Approved Standard—Third Edition. CLSI document M31-A3. CLSI, Wayne, PA.

³CLSI. 2015. Performance Standards for Antimicrobial Susceptibility Testing; Twenty-second Informational Supplement. CLSI document M100-S26. CLSI, Wayne, PA.

Breakpoints

Table 1. Interpretive Criteria Used for Susceptibility Testing of Salmonella and E. coli

·		Br	eakpoints (µg/r	nl)
Antimicrobial Class	Antimicrobial Agent	Susceptible	Intermediate	Resistant
Aminoglycosides	Gentamicin	≤ 4	8	≥ 16
	Streptomycin before 2014 beginning in 2014	≤ 32 ≤ 16	N/A N/A	≥ 64 ≥ 32
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin-Clavulanic Acid	≤ 8 / 4	16 / 8	≥ 32 / 16
Cephems	Cefoxitin	≤ 8	16	≥ 32
	Ceftiofur	≤ 2	4	≥ 8
	Ceftriaxone	≤ 1	2	≥ 4
Folate Pathway Inhibitors	Sulfamethoxazole/Sulfisoxazole ²	≤ 256	N/A	≥ 512
	Trimethoprim-Sulfamethoxazole	≤ 2 / 38	N/A	≥ 4 / 76
Macrolides	Azithromycin	≤ 16	N/A	≥ 32
Penicillins	Ampicillin	≤ 8	16	≥ 32
Phenicols	Chloramphenicol	≤ 8	16	≥ 32
Quinolones	Ciprofloxacin ³	≤ 0.06	0.12-0.5	≥1
	Nalidixic acid	≤ 16	N/A	≥ 32
Tetracyclines	Tetracycline	≤ 4	8	≥ 16

¹ Breakpoints were adopted from CLSI (Clinical and Laboratory Standards Institute) M100-S26 document, except for streptomycin and azithromycin, which has no CLSI breakpoints

 $^{^{\}rm 2}$ Sulfamethoxazole was tested from 1996 through 2003 and was replaced by sulfisoxazole in 2004

³ Ciprofloxacin breakpoints for invasive *Salmonella* serotypes from the CLSI M100-S26 document are used for all *Salmonella* and *E. coli* analyses

Table 2. Interpretive Criteria Used for Susceptibility Testing of Campylobacter ¹

			Breakpoii	nts (µg/ml)	
		C. je	ejuni	С.	coli
Antimicrobial Class	Antimicrobial Agent	Susceptible	Resistant	Susceptible	Resistant
Aminoglycosides	Gentamicin	≤ 2	≥ 4	≤ 2	≥ 4
Ketolides	Telithromycin	≤ 4	≥ 8	≤ 4	≥ 8
Lincosamides	Clindamycin	≤ 0.5	≥ 1	≤ 1	≥ 2
Macrolides	Azithromycin	≤0.25	≥ 0.5	≤ 0.5	≥ 1
	Erythromycin	≤ 4	≥ 8	≤ 8	≥ 16
Phenicols	Chloramphenicol	≤ 16	≥ 32	≤ 16	≥ 32
	Florfenicol	≤ 4	≥ 8	≤ 4	≥ 8
Quinolones	Ciprofloxacin	≤ 0.5	≥ 1	≤ 0.5	≥ 1
	Nalidixic acid	≤ 16	≥ 32	≤ 16	≥ 32
Tetracyclines	Doxycycline	≤ 0.5	≥ 1	≤ 1	≥ 2
	Tetracycline	≤ 1	≥ 2	≤ 2	≥ 4

¹ Breakpoints were adopted from epidemiological cut off values

Table 3. Interpretive Criteria Used for Susceptibility Testing of Enterococcus 1

		Br	eakpoints (μg/r	nl)
Antimicrobial Class	Antimicrobial Agent	Susceptible	Intermediate	Resistant
Aminoglycosides	Gentamicin	≤ 500	N/A	>500
	Kanamycin ²	≤ 512	N/A	≥ 1024
	Streptomycin	≤ 512	N/A	≥ 1024
Glycopeptides	Vancomycin	≤ 4	8 -16	≥ 32
Glycylcycline	Tigecycline ^{2,3}	≤ 0.25	N/A	N/A
Lincosamides	Lincomycin ²	≤ 2	4	≥ 8
Lipopeptides	Daptomycin ⁴	≤ 4	N/A	N/A
Macrolides	Erythromycin	≤ 0.5	1 - 4	≥ 8
	Tylosin ²	≤ 8	16	≥ 32
Nitrofurans	Nitrofurantoin	≤ 32	64	≥ 128
Oxazolidinones	Linezolid	≤ 2	4	≥ 8
Penicillins	Penicillin	≤ 8	N/A	≥ 16
Phenicols	Chloramphenicol	≤ 8	16	≥ 32
Quinolone	Ciprofloxacin	≤ 1	2	≥ 4
Streptogramins	Quinupristin/Dalfopristin	≤ 1	2	≥ 4
Tetracyclines	Tetracycline	≤ 4	8	≥ 16

Table 4. Interpretive Criteria Used for Susceptibility Testing of *Salmonella* and *E. coli* Resistant to Ceftriaxone or Ceftiofur¹

		Br	eakpoints (μg/r	nl)
Antimicrobial Class	Antimicrobial Agent	Susceptible	Intermediate	Resistant
β-Lactam/β-Lactamase Inhibitor Combinations	Piperacillin-tazobactam	≤ 16	32 - 64	≥ 128
Penems	Imipenem	≤ 1	2	≥ 4
Cephems	Cefepime ⁵	≤ 2	4 - 8	≥ 16
	Cefotaxime	≤ 1	2	≥ 4
	Ceftazidime	≤ 4	8	≥ 16
Monobactams	Aztreonam	≤ 4	8	≥ 16

¹ Breakpoints were adopted from CLSI (Clinical and Laboratory Standards Institute) M100-S26 document, where available

 $^{^{2}\,\}mathrm{No}\;\mathrm{CLSI}$ interpretive criteria for this bacterium/antimicrobial combination currently available

 $^{^3}$ Only a susceptible breakpoint (\leq 0.25 µg/ml) has been established. Isolates with an MIC \geq 0.5 µg/ml are reported as resistant

 $^{^4}$ Only a susceptible breakpoint (≤4 μg/ml) has been established for *E. faecalis*. Isolates with an MIC ≥8 μg/ml are reported as resistant. There are no established CLSI breakpoints for *E. faecium* and *E. hirae*

⁵ Cefepime MICs above the susceptible range and below the resistant range are Susceptible Dose Dependent (SDD) according to the CLSI guidelines in the M100-S24 document

Non-Typhoidal Salmonella Data

Non-Typhoidal Salmonella Isolates Tested

Table 5. Number of Non-Typhoidal Salmonella Isolates Tested, 1996-2014¹

		7.									١	ear ear								
	Source	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Humans	1318	1297	1454	1493	1372	1409	1998	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
sus	Retail Chickens							60	83	157	153	152	99	198	272	171	158	229	208	143
icke			214	561	1438	1173	1307	1500	1158	1280	1989	1380	994	624	551	564	491	864	520	936
ည်	Cecal																		55	103
s/	Retail Ground Turkey							74	114	142	183	159	190	246	193	202	162	91	106	86
ırke	HACCP		107	240	713	518	550	244	262	236	227	304	271	148	121	151	103	175	87	299
Ţ	Cecal																		28	45
	Retail Ground Beef							9	10	14	8	19	13	24	14	7	9	13	15	13
ttle	HACCP		24	284	1610	1388	893	1008	670	607	329	389	439	443	200	247	340	280	310	344
Ca	Cecal (Beef)																		124	104
	Cecal (Dairy)																		310	217
ø	Retail Pork Chops							10	5	11	9	8	18	23	8	20	28	12	24	20
wi	Cecal (Market Swine)																		260	279
S	Cecal (Sows)																		289	327

¹ NARMS reports for the years 1996-2006 combined data for all non-Typhi *Salmonella* isolates from humans. Beginning in 2007, NARMS reported data separately for all typhoidal *Salmonella* serotypes (i.e. Typhi, Paratyphi A, tartrate-negative Paratyphi B, and Paratyphi C). This report includes data only for non-typhoidal isolates from humans. Data for typhoidal *Salmonella* can be found in the NARMS Human Isolates Final Reports, published by CDC.

Isolation of Non-Typhoidal Salmonella from Retail Meats

Table 6. Number and Percent of Retail Meat Samples Culture Positive for Salmonella, 2014

	Retail Chickens	Retail Ground Turkey	Retail Ground Beef	Retail Pork Chops
Number of Meat Samples Tested	1570	1557	1557	1567
Number Positive for Salmonella	143	86	13	20
Percent Positive for Salmonella	9.1%	5.5%	0.8%	1.3%

Figure 1. Percent of Retail Meat Samples Culture Positive for Salmonella, 2014

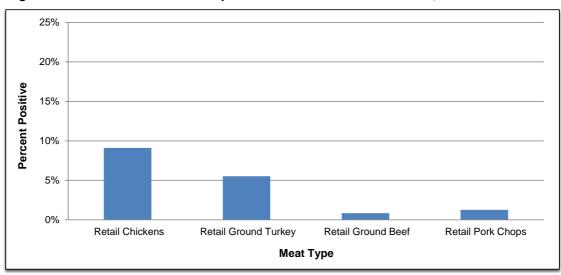
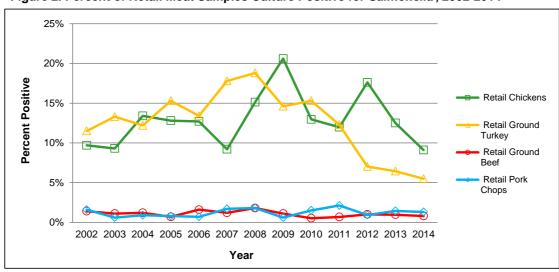


Figure 2. Percent of Retail Meat Samples Culture Positive for Salmonella, 2002-2014



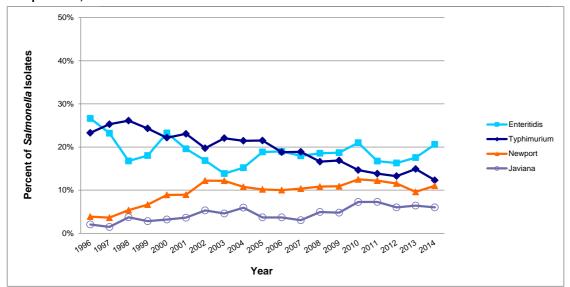
Non-Typhoidal Salmonella Serotypes

Tuble 1.	Top Serotypes among N Humans	on-Ty	phoida	l Salmonella I	solates, 2014				Chick	ens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans (N=2127)	Enteritidis Typhimurium Newport Javiana 14,[5],12::- Infantis Heidelberg Saintpaul Muenchen Montevideo Oranienburg	438 262 235 128 110 73 71 52 45 44 36	20.6 12.3 11.0 6.0 5.2 3.4 3.3 2.4 2.1 1.7	Retail Chickens (N=143)	Typhimurium Kentucky Enteritidis Heidelberg Infantis Schwarzengrund Mbandaka Other	38 35 27 24 4 4 8	26.6 24.5 18.9 16.8 2.8 2.8 2.1 5.6	HACCP (N=936)	Kentucky Enteritidis Heidelberg Typhimuriu Schwarzen Infantis I 4,[5],12:i- Thompson Montevideo Other	grund 61 43 37 23		Cecal (N=103)	Kentucky Typhimurium Enteritidis Schwarzengrund Heideberg Senftenberg Other	27 27 17 8 7 5	26.2 26.2 16.5 7.8 6.8 4.9 11.7
	Braenderup	31	1.5						Turk	•					
	Mississippi Agona Thompson Berta Rubislaw Paratyphi B var. L(+) tartrate+ Poona Bareilly Panama Unknown serotype Partially serotyped Rough/Nonmottle isolates Other	26 25 24 19 19 18 18 16 16 25 2 6 388	1.2 1.2 1.1 0.9 0.8 0.8 0.8 1.2 0.1 0.3 18.2	Source Retail Ground Turkey (N=86)	Reading Hadar Saintpaul Berta Albany Heidelberg Muenchen Schwarzengrund Senftenberg 14,12:d:- Anatum Brandenburg Infantis Typhimurium Other	18 13 12 8 6 6 4 3 3 2 2 2 2 2 2 3	20.9 15.1 14.0 9.3 7.0 7.0 4.7 3.5 3.5 2.3 2.3 2.3 2.3 2.3 3.5	HACCP (N=299)	Reading Hadar Heidelberg Saintpaul Montevidec Schwarzen Agona Senttenber Anatum Muenchen Other	grund 17 16 g 14 12 12 61	% 22.1 11.4 10.0 6.7 5.7 5.7 5.4 4.7 4.0 4.0 20.4	Cecal (N=45)	Serotype Hadar Senttenberg Reading Anatum Heideberg Saintpaul Schwarzengrund Agona Berta Kentucky Typhimurium Other	7 7 6 4 3 3 3 2 2 2 2 4	% 15.6 15.6 13.3 8.9 6.7 6.7 6.7 4.4 4.4 4.4 4.4 8.9
				Source	Serotype	n	%	Source	Cat Serotype	tle n	%	Source	Serotype	n	%
				Retail Ground Beef (N=13)	Dublin Typhimurium Montevideo Newport Anatum Bredeney Infantis	3 3 2 2 1 1 1	23.1 23.1 15.4 15.4 7.7 7.7 7.7	HACCP (N=344)	Montevideo Dublin Cerro Anatum Newport Muenchen Typhimuriu Kentucky 6,7:g.m,s:e Agona Muenster 14,[5],12::- Meleagridis Mbandaka Reading Infantis Derby Other	91 311 29 18 17 16 m 14 13 10 10 10	26.5 9.0 8.4 5.2 4.9 4.7 4.1 3.8 2.9 2.9 2.0 2.0 2.0 1.7 1.5 13.4	Cecal (Beef) (N=104)	Anatum Montevideo 6,7:g.m.s.e,n,215 Cerro Mbandaka Altona Sentenberg Typhimurium Kentucky Other Cerro Montevideo Agona Anatum Newport Meleagridis Typhimurium Kentucky Mbandaka Havana Muenchen Muenster Other	255 14 8 6 6 6 4 4 4 3 3 30 70 38 16 15 10 10 7 4 3 3 3 23	24.0 13.5 7.7 7.8 5.8 3.8 3.8 2.9 28.8 32.3 17.5 6.9 4.6 4.6 4.6 4.6 4.6 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1
									Swi						
				Source Retail Pork Chops (N=20)	Serotype Derby Infantis 14,[5],12:i:- Anatum Brandenburg Bredeney Cerro London Muenchen Ohio Typhimurium			5 5 2 1 1 1 1 1 1	% 25.0 25.0 10.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	Source Cecal (Market Swine) (N=279)	Derby Anatum Johanne Infantis Agona Typhimu I 4,[5],12 Saintpau Adelaide Cerro London Muench Brander Other	esburg urium 2:i:- ul e		149 29 28 22 17 13 9 8 8 8 8 8	% 17.6 10.4 10.0 7.9 6.1 4.7 3.2 2.9 2.9 2.9 2.9 2.5 22.9
										Cecal (Sows) (N=327)	Anatum Johanne Infantis Derby Agona Uganda I 4,[5],12 Muench Saintpar London Cerro Ohio Typhimu Other	2:i:- en ul		67 42 36 26 13 13 10 9 8 7 6 6 6	20.5 12.8 11.0 8.0 4.0 4.0 3.1 2.8 2.4 2.1 1.8 1.8 23.9

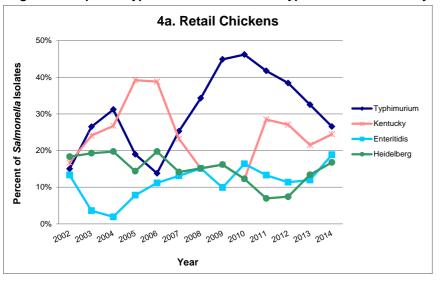
Table 8. Top Non-Typhoidal Salmonella Serotypes in Humans and their Distributions among Retail Meat and Food Animal Isolates, 2014

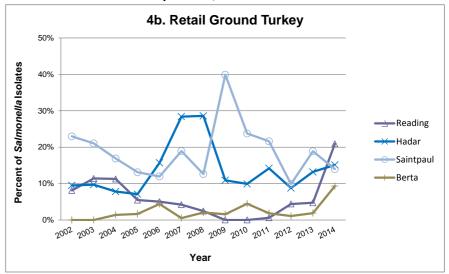
	Humans		Chickens			Turkeys			Ca	ttle			Swine	
	Humans (N=2127)	Retail Chickens (N=143)	HACCP (N=936)	Cecal (N=103)	Retail Ground Turkeys (N=86)	HACCP (N=299)	Cecal (N=45)	Retail Ground Beef (N=13)	HACCP (N=345)	Cecal (Beef) (N=104)	Cecal (Dairy) (N=217)	Retail Pork Chops (N=20)	Cecal (Market Swine) (N=279)	Cecal (Sows) (N=327)
1. Enteritidis	20.6% 438	18.9% 27	13.9% 130	16.5% 17	0.0% 0	1.7% 5	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.5% 1	0.0% 0	0.4% 1	0.0% 0
2. Typhimuriurm	12.3% 262	26.6% 38	8.7% 81	26.2% 27	2.3%	1.0%	4.4% 2	23.1%	4.1% 14	3.8% 4	4.6% 10	5.0% 1	4.7% 13	1.8% 6
3. Newport	11.0% 235	0.0% 0	0.2% 2	0.0% 0	0.0% 0	2.0% 6	0.0% 0	15.4% 2	4.9% 17	1.0% 1	6.9% 15	0.0%	1.8% 5	0.3% 1
4. Javiana	6.0% 128	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0
5. I 4,[5],12:i:-	5.2% 110	1.4% 2	4.0% 37	0.0%	0.0%	2.0% 6	0.0%	0.0% 0	2.0% 7	0.0%	0.0% 0	10.0% 2	3.2% 9	3.1% 10
6. Infantis	3.4% 73	2.8% 4	4.6% 43	1.0% 1	2.3%	0.0%	0.0%	7.7% 1	1.7% 6	0.0%	0.9% 2	25.0% 5	7.9% 22	11.0% 36
7. Heidelberg	3.3% 71	16.8% 24	11.5% 108	6.8% 7	7.0% 6	10.0% 30	6.7% 3	0.0%	0.3% 1	0.0%	0.0%	0.0% 0	0.0%	0.0% 0
8. Saintpaul	2.4% 52	0.0%	0.1% 1	0.0%	14.0% 12	6.7% 20	6.7%	0.0%	0.3% 1	1.0% 1	0.5% 1	0.0% 0	3.2% 9	2.4% 8
9. Muenchen	2.1% 45	0.0%	0.2%	0.0%	4.7% 4	4.0% 12	2.2% 1	0.0%	4.7% 16	1.9% 2	1.4% 3	5.0% 1	2.9%	2.8% 9
10. Montevideo	2.1% 44	0.0%	1.7% 16	0.0%	1.2% 1	5.7% 17	2.2% 1	15.4% 2	26.5% 91	13.5% 14	17.5% 38	0.0% 0	0.7% 2	1.5% 5

Figure 3. Top Non-Typhoidal *Salmonella* Serotypes from Humans in 2014 and their Relative Frequencies, 1996-2014

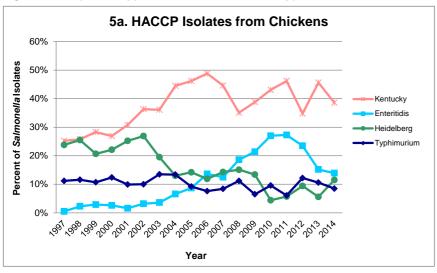


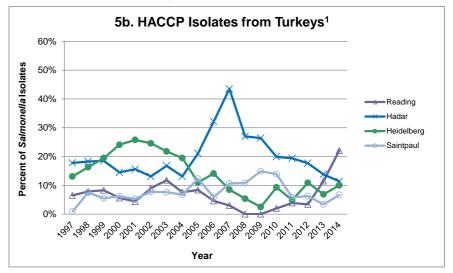
Figures 4. Top Non-Typhoidal Salmonella Serotypes from Retail Poultry in 2014 and their Relative Frequencies, 2002-2014





Figures 5. Top Non-Typhoidal Salmonella Serotypes from Food Animals in 2014 and their Relative Frequencies, 1997-2014





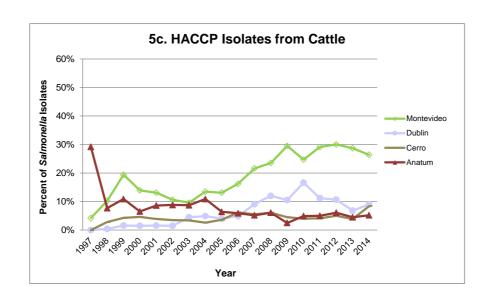


Table 9a. Distribution of MICs and Occurrence of Resistance among all Non-Typhoidal Salmonella Isolates, 2014

		Isolate Source										Distri	bution (%) of M	IICs (µg/	ml) ⁴						
Antimicrobial Class	Antimicrobial Agent	(# of Isolates)	%l ¹	%R²	[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	Gentamicin	Humans (2127)	0.2	1.4	[1.0 - 2.0]					21.9	64.8	11.3	0.4		0.2	0.3	1.1					
		ള Retail Chickens (143)	1.4	6.3	[2.9 - 11.6]					32.9	49.0	10.5			1.4	2.1	4.2					
		₩ HACCP (936)	0.2	3.2	[2.2 - 4.5]					18.6	63.8	12.9	1.1	0.2	0.2	0.7	2.5					
		ਹੈ Cecal (103)	1.0	3.9	[1.1 - 9.6]					25.2	55.3	13.6	1.0		1.0	1.0	2.9					
		Retail Ground Turkey (86)	2.3	20.9	[12.9 - 31.0]					15.1	51.2	9.3	1.2		2.3	2.3	18.6					
		∯ HACCP (299)	1.0	19.7	[15.4 - 24.7]					6.4	60.2	12.7			1.0	4.0	15.7					
		P Cecal (45)	2.2	31.1	[18.2 - 46.6]					6.7	48.9	11.1			2.2	6.7	24.4					
		Retail (13)	0.0	7.7	[0.2 - 36.0]					15.4	46.2	30.8					7.7					
		⊕ HACCP (344)	0.0	0.6	[0.1 - 2.1]					9.9	64.5	23.5	1.5				0.6					
		Ö Cecal (Beef) (104)	0.0	1.0	[0.0 - 5.2]					11.5	68.3	18.3	1.0				1.0					
		Cecal (Dairy) (217)	0.0	0.5	[0.0 - 2.5]					6.5	52.5	34.6	6.0				0.5					
		Retail (20)	15.0	5.0	[0.1 - 24.9]					25.0	50.0		5.0		15.0		5.0					
		Cecal (Market Swine) (279)	0.0	3.2	[1.5 - 6.0]					12.5	64.5	19.4	0.4			0.7	2.5					
		Cecal (Sows) (327)	0.0	0.6	[0.1 - 2.2]					18.4	64.5	15.9	0.6				0.6					
	Streptomycin	Humans (2127)	N/A	11.2	[9.9 - 12.7]								13.3	16.5	47.9	11.0	2.5	2.1	6.6			
		g Retail Chickens (143)	N/A	31.5	[24.0 - 39.8]								7.0	21.0	30.8	9.8	2.8	14.7	14.0			
		왕 HACCP (936)	N/A	41.9	[38.7 - 45.1]								6.3	14.3	24.3	13.2	3.7	23.9	14.2			
		ට Cecal (103)	N/A	30.1	[21.5 - 39.9]								6.8	26.2	23.3	13.6	2.9	10.7	16.5			
		Retail Ground Turkey (86)	N/A	52.3	[41.3 - 63.2]										31.4	16.3	11.6	29.1	11.6			
		활 HACCP (299)	N/A	52.8	[47.0 - 58.6]								0.7	7.0	25.8	13.7	11.0	21.4	20.4			
		Cecal (45)	N/A	57.8	[42.2 - 72.3]									4.4	26.7	11.1	13.3	24.4	20.0			
		Retail (13)	N/A	38.5	[13.9 - 68.4]										38.5	23.1	7.7		30.8			
		# HACCP (344)	N/A	16.9	[13.1 - 21.2]								0.6	12.2	53.5	16.9	1.7		15.1			
		Ö Cecal (Beef) (104)	N/A	10.6	[5.4 - 18.1]									5.8	60.6	23.1	5.8	2.9	1.9			
		Cecal (Dairy) (217)	N/A	13.4	[9.1 - 18.6]								0.9	12.0	45.2	28.6	2.8	0.5	10.1			
		Retail (20)	N/A	35.0	[15.4 - 59.2]										40.0	25.0			35.0			
		Cecal (Market Swine) (279) Cecal (Sows) (327)	N/A N/A	22.2	[17.5 - 27.6]								0.4 1.8	17.6	43.4 52.6	16.5	1.1	1.8 1.2	19.4 4.9			
β-Lactam/β-Lactamase	Ai-illi- Olli- A -i-l			9.8	[6.8 - 13.5]							07.4		18.0		17.7	3.7		4.9			
Inhibitor Combinations	Amoxicillin-Clavulanic Acid	Humans (2127)	2.1	2.1	[1.5 - 2.8]							87.1	3.2	1.4	4.0	2.1		2.1				
		Retail Chickens (143)	0.7	16.8	[11.1 - 23.9]							76.9	4.2		1.4	0.7	4.9	11.9				
		ਨੂੰ HACCP (936) Cecal (103)	0.3 1.0	6.5 8.7	[5.0 - 8.3] [4.1 - 15.9]							88.4 87.4	3.3 1.9		1.5 1.0	0.3 1.0	2.5 2.9	4.1 5.8				
		00001 (100)																				
		Retail Ground Turkey (86)	12.8 11.7	7.0 12.0	[2.6 - 14.6]							70.9 61.2	2.3	0.7	7.0 10.7	12.8 11.7	3.5 1.3	3.5 10.7				
		HACCP (299) Cecal (45)	17.8	11.1	[8.6 - 16.3] [3.7 - 24.1]							48.9	6.7	0.7	15.6	17.8	1.3	11.1				
				38.5											. 5.0			38.5				
		Retail (13) B HACCP (344)	0.0	38.5 7.6	[13.9 - 68.4] [5.0 - 10.9]							61.5 86.0	3.8	0.6	1.5	0.6	1.5	6.1				
		# HACCP (344) C Cecal (Beef) (104)	0.0	0.0	[0.0 - 3.5]							96.2	1.9	0.0	1.9	0.0		0.1				
		Cecal (Dairy) (217)	1.4	5.5	[2.9 - 9.5]							88.0	3.7	0.5	0.9	1.4	0.5	5.1				
		Retail (20)	5.0	0.0	[0.0 - 16.8]							80.0			15.0	5.0						
		Cecal (Market Swine) (279)	2.5	3.6	[1.7 - 6.5]							87.8	1.8	1.1	3.2	2.5		3.6				
		တ် Cecal (Sows) (327)	0.6	1.5	[0.5 - 3.5]							93.0	3.1	0.3	1.5	0.6	0.6	0.9				

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

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

⁴The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations. Pumbers in the shaded areas indicate the percentages of isolates with MICs greater than the lowest tested concentration.

Table 9b. Distribution of MICs and Occurrence of Resistance among all Non-Typhoidal Salmonella Isolates, 2014

Antimicrobial Class	Antimicrobial Agent		Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.015	0.06	0.125	0.25	0.50	Distr 1	ibution ((%) of M	IICs (µg/ 8	'ml) ⁴ 16	32	64	128	256	512 1	024
Cephems	Cefoxitin	Ì	Humans (2127)	0.2	2.2	[1.6 - 2.9]					<0.1	5,6	71.1	19.7	1.2	0.2	1.0	1.1				
Серпеніз	COTOXICIT	-									νο. 1											
		kens	Retail Chickens (143) HACCP (936)	2.8 1.0	14.7 5.7	[9.3 - 21.6] [4.3 - 7.3]						4.2 8.3	49.0 63.4	26.6 20.1	2.8 1.6	2.8 1.0	10.5 4.3	4.2 1.4				
		SPic	Cecal (103)	2.9	5.8	[2.2 - 12.2]						0.0	58.3	30.1	2.9	2.9	2.9	2.9				
		"	Retail Ground Turkey (86)	0.0	7.0	[2.6 - 14.6]						7.0	34.9	32.6	18.6		2.3	4.7				
		rkeys	HACCP (299)	1.7	12.0	[8.6 - 16.3]						2.3	39.1	37.1	7.7	1.7	3.3	8.7				
		1	Cecal (45)	2.2	8.9	[2.5 - 21.2]							31.1	46.7	11.1	2.2	4.4	4.4				
			Retail (13)	0.0	38.5	[13.9 - 68.4]							46.2	15.4				38.5				
		ittle	HACCP (344)	1.2	7.3	[4.8 - 10.5]						2.6	46.5	34.9	7.6	1.2	2.0	5.2				
		ပိ	Cecal (Beef) (104)	0.0	0.0	[0.0 - 3.5]						3.9	29.8	63.5	2.9							
		-	Cecal (Dairy) (217)	0.5	5.5	[2.9 - 9.5]						5.5	54.4	31.3	2.8	0.5	2.3	3.2				
		ne	Retail (20)	0.0	0.0	[0.0 - 16.8]							25.0	70.0	5.0							
		Swi	Cecal (Market Swine) (279) Cecal (Sows) (327)	0.7	3.6 1.5	[1.7 - 6.5]						1.8 1.2	35.1 34.6	53.4 55.4	5.4 7.0	0.7	0.7	2.9				
		┢				[0.5 - 3.5]									ll .			1.5				
	Ceftiofur	_	Humans (2127)	0.1	2.4	[1.8 - 3.1]			0.1	0.3	29.0	66.3	1.7	0.1	0.2	2.2						
		ens	Retail Chickens (143)	0.0	17.5	[11.6 - 24.7]					20.3	58.7	3.5		8.4	9.1						
		Chick	HACCP (936)	0.3	6.3 8.7	[4.8 - 8.1]					44.3	48.7	0.3	0.3	1.2 2.9	5.1 5.8						
		Ĕ	Cecal (103)			[4.1 - 15.9]					35.0	54.4	1.9		2.9							
		keys	Retail Ground Turkey (86) HACCP (299)	0.0	7.0 13.0	[2.6 - 14.6] [9.4 - 17.4]					12.8 13.0	70.9 70.6	9.3 3.0	0.3	0.3	7.0 12.7						
		Ţ	Cecal (45)	0.0	11.1	[3.7 - 24.1]					13.3	71.1	4.4	0.5	2.2	8.9						
			Retail (13)	0.0	38.5	[13.9 - 68.4]					7.7	53.8				38.5						
		te	HACCP (344)	0.0	7.6	[5.0 - 10.9]				1.7	23.0	65.7	2.0		0.6	7.0						
		Cat	Cecal (Beef) (104)	1.0	0.0	[0.0 - 3.5]				1.0	24.0	74.0		1.0								
			Cecal (Dairy) (217)	0.0	5.5	[2.9 - 9.5]				0.5	37.8	53.5	2.8			5.5						
		Φ	Retail (20)	0.0	0.0	[0.0 - 16.8]					10.0	65.0	25.0									
		Swin	Cecal (Market Swine) (279)	0.4	3.6	[1.7 - 6.5]			0.4		25.8	67.0	2.9	0.4		3.6						
		╁	Cecal (Sows) (327)	0.0	1.5	[0.5 - 3.5]			0.3	0.6	33.9	62.1	1.5			1.5						
	Ceftriaxone		Humans (2127)	0.0	2.4	[1.8 - 3.1]				97.4	0.2			<0.1	0.2	1.1	0.6	0.2	0.2			
		ens	Retail Chickens (143)	0.0	17.5	[11.6 - 24.7]				81.8		0.7			10.5	4.2	0.7	2.1				
		Chick	HACCP (936)	0.0	6.6	[5.1 - 8.4]				93.4				0.5	1.2	3.5	1.2	0.1	0.1			
		Ĕ	Cecal (103)	0.0	8.7	[4.1 - 15.9]				91.3				1.0	1.9	3.9	1.0	1.0				
		ceys	Retail Ground Turkey (86) HACCP (299)	0.0	7.0 13.4	[2.6 - 14.6] [9.7 - 17.8]				93.0	0.3				1.2 1.0	5.8 3.3	4.7	3.3	1.0			
		Ę	Cecal (45)	0.0	11.1	[3.7 - 24.1]				86.3 88.9	0.3			2.2	1.0	2.2	2.2	4.4	1.0			
			Retail (13)	0.0	38.5	[13.9 - 68.4]				61.5						15.4	15.4	7.7				
		tle	HACCP (344)	0.0	7.6	[5.0 - 10.9]				92.4				0.3	0.6	2.6	2.9	1.2				
		Catt	Cecal (Beef) (104)	0.0	1.0	[0.0 - 5.2]				99.0						1.0						
			Cecal (Dairy) (217)	0.0	5.5	[2.9 - 9.5]				94.5						2.3	2.8	0.5				
		Ф	Retail (20)	0.0	0.0	[0.0 - 16.8]				100.0												
		Swin	Cecal (Market Swine) (279)	0.0	3.9	[2.0 - 6.9]				96.1					0.4	0.7	2.9					
			Cecal (Sows) (327)	0.0	1.5	[0.5 - 3.5]				98.2	0.3						0.9	0.6				

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %s, to the right of the double vertical bars, are due to rounding

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

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 9c. Distribution of MICs and Occurrence of Resistance among all Non-Typhoidal Salmonella Isolates, 2014

		Isolate Source										Distri	bution (%) of M	ICs (µg/ı	ml) ⁴						
Antimicrobial Class	Antimicrobial Agent	(# of Isolates)	%l 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
Folate Pathway Inhibitors	Sulfisoxazole ⁵	Humans (2127)	N/A	9.4	[8.2 - 10.8]											11.5	44.2	31.1	3.4	0.3	9.4	
		g Retail Chickens (143)	N/A	30.8	[23.3 - 39.0]											20.3	38.5	10.5			30.8	
		HACCP (936)	N/A	9.6	[7.8 - 11.7]											10.0	49.4	27.6	3.0	0.4	9.6	
		Ö Cecal (103)	N/A	29.1	[20.6 - 38.9]											13.6	26.2	29.1	1.9		29.1	
		σ Retail Ground Turkey (86)	N/A	26.7	[17.8 - 37.4]											22.1	29.1	20.9	1.2		26.7	
		원 HACCP (299)	N/A	29.1	[24.0 - 34.6]											5.4	31.4	30.8	2.7	0.7	29.1	
		Cecal (45)	N/A	26.7	[14.6 - 41.9]											8.9	33.3	24.4	4.4	2.2	26.7	
		Retail (13)	N/A	38.5	[13.9 - 68.4]											53.8	7.7				38.5	
		⊕ HACCP (344)	N/A	16.0	[12.3 - 20.3]											11.0	43.6	25.0	3.5	0.9	16.0	
		Ö Cecal (Beef) (104)	N/A	8.7	[4.0 - 15.8]											12.5	45.2	29.8	3.9		8.7	
		Cecal (Dairy) (217)	N/A	11.1	[7.2 - 16.0]											10.6	49.3	24.9	3.7	0.5	11.1	
		Retail (20)	N/A	30.0	[11.9 - 54.3]											20.0	20.0	25.0	5.0		30.0	
		Cecal (Market Swine) (279)	N/A	21.9	[17.2 - 27.2]											14.0	35.5	24.4	3.9	0.4	21.9	
		Cecal (Sows) (327)	N/A	6.7	[4.3 - 10.0]											20.8	39.1	30.0	2.8	0.6	6.7	
	Trimethoprim- Sulfamethoxazole	Humans (2127)	N/A	1.3	[0.9 - 1.9]				96.0	2.4	0.2		0.1		1.3							
		g Retail Chickens (143)	N/A	0.0	[0.0 - 2.5]				99.3			0.7										
		출 HACCP (936)	N/A	0.4	[0.1 - 1.1]				96.4	3.1	0.1				0.4							
		Ö Cecal (103)	N/A	1.9	[0.2 - 6.8]				88.4	9.7					1.9							
		Retail Ground Turkey (86)	N/A	0.0	[0.0 - 4.2]				98.8	1.2												
		볼 HACCP (299)	N/A	0.7	[0.1 - 2.4]				89.0	9.4	0.7	0.3			0.7							
		Cecal (45)	N/A	6.7	[1.4 - 18.3]				84.4	8.9					6.7							
		Retail (13)	N/A	0.0	[0.0 - 24.7]				76.9	23.1												
		# HACCP (344)	N/A	1.7	[0.6 - 3.8]				87.8	6.1	4.1	0.3		0.6	1.2							
		රී Cecal (Beef) (104) Cecal (Dairy) (217)	N/A N/A	1.9 0.9	[0.2 - 6.8] [0.1 - 3.3]				94.2 92.6	3.9 6.5					1.9 0.9							
		Retail (20)	N/A	5.0 2.5	[0.1 - 24.9]				90.0	5.0		0.4			5.0 2.5							
		Cecal (Market Swine) (279) Cecal (Sows) (327)	N/A N/A	0.0	[1.0 - 5.1] [0.0 - 1.1]				85.0 96.0	11.1 3.7	1.1 0.3	0.4			2.5							
									30.0	5.1							1					
Macrolides	Azithromycin	Humans (2127)	N/A	<0.1	[0.0 - 0.3]						0.1	0.1	39.5	55.4	4.5	0.4	<0.1					
		Retail Chickens (143)	N/A	0.0	[0.0 - 2.5]							0.7	12.6	65.7	21.0							
		충 HACCP (936)	N/A	0.0	[0.0 - 0.4]							1.2	36.1	56.1	6.4	0.2						
		O Cecal (103)	N/A	1.0	[0.0 - 5.3]							1.9	43.7	43.7	9.7		1.0					
		Retail Ground Turkey (86)	N/A	0.0	[0.0 - 4.2]								14.0	62.8	23.3							
		볼 HACCP (299)	N/A	0.3	[0.0 - 1.8]				0.3				31.1	57.5	10.4	0.3	0.3					
		Cecal (45)	N/A	2.2	[0.1 - 11.8]								26.7	60.0	11.1		2.2					
		Retail (13)	N/A	0.0	[0.0 - 24.7]									76.9	23.1							
		# HACCP (344) C Cecal (Beef) (104)	N/A	0.0	[0.0 - 1.1]								20.6	63.7	15.1	0.6						
		് Cecal (Beef) (104) Cecal (Dairy) (217)	N/A N/A	0.0 0.5	[0.0 - 3.5] [0.0 - 2.5]								28.9 30.0	57.7 54.8	13.5 14.3	0.5	0.5					
													55.6			0.0	0.0					
		Retail (20) © Cacal (Market Swine) (279)	N/A N/A	0.0 0.7	[0.0 - 16.8]								22.6	65.0 54.1	35.0 19.7	2.9	0.7					
		Cecal (Market Swine) (279) Cecal (Sows) (327)	N/A N/A	0.7	[0.1 - 2.6] [0.0 - 1.1]								27.5	50.5	19.7	3.4	0.7					
		060ai (30ws) (321)	IN/A	0.0	[0.0 - 1.1]								21.0	50.5	10.7	3.4						

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

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

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

⁵ Sulfisoxazole replaced sulfamethoxazole in 2004

Table 9d. Distribution of MICs and Occurrence of Resistance among all Non-Typhoidal Salmonella Isolates, 2014

		Isolate Source	71: -									Distri	bution ((%) of M	ICs (ua	ml) ⁴						\neg
Antimicrobial Class	Antimicrobial Agent	(# of Isolates)	%l ¹	%R²	[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
Penicillins	Ampicillin	Humans (2127)	0.0	9.1	[7.9 - 10.4]							80.6	9.4	0.7	0.2		0.2	8.9				
		Retail Chickens (143) HACCP (936) Cecal (103)	0.0 0.0 0.0	19.6 8.3 10.7	[13.4 - 27.0] [6.6 - 10.3] [5.5 - 18.3]							67.1 80.3 78.6	12.6 11.3 10.7	0.7			0.3	19.6 8.0 10.7				
		Retail Ground Turkey (86) HACCP (299) Cecal (45)	0.0 0.0 2.2	26.7 34.8 44.4	[17.8 - 37.4] [29.4 - 40.5] [29.6 - 60.0]							60.5 55.9 48.9	12.8 7.7 4.4	1.0	0.7	2.2		26.7 34.8 44.4				
		Retail (13) HACCP (344) Cecal (Beef) (104) Cecal (Dairy) (217)	0.0 0.0 0.0 0.0	38.5 9.9 1.9 8.3	[13.9 - 68.4] [6.9 - 13.5] [0.2 - 6.8] [5.0 - 12.8]							61.5 82.8 95.2 86.2	6.7 2.9 5.5	0.6				38.5 9.9 1.9 8.3				
		Retail (20) Cecal (Market Swine) (279) Cecal (Sows) (327)	0.0 0.0 0.0	20.0 10.8 4.0	[5.7 - 43.7] [7.4 - 15.0] [2.1 - 6.7]							75.0 83.9 90.5	5.0 5.0 5.5	0.4				20.0 10.8 4.0				
Phenicols	Chloramphenicol	Humans (2178) E Retail Chickens (143) HACCP (936) Cecal (103)	1.2 0.0 0.7 1.9	4.0 4.2 0.9 0.0	[3.2 - 4.9] [1.6 - 8.9] [0.4 - 1.7] [0.0 - 3.5]								0.5 2.1 1.0	52.8 49.7 49.0 41.8	41.5 44.1 48.3 56.3	1.2 0.7 1.9	0.3	3.7 4.2 0.9				
		Retail Ground Turkey (86) HACCP (299) Cecal (45)	0.0 2.3 0.0	2.3 2.3 6.7	[0.3 - 8.1] [0.9 - 4.8] [1.4 - 18.3]								1.2 0.7	37.2 26.1 17.8	59.3 68.6 75.6	2.3		2.3 2.3 6.7				
		Retail (13) HACCP (344) Cecal (Beef) (104) Cecal (Dairy) (217)	0.0 2.0 1.0 3.7	38.5 12.5 1.0 8.3	[13.9 - 68.4] [9.2 - 16.5] [0.0 - 5.2] [5.0 - 12.8]								0.3	7.7 23.3 24.0 48.4	53.8 61.9 74.0 38.3	2.0 1.0 3.7		38.5 12.5 1.0 8.3				
		Retail (20) Cecal (Market Swine) (279) Cecal (Sows) (327)	5.0 4.7 3.7	5.0 4.3 1.5	[0.1 - 24.9] [2.2 - 7.4] [0.5 - 3.5]								0.4	10.0 14.3 16.5	80.0 76.3 77.7	5.0 4.7 3.7	0.3	5.0 4.3 1.2				
Quinolones	Ciprofloxacin	Humans (2178) Retail Chickens (143) HACCP (936) Cecal (103) Retail Ground Turkey (86) HACCP (299)	3.9 0.7 0.0 0.0 0.0 0.6	0.4 0.0 0.0 0.0 0.0	[0.2 - 0.8] [0.0 - 2.5] [0.0 - 0.4] [0.0 - 3.5] [0.0 - 4.2] [0.0 - 1.2]	90.6 67.1 59.3 84.6	4.7 31.5 39.5 14.7	0.4	1.6 0.7	0.3	0.3	0.3			0.1							
		Cecal (45) Retail (13) HACCP (344) Cecal (Beef) (104) Cecal (Dairy) (217)	0.0 7.7 2.6 1.0 0.5	0.0 0.0 0.3 0.0 0.0	[0.0 - 7.9] [0.0 - 24.7] [0.0 - 1.6] [0.0 - 3.5] [0.0 - 1.7]	82.2 53.8 84.6 86.5 90.3	17.8 30.8 11.3 12.5 9.2	7.7 1.2	0.6	7.7 0.6 1.0	0.5	0.3										
		Retail (20) Cecal (Market Swine) (279) Cecal (Sows) (327)	5.0 3.6 2.7	5.0 0.7 0.3	[0.1 - 24.9] [0.1 - 2.6] [0.0 - 1.7]	50.0 79.9 78.6	40.0 15.8 18.0	0.3	0.3	0.6	5.0 3.6 1.8	0.7 0.3	5.0									

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

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

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 9e. Distribution of MICs and Occurrence of Resistance among all Non-Typhoidal Salmonella Isolates, 2014

			Isolate Source										Distr	ibution (%) of M	ICs (µg/	ml) ⁴						
Antimicrobial Class	Antimicrobial Agent		(# of Isolates)	%l ¹	%R²	[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
Quinolones	Nalidixic Acid		Humans (2178)	N/A	3.5	[2.7 - 4.3]						<0.1	0.1	27.1	67.0	1.7	0.6	0.5	3.0				
		ickens	Retail Chickens (143)	N/A	0.7	[0.0 - 3.8]								55.9	42.7	0.7			0.7				
		Chicke	HACCP (936) Cecal (103)	N/A N/A	0.2 0.0	[0.0 - 0.8] [0.0 - 3.5]							0.7	44.7 32.0	52.6 68.0	1.7	0.1		0.2				
			Retail Ground Turkey (86)	N/A	0.0	[0.0 - 3.3]								52.3	47.7								
		Furkeys	HACCP (299)	N/A	0.7	[0.1 - 2.4]							26.1	71.9	1.3				0.7				
		Ē	Cecal (45)	N/A	0.0	[0.0 - 7.9]								17.8	82.2								
		Φ	Retail (13) HACCP (344)	N/A N/A	7.7 2.3	[0.2 - 36.0] [1.0 - 4.5]								46.2 39.5	46.2 57.0	0.6	0.6	0.6	7.7 1.7				
		Cattle	Cecal (Beef) (104)	N/A	0.0	[0.0 - 3.5]								39.4	59.6	0.0	1.0		•••				
			Cecal (Dairy) (217)	N/A	0.0	[0.0 - 1.7]								41.5	57.6	0.5	0.5						
		Swine	Retail (20) Cecal (Market Swine) (279)	N/A N/A	5.0 1.1	[0.1 - 24.9] [0.2 - 3.1]							0.4	50.0 24.7	35.0 69.5	5.0 1.1	5.0 3.2	1.1	5.0				
		Ś	Cecal (Sows) (327)	N/A	0.9	[0.2 - 2.7]							0.3	20.8	75.2	0.6	2.1	0.6	0.3				
Tetracyclines	Tetracycline		Humans (2178)	0.8	10.4	[9.1 - 11.8]									88.8	0.8	0.2	1.1	9.1				
		ickens	Retail Chickens (143)	0.7	47.6	[39.1 - 56.1]									51.7	0.7			47.6				
		Chick	HACCP (936) Cecal (103)	0.5	36.9 36.9	[33.8 - 40.0] [27.6 - 47.0]									62.6 63.1	0.5	0.2	0.4	36.2 36.9				
		s/	Retail Ground Turkey (86)	0.0	60.5	[49.3 - 70.8]									39.5			2.3	58.1				
		Turkeys	HACCP (299)	0.0	54.2	[48.3 - 59.9]									45.8			0.7	53.5				
			Cecal (45) Retail (13)	0.0	64.4 46.2	[48.8 - 78.1] [19.2 - 74.9]									35.6 53.8			2.2 7.7	62.2 38.5				
		Cattle	HACCP (344)	0.3	25.0	[20.5 - 29.9]									74.7	0.3		2.6	22.4				
		ပ္မ	Cecal (Beef) (104) Cecal (Dairy) (217)	0.0 0.5	17.3 15.7	[10.6 - 26.0] [11.1 - 21.2]									82.7 83.9	0.5		2.9 2.3	14.4 13.4				
			Retail (20)	0.5	55.0	[31.5 - 76.9]									45.0	0.5		2.3	55.0				
		Swine	Cecal (Market Swine) (279)	0.0	40.5	[34.7 - 46.5]									59.5			5.7	34.8				
		Ś	Cecal (Sows) (327)	0.0	23.2	[18.8 - 28.2]									76.8		0.3	5.5	17.4				

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

 $^{^3}$ 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Resistance by Year

Table 10a. Antimicrobial Resistance among all Non-Typhoidal Salmonella Isolates. 2003-2014

Table 10a. Antimicro	bial Resistance amo	ng a	II Non-Typhoidal Sa	Imonella 2003	solates, 2	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
		sus	Retail Chickens	83	157	153	152	99	198	272	171	158	229	208	143
		Chickens	HACCP	1158	1280	1989	1380	994	624	551	564	491	864	520	936
		_	Cecal											55	103
		Turkeys	Retail Ground Turkey	114	142	183	159	190	246	193	202	162	91	106	86
		Tur	HACCP Cecal	262	236	227	304	271	148	121	151	103	175	87 28	299 45
			Retail Ground Beef	10	14	8	19	13	24	14	7	9	13	15	13
		Cattle	HACCP	670	607	329	389	439	443	200	247	340	280	310	344
		ပိ	Cecal (Beef)											124	104
		-	Cecal (Dairy)	_		_								310	217
		Swine	Retail Pork Chops Cecal (Market Swine)	5	11	9	8	18	23	8	20	28	12	24 260	20 279
		Ś	Cecal (Sows)											289	327
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Aminoglycosides	Gentamicin (MIC ≥ 16 µg/ml)		Humans	1.4% 26	1.3% 24	2.2% 44	2.0% 44	2.1% 45	1.5% 35	1.3% 28	1.0% 24	1.7% 40	1.2% 26	2.0% 43	1.4% 30
	, , ,		Retail Chickens	6.0%	3.8%	3.3%	9.2%	6.1%	7.1%	3.3% 9	5.8% 10	3.8%	5.2% 12	5.3%	6.3% 9
		Chickens	HACCP	5 6.3%	6 4.9%	5 4.3%	14 5.7%	6 4.5%	14 5.6%	5.6%	4.6%	3.5%	4.6%	2.3%	3.2%
		Chic		73	63	85	79	45	35	31	26	17	40	12 1.8%	30 3.9%
			Cecal	00.00/	20.40/	22.22	00.00/	0.4.770/	07.00/	10.70/	10.00/	00.40/	00.40/	1	4
		υ	Retail Ground Turkey	22.8% 26	20.4% 29	26.8% 49	28.9% 46	24.7% 47	27.6% 68	18.7% 36	16.3% 33	32.1% 52	26.4% 24	27.4% 29	20.9% 18
		Turkeys	HACCP	21.0% 55	25.4% 60	22.9% 52	16.4% 50	12.9% 35	16.9% 25	14.9% 18	19.9% 30	14.6% 15	24.6% 43	23.0% 20	19.7% 59
		٦	Cecal	33	00	JZ	30	33	20	10	30	10	40	28.6%	31.1%
			Retail Ground Beef	0.0%	0.0%	25.0%	0.0%	7.7%	8.3%	14.3%	0.0%	0.0%	0.0%	8 13.3%	14 7.7%
			Retail Ground Beer	0	0	2	0	1	2	2	0	0	0	2	1
		Cattle	HACCP	2.7% 18	1.8% 11	2.4% 8	3.9% 15	1.6% 7	1.6% 7	2.0% 4	4.9% 12	2.1% 7	2.1% 6	1.9% 6	0.6% 2
		ပိ	Cecal (Beef)											0.0% 0	1.0%
			Cecal (Dairy)											0.0%	0.5%
				0.0%	0.0%	0.0%	50.0%	5.6%	13.0%	0.0%	10.0%	3.6%	8.3%	0.0%	5.0%
		e	Retail Pork Chops	0	0	0	4	1	3	0	2	1	1	0 3.1%	1 3.2%
		Swine	Cecal (Market Swine)											8	9
			Cecal (Sows)											0.7% 2	0.6% 2
	Streptomycin		Humans	15.0%	12.0%	11.1%	10.7%	10.3%	10.0%	8.9%	8.6%	9.8%	8.4%	11.5%	11.2%
	(MIC ≥ 64 μg/ml)		Retail Chickens	279 26.5%	213 28.0%	225 30.1%	233 36.2%	222 30.3%	238 23.7%	196 23.2%	210 25.1%	229 38.6%	187 30.6%	251 20.7%	239 31.5%
		ens		22 19.6%	44 22.2%	46 23.3%	55 21.2%	30 19.3%	47 25.2%	63 30.5%	43 36.0%	61 35.8%	70 32.1%	57 42.7%	45 41.9%
		Chickens	HACCP	227	284	464	293	19.3%	157	168	203	176	277	222	392
		0	Cecal											25.5% 14	30.1% 31
			Retail Ground Turkey	45.6%	34.5%	44.3%	40.9%	45.3%	58.5%	28.0%	31.7%	56.2%	44.0%	48.1%	52.3%
		Turkeys	HACCP	52 29.4%	49 33.9%	81 40.1%	65 28.9%	86 34.7%	144 32.4%	54 38.8%	64 27.8%	91 22.3%	40 38.3%	51 35.6%	45 52.8%
		į		77	80	91	88	94	48	47	42	23	67	31 42.9%	158 57.8%
			Cecal											12	26
			Retail Ground Beef	40.0% 4	14.3% 2	25.0% 2	10.5% 2	0.0% 0	20.8% 5	28.6% 4	42.9% 3	33.3% 3	23.1% 3	20.0% 3	38.5% 5
		Ф	HACCP	28.7%	20.9%	24.3%	23.7%	19.8%	23.0%	22.0%	26.7%	19.4%	18.9%	20.0%	16.9%
		Cattle	Cecal (Beef)	192	127	80	92	87	102	44	66	66	53	62 16.9%	58 10.6%
														21 9.0%	11 13.4%
			Cecal (Dairy)	,	0= -	0.7.7		42.5	45.5	05.5			4	28	29
			Retail Pork Chops	40.0% 2	27.3% 3	33.3% 3	25.0% 2	16.7% 3	13.0% 3	37.5% 3	45.0% 9	57.1% 16	41.7% 5	41.7% 10	35.0% 7
		Swine	Cecal (Market Swine)											18.1% 47	22.2% 62
		S	Cecal (Sows)											9.3%	9.8%
β-Lactam/β-Lactamase	Amoxicillin-	╁		4.6%	3.7%	3.2%	3.7%	3.3%	3.1%	3.4%	2.9%	2.6%	2.9%	27 2.4%	32 2.1%
Inhibitor Combinations	Clavulanic Acid		Humans	86	66	65	81	70	73	75	70	60	65	53	45
	(MIC ≥ 32 / 16 μg/ml)	SL	Retail Chickens	25.3% 21	24.8% 39	21.6% 33	19.1% 29	16.2% 16	22.2% 44	37.5% 102	33.3% 57	33.5% 53	27.9% 64	19.7% 41	16.8% 24
		Chickens	HACCP	9.7% 112	12.4% 159	12.1% 241	12.9% 178	15.6% 155	8.7% 54	12.9% 71	11.7% 66	6.3% 31	11.3% 98	8.8% 46	6.5% 61
		ပ်	Cecal	112	103	471	175	100	J-7	,,	55	J.	33	7.3%	8.7%
		-		11.4%	7.7%	8.7%	5.0%	5.3%	5.7%	5.7%	16.3%	21.0%	17.6%	7.5%	9 7.0%
		ski	Retail Ground Turkey	13	11	16	8	10	14	11	33	34	16	8	6
		Turkeys	HACCP	1.5% 4	4.7% 11	3.5% 8	5.6% 17	11.1% 30	5.4% 8	13.2% 16	15.2% 23	11.7% 12	15.4% 27	9.2% 8	12.0% 36
			Cecal											7.1% 2	11.1% 5
			Retail Ground Beef	40.0%	14.3%	0.0%	0.0%	0.0%	8.3%	14.3%	28.6%	11.1%	15.4%	26.7%	38.5%
				4 21.0%	13.5%	0 21.0%	0 18.5%	0 15.5%	2 16.5%	2 15.0%	21.5%	1 14.7%	2 11.1%	4 14.8%	5 7.6%
	i	ŧ	HACCP	141	82	69	72	68	73	30	53	50	31	46	26
		7												10.5%	0.0%
		Cattle	Cecal (Beef)											13	
		Cat	Cecal (Beef) Cecal (Dairy)											6.8%	5.5% 12
		Cat		20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	3.6%	0.0%	6.8% 21 0.0%	12 0.0%
			Cecal (Dairy) Retail Pork Chops	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0% 2	0.0%	3.6%	0.0%	6.8% 21	12
		Swine Cat	Cecal (Dairy)											6.8% 21 0.0% 0	12 0.0% 0

Table 10b. Antimicrobial Resistance among all Non-Typhoidal Salmonella Isolates, 2003-2014

Year Number of Isolates Teste	d		Humans	2003	2004	2005	2006	2007	2008	2009		2011	2012	2013	2014
			Hullians	1855	1782	2036	2170	2145	2384	2192	2010 2448	2335	2233	2178	2127
		sus	Retail Chickens	83	157	153	152	99	198	272	171	158	229	208	143
		Chickens	HACCP	1158	1280	1989	1380	994	624	551	564	491	864	520	936
		_	Cecal											55	103
		Turkeys	Retail Ground Turkey HACCP	114 262	142 236	183 227	159 304	190 271	246 148	193 121	202 151	162 103	91 175	106 87	86 299
		Ţ	Cecal	202	230	221	304	2/1	140	121	151	103	175	28	45
			Retail Ground Beef	10	14	8	19	13	24	14	7	9	13	15	13
		Cattle	HACCP	670	607	329	389	439	443	200	247	340	280	310	344
			Cecal (Beef) Cecal (Dairy)											124 310	104 217
		Ф	Retail Pork Chops	5	11	9	8	18	23	8	20	28	12	24	20
		Swine	Cecal (Market Swine)											260	279
	Antimicrobial		Cecal (Sows)											289	327
	(Resistance		Isolate												
	Breakpoint) Cefoxitin	1	Source Humans	4.3%	3.4%	3.0%	3.5%	2.9%	3.0%	3.2%	2.6%	2.6%	2.7%	2.4%	2.2%
	(MIC ≥ 32 μg/mI)		1	79 25.3%	61 24.8%	62 20.9%	77 18.4%	63 15.2%	72 21.2%	71 33.1%	63 28.7%	60 25.9%	61 22.7%	53 17.3%	46 14.7%
		sus	Retail Chickens	21	39	32	28	15	42	90	49	41	52	36	21
		Chickens	HACCP	8.2% 95	12.4% 159	12.0% 238	12.8% 176	13.0% 129	8.0% 50	11.4% 63	11.3% 64	6.5% 32	8.6% 74	7.1% 37	5.7% 53
		0	Cecal											3.6% 2	5.8% 6
			Retail Ground Turkey	2.6% 3	4.9% 7	7.1% 13	5.0% 8	5.3% 10	4.9% 12	5.7% 11	15.3% 31	17.9% 29	15.4% 14	7.5% 8	7.0% 6
		Turkeys	HACCP	1.1%	5.1%	3.5%	5.3%	9.2%	5.4%	12.4%	15.2%	11.7%	14.9%	9.2%	12.0%
		Tur		3	12	8	16	25	8	15	23	12	26	8 7.1%	36 8.9%
		<u> </u>	Cecal	40.0%	14.3%	0.0%	0.0%	0.0%	8.3%	14.3%	28.6%	0.0%	15.4%	20.0%	4 38.5%
			Retail Ground Beef	4	2	0	0	0	2	2	2	0	2	3	5
		Cattle	HACCP	17.8% 119	13.2% 80	19.8% 65	17.7% 69	15.0% 66	14.7% 65	13.5% 27	20.6% 51	13.8% 47	10.4% 29	14.5% 45	7.3% 25
		Sa	Cecal (Beef)											10.5% 13	0.0% 0
			Cecal (Dairy)											6.8%	5.5%
			Retail Pork Chops	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	10.7%	0.0%	21 0.0%	12 0.0%
		ne		1	0	0	0	0	0	2	0	3	0	0 1.9%	0 3.6%
		Swine	Cecal (Market Swine)											5	10
			Cecal (Sows)											2.4% 7	1.5% 5
	Ceftiofur (MIC ≥ 8 μg/ml)		Humans	4.5% 83	3.4% 60	2.9% 59	3.6% 79	3.3% 70	3.1% 73	3.4% 75	2.8% 69	2.5% 58	2.9% 64	2.5% 55	2.4% 51
	(Retail Chickens	25.3% 21	24.8% 39	20.9% 32	19.1% 29	16.2% 16	22.2% 44	37.1% 101	33.3% 57	34.2% 54	27.5% 63	19.7% 41	17.5% 25
		Chickens	HACCP	9.8%	12.4%	12.2%	12.8%	15.4%	8.7%	12.7%	12.1%	6.1%	10.2%	8.1%	6.3%
		SPI	Cecal	113	159	242	177	153	54	70	68	30	88	7.3%	59 8.7%
				2.6%	4.9%	7.1%	5.0%	5.3%	4.9%	5.7%	15.8%	20.4%	16.5%	4 8.5%	9 7.0%
		ys	Retail Ground Turkey	3	7	13	8	10	12	11	32	33	15	9	6
		Turkeys	HACCP	1.5% 4	4.7% 11	3.5% 8	5.3% 16	11.1% 30	5.4% 8	12.4% 15	15.2% 23	11.7% 12	14.9% 26	10.3% 9	13.0% 39
		-	Cecal											7.1% 2	11.1% 5
			Retail Ground Beef	40.0%	14.3%	0.0%	0.0%	0.0%	8.3%	14.3%	28.6%	11.1%	15.4%	20.0%	38.5%
			HACCP	21.0%	13.3%	21.6%	0 18.8%	0 15.5%	16.3%	2 14.5%	21.5%	13.2%	11.1%	3 14.8%	5 7.6%
		Cattle	Cecal (Beef)	141	81	71	73	68	72	29	53	45	31	46 10.5%	26 0.0%
														13 6.8%	0 5.5%
		<u> </u>	Cecal (Dairy)	00.00	0.05	0.00:	0.00:	0.00:	0.00:	05.00	0.00	- 461	0.00	21	12
			Retail Pork Chops	20.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	25.0% 2	0.0% 0	7.1% 2	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											2.3% 6	3.6% 10
		S	Cecal (Sows)											2.4% 7	1.5%
	Ceftriaxone	+	Humans	4.4%	3.3%	2.9%	3.7%	3.3%	3.1%	3.4%	2.9%	2.5%	2.9%	2.5%	2.4%
	(MIC ≥ 4 μg/ml)	-		81 26.5%	59 24.8%	59 21.6%	79 19.1%	70 16.2%	73 22.2%	75 37.9%	70 34.5%	58 33.5%	64 27.9%	55 19.7%	51 17.5%
		şuş	Retail Chickens	22	39	33	29	16	44	103	59	53	64	41	25
		Chickens	HACCP	9.7% 112	12.3% 158	12.2% 242	12.8% 177	15.6% 155	8.7% 54	12.9% 71	11.9% 67	6.3% 31	11.2% 97	8.7% 45	6.6% 62
		Ö	Cecal											7.3% 4	8.7% 9
		 	Retail Ground Turkey	2.6%	5.6%	7.1%	5.0%	5.8%	4.9%	5.7%	16.3%	22.2%	17.6%	8.5%	7.0%
		eys	-	3 1.1%	8 4.7%	13 3.5%	8 5.3%	11 11.1%	12 5.4%	11 12.4%	33 15.2%	36 11.7%	16 16.0%	9 10.3%	6 13.4%
		Turkeys	HACCP	3	11	8	16	30	8	15	23	12	28	9	40
			Cecal											7.1% 2	11.1% 5
			Retail Ground Beef	40.0% 4	14.3% 2	0.0%	0.0% 0	0.0%	8.3% 2	14.3% 2	28.6% 2	11.1% 1	15.4% 2	26.7% 4	38.5% 5
		ø	HACCP	21.0%	13.5%	20.7%	18.5%	15.9%	16.0%	14.5%	21.5%	14.4%	10.7%	14.8%	7.6%
		Cattle	Cecal (Beef)	141	82	68	72	70	71	29	53	49	30	46 10.5%	26 1.0%
														13	1 5.5%
		1	Cecal (Dairy)											6.8%	5.5% 12
			Retail Pork Chops	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	7.1%	0.0%	0.0%	0.0%
		vine	Retail Pork Chops Cecal (Market Swine)	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0% 2	0.0%	7.1% 2	0.0%	0.0% 0 2.3%	0 3.9%
		Swine												0.0% 0	0

Table 10c. Antimicrobial Resistance among all Non-Typhoidal Salmonella Isolates, 2003-2014

	obial Resistance amo	ng a	II Non-Typhoidal Sa				2000	2007	2000	2000	2010	2044	2012	2012	2014
Year	tod		Humans	2003	2004 1782	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	teu	SI	Humans Retail Chickens	1855		2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
		Chickens	HACCP	83 1158	157 1280	153 1989	152 1380	99 994	198 624	272 551	171 564	158 491	229 864	208 520	143 936
		Shi	Cecal	1130	1200	1909	1300	334	024	331	304	451	004	55	103
		sk	Retail Ground Turkey	114	142	183	159	190	246	193	202	162	91	106	86
		Turkeys	HACCP	262	236	227	304	271	148	121	151	103	175	87	299
		-	Cecal											28	45
		0	Retail Ground Beef	10	14	8	19	13	24	14	7	9	13	15	13
		Cattle	HACCP Cecal (Beef)	670	607	329	389	439	443	200	247	340	280	310	344
			Cecal (Beer) Cecal (Dairy)											124 310	104 217
		0	Retail Pork Chops	5	11	9	8	18	23	8	20	28	12	24	20
		Swine	Cecal (Market Swine)		- ''	9	0	10	23		20	20	12	260	279
	Anthologis	()	Cecal (Sows)											289	327
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Folate Pathway Inhibito	Sulfamethoxazole/ Sulfisoxazole 1		Humans	15.1% 280	13.3% 237	12.6% 256	12.1% 263	12.3% 264	10.1% 240	9.9% 217	9.0% 221	8.6% 201	8.4% 188	10.3% 225	9.4% 201
	(MIC ≥ 512 μg/ml)		Retail Chickens	14.5%	28.7%	17.0%	23.0%	25.3%	38.9%	48.2%	44.4%	44.9%	37.1%	33.7%	30.8%
		ens		12 10.3%	45 11.9%	26 8.5%	35 10.7%	25 10.4%	77 13.3%	131 10.0%	76 12.4%	71 7.9%	85 14.4%	70 11.0%	9.6%
		Chickens	HACCP	119	152	169	148	103	83	55	70	39	124	57	90
			Cecal											30.9% 17	29.1% 30
			Retail Ground Turkey	33.3%	28.2%	34.4%	32.1%	34.7%	27.6%	20.2%	24.8%	26.5%	27.5%	27.4%	26.7%
		sys	-	38 28.2%	40 36.4%	63 37.0%	51 27.3%	66 25.5%	68 24.3%	39 28.9%	50 25.2%	43 22.3%	25 22.3%	29 29.9%	23 29.1%
		Turkeys	HACCP	26.2% 74	36.4% 86	84	83	25.5% 69	24.3% 36	26.9% 35	38	22.3%	39	26	87
			Cecal											14.3% 4	26.7% 12
			Retail Ground Beef	40.0%	14.3%	25.0%	10.5%	7.7%	20.8%	35.7%	42.9%	0.0%	23.1%	33.3%	38.5%
			Retail Glouriu Beel	4	2	2	2	1	5	5	3	0	3	5	5
		Cattle	HACCP	25.1% 168	22.7% 138	27.4% 90	24.2% 94	21.6% 95	24.8% 110	24.5% 49	26.3% 65	20.0% 68	19.6% 55	20.6% 64	16.0% 55
		Cal	Cecal (Beef)											18.6%	8.7%
			0 1/2:)											9.0%	9 11.1%
			Cecal (Dairy)											28	24
			Retail Pork Chops	40.0% 2	18.2% 2	33.3% 3	75.0% 6	16.7% 3	30.4% 7	37.5% 3	50.0% 10	25.0% 7	33.3% 4	29.2% 7	30.0% 6
		Swine	Cecal (Market Swine)		_			J	,			,		20.8%	21.9%
		Š												54 9.7%	61 6.7%
			Cecal (Sows)											28	22
	Trimethoprim- Sulfamethoxazole		Humans	1.9% 36	1.7% 31	1.7% 34	1.7% 36	1.5% 33	1.6% 37	1.7% 38	1.6% 38	1.2% 28	1.3% 29	1.4% 31	1.3% 28
	(MIC ≥ 4 / 76 µg/ml)		Retail Chickens	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.4%	0.0%	1.3%	0.0%	0.0%	0.0%
		ens		0.3%	0.2%	0.2%	0.1%	0.0%	0.3%	1 0.2%	0.0%	2 0.2%	0.5%	0.2%	0.4%
		Chickens	HACCP	4	3	4	1	0.0%	2	1	0.0%	1	4	1	4
		O	Cecal											3.6%	1.9% 2
			Retail Ground Turkey	0.0%	0.0%	0.5%	0.0%	0.5%	0.4%	1.6%	0.0%	3.7%	0.0%	0.9%	0.0%
		ys	Retail Glourid Turkey	0 2.3%	0	1.8%	0	1 1.1%	1 1.4%	3 1.7%	0.0%	6 0.0%	0	1 1.1%	0
		Turkeys	HACCP	6	0.8% 2	4	1.0% 3	3	1.4%	1.7%	0.0%	0.0%	0.6% 1	1.1%	0.7% 2
		-	Cecal											0.0%	6.7%
			Retail Ground Beef	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Glouriu Beel	0	1	0	0	0	0	0	0	0	0	0	0
		e E	HACCP	3.3% 22	1.5% 9	4.9% 16	4.6% 18	3.0% 13	4.5% 20	1.5% 3	4.5% 11	1.8% 6	1.1% 3	1.3% 4	1.7% 6
		Cattle	Cecal (Beef)											2.4%	1.9%
			01 (D-i)											0.6%	0.9%
			Cecal (Dairy)	0.007	2.20/	44.40/	E0.00/	E 00/	0.007	05.00/	0.007	0.007	0.007	2	2
			Retail Pork Chops	0.0% 0	0.0% 0	11.1% 1	50.0% 4	5.6% 1	0.0% 0	25.0% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	5.0% 1
		Swine	Cecal (Market Swine)											0.8%	2.5%
		Ó	Cecal (Sows)											1.0%	0.0%
Managhan			Cecai (30ws)									0.007	0.404	3	0
Macrolides	Azithromycin (MIC ≥32 μg/mI)	L	Humans									0.2% 5	<0.1% 1	0.2% 5	<0.1% 1
		s	Retail Chickens									0.6% 1	0.0% 0	0.0%	0.0% 0
		Chickens	HACCP									0.0%	0.0%	0.0%	0.0%
		SPi	Cecal									0	0	0.0%	1.0%
		-										0.0%	0.0%	0.0%	0.0%
		sk	Retail Ground Turkey									0	0	0	0
		Turkeys	HACCP									0.0% 0	0.0% 0	0.0% 0	0.3% 1
		-	Cecal											0.0% 0	2.2% 1
			Retail Ground Beef									0.0%	0.0%	0.0%	0.0%
			HACCP									0.3%	0.0%	0.0%	0.0%
		Cattle										1	0	0.0%	0.0%
		O	Cecal (Beef)											0	0
			Cecal (Dairy)											0.0%	0.5% 1
			Retail Pork Chops									0.0% 0	0.0% 0	0.0%	0.0%
		Swine	Cecal (Market Swine)										0	0.4%	0.7%
		Š												0.3%	0.0%
10 %		1	Cecal (Sows)	200:										1	0.070
Sultamethovazole was to	ested from 1996-2003 and v	Mac re	aniogod by culficoverole in	NOOA.											

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Year	obial Resistance am	ong a	III Non-Typhoidal Sa	Imonella 2003	solates, 2	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
		ens	Retail Chickens	83	157	153	152	99	198	272	171	158	229	208	143
		Chickens	HACCP	1158	1280	1989	1380	994	624	551	564	491	864	520	936
			Cecal Retail Ground Turkey	444	4.40	400	450	100	240	400	200	400	04	55	103
		Turkeys	HACCP	114 670	142 607	183 329	159 389	190 439	246 443	193 200	202 247	162 340	91 280	106 310	86 344
		Ĕ	Cecal											124	104
		<u>e</u>	Retail Ground Beef HACCP	10	14	8	19	13	24	14	7	9	13	15	13
		Cattle	Cecal (Beef)	670	607	329	389	439	443	200	247	340	280	310 124	344 104
			Cecal (Dairy)											310	217
		Swine	Retail Pork Chops	5	11	9	8	18	23	8	20	28	12	24	20
		Š	Cecal (Market Swine) Cecal (Sows)											260 289	279 327
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source	40.00/	40.40/	44.00/	40.00/	40.40/	0.70/	0.00/	0.40/	0.40/	0.00/	40.40/	0.40/
Penicillins	Ampicillin (MIC ≥ 32 μg/ml)		Humans	13.6% 253	12.1% 216	11.3% 231	10.9% 237	10.1% 217	9.7% 232	9.8% 216	9.1% 223	9.1% 213	8.8% 196	10.4% 227	9.1% 194
		s s	Retail Chickens	33.7% 28	30.6% 48	26.8% 41	22.4% 34	18.2% 18	28.3% 56	45.6% 124	38.0% 65	40.5% 64	29.3% 67	22.1% 46	19.6% 28
		Chickens	HACCP	13.7% 159	14.5% 185	14.0% 279	14.9% 205	17.0% 169	10.6% 66	13.8% 76	13.7% 77	7.3% 36	12.2% 105	10.4% 54	8.3% 78
		င်	Cecal	100	100	EIG	200	103	00	70	,,	30	100	12.7%	10.7%
			Retail Ground Turkey	28.9%	20.4%	26.8%	25.8%	42.6%	51.2%	58.0%	48.0%	58.0%	40.7%	7 47.2%	11 26.7%
		eys	HACCP	33 18.7%	29 22.0%	49 22.9%	41 25.3%	81 36.9%	126 32.4%	112 38.8%	97 44.4%	94 27.2%	37 42.3%	50 26.4%	23 34.8%
		Turkeys		49	52	52	77	100	48	47	67	28	74	23	104 44.4%
		<u> </u>	Cecal	40.000	04.407	25.007	40.501	0.001	40.504	20.001	20.001	44.407	20.407	10	20
			Retail Ground Beef	40.0% 4	21.4% 3	25.0% 2	10.5% 2	0.0% 0	12.5% 3	28.6% 4	28.6% 2	11.1% 1	23.1% 3	26.7% 4	38.5% 5
		‡	HACCP	28.1% 188	19.3% 117	26.7% 88	22.4% 87	20.0% 88	21.7% 96	22.5% 45	26.3% 65	17.1% 58	15.4% 43	17.1% 53	9.9% 34
		Cattle	Cecal (Beef)			33	Ů.	33		٠	33	33	٠	14.5% 18	1.9%
			Cecal (Dairy)											8.1%	8.3%
				40.0%	9.1%	22.2%	25.0%	5.6%	13.0%	37.5%	15.0%	46.4%	16.7%	25 25.0%	18 20.0%
		e e	Retail Pork Chops	2	1	2	2	1	3	3	3	13	2	6 9.6%	4 10.8%
		Swine	Cecal (Market Swine)											25	30
			Cecal (Sows)											3.5% 10	4.0% 13
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	10.1% 187	7.6% 136	7.8% 159	6.4% 139	7.3% 156	6.1% 146	5.7% 125	5.0% 122	4.4% 103	3.9% 87	3.9% 85	4.0% 85
	, , ,		Retail Chickens	2.4%	1.9% 3	0.7% 1	2.6% 4	1.0%	0.5% 1	0.0%	2.3% 4	0.6% 1	0.0%	0.5% 1	4.2% 6
		Chickens	HACCP	2.1%	1.3%	1.8%	1.7%	1.8%	1.8%	1.6%	3.0%	0.4%	0.6%	0.4%	0.9%
		S.	Cecal	24	16	36	24	18	11	9	17	2	5	0.0%	8 0.0%
				0.9%	2.8%	0.5%	0.6%	1.6%	1.6%	1.6%	2.5%	3.7%	3.3%	2.8%	0 2.3%
		ske	Retail Ground Turkey	1 4.2%	4 4.7%	1 4.8%	1 3.9%	3 5.5%	4 2.7%	3.3%	5 4.6%	6 1.0%	3 1.1%	3 1.1%	2.3%
		Turkeys	HACCP	11	11	11	12	15	4	4	7	1.076	2	1	7
			Cecal											0.0% 0	6.7% 3
			Retail Ground Beef	40.0% 4	14.3% 2	12.5% 1	5.3% 1	0.0%	12.5% 3	21.4% 3	42.9% 3	0.0%	23.1% 3	26.7% 4	38.5% 5
		<u>0</u>	HACCP	25.1% 168	17.6% 107	21.9% 72	19.8% 77	20.0%	19.6% 87	21.0% 42	25.1% 62	17.9% 61	15.0% 42	15.5% 48	12.5% 43
		Cattle	Cecal (Beef)	100	107	12	- //	- 00	67	42	02	61	42	12.9%	1.0%
			Cecal (Dairy)											7.4%	1 8.3%
		\vdash		40.0%	18.2%	22.2%	0.0%	0.0%	0.0%	12.5%	15.0%	17.9%	0.0%	23 12.5%	18 5.0%
		ō	Retail Pork Chops	2	2	2	0.078	0.078	0.078	1	3	5	0.078	3 3.5%	1
		Swine	Cecal (Market Swine)											9	4.3% 12
			Cecal (Sows)											2.4% 7	1.5% 5
Quinolones	Ciprofloxacin (MIC ≥ 1 µg/mI)		Humans	0.2% 4	0.3% 5	0.1% 2	0.1% 3	0.1% 2	0.2% 5	0.3% 7	0.2% 6	0.2% 4	0.3% 7	0.5% 11	0.4% 9
	(o = 1 pg/iii)	T.	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic		1	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		_	Cecal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ys	Retail Ground Turkey	0	0	0	0	0	0	0	0	0	0	0	0
		Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		-	Cecal											0.0%	0.0% 0
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%
			HACCP	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.3%
		Cattle		0	0	0	1	0	0	0	0	2	0	0.0%	1 0.0%
			Cecal (Beef)											0.3%	0.0%
		<u> </u>	Cecal (Dairy)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	0
			Retail Pork Chops	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	5.0% 1
		Swine	Cecal (Market Swine)											0.4% 1	0.7% 2
		0	Cecal (Sows)											0.3%	0.3%
			1											_ '	1 1

Table 10e. Antimicro	obial Resistance amo	ng a	II Non-Typhoidal Sai	monella l	solates, 2	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
		sue	Retail Chickens	83	157	153	152	99	198	272	171	158	229	208	143
		Chickens	HACCP	1158	1280	1989	1380	994	624	551	564	491	864	520	936
		_	Cecal											55	103
		Turkeys	Retail Ground Turkey HACCP	114 262	142 236	183 227	159	190	246	193 121	202	162 103	91 175	106	86
		Ţ	Cecal	202	236	221	304	271	148	121	151	103	1/5	87 28	299 45
			Retail Ground Beef	10	14	8	19	13	24	14	7	9	13	15	13
		Cattle	HACCP	670	607	329	389	439	443	200	247	340	280	310	344
		0	Cecal (Beef) Cecal (Dairy)											124 310	104 217
		0	Retail Pork Chops	5	11	9	8	18	23	8	20	28	12	24	20
		Swine	Cecal (Market Swine)	3	- ''	9	0	10	23	8	20	26	12	260	279
	Antimicrobial	0)	Cecal (Sows)											289	327
	(Resistance		Isolate												
Antimicrobial Class Quinolones	Breakpoint) Nalidixic Acid	+	Source	1.9%	2.2%	1.9%	2.4%	2.2%	2.1%	1.8%	2.0%	2.2%	2.4%	2.8%	3.5%
Quilloiones	(MIC ≥ 32 μg/ml)		Humans	36	39	38	51	48	49	39	48	51	54	61	74
		SC	Retail Chickens	1.2% 1	0.0% 0	0.7% 1	0.7% 1	0.0% 0	0.0% 0	0.4% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.7% 1
		Chickens	HACCP	0.4% 5	0.5% 6	0.3% 6	0.1% 2	0.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.1% 1	0.0% 0	0.2% 2
			Cecal	J	0	0			U	U	0	0	'	0.0%	0.0%
				4.4%	0.0%	1.1%	0.0%	2.6%	0.4%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%
		ske	Retail Ground Turkey	5 3.8%	0 2.1%	2.2%	0.7%	5 1.1%	1 0.7%	0	1 0.7%	0.0%	0 1.7%	0 1.1%	0.7%
		Turkeys	HACCP	10	5	5	2	3	1	1	1	0.078	3	1	2
		ľ	Cecal											0.0% 0	0.0% 0
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	14.3%	0.0%	0.0%	0.0%	0.0%	7.7% 1
			HACCP	0.4%	2.0%	1.5%	0.5%	0.7%	0.7%	1.0%	2.8%	1.8%	3.6%	2.3%	2.3%
		Cattle		3	12	5	2	3	3	2	7	6	10	7 1.6%	0.0%
		ľ	Cecal (Beef)											2 0.3%	0.0%
			Cecal (Dairy)											1	0
			Retail Pork Chops	0.0% 0	5.0% 1										
		Swine	Cecal (Market Swine)											1.2% 3	1.1% 3
		0)	Cecal (Sows)											0.7%	0.9%
Tetracyclines	Tetracycline	+	Humans	16.3%	13.6%	13.9%	13.5%	14.5%	11.5%	11.9%	11.0%	10.5%	11.1%	12.6%	3 10.4%
	(MIC ≥ 16 μg/ml)	-	1	302 27.7%	242 46.5%	282 43.8%	293 46.7%	310 41.4%	275 46.5%	261 60.3%	270 56.7%	245 65.8%	247 48.5%	275 48.1%	221 47.6%
		sus	Retail Chickens	23	73	67	71	41	92	164	97	104	111	100	68
		Chickens	HACCP	26.2% 303	27.4% 351	28.3% 563	31.8% 439	35.5% 353	30.4% 190	33.9% 187	41.8% 236	40.9% 201	33.7% 291	42.7% 222	36.9% 345
		O	Cecal											38.1% 21	36.9% 38
			Retail Ground Turkey	39.5%	56.3%	39.9%	56.0%	67.4%	66.3%	64.8%	54.0%	64.8%	45.1%	62.3%	60.5%
		Turkeys	HACCP	45 58.8%	80 48.3%	73 54.6%	89 61.8%	128 73.8%	163 64.2%	125 63.6%	109 57.6%	105 45.6%	41 46.3%	66 43.7%	52 54.2%
		Ţ		154	114	124	188	200	95	77	87	47	81	38 46.4%	162 64.4%
		_	Cecal											13	29
			Retail Ground Beef	40.0% 4	14.3% 2	12.5% 1	21.1% 4	0.0% 0	20.8% 5	42.9% 6	42.9% 3	44.4% 4	23.1% 3	40.0% 6	46.2% 6
		<u>e</u>	HACCP	36.9% 247	31.8% 193	34.0% 112	30.3% 118	27.3% 120	29.3% 130	29.0% 58	33.6% 83	30.6% 104	28.9% 81	24.8% 77	25.0% 86
		Cattle	Cecal (Beef)	271	193	112	110	120	130	30	0.5	104	01	29.0%	17.3%
														36 12.3%	18 15.7%
		<u> </u>	Cecal (Dairy)	80.0%	54.5%	55.6%	25.0%	50.0%	34.8%	37.5%	45.0%	39.3%	41.7%	38 45.8%	34 55.0%
		m	Retail Pork Chops	80.0%	54.5% 6	55.6%	25.0%	9	34.8% 8	37.5%	45.0% 9	39.3% 11	41.7%	11	11
		Swine	Cecal (Market Swine)											31.2% 81	40.5% 113
		0)	Cecal (Sows)											24.6% 71	23.2% 76
														/ 1	70

Ceftriaxone Resistance

Table 11. Ceftriaxone-Resistant Non-Typhoidal Salmonella Isolates, 2014

	Humans			,,	imonena isolate				Chic	ckens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans	Typhimurium	14	27.5	Retail	Typhimurium	18	72.0	HACCP	Kentucky	42	67.7	Cecal	Kentucky	5	55.6
(N=51)	Newport	7	13.7	Chickens	Heidelberg	3	12.0	(N=62)	Heidelberg	9	14.5	(N=9)	Typhimurium	4	44.4
	Dublin	6	11.8	(N=25)	Kentucky	3	12.0		Typhimuriun	n 9	14.5				
	Heidelberg	6	11.8		Infantis	1	4.0		Infantis	1	1.6				
	I 4,[5],12:i:-	5	9.8						Thompson	1	1.6				
	Infantis	3	5.9												
	Enteritidis	2	3.9						Tur	rkeys					
	Saintpaul	2	3.9	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	I 4,[5],12:r:-	1	2.0												
	Agona	1	2.0	Retail	Infantis	2	33.3	HACCP	Heidelberg	9	22.5	Cecal	Heidelberg	3	60.0
	Braenderup	1	2.0	Ground Turkey	I 4,12:non-motile	1	16.7	(N=40)	Senftenberg	g 6	15.0	(N=5)	Senftenberg	1	20.0
	Javiana	1	2.0	(N=6)	Hadar	1	16.7		Albany	4	10.0		Typhimurium	1	20.0
	Montevideo	1	2.0		Montevideo	1	16.7		Agona	3	7.5				
	Panama	1	2.0		Saintpaul	1	16.7		Reading	3	7.5				
									Saintpaul	3	7.5				
									Schwarzeng	_	7.5				
									Other	9	22.5				
									Ca	attle					
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail	Dublin	3	60.0	HACCP	Dublin	9	34.6	Cecal	Agona	1	100.0
				Ground Beef	Newport	2	40.0	(N=26)	Newport	9	34.6	(Beef)			
				(N=5)					Reading	4	15.4	(N=1)			
									Agona	1	3.8				
									I 4,[5],12:i:-	1	3.8				
									Meleagridis	1	3.8				
									Montevideo	, 1	3.8				
												Cecal	Newport	8	66.7
												(Dairy)	Typhimurium	3	25.0
												(N=12)	Montevideo	1	8.3
				0	0 1		0/		Sv	wine	Caration				0/
				Source	Serotype	n	%			Source	Serotyp	ie		n	%
				Retail						Cecal	Agona			3	27.3
				Pork Chops						(Market Swine)	Derby			2	18.2
				(N=0)						(N=11)	Albany			1	9.1
											1 4,[5],12	Drit-		1	9.1
														1	9.1
											Johanne Newport	-		1	9.1
														1	
											Senftenl Typhimu			1	9.1 9.1
											тургііті	mulli		1	J. I
										Cecal	Typhimu	ırium		2	40.0
										(Sows)	Agona			1	20.0
										(N=5)	Derby			1	20.0
											Muenste	er		1	20.0
											www	, 1			∠∪.∪

Nalidixic Acid Resistance

Table 12. Naldixic Acid-Resistant Non-Typhoidal Salmonella Isolates, 2014

	Humans								Chi	ckens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans (N=74)	Enteritidis I 4,[5],12:i:- Typhimurium	35 7 7	47.3 9.5 9.5	Retail Chickens (N=1)	Infantis	1	100.0	HACCP (N=2)	Infantis	2	100.0	Cecal (N=0)			
	Heidelberg	3	4.1												
	Infantis	3	4.1						Tu	rkeys					
	Kentucky	3	4.1	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Potsdam	2	2.7												
	Saintpaul	2	2.7	Retail				HACCP	Albert	1	50.0	Cecal			
	Virchow	2	2.7	Ground Turkey				(N=2)	Ohio	1	50.0	(N=0)			
	I 4,[5],12:-:1,2	1	1.4	(N=0)											
	Anatum	1	1.4												
	Dublin	1	1.4						С	attle					
	Give	1	1.4	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Grumpensis	1	1.4												
	Hadar	1	1.4	Retail	Dublin	1	100.0	HACCP	Dublin	5	62.5	Cecal			
	Newport	1	1.4	Ground Beef				(N=8)	Muenster	1	12.5	(Beef)			
	Oslo	1	1.4	(N=1)					Reading	2	25.0	(N=0)			
	Paratyphi B car. L(+) tartrate+	1	1.4												
	Urbana	1	1.4									Cecal (Dairy) (N=0)			
									Sı	wine					
				Source	Serotype			n	%	Source	Serotyp	е		n	%
				Retail Pork Chops (N=1)	Derby			1	100.0	Cecal (Market Swine) (N=3)	Adelaide Brander Muench	burg		1 1 1	33.3 33.3 33.3
										Cecal (Sows) (N=3)	Anatum Derby Muench	en		1 1 1	33.3 33.3 33.3

Table 13. Number of Non-Typhoidal Salmonella Isolates among the Top Serotypes from Humans with the Number of Resistant Isolates by Class and Agent, 2014

					Num	ber o	f Isola	ites					Nu	mber	of Res	istant I	solates l	by Antimicrobia	I Class and A	gent ¹			
					ses to		ch Iso	crobial lates a		Aminogl	ycosides	β-Lactam/β- Lactamase Inhibitor Combinations	С	ephe	ms	Pat	olate hway bitors	Macrolides	Penicillins	Phenicols	Quino	olones	Tetracyclines
Sources	Salmonella Serotype	No. of Isolates	% of Isolates	0	1	2-3	4-5	6-7	8-9	GEN	STR	AMC	FOX	TIO	AXO	FIS	СОТ	AZI	AMP	CHL	CIP	NAL	TET
	Enteritidis	438	20.6%	384	38	10	4	1	1		13	2	3	2	2	8	2		14	5	1	35	11
	Typhimurium	262	12.3%	180	13	20	38	10	1	8	65	14	14	14	14	66	6	1	52	42	1	7	59
	Newport	235	11.0%	219	5	1	3	7		1	11	7	7	7	7	11	1		9	10		1	12
	Javiana	128	6.0%	115	9	4					10	1	1	1	1	2	2		3				3
	I 4,[5],12:i:-	110	5.2%	42	6	10	50	2		2	58	3	3	5	5	55	2		56	4	2	7	59
	Infantis	73	3.4%	62	6	1	2	2		1	5	1	1	3	3	4	2		5	3		3	6
S	Heidelberg	71	3.3%	44	8	10	9			11	18	6	6	6	6	11	2		16	7		3	11
nans	Saintpaul	52	2.4%	42	4	5	1			3	3	1	1	2	2	3	2		5			2	6
	Muenchen	45	2.1%	44		1					1					1							1
	Montevideo	44	2.1%	42	1	1						1	1	1	1				1				1
	Oranienburg	36	1.7%	35			1				1					1	1		1				1
	Unknown serotype	25	1.2%	21	4						2								1				1
	Partially serotyped	2	0.1%	2																			
	Rough/Nonmotile isolates Other	6 600	0.3% 28.2%	5 514	31	1 35	13	7		4	1 51	9	9	10	10	1 38	8		31	14	5	16	50
	Total	2127	100.0%	1751	_			29	2	30	239	45		51		201	28	1	194	85	9	74	221

GEN= Gentamicin, KAN= Kanamycin, STR= Streptomycin, AMC= Amoxicillin/Clavulanic Acid, FOX= Cefoxitin, TIO= Ceftiofur, AXO= Ceftriaxone, FIS= Sulfisoxazole, COT= Trimethoprim/Sulfamethoxazole, AZI= Azithromycin, AMP= Ampicillin, CHL= Chloramphenicol, CIP= Ciprofloxacin, NAL= Nalidixic Acid, TET= Tetracycline

Table 14. Number of Non-Typhoidal Salmonella Isolates among the Top Serotypes from Chickens with the Number of Resistant Isolates by Class and Agent, 2014

					Nun	nber o	f Isola	ites				Nu	mber	of Re	sistant	Isolates I	by Antimicrobia	I Class and A	gent ¹		
							ch Iso	crobial lates are	Aminog	ycosides	β-Lactam/β- Lactamase Inhibitor Combinations	c	ephe	ms	Pa	olate thway ibitors	Macrolides	Penicillins	Phenicols	Quinolones	Tetracyclines
		No. of	% of	0	1	2-3	4-5	6-7 8-9	GEN	STR	AMC	FOX	TIO	AXO	FIS	СОТ	AZI	AMP	CHL	CIP NAL	TET
Source	s Salmonella Serotype	Isolates	Isolates																		
	Typhimurium	38	26.6%	1		18	19		2	1	18	16	18	18	37			19			37
	Kentucky	35	24.5%	4	7	21	3			31	3	2	3	3				3			23
9	Enteritidis	27	18.9%	27																	
3	Heidelberg	24	16.8%	14	2	3	2	3	7	9	3	3	3	3	7			5	5		5
	Infantis	4	2.8%	3			1						1	1				1	1	1	1
	Schwarzengrund	4	2.8%		4					4											
1 2		3	2.1%	1	2																2
	Other	8	5.6%	8																	
	Total	143	100.0%	58	15	42	25	3	9	45	24	21	25	25	44			28	6	1	68
	Kentucky	361	38.6%	58		215			4	296	42		39		6	2		43			243
	Enteritidis	130	13.9%	125	4	1	00			200		00	00		Ü	-		5			1
, l	Heidelberg	108	11.5%	73	11	16	4	4	13	27	9	8	9	9	12	2		13	6		17
e l		81	8.7%	14	3	54	7	3	2	10	9	8	9	9	62	2		13	2		63
Chickens	Schwarzengrund	61	6.5%	25	34	2	′	3	1	36	9	0	9	9	1			13	2		1
5	Infantis	43	4.6%	38	2	2	1		'	1	1	1	1	1	1			1		2	4
-	I 4,[5],12:i:-	37	4.0%	32	2	2	1		2	4					2			1		-	3
	Thompson	23	2.5%	20	_	2	1		2	3		1	1	1	3			1			1
	Other	92	9.8%	74	7	11			6	15		-		-	3			1			12
	Total	936	100.0%	459	112	305	53	7	30	392	61	53	59	62	90	4		78	8	2	345
	Kentucky	27	26.2%	7	9	6	5			18	5	4	5	5	1	1		5			10
	Typhimurium	27	26.2%	1		22	4		2	4	4	2	4	4	26			5			25
	Enteritidis	17	16.5%	17																	
3	Schwarzengrund	8	7.8%	1	5	1	1		2	7					2	1	1	1	1		1
٥	Heidelberg	7	6.8%	7																	
	Senftenberg	5	4.9%	5															1		0
	Other	12	11.7%	10		2				2					1						2
	Total Gentamicin KAN= Kanamycin S	103	100.0%			31			4	31	9	6		9	30		1	11	2		38

GEN= Gentamicin, KAN= Kanamycin, STR= Streptomycin, AMC= Amoxicillin/Clavulanic Acid, FOX= Cefoxitin, TIO= Ceftiofur, AXO= Ceftriaxone, FIS= Sulfisoxazole, COT= Trimethoprim/Sulfamethoxazole, AZI= Azithromycin, AMP= Ampicillin, CHL= Chloramphenicol, CIP= Ciprofloxacin, NAL= Nalidixic Acid, TET= Tetracycline

Table 15. Number of Non-Typhoidal Salmonella Isolates among the Top Serotypes from Turkeys with the Number of Resistant Isolates by Class and Agent, 2014

					Nun	nber o	f Isola	ates				Nu	mber	of Res	istant Is	olates l	by Antimicrobia	Class and A	gent ¹		
							ch Isc	crobial plates are		glycosides	β-Lactam/β- Lactamase Inhibitor Combinations	C	ephe	ms	Fola Path Inhib	way	Macrolides	Penicillins	Phenicols	Quinolones	Tetracyclines
Source	s Salmonella Serotype	No. of Isolates	% of Isolates	0	1	2-3	4-5	6-7 8-	GEN	STR	AMC	FOX	TIO	AXO	FIS	СОТ	AZI	AMP	CHL	CIP NAL	TET
	Reading	18	20.9%	6	3	7	2		2	11					9			5			7
	Hadar	13	15.1%			12		1	1	13	1	1	1	1	1			5			13
	Saintpaul	12	14.0%	6	1	4	1		4	4	1	1	1	1				5			6
	Berta	8	9.3%		8																8
Ι.	Albany	6	7.0%	2	2	2			3	2											2
3	Heidelberg	6	7.0%			5	1		5	6					5			2			3
Į.	Muenchen	4	4.7%			4				4					4						4
3	Schwarzengrund	3	3.5%	3																	
3		3	3.5%	3																	
	1 4 12:d:	2	2.3%	•	2																2
200	Anatum	2	2.3%	1	1																1
l'	Brandenburg	2	2.3%	2																	
	Infantis	2	2.3%	-				2	2	2	2	2	2	2	2			2	2		2
	Typhimurium	2	2.3%			2		2	1	1	2	2	-	2	1			1	2		2
	Other	3	3.5%			1	2		'	2	2	2	2	2	1			3			2
	Total	86	100.0%	23	17			3	18	45	6	6	6	6	23			23	2		52
	Reading	66	22.1%	22	8	30	5	1	3	36	3	3	3	3	32			16			32
	Hadar	34	11.4%	1	1	31	1	'	1	33	3	3	3	3	1			15			32
	Heidelberg	30	10.0%	3	6	13	6	1 1	15	21	9	9	9	9	13	1	1	13	1		13
w	Saintpaul	20	6.7%	2	1	11	6	' '	12	12	3	3	3	3	3	1	'	17			17
Turkeys					2	1	ь		2	2	3	3	3	3	3	'					17
2 6	Montevideo	17	5.7%	14							•							1			
1 2	f	17	5.7%	10	1	3	1	2	2	4	3	3	3	3	3			4	1		5
-		16	5.4%	1 '		9	1	2	6	8	-	3	3	3	9			7	1		7
	Senftenberg	14	4.7%	1		4	3	6	6	12	6	6	6	6	10			12	2		10
	Anatum	12	4.0%		10		2				2	2	2	2				2			12
	Muenchen	12	4.0%	5		6	1		1	7	_	_			7			1			7
	Other	61	20.4%	23	16	11	7	3 1	11	23	7	7	10		9	_		16	2	2	26
-	Total	299	100.0%	85	45	119	33	15 2	59	158	36	36	39	40	87	2	1	104	7	2	162
	Hadar	7	15.6%			7				6								5			7
	Senftenberg	7	15.6%	2	1	3		1	4	4	1	1	1	1	2			3	1		3
	Reading	6	13.3%	1	1	3	1		1	4					4	1		2			3
	Anatum	4	8.9%	1	3																3
	Heidelberg	3	6.7%				2	1		2	3	3	3	3	3	1	1	3	1		2
3	Saintpaul	3	6.7%			3			3	3								3			3
200	Schwarzengrund	3	6.7%	1		2			2	2								2			2
	Agona	2	4.4%	2																	
	Berta	2	4.4%	1	1																1
	Kentucky	2	4.4%			1	1			2					1	1			1		2
	Typhimurium	2	4.4%			1		1	1	2	1		1	1	2			1			2
	Other	4	8.9%	3		1			1	1								1			1
	Total	45	100.0%	11	6	21	4	2 1	14	26	5	4	5	5	12	3	1	20	3		29

¹ GEN= Gentamicin, KAN= Kanamycin, STR= Streptomycin, AMC= Amoxicillin/Clavulanic Acid, FOX= Cefoxitin, TIO= Ceftiofur, AXO= Ceftriaxone, FIS= Sulfisoxazole, COT= Trimethoprim/Sulfamethoxazole, AZI= Azithromycin, AMP= Ampicillin, CHL= Chloramphenicol, CIP= Ciprofloxacin, NAL= Nalidixic Acid, TET= Tetracycline

Table 16. Number of Non-Typhoidal Salmonella Isolates among the Top Serotypes from Cattle with the Number of Resistant Isolates by Class and Agent, 2014

					Num	ber o	f Isola	ates					Nu	mber	of Res	sistant	Isolates	by Antimicrobia	I Class and A	gent ¹			
					umbei sses to		ch Isc			Aminog	lycosides	β-Lactam/β- Lactamase Inhibitor Combinations	С	ephe	ms	Pa	olate thway ibitors	Macrolides	Penicillins	Phenicols	Quino	lones	Tetracyclines
Sources	Salmonella Serotype	No. of Isolates	% of Isolates	0	1	2-3	4-5	6-7	8-9	GEN	STR	AMC	FOX	TIO	AXO	FIS	COT	AZI	AMP	CHL	CIP	NAL	TET
	Dublin	3	23.1%					2	1	1	3	3	3	3	3	3			3	3		1	2
Seef	Typhimurium	3	23.1%	3																			
<u> </u>	Montevideo	2	15.4%	2																			
Ground	Newport	2	15.4%					2			2	2	2	2	2	2			2	2			2
	Anatum	1	7.7%		1																		1
Retail	Bredeney	1	7.7%		1																		1
ĕ	Infantis	1	7.7%	1																			
_	Total	13	100.0%	6	2			4	1	1	5	5	5	5	5	5			5	5		1	6
	Montevideo	91	26.5%	80	9	1	1				2	1	1	1	1	1			1	1			9
	Dublin	31	9.0%	5	1	1	14	8	2	1	24	9	8	9	9	24	4		11	24	1	5	25
	Cerro	29	8.4%	25	4						1												3
	Anatum	18	5.2%	14	4																		4
	Newport	17	4.9%	8				9			9	9	9	9	9	8	1		9	9			9
9	Muenchen	16	4.7%	13	1	2										2							3
AC A	Typhimurium	14	4.1%	10	1	1	2				2					3			3	1			3
-	Kentucky	13	3.8%	5	8						1												7
	6,7:g,m,s:e,n,z15	10	2.9%	8	2						1												1
	Agona	10	2.9%	8		1		1			2		1	1	1	2			1	1			2
	Muenster	10	2.9%	8		1	1				2	1				2	1			1		1	2
	Other	85	24.7%	64	6	7	4	2	2	1	14	6	6	6	6	13			9	6		2	18
	Total	344	100.0%	248	36	14	22	20	4	2	58	26	25	26	26	55	6		34	43	1	8	86
	Anatum	25	24.0%	21	4						1												3
Cattle	Montevideo	14	13.5%	10	3		1				1					1				1			4
ပ္ပို	6,7:g,m,s:e,n,z15	8	7.7%	6	2						1												1
(Jee	Cerro	6	5.8%	6																			
ě	Mbandaka	6	5.8%	5	1																		1
ca	Altona	4	3.8%	2	1	1					2					1							1
ပီ	Senftenberg	4	3.8%	3	1						1												
	Typhimurium	4	3.8%	3			1				1					1			1				1
	Kentucky	3	2.9%	2	1																		1
	Other	30	28.8%	23	1	5	1			1	4				1	6	2		1				6
	Total	104	100.0%	81	14	6	3			1	11				1	9	2		2	1			18
	Cerro	70	32.3%	66	3	1					4												1
	Montevideo	38	17.5%	33	3	1			1		2	1	1	1	1	1	1	1	1	1			5
	Agona	16	7.4%	13	1	2					1					2							3
	Anatum	15	6.9%	14	1						1												
	Newport	15	6.9%	7				8			8	8	8	8	8	8			8	8			8
iz (S	Meleagridis	10	4.6%	6	2	1	1				2					2			1	1			4
(Dai	Typhimurium	10	4.6%	1			6	3			9	3	3	3	3	9			8	7			9
a	Kentucky	7	3.2%	6	1						1												
ő	Mbandaka	4	1.8%	2	2																		2
	Havana	3	1.4%	3																			
	Muenchen	3	1.4%	2		1										1							1
	Muenster	3	1.4%	3																			
	Other	23	10.6%	22			1			1	1					1	1			1			1
	Total	217	100.0%	178	13	6	8	11	1	1	29	12	- 10		12	24	2	1	18	18			34

GEN= Gentamicin, KAN= Kanamycin, STR= Streptomycin, AMC= Amoxicillin/Clavulanic Acid, FOX= Cefoxitin, TIO= Ceftiofur, AXO= Ceftriaxone, FIS= Sulfisoxazole, COT= Trimethoprim/Sulfamethoxazole, AZI= Azithromycin, AMP= Ampicillin, CHL= Chloramphenicol, CIP= Ciprofloxacin, NAL= Nalidixic Acid, TET= Tetracycline

Table 17. Number of Non-Typhoidal Salmonella Isolates among the Top Serotypes from Swine with the Number of Resistant Isolates by Class and Agent, 2014

					Num	ber o	f Isol	olates Number of Resistant Isolates by Antimicrobial Class and Agent ¹															
							ch Isc	crobial plates are	Aminog	lycosides	β-Lactam/β- Lactamase Inhibitor Combinations		Ceph	nems		Fola Pathy Inhibi	way	Macrolides	Penicillins	Phenicols	Quin	olones	Tetracyclines
Source	s Salmonella Serotype	No. of Isolates	% of Isolates	0	1	2-3	4-5	6-7 8-9	GEN	STR	AMC	FO	х ті	O A	хо	FIS	СОТ	AZI	AMP	CHL	CIP	NAL	TET
	Derby	5	25.0%	1	3			1		1						1	1		1	1	1	1	4
	Infantis	5	25.0%	3		2				2													2
	I 4,[5],12:i:-	2	10.0%				2			2						2			2				2
9	Anatum	1	5.0%	1																			
9	Brandenburg	1	5.0%			1										1							1
	✓ Bredeney	1	5.0%	1																			
2	Cerro	1	5.0%	1																			
100	London	1	5.0%		1																		1
٥	Muenchen	1	5.0%	1																			
	Ohio	1	5.0%			1			1	1						1							
	Typhimurium	1	5.0%				1			1						1			1				1
	Total	20	100.0%	8	4	4	3	1	1	7						6	1		4	1	1	1	11
	Derby	49	17.6%	10	13	23	1	2	3	26	1	1	1		2	25	1		3	1			37
	Anatum	29	10.4%	8	21		·	-		20	•				-		•		· ·	•			21
	Johannesburg	28	10.0%	25	2	1					1	1	1		1				1				2
	Infantis	22	7.9%	19	-	3				2	•					1			2				3
	_	17	6.1%	8	2	4		2 1	1	7	3	3		3	3	7	2	1	3	3			8
		13	4.7%	3	4	3	4	2	'	8	1	3	1			9	1	1	7	6			9
و	Typhimurium			"	1	3			'		1	1			1	8	'	'		O			
	1 4,[5],12:i:-	9	3.2%		2	1	7	1	1	8 1	1	1	1	1	1	8			8 1				9
g 5	Saintpaul			6	2	'			'	'									'				
Swine	Adelaide	8	2.9%	6	2																1	1	1
Swi	Cerro	8	2.9%	8																			
	London	8	2.9%	7		1										1	1						1
	Muenchen	8	2.9%	5	1	2										2						1	2
	Brandenburg	7	2.5%	3		4			1	1						3			1	1	1	1	4
	Other	64	22.9%	50	4	6	2	2	2	9	3	3			3	5	2		4	1			13
 	Total	279	100.0%	158	49	48	14	9 1	9	62	10	10) 1	0 ′	11	61	7	2	30	12	2	3	113
	Anatum	67	20.5%	40	25	2				1											1	1	27
	Johannesburg	42	12.8%	37	4	1			1	2									1				4
	Infantis	36	11.0%	36																			
	Derby	26	8.0%	14	5	6	1			6	1	1			1	4			1			1	11
	Agona	13	4.0%	2	4	7				4	1	1	1	I	1	6			1				10
3	Uganda	13	4.0%	13															0				
٥	1 4,[5],12:i:-	10	3.1%	2	3		5			5						5			5				8
	Muonobon	9	2.8%	8	1																	1	
	Saintpaul	8	2.4%	6	2					1													1
	London	7	2.1%	7																			
	Cerro	6	1.8%	5	1					1													
	Ohio	6	1.8%	6																			
	Typhimurium	6	1.8%	1		2	1	2		4	2	2	2	2	2	5			4	3			4
	Other	78	23.9%	63	9	5		1	1	8	1	1	1		1	2			1	2			11
	Total	327	100.0%	240	54	23	7	3	2	32	5	5	5	5	5	22			13	5	1	3	76

¹ GEN= Gentamicin, KAN= Kanamycin, STR= Streptomycin, AMC= Amoxicillin/Clavulanic Acid, FOX= Cefoxitin, TIO= Ceftiofur, AXO= Ceftriaxone, FIS= Sulfisoxazole, COT= Trimethoprim/Sulfamethoxazole, AZI= Azithromycin, AMP= Ampicillin, CHL= Chloramphenicol, CIP= Ciprofloxacin, NAL= Nalidixic Acid, TET= Tetracycline

Multidrug Resistance

Table 18a. Resistance Patte	,,,,,,	aniong an Non-Typ	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
	Chickens	Retail Chickens HACCP Cecal	83 1158	157 1280	153 1989	152 1380	99 994	198 624	272 551	171 564	158 491	229 864	208 520 55	143 936 103
	Turkeys	Retail Ground Turkey HACCP Cecal	114 262	142 236	183 227	159 304	190 271	246 148	193 121	202 151	162 103	91 175	106 87 28	86 299 45
	Cattle	Retail Ground Beef HACCP Cecal (Beef)	10 670	14 607	8 329	19 389	13 439	24 443	14 200	7 247	9 340	13 280	15 310 124	13 344 104
	Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	5	11	9	8	18	23	8	20	28	12	310 24 260	217 20 279
	Ø	Cecal (Sows)											289	327
Resistance Pattern		Source Humans	78.0%	79.9%	81.0%	80.6%	81.1%	83.9%	83.3%	84.7%	84.9%	84.7%	80.8%	82.3%
1. No Resistance Detected	_	I	1447 45.8%	1424 40.1%	1649 46.4%	1749 39.5%	1739 47.5%	2001 46.0%	1825 29.0%	2073 36.3%	1982 29.1%	1892 37.1%	1760 40.4%	1751 40.6%
	sus	Retail Chickens	38	63	71	60	47	91	79	62	46	85	84	58
	Chickens	HACCP	61.2% 709	62.7% 803	61.2% 1217	57.2% 790	53.9% 536	60.6% 378	56.1% 309	49.3% 278	50.7% 249	52.0% 449	44.4% 231	49.0% 459
	0	Cecal											41.8% 23	46.6% 48
		Retail Ground Turkey	34.2% 39	28.9% 41	30.1% 55	18.2% 29	15.8% 30	21.1% 52	22.3% 43	31.7% 64	27.2% 44	36.3% 33	22.6% 24	26.7% 23
	Turkeys	HACCP	24.0%	33.5%	27.8%	28.0%	15.5%	21.6%	20.7%	25.2%	40.8%	29.1%	35.6%	28.4%
	ī	Cecal	63	79	63	85	42	32	25	38	42	51	31 35.7%	85 24.4%
	-	Retail Ground Beef	60.0%	78.6%	75.0%	73.7%	92.3%	79.2%	57.1%	57.1%	55.6%	76.9%	10 60.0%	11 46.2%
			61.2%	11 65.6%	6 63.2%	14 67.6%	12 72.0%	19 68.8%	8 68.5%	4 61.1%	5 67.6%	10 69.3%	9 72.6%	6 72.1%
	Cattle	HACCP	410	398	208	263	316	305	137	151	230	194	225 71.0%	248 77.9%
		Cecal (Beef)											88	81
		Cecal (Dairy)											86.5% 268	82.0% 178
		Retail Pork Chops	20.0% 1	45.5% 5	44.4% 4	25.0% 2	44.4% 8	65.2% 15	50.0% 4	35.0% 7	28.6% 8	33.3% 4	54.2% 13	40.0% 8
	Swine	Cecal (Market Swine)											66.5% 173	56.6% 158
	0,	Cecal (Sows)											74.4% 215	73.4% 240
		Humans	14.1%	11.3%	11.8%	11.7%	11.0%	9.5%	9.6%	9.1%	9.1%	8.6%	9.8%	9.3%
2. Resistant to ≥ 3 Antimicrobial Classes		Retail Chickens	262 30.1%	202 28.7%	240 24.8%	253 21.7%	236 23.2%	226 33.8%	210 47.4%	223 40.9%	213 40.5%	193 33.6%	214 25.0%	197 20.3%
	Chickens	HACCP	25 13.1%	45 15.5%	38 14.9%	33 15.7%	23 17.8%	67 11.1%	129 15.4%	70 14.4%	64 7.7%	77 12.7%	52 10.2%	29 8.3%
	Shic	Cecal	152	198	296	217	177	69	85	81	38	110	53 9.1%	78 14.6%
	_		28.1%	25.4%	26.8%	24.5%	40.5%	50.8%	25.9%	32.7%	42.6%	37.4%	5 39.6%	15 36.0%
	sys	Retail Ground Turkey	32 21.0%	36 26.7%	49 26.0%	39 26.3%	77 32.1%	125 28.4%	50 30.6%	66 35.8%	69	34 40.0%	42 34.4%	31 41.1%
	Turkeys	HACCP	55	63	59	80	87	42	37	54	23	70	30	123
		Cecal											28.6% 8	46.7% 21
		Retail Ground Beef	40.0% 4	14.3% 2	25.0% 2	10.5% 2	0.0% 0	20.8% 5	35.7% 5	42.9% 3	0.0%	23.1% 3	33.3% 5	38.5% 5
	유	HACCP	29.6% 198	21.1% 128	27.7% 91	23.9% 93	22.1% 97	23.5% 104	26.0% 52	28.7% 71	20.0% 68	19.3% 54	20.3% 63	16.6% 57
	Cattle	Cecal (Beef)											16.9% 21	5.8% 6
		Cecal (Dairy)											9.0%	10.1%
		Retail Pork Chops	40.0%	18.2%	22.2%	25.0%	5.6%	17.4%	50.0%	50.0%	28.6%	25.0%	33.3%	20.0%
	Swine	Cecal (Market Swine)	2	2	2	2	1	4	4	10	8	3	8 17.7%	20.1%
	တ်	Cecal (Sows)											46 9.0%	56 6.4%
	<u> </u>	Humans	11.2%	9.0%	8.8%	7.9%	8.1%	7.4%	7.2%	6.8%	6.5%	6.1%	26 7.7%	21 7.1%
3. Resistant to ≥ 4 Antimicrobial Classes	<u> </u>	1	208 16.9%	161 24.2%	180 18.3%	171 15.1%	174 13.1%	176 21.2%	157 33.5%	166 32.2%	152 25.9%	137 28.8%	167 19.7%	152 19.6%
	sus	Retail Chickens	14	38	28	23	13	42 7.4%	91	55 11.3%	41	66	41	28
	Chickens	HACCP	79	126	173	10.3%	12.3%	46	60	64	4.9%	68	36	60
		Cecal											7.3% 4	9.7% 10
	ဖွာ	Retail Ground Turkey	14.9% 17	12.7% 18	7.1% 13	8.2% 13	14.2% 27	15.4% 38	11.4% 22	17.3% 35	16.0% 26	13.2% 12	13.2% 14	10.5% 9
	Turkeys	HACCP	9.5% 25	9.7% 23	11.0% 25	11.8% 36	14.8% 40	10.1% 15	11.6% 14	13.9% 21	8.7% 9	11.4% 20	11.5% 10	16.7% 50
	Ĺ	Cecal											7.1% 2	15.6% 7
		Retail Ground Beef	40.0% 4	14.3% 2	12.5% 1	5.3% 1	0.0%	12.5% 3	35.7% 5	42.9% 3	0.0%	23.1% 3	26.7% 4	38.5% 5
	e ‡	HACCP	27.5% 184	18.8% 114	24.3% 80	21.9% 85	20.7% 91	21.9% 97	24.0% 48	25.5% 63	19.4% 66	17.5% 49	17.4% 54	13.4% 46
	Cattle	Cecal (Beef)											16.9% 21	2.9%
		Cecal (Dairy)											7.7%	9.2% 20
		Retail Pork Chops	40.0%	18.2%	22.2%	25.0%	5.6%	13.0%	25.0%	5.0%	14.3%	8.3%	20.8%	20.0%
	Swine	Cecal (Market Swine)	2	2	2	2	1	3	2	1	4	1	5 6.9%	8.6%
	Ś	Cecal (Sows)											18 3.1%	24 3.1%
¹ Starting in 2011, testing included r	nine ar		the addition	of the macr	olide azithron	ovcin Becau	no registence	to ozithrom	voin in low (in	thin once	10() antimin	11.1.1.1	9	10

1 Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 18b. Resistance Patte	J1113 C		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
	Chickens	Retail Chickens HACCP	83 1158	157 1280	153 1989	152 1380	99 994	198 624	272 551	171 564	158 491	229 864	208 520	143 936
		Cecal	444	440	400	450	400	040	400	200	400	04	55	103
	Turkeys	Retail Ground Turkey HACCP Cecal	114 262	142 236	183 227	159 304	190 271	246 148	193 121	202 151	162 103	91 175	106 87 28	86 299 45
		Retail Ground Beef	10	14	8	19	13	24	14	7	9	13	15	13
	Cattle	HACCP Cecal (Beef)	670	607	329	389	439	443	200	247	340	280	310 124	344 104
		Cecal (Dairy)											310	217
	Swine	Retail Pork Chops Cecal (Market Swine)	5	11	9	8	18	23	8	20	28	12	24 260	20 279
Resistance Pattern		Cecal (Sows) Source											289	327
		Humans	9.8%	7.9%	7.2%	6.3%	6.9%	6.6%	6.1%	5.2%	4.6%	3.9%	4.0%	3.9%
4. Resistant to ≥ 5 Antimicrobial Classes	┢	Retail Chickens	181 12.0%	140 22.3%	146 17.6%	137 14.5%	149 11.1%	157 18.7%	133 31.6%	128 30.4%	108 23.4%	87 24.5%	87 18.8%	82 17.5%
	Chickens	HACCP	10 4.9%	35 8.0%	27 5.8%	22 6.6%	7.4%	37 6.1%	86 7.8%	52 9.0%	37 3.5%	56 5.9%	39 5.4%	25 5.3%
	Chic		56	103	116	91	74	38	43	51	17	51	28 5.5%	50 7.8%
		Cecal	4.4%	4.9%	2.7%	2.5%	2.6%	3.3%	3.6%	11.4%	11.7%	7.7%	3 6.6%	8 5.8%
	ş	Retail Ground Turkey	5	7	5	4	5	8	7	23	19	7	6	5
	Turkeys	HACCP	3.1% 8	5.5% 13	6.2% 14	5.6% 17	6.3% 17	4.1% 6	9.1% 11	9.3% 14	5.8% 6	5.7% 10	2.2% 2	8.0% 24
	آ ا	Cecal											3.6% 1	11.1% 5
		Retail Ground Beef	40.0% 4	14.3% 2	12.5% 1	5.3%	0.0%	12.5% 3	14.3%	28.6%	0.0%	23.1% 3	26.7% 4	38.5% 5
	۰	HACCP	23.6%	17.6%	23.1%	20.1%	18.2%	19.0%	20.0%	23.1%	16.2%	13.6%	14.8%	8.5%
	Cattle	Cecal (Beef)	158	107	76	78	80	84	40	57	55	38	46 12.1%	1.0%
													15 7.1%	1 7.4%
		Cecal (Dairy)	40.0%	9.1%	22.2%	0.0%	0.0%	0.0%	25.0%	5.0%	10.7%	0.0%	22 12.5%	16 5.0%
	۰	Retail Pork Chops	2	1	2	0	0	0.070	2	1	3	0.076	3	1
	Swine	Cecal (Market Swine)											4.2% 11	5.4% 15
		Cecal (Sows)											2.1% 6	1.2% 4
5. At Least ACSSuT ² Resistant		Humans	9.3% 173	7.2% 129	6.9% 141	5.6% 121	6.3% 136	5.8% 138	5.1% 112	4.4% 107	3.9% 91	3.4% 77	3.4% 74	3.1% 67
The Education of the Indicate		Retail Chickens	2.4%	1.9%	0.7%	2.6%	0.0%	0.5%	0.0%	1.8%	0.0%	0.0%	0.5%	2.1%
	Chickens	HACCP	1.5%	0.9%	1.6%	1.6%	1.5%	1.4%	1.3%	2.3%	0.4%	0.3%	0.2%	1.5%
	Chic	Cecal	17	12	31	22	15	9	7	13	2	3	0.0%	5 0.0%
	<u> </u>		0.9%	2.8%	0.5%	0.6%	1.6%	1.6%	0.5%	2.5%	2.5%	3.3%	0 2.8%	0 2.3%
	sys	Retail Ground Turkey	2.3%	4.7%	1 4.0%	1 3.9%	3 4.8%	2.0%	3.3%	5 4.0%	1.0%	3 1.1%	3 1.1%	2.0%
	Turkeys	HACCP	6	11	9	12	13	3	4	6	1	2	1	6
		Cecal	40.00/	44.00/	10.50/	5.00/	0.00/	40.50/	44.00/	00.00/	0.00/	00.40/	0.0%	4.4%
		Retail Ground Beef	40.0% 4	14.3% 2	12.5% 1	5.3% 1	0.0%	12.5% 3	14.3% 2	28.6% 2	0.0%	23.1% 3	20.0%	30.8% 4
	Cattle	HACCP	18.1% 121	16.3% 99	20.4% 67	18.3% 71	16.2% 71	18.1% 80	15.0% 30	18.6% 46	12.6% 43	9.3% 26	12.9% 40	7.0% 24
	ő	Cecal (Beef)											11.3% 14	0.0%
		Cecal (Dairy)											7.1% 22	7.4% 16
		Retail Pork Chops	40.0% 2	9.1%	22.2% 2	0.0%	0.0%	0.0%	12.5%	5.0%	10.7% 3	0.0%	12.5%	5.0%
	Swine	Cecal (Market Swine)											3.5% 9	4.3% 12
	S	Cecal (Sows)											2.1%	1.2%
		Humans	1.2%	0.6%	0.9%	0.7%	0.7%	0.5%	0.7%	0.4%	0.4%	0.3%	0.5%	0.6%
6. At Least ACT/S ³ Resistant	\vdash	Retail Chickens	0.0%	0.0%	18 0.0%	15 0.0%	16 0.0%	0.0%	15 0.0%	0.0%	9	7 0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.1%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	Chic	Cecal	0	1	2	0	0	1	0	0	0	0	0.0%	1 0.0%
	<u> </u>		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0	0.0%
	ske	Retail Ground Turkey	0.0%	0	0.0%	0	0.0%	0.7%	0	0	4 0.0%	0.0%	1 0.0%	0.1%
	Turkeys	HACCP	0	1	0	1	0	1	1	0.070	0	0	0.0%	1 2.2%
	<u> </u>	Cecal	0.004	7.40/	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0	1
		Retail Ground Beef	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	2.7% 18	1.2% 7	4.3% 14	4.1% 16	2.5% 11	3.8% 17	1.5% 3	4.5% 11	1.5% 5	0.4% 1	1.0%	1.2% 4
	ű	Cecal (Beef)											1.6% 2	0.0% 0
		Cecal (Dairy)											0.3%	0.5% 1
		Retail Pork Chops	0.0%	0.0%	11.1% 1	0.0%	0.0% 0	0.0%	12.5% 1	0.0% 0	0.0%	0.0%	0.0% 0	5.0% 1
	Swine	Cecal (Market Swine)					Ì				Ť		0.0%	1.4%
	S	Cecal (Sows)											0.7%	0.0%
1 Starting in 2011, testing included	ĺ												2	0

<sup>2

1</sup> Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 18c. Resistance	Patterns among all I	Non-Typhoidal Salmonel	la Isolates, 2003-2014

Table 18c. Resistance Patte	:1115 c	imong ali Non-1 y	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	1855	1782	2036	2170	2145	2384	2192	2448	2335	2233	2178	2127
	Chickens	Retail Chickens HACCP Cecal	83 1158	157 1280	153 1989	152 1380	99 994	198 624	272 551	171 564	158 491	229 864	208 520 55	143 936 103
	Turkeys	Retail Ground Turkey HACCP Cecal	114 262	142 236	183 227	159 304	190 271	246 148	193 121	202 151	162 103	91 175	106 87 28	86 299 45
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	10 670	14 607	8 329	19 389	13 439	24 443	14 200	7 247	9 340	13 280	15 310 124 310	13 344 104 217
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	5	11	9	8	18	23	8	20	28	12	24 260 289	20 279 327
Resistance Pattern		Source												
7. At Least ACSSuTAuCx 1		Humans	3.2% 60	2.4% 42	2.0% 41	2.0% 43	2.1% 46	1.8% 44	1.4% 30	1.3% 33	1.5% 36	1.5% 34	1.4% 31	1.2% 26
Resistant		Retail Chickens	0.0%	1.9% 3	0.0%	2.6%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	1.4%
	Chickens	HACCP	1.0%	0.4%	0.9% 18	1.1% 15	1.4%	1.1%	1.3%	2.0%	0.4%	0.2%	0.2%	0.1%
	ర్	Cecal	12	5	18	15	14	,	,		2		0.0%	0.0%
		Retail Ground Turkey	0.9%	2.1%	0.5%	0.0%	1.1%	1.2%	0.5%	2.0%	2.5%	3.3%	1.9%	2.3%
	Turkeys	HACCP	0.8%	2.1% 5	1.8%	2.3%	4.1% 11	2.0%	3.3%	1.3%	1.0%	0.0%	0.0%	1.7%
	F	Cecal		J	7	,		3	7	2			0.0%	4.4%
		Retail Ground Beef	40.0% 4	14.3% 2	0.0%	0.0%	0.0%	8.3% 2	14.3%	28.6%	0.0%	15.4% 2	20.0%	30.8%
	e £	HACCP	15.1% 101	12.0% 73	17.3% 57	16.2% 63	13.9% 61	14.7% 65	9.5%	16.2% 40	11.2% 38	6.8% 19	12.6% 39	6.1% 21
	Cattle	Cecal (Beef)	101	7,0	0.		<u> </u>			10	00	10	9.7% 12	0.0%
		Cecal (Dairy)											6.5%	5.5% 12
		Retail Pork Chops	20.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	3.6% 1	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)											1.2% 3	1.8% 5
		Cecal (Sows)											1.7% 5	0.9%
8. At Least Ceftriaxone and		Humans	0.1% 1	0.1% 2	<0.1% 1	0.1% 3	0.2% 5	<0.1% 1	0.2% 4	0.1% 2	0.1% 2	0.3% 6	0.2% 5	0.2% 5
Nalidixic Acid Resistant	S	Retail Chickens	0.0%	0.0%	0.7% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7% 1
	Chickens	HACCP	0.0%	0.2% 2	0.1% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	O	Cecal											0.0%	0.0%
	s	Retail Ground Turkey	0.9% 1	0.0%	0.0%	0.0%	0.5% 1	0.0%	0.0%	0.5% 1	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.4%	0.8% 2	0.9% 2	0.3%	0.7% 2	0.0%	0.0%	0.7% 1	0.0%	0.0%	0.0%	0.3%
	_	Cecal											0.0%	0.0%
		Retail Ground Beef	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	14.3% 2	0.0% 0	0.0% 0	0.0%	0.0% 0	7.7% 1
	Cattle	HACCP	0.4% 3	1.0% 6	0.9% 3	0.3% 1	0.2% 1	0.7% 3	0.0%	1.2% 3	0.9% 3	1.8% 5	1.9% 6	1.2% 4
	ర	Cecal (Beef)											0.8% 1	0.0% 0
		Cecal (Dairy)											0.3% 1	0.0% 0
	_	Retail Pork Chops	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)											0.4%	0.0%
		Cecal (Sows)											0.3% 1	0.0%

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 19	. Non-Typhoidal Salmor	nella I	solate	s that are Resi	stant to ≥ 3 Antim	icrobi	ial Clas	sses, by							
Source	Humans Serotype	n	%	Source	Serotype	n	%	Source	Chick Serotype	r ens	%	Source	Serotype	n	%
Source	Зеготуре		70	Source	Serotype		70	Source	Serotype	n	70	Source	Serotype	"	70
Humans	Typhimurium	57	28.9	Retail	Typhimurium	20	69.0	HACCP	Kentucky	45	57.7	Cecal	Typhimurium	8	53.3
(N=197)	I 4,[5],12:i:-	55	27.9	Chickens	Heidelberg	5	17.2	(N=78)	Heidelberg	14	17.9	(N=15)	Kentucky	5	33.3
	Heidelberg	15	7.6	(N=29)	Kentucky	3	10.3		Typhimurium	13	16.7		Idikan	1	6.7
	Newport	11	5.6		Infantis	1	3.4		Infantis	2	2.6		Schwarzengrund	1	6.7
	Enteritidis	9	4.6						I 4,[5],12:i:-	1	1.3				
	Dublin	6	3.0						Braenderup	1	1.3				
	Infantis	5	2.5						Saintpaul	1	1.3				
	Agona	4	2.0						Thompson	1	1.3				
	Derby Reading	4	2.0						Turk	ove		l			
	Saintpaul	4	2.0	Source	Serotype	n	%	Source	Serotype	n n	%	Source	Serotype	n	%
	Javiana	3	1.5	000.00	остотуро		,,,	000.00	осторо		,,,	000.00	остотуро		,,,
	Hadar	2	1.0	Retail	Reading	9	29.0	HACCP	Reading	34	27.6	Cecal	Hadar	4	19.0
	Mbandaka	2	1.0	Ground Turkey	Hadar	5	16.1	(N=123)	Hadar	15	12.2	(N=21)	Heidelberg	3	14.3
	Panama	2	1.0	(N=31)	Muenchen	4	12.9		Heidelberg	14	11.4		Reading	3	14.3
	I 4,[5],12:r:-	1	0.5		Saintpaul	4	12.9		Saintpaul	14	11.4		Saintpaul	3	14.3
	Agbeni	1	0.5		Heidelberg	3	9.7		Senftenberg	10	8.1		Schwarzengrund	2	9.5
	Bareilly	1	0.5		Infantis	2	6.5		Agona	7	5.7		Senftenberg	2	9.5
	Give	1	0.5		I 4,12: nonmotile	1	3.2		Muenchen	7	5.7	1	Typhimurium	2	9.5
	Hartford	1	0.5		Montevideo	1	3.2		I 4,[5],12:i:-	5	4.1		Albany	1	4.8
	Hvittingfoss Kentucky	1	0.5 0.5		Typhimurium Worthington	1	3.2		Albany Schwarzengrund	4	3.3 2.4		Kentucky	1	4.8
	Monschaui	1	0.5		worthington	'	3.2		Anatum	2	1.6				
	Montevideo	1	0.5						Kentucky	2	1.6				
	Muenchen	1	0.5						Typhimurium	2	1.6				
	Oranienburg	1	0.5						Albert	1	0.8				
	Oslo	1	0.5						Litchfield	1	0.8				
	Paratyphi B var. L(+) tartrate+	1	0.5						Montevideo	1	0.8				
	Stanley	1	0.5						Tennessee	1	0.8				
								<u> </u>							
					•		0/	1.	Cat		0/	I.			0/
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail	Dublin	3	60.0	HACCP	Dublin	25	43.9	Cecal	Agona	1	16.7
				Ground Beef	Newport	2	40.0	(N=57)	Newport	9	15.8	(Beef)	Altona	1	16.7
				(N=5)	Homport	-	10.0		Derby	4	7.0	(N=6)	Derby	1	16.7
									Reading	4	7.0		Liverpool	1	16.7
									I 4,[5],12:i:-	3	5.3		Montevideo	1	16.7
									Agona	2	3.5		Typhimurium	1	16.7
									Meleagridis	2	3.5				
									Montevideo	2	3.5				
									Muenster	2	3.5	Cecal	Typhimurium	9	40.9
									Typhimurium	2	3.5	(Dairy) (N=22)	Newport	8	36.4
									Heidelberg	1	1.8	` '	Meleagridis	2	9.1
									Ohio	1	1.8		Agona	1	4.5 4.5
													Montevideo Uganda	1	4.5
													Ogarida	•	4.0
									Swi	ne					
				Source	Serotype			n	%	Source	Serotyp	e		n	%
				Retail Pork Chops	I 4,[5],12:i:-			2	50.0	Cecal (Market Swine)	Derby			23	41.1
				(N=4)	Derby			1	25.0	(N=56)	1 4,[5],1			8	14.3
				1	Typhimurium			1	25.0	1	Typhim	urium		8	14.3
										1	Agona	bura		2	10.7 3.6
										1	Infantis	ibaig		2	3.6
										1	Albany			1	1.8
										1	Johann	esburg		1	1.8
										1	Krefeld	ū		1	1.8
										1	Newpor	t		1	1.8
										1	Saintpa			1	1.8
										1	Senften			1	1.8
											Soeren	ja		1	1.8
										Cecal	Agona			5	23.8
										(Sows)	Derby			5	23.8
										(N=21)	I 4,[5],1	2:i:-		5	23.8
										1	Typhim			4	19.0
ł										1	Johann			1	4.8
										1	Muenste	er		1	4.8
										I					

			00.0.0	that are recon	Stant to 2 4 Antin	IICrobi	ai Cias	ses, by	Serotype, 2014						
	Humans								Chick						
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
l															
Humans (N=152)	I 4,[5]12:i:-	52	34.2	Retail Chickens	Typhimurium	19	67.9	HACCP (N=60)	Kentucky	39	65.0	Cecal (N=10)	Kentucky	5	50.0
()	Typhimurium	49	32.2	(N=28)	Heidelberg	5	17.9	(55)	Typhimurium	10	16.7	()	Typhimurium	4	40.0
	Newport	10	6.6		Kentucky	3	10.7		Heidelberg	8	13.3		Schwarzengrund	1	10.0
	Heidelberg Dublin	9	5.9		Infantis	1	3.6		Thompson	1	1.7 1.7				
	Enteritidis	6	3.9						I 4,[5],12:i:-	1	1.7				
	Infantis	6 4	3.9 2.6						Infantis	1	1.7				
		2						<u> </u>	Tuek	21/0					
	Agona Mbandaka	2	1.3	Source	Serotype	n	%	Source	Turke Serotype	eys n	%	Source	Serotype	n	%
	Derby	1	0.7	Source	Зеготуре	- "	/0	Source	Serotype		/0	Source	Зеготуре	- "	/0
	Give	1	0.7	Retail	Infantis	2	22.2	HACCP	Senftenberg	9	18.0	Cecal	Heidelberg	3	42.9
	Hadar	1	0.7	Ground Turkey	Reading	2	22.2	(N=50)	Heidelberg	8	16.0	(N=7)	Kentucky	1	14.3
	Hvittingfoss	1	0.7	(N=9)	I 4,12: nonmotile	1	11.1		Reading	6	12.0		Reading	1	14.3
	Kentucky	1	0.7		Hadar	1	11.1		Saintpaul	6	12.0		Senftenberg	1	14.3
	Oranienburg	1	0.7		Heidelberg	1	11.1		I 4,[5],12:i:-	4	8.0		Typhimurium	1	14.3
	Oslo	1	0.7		Montevideo	1	11.1		Agona	3	6.0		1,751	•	
	Panama	1	0.7		Saintpaul	1	11.1		Schwarzengrund	3	6.0				
	Paratyphi B var. L(+) tartrate+	1	0.7		Campaa				Albany	2	4.0				
	Reading	1	0.7						Anatum	2	4.0				
	Saintpaul	1	0.7						Typhimurium	2	4.0				
	Stanley	1	0.7						Albert	1	2.0				
									Hadar	1	2.0				
									Kentucky	1	2.0				
									Muenchen	1	2.0				
									Tennessee	1	2.0				
									Catt						
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail	Dublin	2	60.0	НАССР	Dublin	24	52.2	Cecal	Agona	1	33.3
				Retail Ground Beef	Dublin	3	60.0	HACCP (N=46)	Dublin	24	52.2	Cecal (Beef)	Agona Montevideo	1	33.3
					Dublin Newport	3 2	60.0 40.0	HACCP (N=46)	Newport	9	19.6		Montevideo	1	33.3
				Ground Beef					Newport Reading	9 4	19.6 8.7	(Beef)	-		
				Ground Beef					Newport Reading I 4,[5],12:i:-	9 4 2	19.6 8.7 4.3	(Beef)	Montevideo	1	33.3
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium	9 4 2 2	19.6 8.7 4.3 4.3	(Beef) (N=3)	Montevideo Typhimurium	1	33.3 33.3
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium Agona	9 4 2 2 1	19.6 8.7 4.3 4.3 2.2	(Beef)	Montevideo Typhimurium Typhimurium	1 1 9	33.3 33.3 45.0
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium Agona Heidelberg	9 4 2 2 1 1	19.6 8.7 4.3 4.3 2.2 2.2	(Beef) (N=3)	Montevideo Typhimurium Typhimurium Newport	1 1 9 8	33.3 33.3 45.0 40.0
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium Agona Heidelberg Montevideo	9 4 2 2 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy)	Montevideo Typhimurium Typhimurium Newport Meleagridis	1 1 9	33.3 33.3 45.0 40.0 5.0
				Ground Beef					Newport Reading 14,[5],12:i:- Typhimurium Agona Heidelberg Montevideo Muenster	9 4 2 2 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 9 8 1	33.3 33.3 45.0 40.0 5.0 5.0
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium Agona Heidelberg Montevideo Muenster Ohio	9 4 2 2 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy)	Montevideo Typhimurium Typhimurium Newport Meleagridis	1 1 9 8 1 1	33.3 33.3 45.0 40.0 5.0
				Ground Beef (N=5)	Newport			(N=46)	Newport Reading 1 4,[5],12:i- Typhimurium Agona Heidelberg Montevideo Muenster Ohio	9 4 2 2 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1	45.0 40.0 5.0 5.0
				Ground Beef					Newport Reading I 4,[5],12:i:- Typhimurium Agona Heidelberg Montevideo Muenster Ohio	9 4 2 2 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 9 8 1 1	33.3 33.3 45.0 40.0 5.0 5.0
				Ground Beef (N=5) Source Retail	Newport			(N=46)	Newport Reading 1 4,[5],12:i- Typhimurium Agona Heidelberg Montevideo Muenster Ohio	9 4 2 2 1 1 1 1 1 1 Source	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1	45.0 40.0 5.0 5.0
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 1 4,[5],12:i-			(N=46)	Newport Reading 1 4,[5],12:i- Typhimurium Agona Heidelberg Montevideo Muenster Ohio	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 2.2	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0
				Ground Beef (N=5) Source Retail	Newport			n 2	Newport Reading I 4,[5],12:i- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii	9 4 2 2 1 1 1 1 1 1 Source	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 5.0
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1 4,[5],12 Typhimu Agona	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1 1 8 6 3	33.3 33.3 45.0 40.0 5.0 5.0 5.0 5.0 12.5
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 1 9 8 1 1 1 1 8 6 3 3	33.3 33.3 45.0 40.0 5.0 5.0 5.0 5.0 12.5 12.5
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1 4,[5],12 Typhimu Agona Derby Albany	(Baef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 1 9 8 1 1 1 1 8 6 3 3 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 40.0 5.0 5.0 5.0 5.0 40.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby Albany Krefeld	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 1 9 8 1 1 1 1 1 8 6 3 3 3 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 33.3 25.0 12.5 4.2 4.2
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby Albany Krefeld Newport	(Beef) (N=3) Cecal (Dairy) (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	1 1 1 9 8 1 1 1 1 8 6 3 3 3 1 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 5.0 12.5 4.2 4.2
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 2 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 2.2 1 4,[5],1: T Agona Agona Derby Albany Krefeld Newport Senftent	(N=3) Cecal (Dairy) (N=20) Lecurium	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1 1 1 8 6 6 3 3 3 1 1 1 1 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 5.0 12.5 4.2 4.2
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 2 1 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby Krefeld Newport Senftent	(Beef) (N=3) Cecal (Dairy) (N=20) Electric (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1 1 1 m 8 6 6 3 3 3 1 1 1 1 1 5 5	33.3 33.3 45.0 40.0 5.0 5.0 5.0 25.0 12.5 12.5 4.2 4.2 4.2
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 2 1 1 1 1 1	19.6 8.7 4.3 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby Albany Krefeld Newport Senftent	(Beef) (N=3) Cecal (Dairy) (N=20) Electric (N=20)	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1 1 1 8 6 6 3 3 3 1 1 1 1 1 1	33.3 33.3 45.0 40.0 5.0 5.0 5.0 7% 33.3 25.0 12.5 4.2 4.2 4.2 4.2
				Ground Beef (N=5) Source Retail Pork Chops	Newport Serotype 14,[5],12:i:- Derby			n 2 1	Newport Reading 1 4,[5],12::- Typhimurium Agona Heidelberg Montevideo Muenster Ohio Swii % 50.0 25.0	9 4 2 2 1 1 1 1 1 1 1	19.6 8.7 4.3 4.3 2.2 2.2 2.2 2.2 2.2 1.4,[5],12 Typhimu Agona Derby Krefeld Newport Senftent	(N=3) Cecal (Dairy) (N=20) (N=20) Exercise the control of the c	Montevideo Typhimurium Typhimurium Newport Meleagridis Montevideo	9 8 1 1 1 1 1 8 6 6 3 3 3 1 1 1 1 1 5 3 3	33.3 33.3 45.0 40.0 5.0 5.0 5.0 25.0 12.5 12.5 4.2 4.2 4.2

Table 21. Non-Typhoidal Salmonella Isolates that are Resistant to ≥ 5 Antimicrobial Classes, by Serotype, 2014

	Humans								Chick	ens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans	Typhimurium	41	50.0	Retail	Typhimurium	18	72.0	HACCP	Kentucky	31	62.0	Cecal	Typhimurium	4	50.0
(N=82)	I 4,[5],12:i:-	8	9.8	Chickens	Heidelberg	4	16.0	(N=50)	Typhimurium	10	20.0	(N=8)	Kentucky	3	37.5
	Heidelberg	8	9.8	(N=25)	Kentucky	2	8.0		Heidelberg	8	16.0		Schwarzengrund	1	12.5
	Newport	7	8.5		Infantis	1	4.0		Thompson	1	2.0		-		
	Dublin	6	7.3												
	Enteritidis	4	4.9						Turke	eys		•			
	Infantis	3	3.7	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Agona	1	1.2												
	Kentucky	1	1.2	Retail	Infantis	2	40.0	HACCP	Senftenberg	7	29.2	Cecal	Heidelberg	3	60.0
	Oslo	1	1.2	Ground Turkey	I 4,5: nonmotile	1	20.0	(N=24)	Heidelberg	6	25.0	(N=5)	Senftenberg	1	20.0
	Paratyphi B var. L(+) tartrate+	1	1.2	(N=5)	Hadar	1	20.0		Agona	2	8.3		Typhimurium	1	20.0
	Saintpaul	1	1.2		Saintpaul	1	20.0		Schwarzengrund	2	8.3				
									Typhimurium	2	8.3				
									Albany	1	4.2				
									Albert	1	4.2				
									Kentucky	1	4.2				
									Reading	1	4.2				
									Tennessee	1	4.2				
									Cat	tle					
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail Ground Beef	Dublin	3	60.0	HACCP (N=29)	Dublin	12	41.4	Cecal (Beef)	Agona	1	100.0
				(N=5)	Newport	2	40.0	(14=25)	Newport	9	31.0	(N=1)			
				` ',					Reading	4	13.8	` '			
									Agona	1	3.4				
									Muenster	1	3.4	0			
									Ohio	1	3.4	Cecal (Dairy)	Newport	8	50.0
									Typhimurium	1	3.4	(N=16)	Typhimurium	6	37.5
													Meleagridis	1	6.3
													Montevideo	1	6.3
									Swi	ne					
				Source	Serotype			n	%	Source	Serotyp	e		n	%
				Retail	Derby			1	100.0	Cecal	Typhimu	ırium		6	40.0
				Pork Chops						(Market Swine)	Agona			3	20.0
				(N=4)						(N=15)	Derby			2	13.3
											I 4,[5],12	2:i:-		1	6.7
				1							Krefeld			1	6.7
															6.7
											Newport			1	0.7
											Newport Senftent			1 1	6.7
										Const	Senftent	perg		1	6.7
										Cecal (Sows)	Senftent	perg		3	6.7 75.0
										Cecal (Sows) (N=4)	Senftent	perg		1	6.7

Table 22. Non-Typhoidal Salmonella Isolates that are at least ACSSuT¹ Resistant, by Serotype, 2014

	Humans								Chick	ens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans	Typhimurium	38	56.7	Retail	Heidelberg	3	100.0	HACCP	Heidelberg	3	60.0	Cecal			
(N=67)	Heidelberg	7	10.4	Chickens				(N=5)	Typhimurium	2	40.0	(N=0)			
	Newport	7	10.4	(N=3)											
	Dublin	6	9.0												
	I 4,[5],12:i:-	4	6.0						Turke	eys					
	Enteritidis	2	3.0	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Agona	1	1.5												
	Infantis	1	1.5	Retail	Infantis	2	100.0	HACCP	Senftenberg	2	33.3	Cecal	Heidelberg	1	50.0
	Paratyphi B var. L(+) tartrate+	1	1.5	Ground Turkey				(N=6)	Albany	1	16.7	(N=2)	Senftenberg	1	50.0
				(N=2)					Albert	1	16.7				
									Heidelberg	1	16.7				
									Schwarzengrund	1	16.7				
									-						
									Cat	tle					
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail	Dublin	2	50.0	HACCP	Dublin	9	37.5	Cecal			
				Ground Beef (N=4)	Newport	2	50.0	(N=24)	Newport	8	33.3	(Beef)			
				(14=4)					Reading	4	16.7	(N=0)			
									Agona	1	4.2				
									Ohio	1	4.2				
									Typhimurium	1	4.2				
												Cecal	Newport	8	50.0
												(Dairy)	Typhimurium	6	37.5
												(N=16)	Meleagridis	1	6.3
													Montevideo	1	6.3
									Swi	ne					
				Source	Serotype			n	%	Source	Serotyp	e		n	%
				Retail	Derby			1	100.0	Cecal	Typhim	urium		6	50.0
				Pork Chops (N=1)						(Market Swine) (N=12)	Agona			3	25.0
				(N=1)						(14=12)	Derby			1	8.3
											Krefeld			1	8.3
											Newpor	t		1	8.3
										Cecal	Typhim			3	75.0
										(Sows)	Muenste	er		1	25.0
										(N=4)					
				<u> </u>											
1 ACCCUIT	= ampicillin, chloramphenicol,	etronte	amuoin	culfamethovazole	culficovazole, and to	tracyclin	10	_					•		

Table 23. Non-Typhoidal Salmonella Isolates that are at least ACT/S¹ Resistant, by Serotype, 2014

	Humans								Chic	kens					
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
Humans (N=12)	Typhimurium Infantis I 4,[5],12:i:- Agona	4 2 1	33.3 16.7 8.3 8.3	Retail Chickens (N=0)				HACCP (N=1)	Heidelberg	1	100.0	Cecal (N=0)			
	Give	1	8.3						Turl	keys					
	Heidelberg	1	8.3	Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Panama	1	8.3		,	-					,,,		,		
	Stanley	1	8.3	Retail Ground Turkey (N=0)				HACCP (N=1)	Heidelberg	1	100.0	Cecal (N=1)	Heidelberg	1	100.0
									Ca	attle					
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail Ground Beef (N=0)				HACCP (N=4)	Dublin Newport	3 1	75.0 25.0	Cecal (Beef) (N=0) Cecal (Dairy) (N=1)	Montevideo	1	100.0
									Sw	vine					
				Source	Serotype			n	%	Source	Serotyp	е		n	%
				Retail Pork Chops (N=1)	Derby			1	100.0	Cecal (Market Swine) (N=4)	Agona Derby Typhimu	ırium		2 1 1	50.0 25.0 25.0
1.07/5	ampicillin, chloramphenicol, a									Cecal (Sows) (N=0)					

Table 24. Non-Typhoidal Salmonella Isolates that are at least ACSSuTAuCx¹ Resistant, by Serotype, 2014

Source Humans (N=26)	Serotype Typhimurium	n	%	Source											
					Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
	Newport Dublin	11 7 6	42.3 26.9 23.1	Retail Chickens (N=2)	Heidelberg	2	100.0	HACCP (N=1)	Typhimurium	1	100.0	Cecal (N=0)			
	Agona Enteritidis	1	3.8					<u> </u>	Turke	ove		<u> </u>			
	Litteritius	'	3.0	Source	Serotype	n	%	Source	Serotype	n n	%	Source	Serotype	n	%
				oou.oo	остотуро			000.00	остотуро			Course	остолуро		
				Retail Ground Turkey	Infantis	2	50.0	HACCP (N=5)	Albany Albert	1	20.0 20.0	Cecal (N=2)	Heidelberg Senftenberg	1 1	50.0 50.0
				(N=2)					Heidelberg	1	20.0				
									Schwarzengrund	1	20.0				
									Senftenberg	1	20.0				
								<u> </u>	Catt	·lo		<u> </u>			
				Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype	n	%
				Retail	Dublin	2	50.0	HACCP	Dublin	8	38.1	Cecal			
				Ground Beef (N=4)	Newport	2	50.0	(N=21)	Newport	8	38.1	(Beef) (N=0)			
				, ,					Reading Agona	4	19.0 4.8	, ,			
									Agona	'	4.0				
												Cecal	Newport	8	66.7
												(Dairy)	Typhimurium	3	25.0
												(N=12)	Montevideo	1	8.3
				0	0				Swi		Caratim				%
				Source	Serotype			n	76	Source	Serotyp	le .		n	70
				Retail						Cecal	Agona			3	60.0
				Pork Chops						(Market Swine)	Newport	t		1	20.0
				(N=0)						(N=5)	Typhim	urium		1	20.0
										Cecal	Typhimu	ırium		2	66.7
										(Sows) (N=3)	Muenste			1	33.3

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 25. Non-Typhoidal Salmonella Isolates that are at least Ceftriaxone and Nalidixic Acid Resistant, by Serotype, 2014

	Humans								Ch	nickens						
Source	Serotype	n	%	Source	Serotype	n	%	Source	Serotype		n	%	Source	Serotype	n	%
Humans (N=5)	Infantis Enteritidis Heidelberg Typhimurium	2 1 1	40.0 20.0 20.0 20.0	Retail Chickens (N=1)	Infantis	1	100.0	HACCP (N=0)					Cecal (N=0)			
									Τι	urkeys						
				Source	Serotype	n	%	Source	Serotype		n	%	Source	Serotype	n	%
				Retail Ground Turkey (N=0)				HACCP (N=1)	Albert		1	100.0	Cecal (N=0)			
									(Cattle						
				Source	Serotype	n	%	Source	Serotype		n	%	Source	Serotype	n	%
				Retail Ground Beef (N=1)	Dublin	1	100.0	HACCP (N=4)	Dublin Reading		2 2	50.0 50.0	Cecal (Beef) (N=0) Cecal (Dairy) (N=0)			
										Swine						
				Retail Pork Chops (N=0)	Serotype			n	%	Cec: (Mai (N=0	al rket Swine) D) al ws)	Serotyp	e		n	%

Table 26. Distribution of MICs and Occurrence of Resistance to Selected Beta-Lactam Agents among Non-Typhoidal Salmonella Isolates Resistant to Ceftiofur or Ceftriaxone, 2014

Antimicrobial Class	Antimicrobial Agent	Resistance to Selected βeta Isolate Source (# of Isolates)	%l ¹ (or S-DD ²)	%R ³	[95% CI] ⁴	0.03							(%) of M 4			32	64	128	256	512	1024
β-Lactam/β-Lactamase Inhibitor Combinations	Piperacillin-tazobactam	Humans (51)	5.9	2.0	[0.0 - 10.4]							5.9	35.3	37.3	13.7	2.0	3.9		2.0		
		Retail Chickens (24)	0.0	4.2	[0.1 - 21.1]							29.2	58.3	4.2	4.2				4.2		
		Retail Ground Turkey (7)	14.3	0.0	[0.0 - 41.0]							14.3	57.1	14.3		14.3					
		Retail Ground Beef (5)	0.0	20.0	[0.5 - 71.6]								40.0	40.0					20.0		
Cephems	Cefepime	Humans (51)	3.9	3.9	[0.5 - 13.5]			3.9	41.2	29.4	11.8	5.9	2.0	2.0	2.0	2.0					
		Retail Chickens (24)	4.2	0.0	[0.0 - 14.2]			37.5	25.0	29.2	4.2		4.2								
		양 본 Retail Ground Turkey (7)	0.0	0.0	[0.0 - 41.0]		14.3	28.6	14.3	42.9											
		Retail Ground Beef (5)	20.0	0.0	[0.0 - 52.2]				20.0	20.0	40.0		20.0								
	Cefotaxime	Humans (51)	0.0	100.0	[93.0 - 100.0]								5.9	11.8	52.9	17.6	5.9	5.9			
		Retail Chickens (24)	0.0	100.0	[85.8 - 100.0]								37.5	33.3	12.5	12.5	4.2				
		Retail Ground Turkey (7)	0.0	85.7	[42.1 - 99.6]		14.3						14.3	14.3	42.9	14.3					
		Retail Ground Beef (5)	0.0	100.0	[47.8 - 100.0]										60.0	20.0	20.0				
	Ceftazidime	Humans (51)	3.9	90.2	[78.6 - 96.7]							2.0	3.9	3.9	54.9	23.5	11.8				
		Retail Chickens (24)	54.2	41.7	[22.1 - 63.4]								4.2	54.2	29.2	8.3	4.2				
		양 Retail Ground Turkey (7)	14.3	71.4	[29.0 - 96.3]				14.3					14.3	42.9	28.6					
		© Retail Ground Beef (5)	0.0	100.0	[47.8 - 100.0]										40.0	60.0					
Monobactam	Aztreonam	Humans (51)	47.1	27.5	[15.9 - 41.7]						2.0	2.0	21.6	47.1	17.6	2.0	7.8				
		은 보호 Retail Chickens (24)	8.3	12.5	[2.7 - 32.4]						4.2	37.5	37.5	8.3	4.2	8.3					
		용한 Retail Ground Turkey (7)	28.6	14.3	[0.4 - 57.9]		14.3					28.6	14.3	28.6	14.3						
		型 で Retail Ground Beef (5)	20.0	40.0	[5.3 - 85.3]								40.0	20.0	20.0	20.0					
Penems	Imipenem	Humans (51)	0.0	0.0	[0.0 - 7.0]			2.0	68.6	29.4											
		Retail Chickens (24)	0.0	0.0	[0.0 - 14.2]				75.0	25.0											
		Retail Ground Turkey (7)	0.0	0.0	[0.0 - 41.0]				100.0												
		e Retail Ground Beef (5)	0.0	0.0	[0.0 - 52.2]				80.0	20.0											

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates that are susceptible-dose dependent (S-DD). Cefepime MIC's above the susceptible range but below the resistant range are designated by CLSI to be S-DD.

³ Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding.

⁴ 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁵ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 27a. Antimicrobial Resistance among Salmonella Enteritidis Isolates, 2003-2014

Year		Ī		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ited	_	Humans	257	271	384	412	385	442	410	513	391	364	382	438
		Chickens	Retail Chickens	3	3	12	17	13	30	27	28	21	26	25	27
		Chic	HACCP Cecal	42	84	173	188	124	116	118	152	134	203	79 6	130 17
			Retail Ground Turkey	1	0	0	0	0	2	0	0	1	4	2	0
		Turkeys	HACCP	0	0	0	3	0	1	0	1	0	1	1	5
		-	Cecal											1	0
		<u>e</u>	Retail Ground Beef	1	0	0	0	0	1	0	1	0	0	0	0
		Cattle	HACCP Cecal (Beef)	3	2	2	2	4	5	0	1	0	1	0	0
			Cecal (Dairy)											0	1
		ЭС	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	0	0
		Swine	Cecal (Market Swine)											0	1
	Antimicrobial		Cecal (Sows)											1	0
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Aminoglycosides	Gentamicin		Humans	0.4%	0.4%	0.8%	0.2%	0.0%	0.2%	0.0%	0.2%	0.5%	0.0%	0.0%	0.0%
	(MIC ≥ 16 μg/ml)	_	1	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		sue	Retail Chickens	0.0%	0 1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0 1.3%	0.0%
		Chickens	HACCP	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	1	0.0%	0.0%	1	0
		0	Cecal											0.0%	0.0%
			Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	
		Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
		Ţ					0		0		0		0	0.0%	0
			Cecal	0.001					0.001		0.001			0.076	
			Retail Ground Beef	0.0% 0					0.0% 0		0.0%				
		<u>e</u>	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	J					Ü				Ü	Ü	
															0.0%
			Cecal (Dairy)												0
		o o	Retail Pork Chops												
		Swine	Cecal (Market Swine)												0.0%
		0,	Cecal (Sows)											0.0% 0	
	Streptomycin		Humans	1.2%	2.2%	1.0%	1.2%	0.5%	0.7%	1.2%	0.6%	1.8%	1.9%	2.6%	3.0%
	(MIC ≥ 64 μg/ml)		1	0.0%	6 0.0%	0.0%	5 0.0%	0.0%	3.3%	5 0.0%	0.0%	7 14.3%	7 0.0%	10 0.0%	13 0.0%
		sus	Retail Chickens	0.0%	0 1.2%	0.6%	0.0%	0.8%	0.0%	0.0%	0 1.3%	3 0.0%	0 1.5%	0 2.5%	0
		Chickens	HACCP	0.0%	1.2%	1	0.0%	1	0.0%	0.0%	1.3%	0.0%	3	2	0.0% 0
		0	Cecal											0.0% 0	0.0%
			Retail Ground Turkey	0.0%					0.0%			0.0%	25.0%	0.0%	
		Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
		Ţ					0		0		0		0	0.0%	0
			Cecal	0.00/					0.00/		0.00/	0.00/		0	
			Retail Ground Beef	0.0% 0					0.0% 0		0.0% 0	0.0% 0			
		<u>e</u>	HACCP	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0% 0		100.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)			Ů							-	-	
			Cecal (Dairy)												0.0%
															0
		Ф	Retail Pork Chops												0.007
		Swine	Cecal (Market Swine)												0.0% 0
			Cecal (Sows)											0.0% 0	
β-Lactam/β-Lactamase		1	Humans	0.0%	0.0%	0.8%	0.5%	0.5%	0.0%	0.0%	0.4%	0.3%	0.5%	0.0%	0.5%
Inhibitor Combinations	Clavulanic Acid (MIC ≥ 32 / 16 µg/ml)	-	Retail Chickens	33.3%	33.3%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%
	,	ens		0.0%	1.2%	0.6%	0.0%	0.0%	0.9%	0.8%	0.0%	0.7%	0.5%	0.0%	0.0%
		Chickens	HACCP	0.0%	1.2%	1	0.0%	0.0%	1	1	0.0%	1	1	0	0
			Cecal											0.0%	0.0%
			Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	
		Turkeys	HACCP	0			0.0%		0.0%		0.0%	U	0.0%	0.0%	0.0%
		Ţ					0		0		0		0	0.0%	0
		-	Cecal	0.004					0.007		0.004			0	
			Retail Ground Beef	0.0% 0					0.0% 0		0.0% 0				
		ie.	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)		Ľ	Ľ	Ľ	Ľ	Ĭ		Ĭ		Ť	Ť	
															0.0%
			Cecal (Dairy)												0
		m	Retail Pork Chops												
		Swine	Cecal (Market Swine)												0.0%
		3,	Cecal (Sows)											0.0%	

Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	ø	Humans	257	271	384	412	385	442	410	513	391	364	382	438
		Chickens	Retail Chickens HACCP Cecal	3 42	3 84	12 173	17 188	13 124	30 116	27 118	28 152	21 134	26 203	25 79 6	27 130 17
		sys	Retail Ground Turkey	1	0	0	0	0	2	0	0	1	4	2	0
		Turke	HACCP Cecal	0	0	0	3	0	1	0	1	0	1	1	5 0
			Retail Ground Beef	1	0	0	0	0	1	0	1	0	0	0	0
		Cattle	HACCP Cecal (Beef)	3	2	2	2	4	5	0	1	0	1	1 0	0
			Cecal (Dairy)											0	1
		vine	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	0	0
	LAndrelandela	Swi	Cecal (Market Swine) Cecal (Sows)											1	0
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Cephems	Breakpoint) Cefoxitin		Source Humans	0.0%	0.0%	1.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.3%	0.5%	0.0%	0.7%
	(MIC ≥ 32 μg/ml)		Retail Chickens	33.3%	33.3%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0%	1.2%	0.6%	0.0%	0.0%	0.9%	0.0%	0.0%	0.7%	0.5%	0.0%	0.0%
		Ŗ	Cecal	0	1	1	0	0	1	0	0	1	1	0.0%	0.0%
			Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	0
		Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
		Ţ	Cecal				0		0		0		0	0.0%	0
			Retail Ground Beef	0.0%					0.0%		0.0%			0	
			HACCP	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	0	0	0	1	0	0		0		0	0	
			Cecal (Dairy)												0.0%
			Retail Pork Chops												0
		ine													0.0%
		Swine	Cecal (Saure)											0.0%	0
	Ceftiofur		Cecal (Sows)	0.0%	0.0%	0.3%	0.5%	0.3%	0.2%	0.0%	0.0%	0.3%	0.5%	0.3%	0.5%
	(MIC ≥ 8 μg/mI)		Humans	0 33.3%	0 33.3%	0.0%	0.0%	0.0%	0.0%	0 3.7%	0.0%	0.0%	0.0%	0.0%	0.0%
		sens	Retail Chickens	0.0%	1.2%	0 1.2%	0.0%	0.0%	0.9%	0.8%	1.3%	0.7%	0.5%	0.0%	0.0%
		Chickens	HACCP	0	1	2	0	0	1	1	2	1	1	0.0%	0.0%
			Cecal	0.0%					0.0%			0.0%	0.0%	0.0%	0
		eys	Retail Ground Turkey	0			0.0%		0.0%		0.0%	0.070	0.0%	0.0%	0.0%
		Turkeys	HACCP				0		0		0		0	0.0%	0
			Cecal	0.0%					0.0%		0.0%			0	
			Retail Ground Beef	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	HACCP	0	0	0.070	1	0.070	0.070		0.070		0	0	
			Cecal (Beef)												0.0%
			Cecal (Dairy)												0.070
		ЭС	Retail Pork Chops												0.0%
		Swine	Cecal (Market Swine)											0.0%	0
	Ceftriaxone		Cecal (Sows)	0.0%	0.0%	0.3%	0.5%	0.3%	0.2%	0.0%	0.0%	0.3%	0.5%	0.3%	0.5%
	(MIC ≥ 4 μg/ml)		Humans	0 33.3%	0 33.3%	1 0.0%	2 0.0%	1 0.0%	1 0.0%	0 3.7%	0 3.6%	1 0.0%	2	1	2
		sus	Retail Chickens	1	1	0	0	0	0	1	1	0	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0% 0	1.2% 1	0.6% 1	0.0% 0	0.0% 0	0.9% 1	0.8% 1	0.6% 1	0.7% 1	0.5% 1	0.0% 0	0.0% 0
			Cecal											0.0% 0	0.0% 0
		ø	Retail Ground Turkey	0.0%					0.0%			0.0% 0	0.0%	0.0% 0	
		Turkeys	HACCP				0.0% 0		0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0%
		-	Cecal											0.0%	
			Retail Ground Beef	0.0%					0.0%		0.0%				
		<u>@</u>	HACCP	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	J										U	
			Cecal (Dairy)												0.0%
			Retail Pork Chops												0
		Swine	Cecal (Market Swine)												0.0%
		Sw												0.0%	0
			Cecal (Sows)											0	

Table 27c. Antimicrobial Resistance among Salmonella Enteritidis Isolates, 2003-2014

Table 27c. Antimicro		J.19		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	257	271	384	412	385	442	410	513	391	364	382	438
		Chickens	Retail Chickens HACCP	3 42	3 84	12 173	17 188	13 124	30 116	27 118	28 152	21 134	26 203	25 79 6	27 130 17
		_	Cecal	1	0	0	0	0	2	0	0	1	4	2	0
		Turkeys	Retail Ground Turkey HACCP	0	0	0	3	0	1	0	1	0	1	1	5
		<u> </u>	Cecal											1	0
		Cattle	Retail Ground Beef HACCP	1 3	0 2	0 2	0 2	0 4	1 5	0	1	0	0	0	0
		S	Cecal (Beef)											0	0
			Cecal (Dairy)	0	0	0	0	0	0	0	0	0	0	0	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	U	U	U	U	U	U	U	0	U	0	1
	Antimicrobial	0)	Cecal (Sows)											1	0
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Folate Pathway Inhibito	Sulfamethoxazole/		Humans	1.2%	1.8%	1.6%	1.5%	1.6%	1.4%	1.7%	1.9%	2.0%	2.7%	1.6%	1.8%
	Sulfisoxazole ¹ (MIC ≥ 512 µg/ml)	-	Retail Chickens	0.0%	5 33.3%	0.0%	0.0%	0.0%	3.3%	7 3.7%	10 0.0%	9.5%	0.0%	6 0.0%	0.0%
		sens		0 2.4%	1.2%	0.0%	0.0%	0.8%	1 0.9%	1 0.0%	0 2.0%	0.0%	0.0%	0 2.5%	0.0%
		Chickens	HACCP	1	1	0.070	0.076	1	1	0.070	3	0.076	0.076	2	0
			Cecal											0.0% 0	0.0% 0
		ç,	Retail Ground Turkey	0.0% 0					50.0% 1			0.0% 0	0.0% 0	0.0% 0	
		Turkeys	HACCP				0.0% 0		0.0% 0		0.0% 0		0.0% 0	0.0%	0.0%
		F	Cecal											0.0%	
			Retail Ground Beef	0.0%					0.0%		0.0%			U	
			HACCP	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle		0	0	0	1	0	0		0		0	0	
			Cecal (Beef)												0.0%
			Cecal (Dairy)												0.0%
			Retail Ground Turkey												
		Swine	Cecal (Market Swine)												0.0% 0
			Cecal (Sows)											0.0% 0	
	Trimethoprim-		Humans	0.8%	0.0%	0.5%	0.5%	1.0%	0.9%	0.7%	1.0%	0.5%	1.1%	0.5%	0.5%
	Sulfamethoxazole (MIC ≥ 4 / 76 µg/ml)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	5 0.0%	0.0%	0.0%	0.0%	0.0%
		kens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens		0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
			Cecal	0.00/					0.00/			0.00/	0.00/	0.0%	0
		Ns.	Retail Ground Turkey	0.0% 0					0.0% 0			0.0% 0	0.0% 0	0	
		Turkeys	HACCP				0.0% 0		0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0%
			Cecal											0.0% 0	
			Retail Ground Beef	0.0% 0					0.0% 0		0.0% 0				
		Ф	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	0	0	0	0	0	0		0		0	0	
															0.0%
		-	Cecal (Dairy)												0
		ЭС	Retail Pork Chops												0.0%
		Swine	Cecal (Market Swine)											0.0%	0
Magyalist	Azithromyoin		Cecal (Sows)									0.007	0.00/	0	0.00/
Macrolides	Azithromycin (MIC ≥32 μg/mI)	_	Humans									0.0%	0.0%	0.0%	0.0%
		sue	Retail Chickens									0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP									0.0%	0.0%	0.0% 0 0.0%	0.0% 0 0.0%
			Cecal									0.0%	0.0%	0.0%	0.0%
		şλs	Retail Ground Turkey									0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP										0.0%	0.0%	0.0%
		<u> </u>	Cecal											0.0%	
			Retail Ground Beef										0.0%	0.0%	
		Cattle	HACCP										0.0%	0.0%	
		Ö	Cecal (Beef)												0.00/
		<u> </u>	Cecal (Dairy)												0.0%
		Ф	Retail Pork Chops												0.007
		Swine	Cecal (Market Swine)											0.007	0.0%
			Cecal (Sows)											0.0% 0	

Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Table 27d. Antimicr	obial Resistance ar	nong (Salmonella Enteriti	dis Isolat	tes, 2003-	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted		Humans	257	271	384	412	385	442	410	513	391	364	382	438
		Chickens	Retail Chickens HACCP	3 42	3 84	12 173	17 188	13 124	30 116	27 118	28 152	21 134	26 203	25 79	27 130
		S	Cecal				•	^	0	0	0			6	17
		Turkey	Retail Ground Turkey HACCP Cecal	3	0 2	2	2	0 4	2 5	0	0 1	0	1	2 1 0	0 0 0
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	1 3	0 2	0 2	0 2	0 4	1 5	0	1	0	0 1	0 1 0	0 0 0
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0 0 0	1 0 1
	Antimicrobial (Resistance		Cecal (Sows)											1	0
Antimicrobial Class Penicillins	Breakpoint) Ampicillin		Source	2.3%	4.1%	2.6%	4.1%	2.1%	4.1%	3.9%	2.3%	5.1%	4.1%	5.8%	3.2%
	(MIC ≥ 32 μg/ml)		Humans	6 66.7%	11 33.3%	10 0.0%	17 17.6%	8 0.0%	18 6.7%	16 18.5%	12 0.0%	20 9.5%	15 0.0%	22 0.0%	14 0.0%
		sens	Retail Chickens	0.0%	1.2%	0 1.2%	3 1.6%	0 1.6%	2.6%	5 2.5%	0 2.6%	2 1.5%	0 2.5%	0 3.8%	0 3.8%
		Chickens	HACCP	0	1	2	3	2	3	3	4	2	5	3	5 0.0%
		Ĺ	Cecal	0.004					0.00/			0.00/	2.00/	0	0.0%
		s/s	Retail Ground Turkey	0.0% 0					0.0% 0			0.0% 0	0.0% 0	50.0% 1	
		Turkeys	HACCP				0.0% 0		0.0%		0.0% 0		0.0% 0	0.0% 0	0.0% 0
		-	Cecal											0.0% 0	
			Retail Ground Beef	0.0%					0.0%		0.0% 0				
		9	HACCP	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0%		100.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	U	0	U	l	U	U				U	U	
			Cecal (Dairy)												0.0%
			Retail Pork Chops												0
		ne													0.0%
		Swine	Cecal (Market Swine)											0.0%	0
Dhariada	Oblassanhaniaal		Cecal (Sows)	0.40/	0.40/	0.50/	0.00/	0.50/	0.50/	0.00/	0.00/	0.00/	0.50/	0	4.40/
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	0.4% 1	0.4% 1	0.5% 2	0.0% 0	0.5% 2	0.5% 2	0.0%	0.6% 3	0.0% 0	0.5% 2	0.3% 1	1.1% 5
		SL	Retail Chickens	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0% 0	0.0%	0.6% 1	0.0%	0.0%	0.0% 0	0.0% 0	1.3% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Ö	Cecal											0.0% 0	0.0% 0
			Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	J
		Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
		ī	Cecal				0		0		0		0	0.0%	0
			Retail Ground Beef	0.0%					0.0%		0.0%			0	
				0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0 100.0%		0.0%	0.0%	
		Cattle	HACCP	0	0	0	1	0	0		1		0	0	
			Cecal (Beef)												0.00/
			Cecal (Dairy)												0.0% 0
		m	Retail Pork Chops												
		Swine	Cecal (Market Swine)												0.0% 0
			Cecal (Sows)											0.0% 0	
Quinolones	Ciprofloxacin (MIC ≥ 1 µg/mI)		Humans	0.0% 0	0.4% 1	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.2% 1	0.0%	0.0% 0	0.0% 0	0.2% 1
	(o = 1 pg/1111)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ŗ	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		-	Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	0
		eys		0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
		Turkeys	HACCP				0		0		0.070		0.070	0.0%	0
		<u> </u>	Cecal	0.004					0.004		0.004			0.0%	
			Retail Ground Beef	0.0%	0		0.55	_	0.0%		0.0%				
		ttle	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0		0.0% 0	0.0% 0	
		Cattle	Cecal (Beef)												
			Cecal (Dairy)												0.0%
		\vdash	Retail Chickens												U
		Swine	Cecal (Market Swine)												0.0%
		Š	Cecal (Sows)											0.0%	0
			Gecai (SOWS)											0	

Table 27e. Antimicrobial Resistance among Salmonella Enteritidis Isolates, 2003-2014

Table 27e. Antimicro	bial Resistance amo	ong S	Salmonella Enterition				0000	0007	0000	0000	0040	0044	0040	0040	004.4
Year	ad		Humans	2003 257	2004 271	2005 384	2006 412	2007 385	2008 442	2009 410	2010 513	2011 391	2012 364	2013 382	2014 438
Number of Isolates Test	eu	sue	Humans Retail Chickens	3	3	12	17	13	30	27	28	21	26	25	436 27
		Chicker	HACCP Cecal	42	84	173	188	124	116	118	152	134	203	79 6	130 17
		Turkeys	Retail Ground Turkey HACCP Cecal	1 0	0	0	0 3	0	2 1	0	0	1 0	4 1	2 1 1	0 5 0
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	1 3	0 2	0 2	0 2	0 4	1 5	0	1	0	0	0 1 0 0	0 0 0 1
	I Autimiovakial	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	0	0 0 1	0 1 0
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	4.7% 12	6.6% 18	4.7% 18	7.0% 29	5.7% 22	7.2% 32	3.7% 15	5.3% 27	7.2% 28	7.7% 28	5.8% 22	8.0% 35
	(= 1= pg)	SI	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0% 0	0.0% 0	0.6% 1	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		ō	Cecal											0.0% 0	0.0% 0
		s/	Retail Ground Turkey	0.0% 0					0.0% 0			0.0% 0	0.0% 0	0.0% 0	
		Turkeys	HACCP				0.0% 0		0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0% 0
			Cecal											0.0% 0	
			Retail Ground Beef	0.0% 0					0.0% 0		0.0% 0				
		Cattle	HACCP	0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0	0.0%		0.0% 0		0.0% 0	0.0% 0	
		Ö	Cecal (Beef)												0.00/
			Cecal (Dairy)												0.0% 0
		e e	Retail Pork Chops												0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
Tetracyclines	Tetracycline		Cecal (Sows)	1.6%	3.3%	2.3%	1.7%	3.9%	1.8%	1.2%	2.1%	1.8%	3.6%	0.0%	2.5%
retracyclines	(MIC ≥ 16 μg/ml)		Humans	4 0.0%	9 33.3%	9	7 11.8%	15 0.0%	8 3.3%	5 3.7%	11 0.0%	7	13	17 0.0%	11 0.0%
		ens	Retail Chickens	0 2.4%	1 2.4%	0.6%	1.6%	0 2.4%	1 0.9%	1 2.5%	0.076	4 0.7%	0.5%	0.5%	0.8%
		Chickens	HACCP	1	2	1	3	3	1	3	5	1	3	2 0.0%	1 0.0%
			Cecal	0.0%					50.0%			0.0%	25.0%	0 50.0%	0
		Turkeys	Retail Ground Turkey HACCP	0			0.0%		0.0%		0.0%	0	1 0.0%	1 0.0%	0.0%
		Ţn	Cecal				0		0		0		0	0.0%	0
			Retail Ground Beef	0.0%					0.0%		0.0%			0	
		0	HACCP	0.0%	0.0%	0.0%	50.0%	25.0%	0.0%		100.0%		0.0%	0.0%	
		Cattle	Cecal (Beef)	0	0	0	1	1	0		1		0	0	
			Cecal (Dairy)												0.0%
			Retail Pork Chops												U
		Swine	Cecal (Market Swine)												0.0%
		0)	Cecal (Sows)											0.0%	-

Multidrug Resistance

Table 28a. Resistance Patterns among Salmonella Enteritidis Isolates, 2003-2014¹

Table 28a. Resistance Patte	rns	among Saimoneii					600	000-	600-	0047	604	604-	604-	604
Year Number of Isolates Tested		Humans	2003 257	2004 271	2005 384	2006 412	2007 385	2008 442	2009 410	2010 513	2011 391	2012 364	2013 382	2014 438
	ens	Retail Chickens	3	3	12	17	13	30	27	28	21	26	25	27
	Chickens	HACCP Cecal	42	84	173	188	124	116	118	152	134	203	79 6	130 17
		Retail Ground Turkey	1	0	0	0	0	2	0	0	1	4	2	0
	Turkeys	HACCP	0	0	0	3	0	1	0	1	0	1	1	5
		Cecal Retail Ground Beef	1	0	0	0	0	1	0	1	0	0	0	0
	Cattle	HACCP	3	2	2	2	4	5	0	1	0	1	1	0
	Ö	Cecal (Beef) Cecal (Dairy)											0	0
	ө	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	0	0
	Swine	Cecal (Market Swine) Cecal (Sows)											0	1 0
Resistance Pattern		Source												U
1. No Resistance Detected		Humans	91.8% 236	86.7% 235	91.4% 351	88.8% 366	90.4% 348	87.3% 386	92.2% 378	92.0% 472	88.0% 344	88.2% 321	87.4% 334	87.7% 384
		Retail Chickens	33.3% 1	66.7% 2	100.0% 12	82.4% 14	100.0% 13	90.0% 27	74.1% 20	96.4% 27	81.0% 17	100.0% 26	100.0% 25	100.0% 27
	Chickens	HACCP	97.6%	97.6%	97.1%	97.9%	96.0%	97.4%	96.6%	95.4%	97.8%	96.1%	96.2%	96.2%
	S	Cecal	41	82	168	184	119	113	114	145	131	195	76 100.0%	125 100.0%
		Retail Ground Turkey	100.0%					50.0%			100.0%	75.0%	6 50.0%	17
	sys		1			100.0%		100.0%		100.0%	1	3 100.0%	100.0%	100.0%
	Turkeys	HACCP				3		100.0%		1		1	1	5
		Cecal											100.0% 1	
		Retail Ground Beef	100.0% 1					100.0% 1		100.0% 1				
	tle	HACCP	100.0% 3	100.0% 2	100.0% 2	50.0% 1	75.0% 3	100.0% 5		0.0%		100.0% 1	100.0% 1	
	Cattle	Cecal (Beef)		_	_									
		Cecal (Dairy)												100.0%
		Retail Pork Chops												1
	ne													100.0%
	Swine	Cecal (Market Swine)											100.0%	1
		Cecal (Sows)	0.4%	1.1%	1.3%	1.7%	0.8%	0.7%	1.0%	2.1%	2.3%	2.7%	1 1.6%	2.1%
2. Resistant to ≥ 3		Humans	1	3	5	7	3	3	4	11	9	10	6	9
Antimicrobial Classes	St	Retail Chickens	33.3% 1	33.3% 1	0.0%	0.0% 0	0.0% 0	3.3% 1	3.7% 1	0.0% 0	9.5% 2	0.0%	0.0%	0.0% 0
	Chickens	HACCP	0.0%	2.4%	0.6% 1	0.0%	0.0%	0.9% 1	0.8% 1	2.6% 4	0.7% 1	0.5% 1	2.5% 2	0.0%
	S	Cecal											0.0% 0	0.0% 0
		Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	Ü
	Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
	Τ	Cecal				0		0		0		0	0.0%	0
		Retail Ground Beef	0.0%					0.0%		0.0%			0	
			0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0 100.0%		0.0%	0.0%	
	Cattle	HACCP	0	0	0	1	0	0		1		0	0	
	O	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops												
	Swine	Cecal (Market Swine)												0.0%
	0,	Cecal (Sows)											0.0%	Ů
		Humans	0.4%	0.7%	1.0%	0.7%	0.3%	0.2%	0.5%	0.4%	1.3%	1.6%	1.6%	1.4%
3. Resistant to ≥ 4 Antimicrobial Classes		Retail Chickens	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	5 4.8%	0.0%	0.0%	0.0%
	sue		0.0%	1.2%	0.0%	0.0%	0.0%	0.9%	0.8%	0.6%	0.0%	0.0%	0 1.3%	0.0%
	Chickens	HACCP	0	1	0	0	0	1	1	1	0	0	1	0
		Cecal											0.0% 0	0.0% 0
	ŝ	Retail Ground Turkey	0.0%					0.0% 0			0.0% 0	0.0%	0.0% 0	
	Turkeys	HACCP				0.0% 0		0.0%		0.0%		0.0%	0.0%	0.0%
	_	Cecal											0.0% 0	
		Retail Ground Beef	0.0%					0.0%		0.0% 0				
	tle	HACCP	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0%		100.0%		0.0%	0.0%	
	Cattle	Cecal (Beef)												
		Cecal (Dairy)												0.0%
		Retail Pork Chops												0
	Swine	Cecal (Market Swine)												0.0%
	Sw												0.0%	0
¹ Starting in 2011, testing included r	ino o	Cecal (Sows)	th the addition	on of the mar	crolide azithr	omusin Rose	augo rogisto	noo to ozithr	omusin in lou	u (in this oos	2 19()		0	

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 28b. Resistance Patterns among Salmonella Enteritidis Isolates, 2003-2014¹

Table 28b. Resistance Patte	erns	among Saimoneii					2007	2000	2000	2010	2011	2042	2042	2014
Year Number of Isolates Tested		Humans	2003 257	2004 271	2005 384	2006 412	2007 385	2008 442	2009 410	2010 513	2011 391	2012 364	2013 382	2014 438
	Chickens	Retail Chickens HACCP	3 42	3 84	12 173	17 188	13 124	30 116	27 118	28 152	21 134	26 203	25 79	27 130
	Turkeys	Retail Ground Turkey HACCP	1 0	0	0	0	0	2	0	0	1 0	4	6 2 1	17 0
	Tul	Cecal Retail Ground Beef	1		0	3	0			1	0	1	1	5
	Cattle	HACCP Cecal (Beef) Cecal (Dairy)	3	0 2	2	0 2	0 4	1 5	0	1	0	0	0 1 0 0	0 0 0
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	0	0 0 1	0 1 0
Resistance Pattern		Source												
4. Resistant to ≥ 5		Humans	0.4%	0.7%	0.5%	0.2%	0.3%	0.0%	0.2%	0.0%	0.5%	0.5%	0.3%	0.9%
Antimicrobial Classes	sue	Retail Chickens	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.9% 1	0.0% 0	0.6% 1	0.0% 0	0.0%	0.0%	0.0% 0
		Cecal											0.0% 0	0.0% 0
	S.	Retail Ground Turkey	0.0%					0.0% 0			0.0% 0	0.0% 0	0.0% 0	
	Turkeys	HACCP				0.0% 0		0.0%		0.0%		0.0% 0	0.0% 0	0.0% 0
		Cecal											0.0% 0	
		Retail Ground Beef	0.0%					0.0%		0.0%				
	Cattle	HACCP	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0%		0.0%		0.0%	0.0%	
	Ca	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops												-
	Swine	Cecal (Market Swine)												0.0%
	S	Cecal (Sows)											0.0%	U
		Humans	0.4%	0.4%	0.5%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.5%
5. At Least ACSSuT ² Resistant	-	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%
	Š	Cecal	0	0	0	0	0	0	0	1	0	0	0.0%	0.0%
	-	Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	0
	Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
	Ē	Cecal				0		0		0		0	0.0%	0
	-	Retail Ground Beef	0.0%					0.0%		0.0%			0	
		HACCP	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
	Cattle	Cecal (Beef)	0	0	0	1	0	0		0		0	0	
		Cecal (Dairy)												0.0%
		Retail Pork Chops												0
	Swine	Cecal (Market Swine)												0.0%
	Ó	Cecal (Sows)											0.0%	0
C 411 407/03		Humans	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6. At Least ACT/S ³ Resistant	H	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ģ	Cecal	0	0	0	0	0	0	0	0	0	0	0 0.0% 0	0.0%
	Н	Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	0
	Turkeys	HACCP	U			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
	٦	Cecal											0.0%	
		Retail Ground Beef	0.0%					0.0%		0.0%			Ů	
	te te	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
	Cattle	Cecal (Beef)										Ť	Ì	
		Cecal (Dairy)												0.0%
		Retail Pork Chops												
	Swine	Cecal (Market Swine)												0.0%
	3,	Cecal (Sows)											0.0%	
¹ Starting in 2011, testing included i	nine a	ıntimicrobial classes wi	th the addition	on of the ma	crolide azithr	omycin. Bec	ause resista	nce to azithr	omycin is lov	v (in this cas	e. <1%).			

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 28c. Resistance Patterns among Salmonella Enteritidis Isolates, 2003-2014

Year	CITIS	among Samonen	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	257	271	384	412	385	442	410	513	391	364	382	438
	Chickens	Retail Chickens HACCP Cecal	3 42	3 84	12 173	17 188	13 124	30 116	27 118	28 152	21 134	26 203	25 79 6	27 130 17
	Turkeys	Retail Ground Turkey HACCP Cecal	1 0	0	0	0 3	0	2 1	0	0	1 0	4 1	2 1 1	0 5 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	1 3	0 2	0 2	0 2	0 4	1 5	0	1	0	0	0 1 0	0 0 0
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	0	0 0 1	0 1 0
Resistance Pattern		Source	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
7. At Least ACSSuTAuCx 1 Resistant	_	Humans	0.0%	0.0%	1 0.0%	0.0%	1 0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%
Resistant	Chickens	Retail Chickens HACCP	0.0%	0.0%	0.0% 0.0% 0	0.0% 0.0% 0	0.0% 0.0% 0	0.0% 0.0% 0	0.0%	0.0% 0.0% 0	0.0%	0.0%	0.0% 0.0% 0	0.0% 0.0% 0
	Ö	Cecal											0.0%	0.0%
		Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	0
	Turkeys	HACCP	0			0.0%		0.0%		0.0%	0	0.0%	0.0%	0.0%
	2	Cecal				0		0		0		0	0.0%	0
		Retail Ground Beef	0.0%					0.0%		0.0%			0	
	<u>e</u>	HACCP	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%		0.0%		0.0%	0.0%	
	Cattle	Cecal (Beef)	U	0	0	1	0	U		U		0	0	
		Cecal (Dairy)												0.0%
		Retail Pork Chops												
	Swine	Cecal (Market Swine)												0.0% 0
		Cecal (Sows)											0.0%	
8. At Least Ceftriaxone and		Humans	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2% 1
Nalidixic Acid Resistant	S	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0
	ō	Cecal											0.0%	0.0%
	"	Retail Ground Turkey	0.0%					0.0%			0.0%	0.0%	0.0%	
	Turkeys	HACCP				0.0%		0.0%		0.0% 0		0.0% 0	0.0%	0.0% 0
	-	Cecal											0.0%	
		Retail Ground Beef	0.0% 0					0.0%		0.0% 0				
	Cattle	HACCP	0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0	0.0%		0.0% 0		0.0% 0	0.0%	
	ŭ	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops												
	Swine	Cecal (Market Swine)												0.0% 0
		Cecal (Sows)											0.0%	

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 29a. Antimicrobial Resistance among Salmonella Typhimurium Isolates, 2003-2014

Year	bial Resistance amo	nig (заттопопа турппп	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed		Humans	394	409	382	438	408	405	396	370	359	323	296	325	262
		Chickens	Retail Chickens HACCP	9 150	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55	38 81
		<u> </u>	Cecal Retail Ground Turkey					0			4	0			15	27
		Turkeys	HACCP Cecal	9	6	14	7	0 5	6	3	2	6 4	8 2	9	1 5 2	2 3 2
		Cattle	Retail Ground Beef HACCP	2 98	1 78	0 48	0 34	1 22	3 26	2 28	0 18	0 15	0 14	1 16	0 23	3 14
			Cecal (Beef) Cecal (Dairy) Retail Pork Chops	2	1	2	2	2	3	3	1	5	7	6	14 21 4	10
	Antimicrobial	Swine	Cecal (Market Swine) Cecal (Sows)												21 4	13 6
	(Resistance		Isolate													
Antimicrobial Class Aminoglycosides	Breakpoint) Gentamicin		Source Humans	2.3%	2.0%	2.1%	1.8%	2.7%	2.5%	1.5%	1.9%	0.8%	1.9%	3.0%	1.2%	3.1%
	(MIC ≥ 16 μg/ml)		Retail Chickens	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	1.5%	2.5%	6.3%	3.0%	9 6.8%	4.4%	5.3%
		Chickens	HACCP	12.7%	0 5.1%	4.1%	0 4.4%	6.7%	3.6%	5.7%	0.0%	5.6%	6.7%	3.8%	3.6%	2.5%
		Shic	Cecal	19	8	7	8	7	3	4	0	3	2	4	0.0%	7.4%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	25.0%	11.1%	0.0%	50.0%
		Turkeys	HACCP	0 44.4%	0 83.3%	0 64.3%	0 14.3%	20.0%	0 16.7%	0 33.3%	0 50.0%	0.0%	0.0%	1 25.0%	20.0%	0.0%
		Ţū	Cecal	4	5	9	1	1	1	1	1	0	0	1	50.0%	50.0%
			Retail Ground Beef	0.0%	0.0%			0.0%	0.0%	0.0%				0.0%	1	0.0%
			HACCP	2.0%	1.3%	0.0%	0.0%	0.0%	0 7.7%	0.0%	0.0%	0.0%	0.0%	0 6.2%	0.0%	0.0%
		Cattle	Cecal (Beef)	2	1	0	0	0	2	0	0	0	0	1	0.0%	0.0%
															0.0%	0.0%
			Cecal (Dairy)	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne	Retail Pork Chops	0	0	0	0	1	0	0	0	0	0	0	0 9.5%	0 7.7%
		Swine	Cecal (Market Swine)												2 0.0%	1 0.0%
	Streptomycin		Cecal (Sows)	32.0%	35.7%	31.9%	28.1%	29.4%	32.3%	28.5%	25.9%	25.6%	25.7%	24.0%	0 20.6%	0 24.8%
	(MIC ≥ 64 μg/ml)		Humans	126	146 18.2%	122	123	120 9.5%	131	113 16.2%	96 15.6%	92	83	71	67	65 2.6%
		ens	Retail Chickens	0 30.0%	4 16.7%	7 8.2%	1 13.7%	2 17.1%	7 10.8%	11 5.7%	19	18	16	13	3 5.5%	1 12.3%
		Chickens	HACCP	45	26	14	25	18	9	4	2	8	2	9	3	10 14.8%
			Cecal	0.0%	50.0%	50.0%	0.0%		100.0%	0.0%	0.0%	33.3%	50.0%	55.6%	0 100.0%	4 50.0%
		ske	Retail Ground Turkey	0 77.8%	1 100.0%	1 64.3%	0 57.1%	60.0%	1 50.0%	0 33.3%	0 100.0%	2 50.0%	4 0.0%	5 25.0%	1 20.0%	1 66.7%
		Turkeys	HACCP	7	6	9	4	3	3	1	2	2	0.076	1	1 50.0%	100.0%
			Cecal	0.0%	0.0%			100.0%	0.0%	50.0%				0.0%	1	2
			Retail Ground Beef	0.0%	0.0%	56.3%	55.9%	1 54.5%	0.0%	1 50.0%	72.2%	53.3%	57.1%	0.0%	39.1%	0.0%
		Cattle	HACCP	65	41	27	19	12	13	14	13	8	8	8	9 57.1%	25.0% 2
		0	Cecal (Beef)												8 66.7%	1 90.0%
			Cecal (Dairy)	E0.00/	100.00/	100.00/	100.00/	100.00/	0.00/	22.20/	100.00/	00.00/	74.40/	E0.00/	14	9
		Θ	Retail Pork Chops	50.0% 1	100.0% 1	100.0% 2	100.0%	100.0% 2	0.0%	33.3% 1	100.0% 1	80.0% 4	71.4% 5	50.0% 3	70.0% 3 57.1%	100.0%
		Swine	Cecal (Market Swine)												12	61.5%
			Cecal (Sows)	7.00/	E 00/	4.7707	0.007	4.407	0.7707	0.50/	0.00/	1.00/	7.40/	5.70/	100.0%	66.7%
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	7.6% 30	5.9% 24	4.7% 18	3.2% 14	4.4% 18	6.7% 27	3.5% 14	6.2% 23	4.2% 15	7.1% 23	5.7% 17	3.4% 11	5.3% 14
	(MIC ≥ 32 / 16 μg/ml)	us	Retail Chickens	33.3% 3	63.6% 14	49.0% 24	51.7% 15	57.1% 12	44.0% 11	48.5% 33	57.4% 70	60.8% 48	54.6% 36	55.7% 49	50.0% 34	47.4% 18
		Chickens	HACCP	28.7% 43	25.6% 40	43.3% 74	19.7% 36	30.5% 32	33.7% 28	24.3% 17	33.3% 12	29.6% 16	6.7% 2	29.5% 31	9.1% 5	11.1% 9
			Cecal												13.3% 2	14.8% 4
		s,	Retail Ground Turkey	0.0% 0	100.0% 2	0.0% 0	100.0% 1		0.0% 0	0.0% 0	0.0% 0	50.0% 3	62.5% 5	22.2% 2	0.0% 0	0.0%
		Turkeys	HACCP	22.2% 2	16.7% 1	14.3% 2	0.0% 0	0.0% 0	16.7% 1	0.0% 0	50.0% 1	50.0% 2	0.0% 0	50.0% 2	0.0% 0	66.7% 2
		Ľ	Cecal												0.0% 0	50.0% 1
			Retail Ground Beef	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0% 0				0.0% 0		0.0%
		Cattle	HACCP	17.3% 17	20.5% 16	25.0% 12	35.3% 12	27.3% 6	26.9% 7	21.4% 6	27.8% 5	20.0%	35.7% 5	12.5% 2	30.4% 7	0.0%
		Ca	Cecal (Beef)												21.4% 3	0.0%
			Cecal (Dairy)												52.4% 11	30.0%
			Retail Pork Chops	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0%
	Ī	ē	0 1/11 1 10 1 1			-			-		_	-			0.0%	7.7%
		Swine	Cecal (Market Swine)												0	1 1

Table 29b. Antimicrobial Resistance among Salmonella Typhimurium Isolates, 2003-2014

Table 29b. Antimicro Year			7,	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	394	409	382	438	408	405	396	370	359	323	296	325	262
		Chickens	Retail Chickens	9	22	49	29	21	25	68 70	122	79 54	66	88	68	38
		Chic	HACCP Cecal	150	156	171	183	105	83	70	36	54	30	105	55 15	81 27
		ske	Retail Ground Turkey	2	2	2	1	0	1	1	1	6	8	9	1	2
		Turkeys	HACCP	9	6	14	7	5	6	3	2	4	2	4	5	3
		<u> </u>	Cecal							_					2	2
		e E	Retail Ground Beef HACCP	2 98	1 78	0 48	0 34	1 22	3 26	2 28	0 18	0 15	0 14	1 16	0 23	3 14
		Cattle	Cecal (Beef)												14	4
		_	Cecal (Dairy)												21	10
		Swine	Retail Pork Chops Cecal (Market Swine)	2	1	2	2	2	3	3	1	5	7	6	4 21	1 13
		Š	Cecal (Narket Swiffe) Cecal (Sows)												4	6
	Antimicrobial (Resistance		Isolate													
Antimicrobial Class	Breakpoint) Cefoxitin		Source	4.3%	4.6%	4.7%	2.5%	3.9%	5.7%	3.5%	5.4%	3.3%	6.8%	5.4%	3.4%	5.3%
Cephems	(MIC ≥ 32 μg/ml)		Humans	17	19	18	11	16	23	14	20	12	22	16	11	14
		SC	Retail Chickens	33.3% 3	63.6% 14	49.0% 24	51.7% 15	52.4% 11	40.0% 10	45.6% 31	47.5% 58	51.9% 41	34.9% 23	45.5% 40	44.1% 30	42.1% 16
		Chickens	HACCP	26.7% 40	23.7% 37	43.3% 74	19.7% 36	29.5% 31	24.1% 20	20.0% 14	27.8% 10	27.8% 15	6.7% 2	18.1% 19	3.6%	9.9% 8
		5	Cecal		-										6.7%	7.4%
			Retail Ground Turkey	0.0%	100.0%	0.0%	100.0%		0.0%	0.0%	0.0%	50.0%	50.0%	11.1%	0.0%	0.0%
		Turkeys	HACCP	0 22.2%	2 16.7%	0 14.3%	0.0%	0.0%	0 16.7%	0.0%	0 50.0%	0.0%	0.0%	50.0%	0.0%	0 66.7%
		Turk		2	1	2	0	0	1	0	1	0	0	2	0.0%	0.0%
		<u> </u>	Cecal	0.001	0.001			0.007	0.001	0.001				0.001	0.0%	0
			Retail Ground Beef	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0% 0				0.0% 0		0.0% 0
		=	HACCP	11.2% 11	16.7% 13	25.0% 12	35.3% 12	27.3% 6	26.9% 7	17.9% 5	22.2% 4	20.0%	35.7% 5	12.5% 2	30.4% 7	0.0%
		Cattle	Cecal (Beef)												21.4% 3	0.0% 0
			Cecal (Dairy)												52.4%	30.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne.		0	0	0	0	0	0	0	0	0	0	0	0.0%	7.7%
		Swine	Cecal (Market Swine)												0.0%	1 33.3%
	0.61		Cecal (Sows)	4.00/	T 101	4.50/	0.50/	1.00/	0.40/	0.50/	0.50/	4.7707	0.00/	5 70/	0	2
	Ceftiofur (MIC ≥ 8 µg/ml)		Humans	4.3% 17	5.1% 21	4.5% 17	2.5% 11	4.2% 17	6.4% 26	3.5% 14	6.5% 24	4.7% 17	6.8% 22	5.7% 17	3.4% 11	5.3% 14
		S	Retail Chickens	33.3% 3	63.6% 14	49.0% 24	51.7% 15	57.1% 12	44.0% 11	48.5% 33	56.6% 69	60.8% 48	54.6% 36	55.7% 49	50.0% 34	47.4% 18
		Chickens	HACCP	28.0% 42	25.6% 40	43.3% 74	19.7% 36	30.5% 32	32.5% 27	24.3% 17	33.3% 12	29.6% 16	6.7% 2	27.6% 29	9.1% 5	11.1% 9
		ပ်	Cecal	42	40	74	30	32	21	17	12	10		23	13.3%	14.8%
			Retail Ground Turkey	0.0%	100.0%	0.0%	100.0%		0.0%	0.0%	0.0%	50.0%	50.0%	22.2%	0.0%	0.0%
		eys	-	0 22.2%	2 16.7%	0 14.3%	0.0%	0.0%	0 16.7%	0.0%	0 50.0%	0.0%	0.0%	2 50.0%	0.0%	0 66.7%
		Turkeys	HACCP	2	1	2	0	0	1	0	1	0	0	2	0.0%	2 50.0%
			Cecal												0.070	1
			Retail Ground Beef	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0%				0.0%		0.0%
		te E	HACCP	15.3% 15	20.5% 16	25.0% 12	35.3% 12	27.3% 6	26.9% 7	21.4% 6	27.8% 5	20.0% 3	35.7% 5	12.5% 2	30.4% 7	0.0%
		Cattle	Cecal (Beef)												21.4% 3	0.0%
			Cecal (Dairy)												52.4%	30.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ре		0	0	0	0	0	0	0	0	0	0	0	0 4.8%	0 7.7%
		Swine	Cecal (Market Swine)												1 0.0%	1 33.3%
	Outhinner	_	Cecal (Sows)	4.007	F 407	4 = 0.4	0.504	4.007	0.404	0.50	0.504	4 = 2.4	0.007	F 701	0	2
	Ceftriaxone (MIC ≥ 4 µg/mI)		Humans	4.3% 17	5.1% 21	4.5% 17	2.5% 11	4.2% 17	6.4% 26	3.5% 14	6.5% 24	4.7% 17	6.8% 22	5.7% 17	3.4% 11	5.3% 14
		"	Retail Chickens	33.3% 3	63.6% 14	49.0% 24	51.7% 15	57.1% 12	44.0% 11	48.5% 33	57.3% 70	60.8% 48	54.6% 36	55.7% 49	50.0% 34	47.4% 18
		Chickens	HACCP	26.7%	25.6%	43.3%	19.7%	30.5%	33.7%	24.3%	33.3%	29.6%	6.7%	28.6%	9.1%	11.1%
		ş	Cecal	40	40	74	36	32	28	17	12	16	2	30	5 13.3%	9 14.8%
		-		0.0%	100.0%	0.0%	100.0%		0.0%	0.0%	0.0%	50.0%	62.5%	22.2%	2 0.0%	4 0.0%
		ķ	Retail Ground Turkey	0	2	0	1		0	0	0	3	5	2	0	0
		Turkeys	HACCP	22.2% 2	16.7% 1	14.3% 2	0.0% 0	0.0% 0	16.7% 1	0.0% 0	50.0% 1	0.0% 0	0.0% 0	50.0% 2	0.0% 0	66.7% 2
		-	Cecal												0.0%	50.0% 1
		\vdash	Retail Ground Beef	0.0%	0.0%			0.0%	0.0%	0.0%				0.0%	U	0.0%
				0 15.3%	0 20.5%	25.0%	35.3%	0 27.3%	0 26.9%	0 21.4%	27.8%	20.0%	35.7%	12.5%	30.4%	0.0%
		Cattle	HACCP	15	16	12	12	6	7	6	5	3	5	2	7	0
		0	Cecal (Beef)												21.4% 3	0.0%
			Cecal (Dairy)												52.4% 11	30.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0	0 4.8%	7.7%
		Swine													1 0.0%	1 33.3%
			Cecal (Sows)												0.0%	33.3%

Table 29c. Antimicrobial Resistance among Salmonella Typhimurium Isolates, 2003-2014

Year		Jg	Salmonella Typhim	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	394	409	382	438	408	405	396	370	359	323	296	325	262
		ens	Retail Chickens	9	22	49	29	21	25	68	122	79	66	88	68	38
		Chickens	HACCP	150	156	171	183	105	83	70	36	54	30	105	55	81
		0	Cecal												15	27
		rkeys	Retail Ground Turkey HACCP	2 9	2 6	2 14	7	0 5	1 6	1	1 2	6 4	8 2	9	1 5	2
		Τ	Cecal				,	, and		ŭ	_	·	_	·	2	2
			Retail Ground Beef	2	1	0	0	1	3	2	0	0	0	1	0	3
		Cattle	HACCP	98	78	48	34	22	26	28	18	15	14	16	23	14
			Cecal (Beef) Cecal (Dairy)												14 21	4 10
			Retail Pork Chops	2	1	2	2	2	3	3	1	5	7	6	4	1
		Swine	Cecal (Market Swine)	_	·	_	_	_		ŭ		ŭ	•		21	13
	Antimicrobial	0)	Cecal (Sows)												4	6
	(Resistance		Isolate													
Antimicrobial Class Folate Pathway Inhibito	Breakpoint) Sulfamethoxazole/	<u> </u>	Source	32.2%	38.9%	36.1%	32.0%	33.3%	37.3%	30.3%	30.0%	28.7%	27.2%	27.0%	20.9%	25.2%
rolate rathway illilibito	Sulfisoxazole 1		Humans	127	159	138	140	136	151	120	111	103	88	80	68	66
	(MIC ≥ 512 μg/ml)	s	Retail Chickens	44.4% 4	31.8% 7	73.5% 36	69.0% 20	90.5% 19	68.0% 17	94.1% 64	96.7% 118	92.4% 73	93.9% 62	89.8% 79	92.7% 63	97.4% 37
		Chickens	HACCP	31.3%	28.2%	47.4%	37.2%	65.7%	60.2%	70.0%	52.8%	74.1%	70.0%	81.9%	76.4%	76.5%
		S.	Canal	47	44	81	68	69	50	49	19	40	21	86	42 93.3%	62 96.3%
		-	Cecal	0.00/	E0.00/	400.00/	0.00/		100.00/	0.00/	400.00/	66.70/	C2 F0/	EE 60/	14	26
		,s	Retail Ground Turkey	0.0% 0	50.0% 1	100.0% 2	0.0% 0		100.0% 1	0.0% 0	100.0% 1	66.7% 4	62.5% 5	55.6% 5	100.0% 1	50.0% 1
		Turkeys	HACCP	77.8% 7	100.0% 6	78.6% 11	57.1% 4	80.0% 4	83.3% 5	66.7% 2	100.0% 2	50.0% 2	0.0%	75.0% 3	20.0%	33.3%
		٦	Cecal	,			7	7	3					3	50.0%	100.0%
		\vdash		0.0%	0.0%			100.0%	0.0%	50.0%				0.0%	1	0.0%
			Retail Ground Beef	0	0	0.7		1	0	1	0	0		0	,	0
		#e	HACCP	58.2% 57	44.9% 35	60.4% 29	73.5% 25	59.1% 13	65.4% 17	53.6% 15	83.3% 15	60.0% 9	57.1% 8	62.5% 10	43.5% 10	3.7%
		Cattle	Cecal (Beef)												57.1%	25.0% 1
			Cecal (Dairy)												66.7%	90.0%
		-		50.0%	100.0%	100.0%	100.0%	100.0%	0.0%	33.3%	100.0%	80.0%	71.4%	50.0%	14 75.0%	9 100.0%
			Retail Pork Chops	1	1	2	2	2	0.078	1	1	4	5	3	3	1
		Swine	Cecal (Market Swine)												71.4% 15	69.2% 9
		0,	Cecal (Sows)												100.0%	83.3%
	Trimethoprim-		Humans	2.3%	3.4%	2.6%	2.7%	2.2%	2.5%	1.8%	3.0%	1.9%	1.9%	1.7%	1.2%	5 2.3%
	Sulfamethoxazole	<u> </u>	1	9	14	10	12	9	10 0.0%	7	11	7	6	5	4	6
	(MIC ≥ 4 / 76 μg/ml)	SL	Retail Chickens	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	1.5% 1	0.0% 0	0.0% 0	0.0% 0
		Chickens	HACCP	1.3% 2	0.6% 1	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.0%	0.0%	1.0%	0.0%	0.0%
		S	Cecal			Ü	Ü		Ü					1	0.0%	0.0%
		-		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ys	Retail Ground Turkey	0	0	0	0		0	0	0	0	0	0	0	0
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		-	Cecal												0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%			0.0%	0.0%	0.0%				0.0%	-	0.0%
				0 4.1%	0 2.6%	4.2%	5.9%	0 4.5%	0.0%	0.0%	5.6%	6.7%	0.0%	0 6.2%	0.0%	0.0%
		Cattle	HACCP	4	2	2	2	1	0.070	0.070	1	1	0.070	1	0	0
		ပိ	Cecal (Beef)												0.0%	0.0%
			Cecal (Dairy)												0.0%	0.0%
		-	Retail Pork Chops	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Je.		0	0	0	1	0	0	0	1	0	0	0	9.5%	0 7.7%
		Swine	Cecal (Market Swine)												2	1
		┸	Cecal (Sows)												0.0% 0	0.0% 0
Macrolides	Azithromycin (MIC ≥32 µg/mI)		Humans										0.0% 0	0.0% 0	0.0% 0	0.4% 1
	252 рули)	(n	Retail Chickens										0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP										0.0%	0.0%	0.0%	0.0%
		Chic	Cecal										0	0	0.0%	0.0%
		-											0.0%	0.0%	0.0%	0.0%
		3ys	Retail Ground Turkey										0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP										0.0%	0.0%	0	0
		Ľ	Cecal												0.0% 0	0.0% 0
			Retail Ground Beef											0.0% 0		0.0%
		ē	HACCP										0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)												0.0%	0.0%
			Cecal (Dairy)												0.0%	0.0%
		-											0.0%	0.0%	0.0%	0.0%
		Je.	Retail Pork Chops										0	0	0 4.8%	0 7.7%
		Swine	Cecal (Market Swine)												1	1
			Cecal (Sows)												0.0% 0	0.0%

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Year	obial Resistance am			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted		Humans	394	409	382	438	408	405	396	370	359	323	296	325	262
		Chickens	Retail Chickens HACCP	9 150	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55 15	38 81 27
		keys	Retail Ground Turkey	2 9	2	2 14	1 7	0 5	1 6	1 3	1 2	6 4	8 2	9	1	2 3
		Tur	HACCP Cecal												5 2	2
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	2 98	1 78	0 48	0 34	1 22	3 26	2 28	0 18	0 15	0 14	1 16	0 23 14	3 14 4
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	2	1	2	2	2	3	3	1	5	7	6	21 4 21	10 1 13
	Antimicrobial		Cecal (Sows)												4	6
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source													
Penicillins	Ampicillin (MIC ≥ 32 μg/ml)		Humans	33.8% 133	36.4% 149	32.2% 123	29.0% 127	28.2% 115	31.6% 128	26.3% 104	28.1% 104	26.2% 94	26.0% 84	23.6% 70	16.6% 54	19.8% 52
	(o = 02 pg/)	S	Retail Chickens	33.3%	72.7% 16	53.1% 26	55.2% 16	57.1% 12	48.0% 12	60.3% 41	68.0% 83	69.6% 55	66.7% 44	56.8% 50	55.9% 38	50.0% 19
		Chickens	HACCP	45.3% 68	32.1% 50	46.8% 80	26.8% 49	42.9% 45	37.3% 31	28.6%	33.3% 12	35.2% 19	10.0%	27.6% 29	10.9%	16.0% 13
		ర్	Cecal	- 55	- 55	- 55			<u> </u>	20	12			20	20.0%	18.5% 5
			Retail Ground Turkey	0.0%	100.0% 2	50.0%	100.0%		100.0%	0.0%	0.0%	66.7% 4	87.5% 7	44.4% 4	100.0%	50.0%
		Turkeys	HACCP	55.6% 5	66.7% 4	28.6%	57.1% 4	80.0% 4	83.3% 5	33.3% 1	50.0% 1	50.0%	0.0%	75.0% 3	20.0%	66.7%
		1	Cecal	J	7	7			J		•				50.0%	50.0%
			Retail Ground Beef	0.0%	0.0%			100.0%	0.0%	50.0% 1				0.0%	,	0.0%
		<u>a</u>	HACCP	71.4% 70	59.0% 46	60.4% 29	73.5% 25	63.6% 14	61.5% 16	50.0% 14	83.3% 15	53.3% 8	57.1% 8	37.5% 6	39.1% 9	3.7%
		Cattle	Cecal (Beef)	70	40	2.5	23	14	10	14	13	0	0		57.1% 8	25.0%
			Cecal (Dairy)												66.7% 14	80.0%
			Retail Pork Chops	50.0%	100.0%	50.0%	100.0%	100.0%	0.0%	0.0%	100.0%	20.0%	28.6%	16.7%	75.0% 3	100.0%
		Swine	Cecal (Market Swine)	'	ı	'	2		0	U	'	'	2	1	66.7% 14	53.8%
		Ó	Cecal (Sows)												50.0%	66.7% 4
Phenicols	Chloramphenicol		Humans	23.4%	28.4%	24.3%	24.4%	22.1%	25.4%	23.5%	20.5%	20.3%	19.8%	18.2%	13.5%	16.0%
	(MIC ≥ 32 μg/mI)		Retail Chickens	0.0%	9.1%	93 4.1%	3.4%	0.0%	0.0%	0.0%	76 0.0%	3.8%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	16.0%	5.1%	1.8%	8.2%	7.6%	1.2%	1.4%	0.0%	3.7%	0.0%	0.0%	0.0%	2.5%
		Chi	Cecal	24	8	3	15	8	1	1	0	2	0	0	0.0%	0.0%
			Retail Ground Turkey	0.0%	50.0%	50.0%	0.0%		100.0%	0.0%	0.0%	16.7%	0.0%	0.0%	100.0%	0.0%
		Turkeys	HACCP	66.7%	50.0%	28.6%	57.1%	60.0%	66.7%	33.3%	0.0%	50.0%	0.0%	25.0%	0.0%	0.0%
		T	Cecal	6	3	4	4	3	4	1	0	2	0	1	0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%			100.0%	0.0%	50.0%				0.0%	0	0.0%
			HACCP	0 49.0%	0 42.3%	54.2%	47.1%	50.0%	0 65.4%	1 35.7%	66.7%	46.7%	42.9%	43.8%	30.4%	1.2%
		Cattle	Cecal (Beef)	48	33	26	16	11	17	10	12	7	6	7	7 28.6%	0.0%
			Cecal (Dairy)												4 61.9%	70.0%
			Retail Pork Chops	50.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	100.0%	60.0%	28.6%	0.0%	13 75.0%	7 0.0%
		Swine	Cecal (Market Swine)	1	1	2	2	0	0	0	1	3	2	0	28.6%	0 46.2%
		Š	Cecal (Sows)												6 25.0%	50.0%
Quinolones	Ciprofloxacin		Humans	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.8%	0.0%	0.0%	0.3%	0.0%	0.4%
	(MIC ≥ 1 μg/ml)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic	Cecal	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		-	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ţ		0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		-	Cecal Retail Ground Beef	0.0%	0.0%			0.0%	0.0%	0.0%				0.0%	0	0.0%
				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
			Cecal (Beef)												0.0%	0.0%
		-	Cecal (Dairy)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Эе	Retail Pork Chops	0.076	0.076	0.078	0.076	0.076	0.076	0.076	0.076	0.076	0.078	0.076	0.078	0.0%
		Swine	Cecal (Market Swine)												1 0.0%	0.0%
			Cecal (Sows)												0.0%	0.0%

Table 29e. Antimicro	obial Resistance am	ong (Salmonella Typhim													
Year			Umana	2002 394	2003 409	2004 382	2005 438	2006 408	2007 405	2008 396	2009 370	2010 359	2011 323	2012 296	2013 325	2014 262
Number of Isolates Test	ted	S	Humans	1												
		Chickens	Retail Chickens HACCP Cecal	9 150	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55 15	38 81 27
		Turkeys	Retail Ground Turkey HACCP Cecal	2 9	2 6	2 14	1 7	0 5	1 6	1 3	1 2	6 4	8 2	9 4	1 5 2	2 3 2
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	2 98	1 78	0 48	0 34	1 22	3 26	2 28	0 18	0 15	0 14	1 16	0 23 14 21	3 14 4 10
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	2	1	2	2	2	3	3	1	5	7	6	4 21 4	1 13 6
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source													
Quinolones	Nalidixic Acid (MIC ≥ 32 μg/ml)		Humans	1.3% 5	1.2% 5	0.5% 2	0.9% 4	0.7% 3	1.5% 6	1.0% 4	2.2% 8	1.4% 5	0.3% 1	1.7% 5	1.5% 5	2.7% 7
	(o = 62 pg)	_	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	2.7%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic	Cecal	4	0	0	2	0	0	0	0	0	0	0	0.0%	0.0%
				0.0%	50.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ske	Retail Ground Turkey	0 1.0%	0.0%	0 6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP	1	0.070	3	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0	0
			Cecal												0.0% 0	0.0% 0
			Retail Ground Beef	0.0%	0.0%			0.0% 0	0.0%	0.0%				0.0% 0		0.0% 0
		tle	HACCP	1.0% 1	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	6.2% 1	8.7% 2	0.0% 0
		Cattle	Cecal (Beef)					-		-					0.0%	0.0%
			Cecal (Dairy)												0.0%	0.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0	4.8%	0.0%
		Š	Cecal (Sows)												0.0%	0.0%
Tetracyclines	Tetracycline	╁		32.0%	38.1%	30.4%	30.4%	31.6%	36.8%	27.8%	28.9%	29.0%	27.2%	27.0%	0 21.2%	0 22.5%
,	(MIC ≥ 16 μg/ml)		Humans	126 44.4%	156 31.8%	116 71.4%	133 69.0%	129 90.5%	149 72.0%	110 92.6%	107 95.9%	104 92.4%	88 92.4%	80 88.6%	69 92.7%	59 97.4%
		ens	Retail Chickens	4 28.0%	7 33.3%	35 44.4%	20 34.4%	19 61.0%	18 60.2%	63 64.3%	117 55.6%	73 72.2%	61 66.7%	78 81.9%	63 74.5%	37 77.8%
		Chickens	HACCP	42	52	76	63	64	50	45	20	39	20	86	41	63
			Cecal												93.3% 14	92.6% 25
		ø	Retail Ground Turkey	0.0%	50.0% 1	100.0% 2	0.0% 0		100.0% 1	0.0%	100.0% 1	66.7% 4	87.5% 7	44.4% 4	100.0% 1	100.0% 2
		Turkeys	HACCP	77.8% 7	100.0% 6	78.6% 11	57.1% 4	100.0% 5	66.7% 4	66.7% 2	50.0% 1	50.0% 2	0.0% 0	75.0% 3	40.0% 2	100.0% 3
		F	Cecal		-			_		_				-	100.0%	100.0%
			Retail Ground Beef	0.0%	0.0%			100.0%	0.0%	50.0%				0.0%		0.0%
		٥	HACCP	64.3%	53.8%	60.4%	67.6%	54.5%	65.4%	50.0%	88.9%	60.0%	57.1%	62.5%	39.1%	3.7%
		Cattle	Cecal (Beef)	63	42	29	23	12	17	14	16	9	8	10	9 71.4%	3 25.0%
			Cecal (Dairy)												10 66.7%	1 90.0%
		\vdash		100.0%	100.0%	100.0%	100.0%	100.0%	66.7%	33.3%	100.0%	60.0%	57.1%	16.7%	14 75.0%	9 100.0%
		ЭС	Retail Pork Chops	2	1	2	2	2	2	1	1	3	4	1	3 61.9%	1 69.2%
		Swine	Cecal (Market Swine)												13 75.0%	9 66.7%
			Cecal (Sows)												75.0%	4

Table 30a. Resistance Patterns among Salmonella Typhimurium Isolates. 2003-2014¹

Table 30a. Resistance Patte	erns a	among Saimoneila		2004	2005		2007	2009	2000	2010	2011	2012	2012	2014
Year Number of Isolates Tested		Humans	2003 409	382	2005 438	2006 408	2007 405	2008 396	2009 370	2010 359	2011 323	2012 296	2013 325	2014 262
	Chickens	Retail Chickens HACCP Cecal	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55 15	38 81 27
	Turkeys	Retail Ground Turkey HACCP	2 6	2 14	1 7	0 5	1 6	1 3	1 2	6 4	8 2	9	1 5	2 3
	-	Cecal Retail Ground Beef	1	0	0	1	3	2	0	0	0	1	0	3
	Cattle	HACCP Cecal (Beef)	78	48	34	22	26	28	18	15	14	16	23 14	14 4
	Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	1	2	2	2	3	3	1	5	7	6	21 4 21	10 1 13
Resistance Pattern	Š	Cecal (Sows) Source											4	6
No Resistance Detected		Humans	54.5% 223	60.5% 231	65.3% 286	62.5% 255	57.5%	68.2%	63.5% 235	66.9% 240	69.0% 223	68.6% 203	69.5% 226	68.7% 180
1. No Resistance Detected		Retail Chickens	22.7%	14.3%	24.1%	0.0%	233 24.0% 6	270 5.9% 4	2.5%	3.8%	6.1%	9.1%	7.4% 5	2.6%
	Chickens	HACCP	45.5% 71	40.9% 70	54.1% 99	30.5% 32	30.1% 25	28.6% 20	33.3% 12	22.2%	30.0%	15.2% 16	23.6%	17.3% 14
	ర్	Cecal	/1	70	99	32	25	20	12	12	9	16	6.7%	3.7%
		Retail Ground Turkey	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	33.3%	12.5%	44.4%	0.0%	0.0%
	Turkeys	HACCP	0.0%	14.3%	42.9%	0.0%	16.7%	0.0%	0.0%	50.0%	100.0%	25.0%	60.0%	0.0%
	₽	Cecal	0	2	3	0	1	0	0	2	2	1	0.0%	0.0%
	_	Retail Ground Beef	100.0%			0.0%	100.0%	50.0%				100.0%	0	100.0%
		HACCP	39.7%	35.4%	26.5%	0 31.8%	3 34.6%	1 46.4%	5.5%	40.0%	42.9%	1 37.5%	56.5%	3 71.4%
	Cattle	Cecal (Beef)	31	17	9	7	9	13	1	6	6	6	13 28.6%	10 75.0%
		Cecal (Dairy)											33.3%	3 10.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	33.3%	66.7%	0.0%	0.0%	28.6%	50.0%	7 25.0%	0.0%
	Swine	Cecal (Market Swine)	0	0	0	0	1	2	0	0	2	3	1 19.0%	23.1%
	Š	Cecal (Sows)											0.0%	3 16.7%
		Humans	37.4%	31.4%	29.9%	30.4%	33.8%	27.5%	28.1%	27.0%	26.3%	24.7%	0 16.9%	1 21.8%
2. Resistant to ≥ 3 Antimicrobial Classes		Retail Chickens	153 72.7%	120 53.1%	131 55.2%	124 61.9%	137 60.0%	109 67.6%	104 73.0%	97 74.7%	85 68.2%	73 65.1%	55 60.3%	57 52.6%
	Chickens	HACCP	16 32.1%	26 46.8%	16 27.9%	13 46.7%	15 39.8%	46 28.6%	89 36.1%	59 37.0%	45 16.7%	58 32.4%	41 14.5%	20 16.0%
	Chic	Cecal	50	80	51	49	33	20	13	20	5	34	8 20.0%	13 29.6%
		Retail Ground Turkey	100.0%	50.0%	100.0%		100.0%	0.0%	0.0%	66.7%	87.5%	44.4%	3 100.0%	8 50.0%
	Turkeys	HACCP	2 100.0%	1 71.4%	1 57.1%	80.0%	1 83.3%	0 33.3%	0 50.0%	4 50.0%	7 0.0%	4 75.0%	1 20.0%	1 0.0%
	Tu-	Cecal	6	10	4	4	5	1	1	2	0	3	100.0%	0 100.0%
			0.0%			100.0%	0.0%	50.0%				0.0%	2	2 0.0%
		Retail Ground Beef HACCP	0 59.0%	60.4%	73.5%	1 59.1%	0 65.4%	1 50.0%	83.3%	53.3%	57.1%	0 50.0%	39.1%	0 14.3%
	Cattle	Cecal (Beef)	46	29	25	13	17	14	15	8	8	8	9 57.1%	2 25.0%
		, ,											8 66.7%	90.0%
		Cecal (Dairy)	100.0%	100.0%	100.0%	100.0%	0.0%	33.3%	100.0%	80.0%	57.1%	16.7%	14 75.0%	9 100.0%
	ne J	Retail Pork Chops	1	2	2	2	0	1	1	4	4	1	3 57.1%	1 61.5%
	Swine	Cecal (Saws)											12 75.0%	8 66.7%
		Cecal (Sows)	32.0%	27.2%	26.7%	25.7%	29.6%	24.7%	24.1%	24.2%	22.0%	20.9%	3 14.8%	4 18.7%
3. Resistant to ≥ 4 Antimicrobial Classes	-	Humans Potail Chickons	131 36.4%	104 46.9%	117 48.3%	105 47.6%	120 40.0%	98	89 58.2%	87 62.0%	71 51.5%	62 56.8%	48 52.9%	49 50.0%
	kens	Retail Chickens HACCP	8	23	14 21.3%	10 38.1%	10	34 25.7%	71 25.0%	49 31.5%	34 6.7%	50 28.6%	36 9.1%	19 12.3%
	Chickens	Cecal	31	64	39	40	26	18	9	17	2	30	5 13.3%	10 14.8%
		Retail Ground Turkey	50.0%	50.0%	0.0%		100.0%	0.0%	0.0%	66.7%	62.5%	44.4%	2 100.0%	4 0.0%
	Turkeys	HACCP	66.7%	28.6%	0 57.1%	60.0%	66.7%	33.3%	0 50.0%	50.0%	5 0.0%	75.0%	0.0%	0.0%
	Ę	Cecal	4	4	4	3	4	1	1	2	0	3	0.0%	50.0%
	-	Retail Ground Beef	0.0%			100.0%	0.0%	50.0%				0.0%	0	0.0%
	Φ.	HACCP	51.3%	60.4%	61.8%	50.0%	61.5%	46.4%	72.2%	53.3%	57.1%	0 43.8%	34.8%	14.3%
	Cattle	Cecal (Beef)	40	29	21	11	16	13	13	8	8	7	57.1%	25.0%
		Cecal (Dairy)											66.7%	90.0%
		Retail Pork Chops	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	100.0%	20.0%	28.6%	16.7%	75.0%	100.0%
	Swine	Cecal (Market Swine)	1	2	2	2	0	0	1	1	2	1	47.6%	46.2%
	Ś	Cecal (Sows)											10 50.0%	50.0%
		ntimicrobial classes with											2	3

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 30b. Resistance Patterns among Salmonella Typhimurium Isolates, 2003-2014¹

Table 30b. Resistance Patte	erns a	mong Salmonella					2007	2000	2000	2042	0044	2040	1 0040	004.4
Year Number of Isolates Tested		Humans	2003 409	2004 382	2005 438	2006 408	2007 405	2008 396	2009 370	2010 359	2011 323	2012 296	2013 325	2014 262
	Chickens	Retail Chickens HACCP	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55	38 81
		Cecal Retail Ground Turkey	2	2	1	0	1	1	1	6	8	9	15 1	27 2
	Turkeys	HACCP Cecal	6	14	7	5	6	3	2	4	2	4	5 2	3 2
		Retail Ground Beef	1	0	0	1	3	2	0	0	0	1	0	3
	Cattle	HACCP Cecal (Beef)	78	48	34	22	26	28	18	15	14	16	23 14	14 4
		Cecal (Dairy)								-	_		21	10
	Swine	Retail Pork Chops Cecal (Market Swine)	1	2	2	2	3	3	1	5	7	6	4 21	1 13
Resistance Pattern	0)	Cecal (Sows) Source											4	6
4. Resistant to ≥ 5		Humans	27.9% 114	24.3% 93	22.8% 100	20.8% 85	24.9% 101	24.0% 95	21.9% 81	20.9% 75	21.1% 68	18.6% 55	12.3% 40	15.6% 41
Antimicrobial Classes	s	Retail Chickens	27.3% 6	44.9% 22	48.3% 14	47.6% 10	40.0% 10	47.1% 32	56.6% 69	60.8% 48	50.0% 33	55.7% 49	50.0% 34	47.4% 18
	Chickens	HACCP	16.7% 26	36.3% 62	19.7% 36	35.2% 37	30.1% 25	22.8% 16	25.9% 9	29.6% 16	6.7% 2	26.7% 28	9.1% 5	12.3% 10
	O	Cecal											13.3% 2	14.8% 4
		Retail Ground Turkey	50.0% 1	50.0%	0.0%		100.0% 1	0.0% 0	0.0% 0	66.7% 4	62.5% 5	22.2% 2	100.0%	0.0%
	Turkeys	HACCP	50.0%	28.6%	57.1% 4	60.0%	33.3%	33.3%	50.0%	50.0%	0.0%	75.0% 3	0.0%	66.7%
	Ĕ	Cecal	3	4	4	3	2		,	2	0	3	0.0%	50.0%
		Retail Ground Beef	0.0%			100.0%	0.0%	50.0%				0.0%	0	0.0%
	Φ.	HACCP	33.3%	58.3%	50.0%	1 50.0%	0 50.0%	1 35.7%	72.2%	46.7%	42.9%	0 37.5%	30.4%	7.1%
	Cattle	Cecal (Beef)	26	28	17	11	13	10	13	7	6	6	7 35.7%	0.0%
		Cecal (Dairy)											5 61.9%	60.0%
		Retail Pork Chops	100.0%	50.0%	100.0%	0.0%	0.0%	0.0%	100.0%	20.0%	28.6%	0.0%	13 75.0%	0.0%
	Swine	Cecal (Market Swine)	1	1	2	0	0	0	1	1	2	0	3 38.1%	0 46.2%
	Sw	Cecal (Sows)											8 25.0%	6 50.0%
			26.7%	23.6%	22.4%	19.6%	22.7%	23.2%	19.5%	18.7%	19.8%	17.2%	1 12.0%	3 14.5%
5. At Least ACSSuT ³ Resistant		Humans	109	90	98	80	92	92	72	67 2.5%	64	51	39	38
	ens	Retail Chickens	2 3.2%	1.8%	1 7.1%	0	0	0	0.0%	2 3.7%	0	0	0	0 3.7%
	Chickens	HACCP	5	3	13	7	1.2%	0.0%	0.0%	2	0.0%	0.0%	0.0%	3.7%
		Cecal	50.00/	50.00/	0.00/		400.00/	0.004	2.22/	10 70/	2.20/	0.00/	0	0
	ys	Retail Ground Turkey	50.0%	50.0%	0.0%		100.0%	0.0%	0.0%	16.7%	0.0%	0.0%	100.0%	0.0%
	Turkeys	HACCP	50.0% 3	28.6% 4	57.1% 4	60.0%	33.3% 2	33.3% 1	0.0% 0	50.0% 2	0.0% 0	25.0% 1	0.0%	0.0%
		Cecal	0.00/			400.00/	0.00/	50.00/				0.00/	0.0%	0.0%
		Retail Ground Beef	0.0%	E4.00/	44.00/	100.0%	0.0%	50.0%	00.70/	40.70/	40.00/	0.0%	20.40/	0.0%
	Cattle	HACCP	28.2% 22	54.2% 26	41.2% 14	50.0% 11	50.0% 13	35.7% 10	66.7% 12	46.7% 7	42.9% 6	37.5% 6	30.4% 7 28.6%	7.1% 1 0.0%
		Cecal (Beef)											4	0
		Cecal (Dairy)	100.0%	50.0%	100.0%	0.0%	0.0%	0.0%	100.0%	20.0%	28.6%	0.0%	61.9% 13 75.0%	60.0% 6 0.0%
	ē	Retail Pork Chops	100.0%	1	100.0%	0.0%	0.0%	0.0%	100.0%	1	28.6%	0.0%	75.0% 3 28.6%	0.0%
	Swine	Cecal (Market Swine)											6 25.0%	6 50.0%
		Cecal (Sows)	3.2%	1.6%	2.1%	0.7%	2.0%	0.5%	2.2%	1.1%	0.6%	0.7%	1 0.0%	3 1.5%
6. At Least ACT/S ⁴ Resistant	-	Humans	13	6	9	3 0.0%	8 0.0%	0.5%	8 0.0%	4 0.0%	0.6% 2 0.0%	0.7%	0.0%	4 0.0%
	sua	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.070	0	0	0.070	0.070	0	0.070	0.070	0.070	0	0.0%	0.0%
	-	Cecal	0.0%			0.0%	0.0%	0.0%				0.0%	0	0.0%
		Retail Ground Beef	0 2.6%	4.2%	2.9%	0 4.5%	0.0%	0.0%	5.6%	6.7%	0.0%	6.3%	0.0%	0.0%
	Cattle	HACCP	2	2	1	1	0	0	1	1	0	1	0.0%	0.0%
		Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy) Retail Pork Chops	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	e.	Cecal (Market Swine)	0	0	1	0	0	0	1	0	0	0	0.0%	7.7%
	Swine												0.0%	0.0%
¹ Starting in 2011, testing included r	nine ar	Cecal (Sows)	the addition	of the macr	olide azithron	avoin Rossu	no registance	to azithrom	voin is low (in	this soon	19/)		0	0

The starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 30c. Resistance Patterns among Salmonella Typhimurium Isolates, 2003-2014

Table 30c. Resistance Patte	,,,,,	intong Gaintonella		2004			2007	2008	2009	2010	2011	2012	2013	2014
Year Number of Isolates Tested	1	Humans	2003 409	382	2005 438	2006 408	405	396	370	359	323	296	325	262
	Chickens	Retail Chickens HACCP Cecal	22 156	49 171	29 183	21 105	25 83	68 70	122 36	79 54	66 30	88 105	68 55	38 81 27
	Turkeys	Retail Ground Turkey HACCP Cecal	2 6	2 14	1 7	0 5	1 6	1 3	1 2	6 4	8 2	9 4	1 5 2	2 3 2
	Cattle	Retail Ground Beef HACCP Cecal (Beef)	1 78	0 48	0 34	1 22	3 26	2 28	0 18	0 15	0 14	1 16	0 23 14	3 14 4
	Swine	Cecal (Dairy) Retail Pork Chops HACCP ¹ Cecal (Market Swine) Cecal (Sows)	1 27	2 53	2 42	2 25	3 44	3 10	1 20	5 13	7 5	6 0	21 4 0 21 4	10 1 0 13 6
Resistance Pattern		Source	0.40/	0.00/	1.00/	0.00/	0.70/	0.00/	4.00/	4 70/	E 00/	4.40/	0.00/	1.00/
7. At Least ACSSuTAuCx ¹ Resistant		Humans	2.4% 10 0.0%	2.6% 10 4.1%	1.8% 8 0.0%	2.9% 12 0.0%	3.7% 15 0.0%	2.3% 9 0.0%	1.6% 6 0.0%	1.7% 6 0.0%	5.3% 17 0.0%	4.1% 12 0.0%	2.2% 7 0.0%	4.2% 11 0.0%
	Chickens	Retail Chickens HACCP	0.6%	2 0.0%	0 1.1%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%	0.0%	1.2%
	Chic	Cecal	1	0	2	0	0	0	0	1	0	0	0.0%	0.0%
		Retail Ground Turkey	50.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 0.0% 0	0 0.0% 0
	Turkeys	HACCP	16.7% 1	14.2%	0.0%	0.0%	16.7% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal											0.0%	0.0%
		Retail Ground Beef	0.0% 0 12.8%	20.8%	26.5%	0.0% 0 22.7%	0.0% 0 26.9%	0.0% 0 21.4%	16.7%	20.0%	35.7%	0.0% 0 12.5%	30.4%	0.0% 0 0.0%
	Cattle	HACCP Cecal (Beef)	10	10	9	5	7	6	3	3	5	2	7 14.3%	0
		Cecal (Beer)											2 52.4%	0 50.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)	0	0	0	U	0	U	U	0	0	0	0.0%	7.7%
	0,	Cecal (Sows)											0.0%	33.3% 2
8. At Least Ceftriaxone and		Humans	0.0% 0	0.0%	0.0%	0.0%	0.2% 1	0.0%	0.5% 2	0.3% 1	0.0%	0.7% 2	0.0%	0.4% 1
Nalidixic Acid Resistant	S	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0% 0	0.0%	0.5% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	O	Cecal											0.0% 0	0.0%
	S.	Retail Ground Turkey	50.0% 1	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Turkeys	HACCP	16.7% 1	14.3% 2	0.0%	0.0%	16.7% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0 0.0%
		Cecal	0.0%			0.0%	0.0%	0.0%				0.0%	0.0%	0.0%
		Retail Ground Beef	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.7%	0.0%
	Cattle	HACCP Cecal (Beef)	0	2	0	0	0	0	0	0	0	0	0.0%	0.0%
		Cecal (Beer)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0 0.0% 0	0 0.0% 0
	0,	Cecal (Sows)											0.0%	0.0%

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 31a. Antimicrobial Resistance among Salmonella Newport Isolates, 2003-2014

Table 31a. Antimicro	bolai Resistance amo	ong .	Salmonella Newpo				2006	2007	2000	2000	2010	2011	2012	2012	2014
Year Number of Isolates Tes	ted		Humans	2003 226	2004 192	2005 207	2006 219	2007 222	2008 258	2009 239	2010 306	2011 285	2012 258	2013 209	2014 235
Number of Isolates Tes	ieu	su	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
		Chickens	HACCP	7	0	6	0	3	1	0	1	1	2	2	2
		0	Cecal											0	0
		rkeys	Retail Ground Turkey HACCP	2 19	2 7	3 5	0 4	0 15	3 8	3	2 5	0 4	2 4	0 4	0 6
		Tur	Cecal											0	0
		Φ	Retail Ground Beef	1	2	0	0	0	3	2	2	0	1	0	2
		Cattle	HACCP Cecal (Beef)	75	44	27	30	30	31	17	5	13	5	13 8	17 1
			Cecal (Dairy)											7	15
		Swine	Retail Pork Chops	1	0	0	0	0	0	0	0	0	0	0	0
		ð	Cecal (Market Swine) Cecal (Sows)											3 4	5 1
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)	<u> </u>	Source	2.40/	0.50/	1.00/	0.00/	0.00/	0.40/	0.40/	0.20/	0.70/	0.00/	0.50/	0.40/
Aminoglycosides	Gentamicin (MIC ≥ 16 µg/ml)		Humans	3.1% 7	0.5% 1	1.0% 2	0.9% 2	0.9% 2	0.4% 1	0.4% 1	0.3% 1	0.7% 2	0.0%	0.5% 1	0.4% 1
		S	Retail Chickens							0.0%			0.0%	0.0%	
		Chickens	HACCP	0.0%		16.7% 1		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
		ò	Cecal	J		·			- J				- J	J	, i
			Retail Ground Turkey	50.0%	0.0%	0.0%			33.3%	33.3%	50.0%		50.0%		
		Turkeys	HACCP	1 52.6%	0 14.3%	0 80.0%	50.0%	0.0%	25.0%	66.7%	0.0%	0.0%	0.0%	0.0%	0.0%
		Tur		10	1	4	2	0	2	2	0	0	0	0	0
		_	Cecal	0.007	0.001				0.001	0.001	0.004		0.004		0.004
			Retail Ground Beef	0.0% 0	0.0%				0.0%	0.0% 0	0.0%		0.0%		0.0% 0
		te te	HACCP	1.3% 1	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops	0.0%										0	0
		ne		0										0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0	0
	Streptomycin (MIC ≥ 64 µg/ml)		Humans	24.3% 55	16.1% 31	14.0% 29	14.2% 31	10.4% 23	13.6% 35	8.4% 20	8.5% 26	4.2% 12	3.9% 10	5.7% 12	4.7% 11
	, , ,		Retail Chickens							0.0% 0			0.0%	0.0%	
		Chickens	HACCP	85.7%		50.0%		0.0%	100.0%	Ů	0.0%	0.0%	0.0%	0.0%	0.0%
		5	Cecal	6		3		0	1		0	0	0	0	0
				50.0%	0.0%	0.0%			33.3%	33.3%	50.0%		50.0%		
		ske	Retail Ground Turkey	1 31.6%	0 14.3%	0 80.0%	0.0%	6.7%	1 25.0%	1 66.7%	0.0%	0.0%	1 25.0%	0.0%	0.0%
		Turkeys	HACCP	6	14.3%	4	0.0%	1	25.0%	2	0.0%	0.0%	1	0.0%	0.0%
			Cecal												
			Retail Ground Beef	100.0% 1	100.0%				66.7% 2	0.0%	100.0%		0.0%		100.0%
		<u>a</u>	HACCP	84.0% 63	84.1% 37	81.5% 22	83.3% 25	83.3% 25	74.2%	70.6%	60.0%	76.9% 10	80.0% 4	76.9%	52.9%
		Cattle	Cecal (Beef)	63	31	22	23	23	23	12	3	10	4	10 75.0%	0.0%
			Cecal (Dairy)											6 71.4%	53.3%
		-		100.0%										5	8
		ē	Retail Pork Chops	1										66.7%	20.0%
		Swine	Cecal (Market Swine)											2	1
			Cecal (Sows)											0.0% 0	0.0% 0
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	21.7% 49	15.6% 30	12.6% 26	12.8% 28	8.1% 18	12.4% 32	7.5% 18	7.8% 24	3.9% 11	6.2% 16	5.3% 11	3.0% 7
combinations	(MIC ≥ 32 / 16 μg/ml)		Retail Chickens	.,	- 55			.,	, v-	0.0%			0.0%	0.0%	
		Chickens	HACCP	85.7%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
		S	Cecal	6		3		0	1		0	0	0	0	0
		-		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
		s/s	Retail Ground Turkey	0	0	0	25 00/	6 70/	0	0	0	25.00/	1	0.00/	0.007
		Turkeys	HACCP	10.5% 2	14.3% 1	0.0% 0	25.0% 1	6.7% 1	25.0% 2	33.3% 1	20.0% 1	25.0% 1	0.0%	0.0% 0	0.0% 0
		Ľ	Cecal												
			Retail Ground Beef	100.0% 1	100.0% 2				66.7% 2	0.0% 0	50.0% 1		0.0%		100.0% 2
		Φ	HACCP	81.3%	77.3%	81.5%	76.7%	76.7%	64.5%	58.8%	60.0%	76.9%	40.0%	76.9%	52.9%
		Cattle	Cecal (Beef)	61	34	22	23	23	20	10	3	10	2	75.0%	9 0.0%
														6 71.4%	0 53.3%
		_	Cecal (Dairy)	100.00/										5	8
		m	Retail Pork Chops	100.0% 1											
		Swine	Cecal (Market Swine)											33.3% 1	20.0% 1
			Cecal (Sows)											0.0% 0	0.0%
	1		ı												

Table 31b. Antimicro	obial Resistance am	ong	Salmonella Newpo	rt Isolate:	s, 2003-20 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	226	192	2005	219	222	258	239	306	285	258	2013	235
		sues	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
		Chickens	HACCP Cecal	7	0	6	0	3	1	0	1	1	2	2	2
		_	Retail Ground Turkey	2	2	3	0	0	3	3	2	0	2	0	0
		Turkeys	HACCP Cecal	19	7	5	4	15	8	3	5	4	4	4 0	6
			Retail Ground Beef	1	2	0	0	0	3	2	2	0	1	0	2
		Cattle	HACCP	75	44	27	30	30	31	17	5	13	5	13	17
			Cecal (Beef) Cecal (Dairy)											8 7	1 15
		эс	Retail Pork Chops	1	0	0	0	0	0	0	0	0	0	0	0
		Swine	Cecal (Market Swine) Cecal (Sows)											3 4	5 1
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Cephems	Cefoxitin (MIC ≥ 32 µg/ml)		Humans	21.7% 49	15.6% 30	12.6% 26	13.2% 29	8.1% 18	12.4% 32	6.7% 16	7.5% 23	3.9% 11	6.2% 16	5.3% 11	3.0% 7
		S	Retail Chickens							0.0%			0.0%	0.0%	
		Chickens	HACCP	71.4% 5		50.0% 3		0.0%	100.0% 1		0.0%	0.0%	0.0%	0.0%	0.0%
		ō	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
		Turkeys	HACCP	10.5%	14.3%	0.0%	25.0%	6.7%	25.0%	33.3%	20.0%	25.0%	0.0%	0.0%	0.0%
		TuT	Cecal	2	1	0	1	1	2	1	1	1	0	0	0
		-		100.0%	100.0%				66.7%	0.0%	50.0%		0.0%		100.0%
			Retail Ground Beef	1 74.7%	2 77.3%	81.5%	70.0%	76.7%	64.5%	0 52.9%	1 60.0%	76.9%	0 40.0%	76.9%	2 52.9%
		Cattle	HACCP	74.7% 56	34	22	21	23	20	6	3	10	2	10	9
		O	Cecal (Beef)											75.0% 6	0.0%
			Cecal (Dairy)											71.4% 5	53.3% 8
			Retail Pork Chops	100.0% 1											
		Swine	Cecal (Market Swine)											33.3% 1	20.0%
		(O)	Cecal (Sows)											0.0%	0.0%
	Ceftiofur	+	Humans	22.1%	15.6%	12.6%	12.8%	8.1%	12.4%	7.1%	7.5%	3.9%	6.2%	5.3%	3.0%
	(MIC ≥ 8 μg/ml)	-	Retail Chickens	50	30	26	28	18	32	17 0.0%	23	11	16 0.0%	0.0%	7 0.0%
		Chickens	HACCP	85.7%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic		6		3		0	1		0	0	0	0	0
			Cecal	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
		sk	Retail Ground Turkey	0	0	0	25.00/	0.70/	0	0	0	25.00/	1	0.00/	0.00/
		Turkeys	HACCP	10.5% 2	14.3% 1	0.0%	25.0% 1	6.7% 1	25.0% 2	33.3% 1	20.0% 1	25.0% 1	0.0%	0.0% 0	0.0%
		Ĺ	Cecal												
			Retail Ground Beef	100.0% 1	100.0%				66.7% 2	0.0%	50.0% 1		0.0%		100.0% 2
		<u>e</u>	HACCP	81.3% 61	77.3% 34	81.5% 22	76.7% 23	76.7% 23	64.5% 20	58.8% 10	60.0%	76.9% 10	40.0% 2	76.9% 10	52.9% 9
		Cattle	Cecal (Beef)	,	3,					.,		ı.v		75.0%	0.0%
			Cecal (Dairy)											71.4%	53.3%
		-	Retail Pork Chops	100.0%										5	8
		ine	Cecal (Market Swine)	1										33.3%	20.0%
		Swine	, ,											0.0%	0.0%
Cephems	Ceftriayono	1	Cecal (Sows)	21.7%	15.1%	12.6%	12.8%	8.1%	12.4%	7.1%	7.5%	3.9%	6.2%	0.0%	0.0%
Серпеніз	Ceftriaxone (MIC ≥ 4 μg/ml)	<u> </u>	Humans	49	15.1%	12.6%	12.8%	8.1% 18	32	17	7.5%	3.9%	16	11	7
		ns	Retail Chickens							0.0%			0.0%	0.0%	0.0%
		Chickens	HACCP	85.7% 6		50.0% 3		0.0% 0	100.0% 1		0.0%	0.0%	0.0%	0.0%	0.0%
		O	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0% 1		
		Turkeys	HACCP	10.5%	14.3%	0.0%	25.0%	6.7%	25.0%	33.3%	20.0%	25.0%	0.0%	0.0%	0.0%
		ΞĪ	Cecal	2	1	0	1	1	2	1	1	1	0	0	0
		-	Retail Ground Beef	100.0%	100.0%				66.7%	0.0%	50.0%		0.0%		100.0%
				1 81.3%	2 77.3%	81.5%	76.7%	76.7%	2 64.5%	0 58.8%	1 60.0%	76.9%	0 40.0%	76.9%	2 52.9%
		Cattle	HACCP	61	34	22	23	23	20	10	3	10	2	10 75.0%	9
		0	Cecal (Beef)											6	0
		_	Cecal (Dairy)											71.4% 5	53.3% 8
			Retail Pork Chops	100.0% 1											
		Swine	Cecal (Market Swine)											33.3% 1	20.0% 1
		"	Cecal (Sows)											0.0%	0.0%
	1		1											U	U

Table 31c. Antimicrobial Resistance among Salmonella Newport Isolates, 2003-2014

	bial Resistance amo	ong .	Salmonella Newpo				2000	2007	2000	2000	2040	2044	2042	2042	2044
Year Number of Isolates Test	ed		Humans	2003 226	2004 192	2005 207	2006 219	2007 222	2008 258	2009 239	2010 306	2011 285	2012 258	2013 209	2014 235
on soluted 1631		sue	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
		Chickens	HACCP	7	0	6	0	3	1	0	1	1	2	2	2
			Cecal Retail Ground Turkey	2	2	3	0	0	3	3	2	0	2	0	0
		Turkeys	HACCP	19	7	5	4	15	8	3	5	4	4	4	6
		F	Cecal											0	0
		<u>e</u>	Retail Ground Beef HACCP	1 75	2 44	0 27	0 30	0 30	3 31	2 17	2 5	0 13	1 5	0 13	2 17
		Cattle	Cecal (Beef)	/3	44	21	30	30	31	17	3	13	3	8	1
			Cecal (Dairy)											7	15
		Swine	Retail Pork Chops Cecal (Market Swine)	1	0	0	0	0	0	0	0	0	0	0	0 5
	T. A. Control Col	Ó	Cecal (Sows)											4	1
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Folate Pathway Inhibito	Breakpoint) Sulfamethoxazole/	1	Source	24.8%	17.2%	15.5%	15.5%	10.4%	13.2%	8.8%	7.8%	4.6%	3.9%	4.8%	4.7%
,	Sulfisoxazole ¹ (MIC ≥ 512 μg/ml)		Humans	56	33	32	34	23	34	21	24	13	10	10	11
	(WIC 2 312 µg/III)	SU	Retail Chickens							0.078			0	0	
		Chickens	HACCP	71.4% 5		50.0% 3		0.0% 0	100.0% 1		0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0
		0	Cecal												
			Retail Ground Turkey	50.0% 1	0.0%	0.0%			33.3% 1	33.3% 1	50.0% 1		50.0% 1		
		Turkeys	HACCP	52.6%	14.3%	80.0%	75.0%	0.0%	37.5%	100.0%	0.0%	25.0%	25.0%	0.0%	0.0%
		Τn	Cecal	10	1	4	3	0	3	3	0	1	1	0	0
		-		100.0%	100.0%				66.7%	0.0%	100.0%		0.0%		100.0%
			Retail Ground Beef	1 73.3%	2 77.3%	85.2%	83.3%	83.3%	2 74.2%	0 70.6%	2 60.0%	76.9%	0 80.0%	76.9%	2 47.1%
		Cattle	HACCP	73.3% 55	34	23	25	25	23	70.6% 12	3	10	80.0%	10	8
		ő	Cecal (Beef)											75.0% 6	0.0% 0
			Cecal (Dairy)											71.4% 5	53.3% 8
			Retail Pork Chops	100.0% 1											
		Swine	Cecal (Market Swine)	,										33.3%	20.0%
		prim- hoxazole	Cecal (Sows)											0.0%	0.0%
	Trimethoprim-			1.3%	2.1%	1.9%	3.7%	1.8%	3.1%	1.3%	1.3%	0.0%	0.4%	0.5%	0.4%
	Sulfamethoxazole (MIC ≥ 4 / 76 µg/ml)		Humans	3	4	4	8	4	8	3	4	0	1 0.0%	1 0.0%	1
	(MIC 2 4 / 76 µg/IIII)	SU	Retail Chickens							0.0%			0	0	
		Chickens	HACCP	0.0% 0		16.7% 1		0.0%	100.0% 1		0.0% 0	0.0%	0.0%	0.0%	0.0% 0
		0	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%			0.0% 0	0.0%	0.0%		0.0% 0		
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ī	Cecal	0	0	0	0	0	0	0	0	0	0	0	0
		-		0.0%	50.0%				0.0%	0.0%	0.0%		0.0%		0.0%
			Retail Ground Beef	0.0%	1 11.4%	25.9%	16.7%	13.3%	0 12.9%	0.0%	0 20.0%	7.7%	0.0%	15.4%	0 5.9%
		Cattle	HACCP	0.0%	5	7	5	4	4	0.0%	1	1.776	0.0%	2	1
		Ö	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops	0.0%											
		Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Ó	Cecal (Sows)											0.0%	0.0%
Macrolides	Azithromycin		Humans									0.0%	0.0%	0.0%	0.0%
	(MIC ≥32 μg/ml)	-	ı									0	0.0%	0.0%	0
		ens	Retail Chickens									0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP									0.0%	0.0%	0.0%	0.0%
		Ĺ	Cecal												
		s	Retail Ground Turkey										0.0%		
		Turkeys	HACCP									0.0%	0.0%	0.0%	0.0%
		ĭ	Cecal									0		U	U
		-	Retail Ground Beef										0.0%		0.0%
												0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP									0.076	0.076	0.0%	0.0%
		O	Cecal (Beef)											0	0
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops												
		Swine	Cecal (Market Swine)											0.0%	0.0%
		Ó	Cecal (Sows)											0.0%	0.0%
10 %			replaced by sulfisoxazol	o in 2004										0	0

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

	robial Resistance am	ong	Salmonella Newpo				2006	2007	2009	2000	2010	2011	1 2012	1 2012	2014
Year Number of Isolates Te	sted		Humans	2003 226	2004 192	2005 207	2006 219	2007 222	2008 258	2009 239	2010 306	2011 285	2012 258	2013 209	2014 235
		ens	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
		Chickens	HACCP Cecal	7	0	6	0	3	1	0	1	1	2	2	2
			Retail Ground Turkey	2	2	3	0	0	3	3	2	0	2	0	0
		Turkeys	HACCP	75	44	27	30	30	31	17	5	13	5	13	17
		-	Cecal Retail Ground Beef	1	2	0	0	0	3	2	2	0	1	8	2
		Cattle	HACCP	75	44	27	30	30	31	17	5	13	5	13	17
		ő	Cecal (Beef) Cecal (Dairy)											8 7	1 15
		Φ	Retail Pork Chops	1	0	0	0	0	0	0	0	0	0	0	0
		Swine	Cecal (Market Swine)											3	5
	Antimicrobial		Cecal (Sows)											4	1
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Penicillins	Ampicillin (MIC ≥ 32 μg/ml)		Humans	23.0% 52	16.1% 31	14.0% 29	15.5% 34	9.9% 22	14.3% 37	8.4% 20	7.8% 24	3.9% 11	7.0% 18	6.2% 13	3.8% 9
	(WIIO 2 02 pg/III)		Retail Chickens	JZ.	31	23	54	22	- Jr	0.0%	E4	.,	0.0%	0.0%	J
		Chickens	HACCP	85.7%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
		Ş	Cecal	6		3		0	1		0	0	0	0	0
				0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
		3ÀS	Retail Ground Turkey	0 15.8%	0 28.6%	0 20.0%	75.0%	6.7%	0 25.0%	33.3%	20.0%	25.0%	1 25.0%	0.0%	0.0%
		Turkeys	HACCP	3	28.6%	1	75.0%	1	25.0%	1	1	25.0%	25.0%	0.0%	0.0%
			Cecal												
			Retail Ground Beef	100.0% 1	100.0%				66.7% 2	0.0%	50.0% 1		0.0%		100.0%
		e	HACCP	82.7% 62	81.8% 36	85.2% 23	80.0% 24	76.7% 23	74.2% 23	64.7% 11	60.0% 3	76.9% 10	60.0% 3	76.9% 10	52.9% 9
		Cattle	Cecal (Beef)	02	- 55	2.0	2-7	-20	20			10		75.0%	0.0%
			Cecal (Dairy)											71.4%	0 53.3%
			Retail Pork Chops	100.0%										5	8
		ne		1										33.3%	20.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)		4.5.004	10.50	10.00/	2.70/	10.00/				2.22	0	0
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	22.6% 51	15.6% 30	13.5% 28	12.8% 28	9.5% 21	12.0% 31	7.5% 18	7.5% 23	3.5% 10	3.9% 10	4.8% 10	4.3% 10
		S	Retail Chickens							0.0%			0.0%	0.0%	
		Chickens	HACCP	85.7% 6		50.0% 3		0.0%	100.0% 1		0.0%	0.0% 0	0.0%	0.0%	0.0%
		ర్	Cecal			J			•		J				Ů
			Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%		
		Turkeys	HACCP	21.1%	0 14.3%	0.0%	0.0%	0.0%	0 12.5%	0.0%	0.0%	0.0%	0 25.0%	0.0%	0.0%
		Ţ		4	1	0	0	0	1	0	0	0	1	0	0
			Cecal	100.0%	100.0%				66.7%	0.0%	100.0%		0.0%		100.0%
			Retail Ground Beef	1	2	04.50/	00.70/	70.70/	2	0	2	70.00/	0	00.00/	2
		Cattle	HACCP	78.7% 59	77.3% 34	81.5% 22	66.7% 20	76.7% 23	64.5% 20	52.9% 9	60.0% 3	76.9% 10	40.0% 2	69.2% 9	52.9% 9
		ő	Cecal (Beef)											75.0% 6	0.0%
			Cecal (Dairy)											71.4% 5	53.3% 8
			Retail Pork Chops	100.0%											
		Swine	Cecal (Market Swine)											33.3%	20.0%
		Ś	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin	+	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 1 μg/ml)		ı	0	0	0	0	0	0	0.0%	0	0	0.0%	0.0%	0
		ens	Retail Chickens	0.0%		0.0%		0.0%	0.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0%		0.0%		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
		Ĺ	Cecal												
		စ္	Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0% 0		0.0%		
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		-	Cecal												
			Retail Ground Beef	0.0%	0.0%				0.0%	0.0%	0.0%		0.0%		0.0%
		m	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
														0.0%	0.0%
			Cecal (Dairy)	0.0%										0	0
		Ф	Retail Pork Chops	0.0%										0.00	0.000
		Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
			Cecal (Sows)											0.0%	0.0%
	•	-													

Table 31e. Antimicrobial Resistance among Salmonella Newport Isolates, 2003-2014

Year	obial Resistance am			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Te	sted		Humans	226	192	207	219	222	258	239	306	285	258	209	235
		Su	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
		Chickens	HACCP	7	0	6	0	3	1	0	1	1	2	2	2
		ਠ	Cecal											0	0
		sys	Retail Ground Turkey	2	2	3	0	0	3	3	2	0	2	0	0
		Turkeys	HACCP	19	7	5	4	15	8	3	5	4	4	4	6
		-	Cecal											0	0
		Ф	Retail Ground Beef	1	2	0	0	0	3	2	2	0	1 -	0	2
		Cattle	HACCP Cecal (Beef)	75	44	27	30	30	31	17	5	13	5	13 8	17 1
		-	Cecal (Dairy)											7	15
		Ф	Retail Pork Chops	1	0	0	0	0	0	0	0	0	0	0	0
		Swine	Cecal (Market Swine)											3	5
	Antimionabial	0,	Cecal (Sows)											4	1
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	0.4%	0.5%	0.0%	0.5%	0.0%	0.4%	0.0%	0.3%	0.3%	0.0%	0.0%	0.4%
	(WIIO = 02 µg/IIII)		Retail Chickens		,			Ů		0.0%			0.0%	0.0%	
		sue		0.0%		0.0%		0.0%	0.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0%		0.0%		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%
		0	Cecal												
		-		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%		
		s,	Retail Ground Turkey	0	0	0			0	0	0		0		
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		F	Cecal												
				0.0%	0.0%				0.0%	0.0%	0.0%		0.0%		0.0%
			Retail Ground Beef	0.0%	0.0%				0.0%	0.0%	0.0%		0.0%		0.0%
		Ф	HACCP	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	0	1	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		ľ	Cecal (Beef)											0	0
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops	0.0%											
		e e		0										0.0%	0.0%
		Swine	Cecal (Market Swine)											0	0.0%
			Cecal (Sows)											0.0%	0.0%
Tetracyclines	Tetracycline	+	11	24.3%	17.2%	14.5%	14.6%	9.9%	14.0%	8.8%	8.5%	4.9%	4.3%	6.2%	5.1%
	(MIC ≥ 16 μg/ml)	<u> </u>	Humans	55	33	30	32	22	36	21	26	14	11	13	12
		ω,	Retail Chickens							0.0%			0.0%	0.0%	
		Chickens	HACCP	85.7%		50.0%		0.0%	100.0%		0.0%	0.0%	0.0%	0.0%	0.0%
		Ş		6		3		0	1		0	0	0	0	0
			Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%			66.7%	0.0%	0.0%		50.0%		
		Turkeys	HACCP	36.8%	28.6%	60.0%	25.0%	20.0%	62.5%	33.3%	0.0%	50.0%	50.0%	0.0%	16.7%
		į	TIACCI	7	2	3	1	3	5	1	0	2	2	0	1
			Cecal												
			Retail Ground Beef	100.0%	100.0%				66.7%	0.0%	100.0%		0.0%		100.0%
			HACCD	1 84.0%	2 84.1%	81.5%	83.3%	86.7%	2 74.2%	0 70.6%	2 60.0%	76.9%	0 80.0%	76.9%	2 52.9%
		Cattle	HACCP	63	37	22	25	26	23	12	3	10	4	10	9
		ő	Cecal (Beef)											75.0% 6	0.0%
			Cecal (Dairy)											71.4%	53.3%
				100.0%										5	8
		1_	Retail Pork Chops	100.0%											
		Swine	Cecal (Market Swine)											66.7% 2	40.0% 2
		Ġ	Cecal (Sows)											25.0%	0.0%
		1	Cecai (Sows)											1	0

Table 32a. Resistance Patte	erns	among Salmonel	a Newpor	t Isolates,	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	226	192	2003	219	222	258	239	306	285	258	2013	235
	Chickens	Retail Chickens HACCP Cecal	0 7	0	0 6	0	0 3	0 1	1 0	0 1	0 1	1 2	2 2 0	0 2 0
	Turkeys	Retail Ground Turkey HACCP Cecal	2 19	2 7	3 5	0 4	0 15	3 8	3	2 5	0 4	2 4	0 4	0 6
	Cattle -	Retail Ground Beef HACCP	1 75	2 44	0 27	0 30	0 30	3 31	2 17	2 5	0 13	1 5	0 0 13	0 2 17
	Ca	Cecal (Beef) Cecal (Dairy)											8 7	1 15
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	1	0	0	0	0	0	0	0	0	0	0 3 4	0 5 1
Resistance Pattern		Source Humans	73.5%	81.8%	84.1%	82.2%	89.2%	85.3%	89.5%	90.5%	94.4%	93.0%	91.9%	93.2%
1. No Resistance Detected	<u> </u>	Retail Chickens	166	157	174	180	198	220	214 100.0%	277	269	240 100.0%	192 100.0%	219
	Chickens	HACCP	14.3%		50.0%		100.0%	0.0%	1	100.0%	100.0%	1 100.0% 2	2 100.0% 2	100.0%
	0	Cecal												
		Retail Ground Turkey	50.0% 1	100.0% 1	100.0%			0.0%	66.7% 2	50.0% 1		50.0% 1		
	Turkeys	HACCP	21.1%	57.1%	20.0%	25.0%	80.0% 12	12.5%	0.0%	80.0%	50.0% 2	50.0%	100.0% 4	83.3% 5
	ľ	Cecal		4		1	12		U	4				,
		Retail Ground Beef	0.0%	0.0%				33.3% 1	100.0%	0.0%		100.0%		0.0%
	<u>o</u>	HACCP	14.7%	15.9%	14.8%	16.7%	13.3%	25.8%	29.4%	40.0%	23.1%	20.0%	23.1%	47.1%
	Cattle	Cecal (Beef)	11	7	4	5	4	8	5	2	3	1	25.0%	100.0%
		Cecal (Dairy)											28.6%	46.7%
		Retail Pork Chops	0.0%										2	7
	Swine	Cecal (Market Swine)	0										33.3%	60.0%
	Ó	Cecal (Sows)											75.0%	100.0%
	H	Humans	23.5%	16.7%	14.5%	15.6%	10.8%	13.6%	8.4%	7.8%	3.9%	6.2%	3 5.7%	1 4.7%
2. Resistant to ≥ 3 Antimicrobial Classes	H	Retail Chickens	53	32	30	34	24	35	20 0.0%	24	11	16 0.0%	12 0.0%	11
	Chickens	HACCP	85.7%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
	Chic	Cecal	6		3		0	1		0	0	0	0	0
	\vdash	Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
	Turkeys	HACCP	0 26.3%	0 14.3%	0 80.0%	75.0%	6.7%	0 37.5%	0 33.3%	20.0%	25.0%	1 25.0%	0.0%	0.0%
	Ę	Cecal	5	1	4	3	1	3	1	1	1	1	0	0
	\vdash	Retail Ground Beef	100.0%	100.0%				66.7%	0.0%	100.0%		0.0%		100.0%
		HACCP	1 84.0%	2 84.1%	81.5%	83.3%	83.3%	2 74.2%	0 70.6%	2 60.0%	76.9%	0 80.0%	76.9%	2 52.9%
	Cattle	Cecal (Beef)	63	37	22	25	25	23	12	3	10	4	10 75.0%	9
		Cecal (Beer)											6 71.4%	0 53.3%
	\vdash	Cecal (Dairy) Retail Pork Chops	100.0%										5	8
	ne		1										33.3%	20.0%
	Swine	Cecal (Save)											1 0.0%	1 0.0%
		Cecal (Sows)	23.0%	16.1%	14.0%	13.7%	9.5%	13.6%	7.5%	7.8%	3.8%	3.9%	0	0
3. Resistant to ≥ 4 Antimicrobial Classes	L	Humans	52	31	29	30	21	35	18	24	11	10	10	10
	ens	Retail Chickens	85.7%		50.0%		0.0%	100.0%	0.070	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	6		3		0.0%	1		0.0%	0.0%	0.078	0.0%	0.076
	<u> </u>	Cecal	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		50.0%		
	sys	Retail Ground Turkey	0 21.1%	0 14.3%	0.0%	25.0%	6.7%	0 25.0%	0 33.3%	0.0%	25.0%	1 25.0%	0.0%	0.0%
	Turkeys	HACCP	4	14.5%	0.0%	1	1	25.0%	1	0.0%	1	1	0.0%	0.0%
	L	Cecal	100.0%	100.0%				66.7%	0.0%	100.0%		0.0%		100.0%
		Retail Ground Beef	1 84.0%	2 84.1%	81.5%	83.3%	83.3%	2 74.2%	0.0% 0 70.6%	2 60.0%	76.9%	0.0%	76.9%	2 52.9%
	Cattle	HACCP	63	84.1% 37	81.5% 22	83.3% 25	25	23	70.6% 12	3	76.9% 10	80.0%	10	9
	٥	Cecal (Beef)											75.0% 6	0.0%
		Cecal (Dairy)	400.0										71.4% 5	53.3% 8
	m	Retail Pork Chops	100.0% 1											
	Swine	Cecal (Market Swine)											33.3% 1	20.0% 1
		Cecal (Sows)											0.0% 0	0.0% 0
1 Starting in 2011, testing included r	nine :	antimicrobial classes w	ith the addition	on of the mac	rolide azithro	mycin. Becau	ise resistanc	e to azithrom	vcin is low (ir	this case	1%) antimic	robial class re	esistance dat	a from 2011

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 32b. Resistance Patterns among Salmonella Newport Isolates, 2003-2014

Table 32b. Resistance Patte	51113	among Samonen					200=	2002	2002	2042	2044	2042	2042	2044
Year Number of Isolates Tested		Humans	2003 226	2004 192	2005 207	2006 219	2007 222	2008 258	2009 239	2010 306	2011 285	2012 258	2013 209	2014 235
	ns	Retail Chickens	0	0	0	0	0	0	1	0	0	1	2	0
	Chickens	HACCP	7	0	6	0	3	1	0	1	1	2	2	2
		Cecal	0	0		0	^		2	0			0	0
	Turkeys	Retail Ground Turkey HACCP	2 19	2 7	3 5	0 4	0 15	3 8	3	2 5	0 4	2 4	4	0 6
	2	Cecal											0	0
	Ф	Retail Ground Beef HACCP	1 75	2 44	0 27	0 30	0 30	3 31	2 17	2 5	0 13	1 5	0 13	2 17
	Cattle	Cecal (Beef)	73	44	2,	30	30	01	.,	3	15	J	8	1
	-	Cecal (Dairy)											7	15
	Swine	Retail Pork Chops Cecal (Market Swine)	1	0	0	0	0	0	0	0	0	0	0	0 5
	Š	Cecal (Sows)											4	1
Resistance Pattern		Source Humans	22.6%	15.1%	12.6%	13.3%	8.6%	12.8%	7.1%	7.5%	3.5%	3.9%	4.8%	3.0%
4. Resistant to ≥ 5 Antimicrobial Classes	-	ı	51	29	26	29	19	33	17 0.0%	23	10	10 0.0%	10 0.0%	7
	sus	Retail Chickens	85.7%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	6		3		0.0%	100.0%		0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	50.0% 1		
	Turkeys	HACCP	10.5%	14.3% 1	0.0%	25.0% 1	6.7%	12.5% 1	33.3% 1	0.0%	25.0% 1	25.0% 1	0.0%	0.0%
	=	Cecal	2		0		-		'	0			0	0
	┢	Retail Ground Beef	100.0%	100.0%				66.7%	0.0%	50.0%		0.0%		100.0%
			1 81.3%	2 79.5%	81.5%	76.7%	76.7%	2 64.5%	0 58.8%	1 60.0%	76.9%	0 40.0%	76.9%	2 52.9%
	Cattle	HACCP	61	35	22	23	23	20	10	3	10	2	10 75.0%	9
		Cecal (Beef)											6	0
		Cecal (Dairy)											71.4% 5	53.3% 8
		Retail Pork Chops	100.0% 1											
	Swine	Cecal (Market Swine)											33.3% 1	20.0%
	S	Cecal (Sows)											0.0%	0.0%
		Humans	22.1%	15.1%	12.6%	12.3%	8.6%	11.6%	7.1%	7.5%	3.5%	3.9%	0 4.8%	0 3.0%
5. At Least ACSSuT ² Resistant	<u> </u>	ı	50	29	26	27	19	30	17 0.0%	23	10	10 0.0%	10 0.0%	7
	sua	Retail Chickens	71.4%		50.0%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	5		3		0.078	1		0.078	0.078	0.078	0.078	0.0%
	Ĺ	Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%		
	Turkeys	HACCP	5.3% 1	14.3% 1	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	25.0% 1	0.0%	0.0% 0
	F	Cecal					- J			Ü	Ů		Ü	Ü
	<u> </u>	Retail Ground Beef	100.0%	100.0%				66.7%	0.0%	50.0%		0.0%		100.0%
			1 66.7%	2 75.0%	81.5%	63.3%	70.0%	2 64.5%	0 47.1%	1 60.0%	76.9%	20.0%	69.2%	2 47.1%
	Cattle	HACCP	50	33	22	19	21	20	8	3	10	1	9 75.0%	8 0.0%
		Cecal (Beef)											6	0
		Cecal (Dairy)											71.4% 5	53.3% 8
		Retail Pork Chops	100.0% 1											
	Swine	Cecal (Market Swine)											33.3% 1	20.0% 1
	,	Cecal (Sows)											0.0%	0.0%
		Humans	1.3%	1.0%	1.9%	2.7%	0.5%	2.7%	1.3%	1.3%	0.0%	0.4%	0.5%	0.0%
6. At Least ACT/S ³ Resistant	┢	Retail Chickens	3	2	4	6	1	7	0.0%	4	0	0.0%	0.0%	0
	Chickens	HACCP	0.0%		16.7%		0.0%	100.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
	Chic		0		1		0	1		0	0	0	0	0
	<u> </u>	Cecal	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%		
	s/	Retail Ground Turkey	0	0	0			0	0	0		0		
	Turkeys	HACCP	0.0% 0	14.3% 1	0.0% 0									
	ľ	Cecal												
		Retail Ground Beef	0.0%	50.0% 1				0.0%	0.0%	0.0%		0.0%		0.0%
	Φ.	HACCP	0.0%	2.3%	25.9%	10.0%	13.3%	12.9%	0.0%	20.0%	7.7%	0.0%	15.4%	5.9%
	Cattle	Cecal (Beef)	0	1	7	3	4	4	0	1	1	0	0.0%	0.0%
													0.0%	0.0%
	<u> </u>	Cecal (Dairy)	0.0%										0	0
	ø	Retail Pork Chops	0.0%											
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0
1 Starting in 2011, testing included a		entimiorobiol alaccas wi	th the additio	on of the man	rolida azithro	mycin Becc	ico rocietoro	on to azithrom	vcin ie low (i	n this case	19/1 antimio	robiol ologo r		

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 32c. Resistance Patterns among Salmonella Newport Isolates, 2003-2014

Table 32c. Resistance Patte		<u> </u>	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	226	192	207	219	222	258	239	306	285	258	209	235
	Chickens	Retail Chickens HACCP Cecal	0 7	0	0 6	0	0	0	1 0	0	0	1 2	2 2 0	0 2 0
	Turkeys	Retail Ground Turkey HACCP Cecal	2 19	2 7	3 5	0 4	0 15	3 8	3	2 5	0 4	2 4	0 4 0	0 6 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	1 75	2 44	0 27	0 30	0 30	3 31	2 17	2 5	0 13	1 5	0 13 8 7	2 17 1 15
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	1	0	0	0	0	0	0	0	0	0	0 3 4	0 5 1
Resistance Pattern		Source	21.2%	15.1%	12.6%	11.0%	8.1%	11.6%	7.1%	7.5%	3.5%	3.9%	4.8%	3.0%
7. At Least ACSSuTAuCx ¹ Resistant	_	Humans Retail Chickens	48	29	26	24	18	30	17 0.0%	23	10	10	10	7
	Chickens	HACCP	71.4% 5		50.0%		0.0%	100.0%	0	0.0%	0.0%	0 0.0% 0	0 0.0% 0	0.0%
	ర్	Cecal	3		3		0	,			0	0	0	0
	_	Retail Ground Turkey	0.0%	0.0%	0.0%				0.0%	0.0%		0.0%		
	Turkeys	HACCP	5.2% 1	14.3% 1	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0
		Cecal												
		Retail Ground Beef	100.0% 1	100.0% 2				66.7% 2	0.0% 0	50.0% 1		0.0% 0		100.0% 2
	Cattle	HACCP	66.7% 50	72.7% 32	81.5% 22	63.3% 19	70.0% 21	64.5% 20	47.1% 8	60.0% 3	76.9% 10	20.0% 1	69.2%	47.1% 8
	0	Cecal (Beef)											75.0% 6	0.0%
		Cecal (Dairy)	100.0%										71.4% 5	53.3% 8
	e.	Retail Pork Chops	1										33.3%	20.0%
	Swine	Cecal (Market Swine) Cecal (Sows)											0.0%	0.0%
		Humans	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
8. At Least Ceftriaxone and Nalidixic Acid Resistant	_	Retail Chickens	0	1	0	0	0	0	0 0.0% 0	0	1	0 0.0% 0	0 0.0% 0	0
	Chickens	HACCP	0.0%		0.0%		0.0%	0.0%	U	0.0%	0.0%	0.0%	0.0%	0.0%
	Ò	Cecal												
	s	Retail Ground Turkey	0.0%	0.0%	0.0% 0				0.0% 0	0.0% 0		0.0%		
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0
		Cecal												
		Retail Ground Beef	0.0%	0.0%	0.00/	0.004	0.007	0.0%	0.0%	0.0%	0.00/	0.0%	0.007	0.0%
	Cattle	HACCP	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0 0.0%	0.0% 0 0.0%
	Ĭ	Cecal (Beef)											0.0%	0.0%
	<u> </u>	Cecal (Dairy)	0.0%										0.0%	0.078
	ine	Retail Pork Chops Cecal (Market Swine)	0										0.0%	0.0%
	Swine	Cecal (Market Swine) Cecal (Sows)											0.0%	0.0%
1 ACSSuTAuCx = ACSSuT_amoxic	<u> </u>												0	0

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 33a. Antimicro				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed		Humans	36	36	33	105	73	84	72	78	82	117	127	110
		Chickens	Retail Chickens HACCP Cecal	2 N/A ¹	4 44	9 102	9 79	2 49	4 29	8 21	2 17	0 6	6 17	3 21 0	2 37 0
		Turkeys	Retail Ground Turkey HACCP Cecal	0 N/A	0 4	0 2	2 3	0 6	0	0 1	0 0	0 2	0	6 6 0	0 6 0
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 N/A	0 4	0 2	0	2 6	0	0 1	0 0	0 2	0	0 5 0	0 7 0
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	1 2 4	0 2 9
	Antimicrobial (Resistance		Cecal (Sows)											3	10
Antimicrobial Class Aminoglycosides	Breakpoint) Gentamicin		Source Humans	5.6%	5.6%	0.0%	4.8%	1.4%	3.6%	2.8%	1.3%	2.4%	2.6%	4.7%	1.8%
	(MIC ≥ 16 μg/ml)		Retail Chickens	0.0%	0.0%	11.1%	5 22.2%	50.0%	0.0%	2 12.5%	0.0%	2	0.0%	0.0%	0.0%
		kens	HACCP	0	11.4%	1 9.8%	2 11.4%	0.0%	0 6.9%	1 4.8%	0 23.5%	16.7%	0 17.6%	0 9.5%	0 5.4%
		Chickens			5	10	9	0	2	1	4	1	3	2	2
			Cecal				50.0%							0.0%	
		eys	Retail Ground Turkey		100.0%	0.0%	1 100.0%	100.0%				0.0%	0.0%	0 16.7%	16.7%
		Turkeys	HACCP		1	0	1	1				0	0	1	1
			Cecal					50.0%							
			Retail Ground Beef		0.0%	0.0%	0.0%	1 0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP		0	0.076	0.070	0.070	0.070	0.070		0.070	0.070	0.070	0.070
		0	Cecal (Beef)											0.0%	
			Cecal (Dairy)											0.0%	0.0%
		e e	Retail Pork Chops											0.0%	0.0%
		Swine	Cecal (Market Swine)											0	0
	Streets music		Cecal (Sows)	0.20/	F C0/	2.00/	2.00/	0.00/	40.70/	40.50/	40.20/	24.40/	20.40/	0.0%	0.0%
	Streptomycin (MIC ≥ 64 µg/ml)		Humans	8.3%	5.6%	3.0%	3.8%	8.2%	10.7%	12.5%	19.2% 15	24.4% 20	29.1%	53.5% 68	52.7% 58
		sus	Retail Chickens	0.0%	0.0%	11.1%	22.2%	0.0%	0.0%	12.5%	0.0%	40.70/	0.0%	0.0%	0.0%
		Chickens	HACCP		15.9% 7	9.8% 10	6.3% 5	8.2% 4	10.3% 3	9.5% 2	11.8% 2	16.7% 1	17.6% 3	14.3% 3	10.8% 4
			Cecal				#0.00/							100.00/	
		s/s	Retail Ground Turkey		100.004	#0.00/	50.0%	100.00/				2 22/	100.00/	100.0%	00.00/
		Turkey	HACCP		100.0% 1	50.0% 1	100.0% 1	100.0% 1				0.0% 0	100.0% 1	100.0% 6	83.3% 5
		Ĺ	Cecal												
			Retail Ground Beef					0.0% 0							
		Cattle	HACCP		25.0% 1	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0		0.0% 0	66.7% 2	100.0% 5	28.6% 2
		ပိ	Cecal (Beef)												
			Cecal (Dairy)											100.0% 1	
			Retail Pork Chops											100.0% 2	100.0% 2
		Swine	Cecal (Market Swine)											75.0% 3	88.9% 8
			Cecal (Sows)											66.7% 2	50.0% 5
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	5.6% 2	2.8% 1	3.0% 1	3.8% 4	1.4% 1	4.8% 4	4.2% 3	3.8% 3	3.7% 3	1.7% 2	1.6% 2	2.7% 3
	(MIC ≥ 32 / 16 μg/ml)	SL	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	11.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0		33.3% 2	0.0% 0	0.0% 0
		Chickens	HACCP		4.5% 2	5.9% 6	16.5% 13	16.3% 8	3.4% 1	9.5% 2	0.0% 0	16.7% 1	11.8% 2	4.8% 1	0.0%
		Ö	Cecal												
		ş	Retail Ground Turkey				0.0% 0							0.0% 0	
		Turkeys	HACCP		0.0%	50.0% 1	0.0% 0	0.0% 0				0.0% 0	0.0% 0	0.0% 0	16.7% 1
		L	Cecal												
			Retail Ground Beef					0.0% 0							
		Ħe	HACCP		0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%		50.0% 1	0.0% 0	0.0% 0	14.3% 1
		Cattle	Cecal (Beef)												
			Cecal (Dairy)											0.0% 0	
			Retail Pork Chops											0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	11.1%
		"	Cecal (Sows)											0.0%	0.0%

¹ N/A = data not available. Antigenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004

Table 33b. Antimicrobial Resistance among Salmonella I 4,[5],12:i:- Isolates, 2004-2014

Year	robial Resistance an			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	10	Humans	36	36	33	105	73	84	72	78	82	117	127	110
		ckens	Retail Chickens HACCP	2 N/A ¹	4 44	9 102	9 79	2 49	4 29	8 21	2 17	0 6	6 17	3 21	2 37
		Chick	Cecal	IV/A		.02	, ,		20					0	0
		ceys	Retail Ground Turkey	0	0	0	2	0	0	0	0	0	0	6	0
		Ţ	HACCP Cecal	N/A	4	2	3	6	1	1	0	2	1	6 0	6
			Retail Ground Beef	0	0	0	0	2	0	0	0	0	0	0	0
		Cattle	HACCP Cecal (Beef)	N/A	4	2	3	6	1	1	0	2	3	5 0	7
			Cecal (Dairy)											1	0
		ne Pe	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	2	2
		Swi	Cecal (Market Swine) Cecal (Sows)											3	9
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source	# 00/	0.00/	0.00/	0.00/		4.007	0.00/	0.00/	1.00/	2 22/	1.00/	0.70/
Cephems	Cefoxitin (MIC ≥ 32 µg/ml)		Humans	5.6%	2.8%	3.0%	3.8%	1.4%	4.8%	2.8%	2.6%	4.9% 4	0.9%	1.6%	2.7%
		SI	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	11.1% 1	0.0% 0	0.0% 0	0.0%	0.0% 0		33.3% 2	0.0% 0	0.0%
		Chickens	HACCP		4.5% 2	5.9% 6	16.5% 13	16.3% 8	3.4% 1	4.8% 1	0.0%	16.7% 1	11.8% 2	4.8% 1	0.0%
		Ö	Cecal												
			Retail Ground Turkey				0.0%							0.0%	
		Turkeys	HACCP		0.0%	50.0%	0.0%	0.0%				0.0%	0.0%	0.0%	16.7%
		Ţ	Cecal		0	1	0	0				0	0	0	1
		\vdash	Retail Ground Beef					0.0%							
					0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		50.0%	0.0%	0.0%	14.3%
		Cattle	HACCP		0	0	0	0	0	0		1	0	0	1
		0	Cecal (Beef)											0.00/	
			Cecal (Dairy)											0.0% 0	
			Retail Pork Chops											0.0% 0	0.0%
		Swine	Cecal (Market Swine)											0.0%	11.1% 1
		0,	Cecal (Sows)											0.0%	0.0%
	Ceftiofur		Humans	5.6%	2.8%	3.0%	3.8%	2.7%	4.8%	2.8%	2.6%	3.7%	0.9%	1.6%	4.5%
	(MIC ≥ 8 μg/ml)		Retail Chickens	0.0%	0.0%	0.0%	4 11.1%	0.0%	0.0%	0.0%	0.0%	3	33.3%	0.0%	5 0.0%
		kens	HACCP	0	0 4.5%	0 5.9%	16.5%	0 16.3%	0 3.4%	9.5%	0.0%	16.7%	11.8%	0 4.8%	0.0%
		Chickens			2	6	13	8	1	2	0	1	2	1	0
		-	Cecal				0.0%							0.0%	
		iys	Retail Ground Turkey		0.0%	50.0%	0.0%	0.0%				0.0%	0.0%	0.0%	16.7%
		Turkeys	HACCP		0.0%	1	0.0%	0.0%				0.0%	0.0%	0.0%	10.7%
			Cecal												
			Retail Ground Beef					0.0%							
		e E	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		50.0% 1	0.0%	0.0%	14.3% 1
		Cattle	Cecal (Beef)			-		-	-						
			Cecal (Dairy)											0.0%	
		\vdash	Retail Pork Chops											0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	11.1%
		Sw	Cecal (Sows)											0.0%	0.0%
	Ceftriaxone	+		5.6%	2.8%	3.0%	3.8%	2.7%	4.8%	2.8%	2.6%	3.7%	0.9%	1.6%	0 4.5%
	(MIC ≥ 4 μg/ml)	_	Humans	2	1	1	4	2	4	2	2	3.776	1	2	5
		SU	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	11.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0		33.3% 2	0.0% 0	0.0%
		Chickens	HACCP		4.5% 2	5.9% 6	16.5% 13	16.3% 8	3.4% 1	9.5% 2	0.0%	16.7% 1	11.8% 2	4.8% 1	0.0%
		ō	Cecal												
			Retail Ground Turkey				0.0%							0.0%	
		Turkeys	HACCP		0.0%	50.0%	0.0%	0.0%				0.0%	0.0%	0.0%	33.3%
		T.			0	1	0	0				0	0	0	2
		<u> </u>	Cecal					0.0%							
			Retail Ground Beef					0							
		#e	HACCP		0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%		50.0% 1	0.0% 0	0.0% 0	14.3% 1
		Cattle	Cecal (Beef)												
			Cecal (Dairy)											0.0%	
		1												0.0%	0.0%
			Potail Park Chann											0.076	
		ЭС	Retail Pork Chops											0	0
		Swine	Retail Pork Chops Cecal (Market Swine)												

¹ N/A = data not available. Antigenic formulas for monophasic *Salmonella* were not determined for food animal isolates prior to 2004

Year	tad		Humans	2003 36	2004 36	2005 33	2006 105	2007 73	2008 84	2009 72	2010 78	2011 82	2012 117	2013 127	2014 110
Number of Isolates Tes	ted	SI	Retail Chickens		4	9	9								
		Chickens	HACCP	2 N/A ¹	4	102	79	2 49	4 29	8 21	2 17	0 6	6 17	3 21	2 37
		S	Cecal											0	0
		ske	Retail Ground Turkey	0	0	0	2	0	0	0	0	0	0	6	0
		Turkeys	HACCP	N/A	4	2	3	6	1	1	0	2	1	6	6
			Cecal Retail Ground Beef	0	0	0	0	2	0	0	0	0	0	0	0
		Cattle	HACCP	N/A	4	2	3	6	1	1	0	2	3	5	7
		ర్ధ	Cecal (Beef)											0	0
			Cecal (Dairy)											1	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	2 4	2 9
		Ś	Cecal (Sows)											3	10
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source		11.101	2.00/	0.00/		10.101	10.00/	10.00/	22.00/	22.101	=====	=0.00/
Folate Pathway Inhibito	Sulfisoxazole 2		Humans	5.6% 2	11.1% 4	0.0%	8.6% 9	4.1% 3	13.1% 11	13.9% 10	19.2% 15	23.2% 19	29.1% 34	53.5% 68	50.0% 55
	(MIC ≥ 512 μg/ml)		Retail Chickens	0.0%	0.0%	11.1% 1	22.2% 2	50.0% 1	0.0%	25.0% 2	0.0%		33.3% 2	0.0%	0.0%
		Chickens	HACCP	0	13.6%	9.8%	13.9%	6.1%	6.9%	9.5%	29.4%	33.3%	17.6%	14.3%	5.4%
		Shic			6	10	11	3	2	2	5	2	3	3	2
			Cecal				## PA PA							100.00/	
		v	Retail Ground Turkey				50.0% 1							100.0% 6	
		Turkeys	HACCP		100.0% 1	50.0% 1	100.0% 1	100.0% 1				0.0%	100.0% 1	83.3% 5	50.0% 3
		Tu	Cecal				-					U		Ü	3
		-						50.0%							
			Retail Ground Beef					1							
		ile Ele	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	66.7% 2	100.0% 5	28.6%
		Cattle	Cecal (Beef)												
			Cecal (Dairy)											100.0%	
														100.0%	100.09
		Φ	Retail Pork Chops											2	2
		Swine	Cecal (Market Swine)											75.0% 3	88.9% 8
			Cecal (Sows)											66.7% 2	50.0% 5
	Trimethoprim-		Humans	0.0%	2.8%	0.0%	0.0%	1.4%	4.8%	1.4%	1.3%	1.2%	0.0%	2.4%	1.8%
	Sulfamethoxazole (MIC ≥ 4 / 76 µg/ml)	-	I	0.0%	0.0%	0.0%	0.0%	0.0%	4 0.0%	0.0%	0.0%	1	0.0%	0.0%	2 0.0%
	(WIIO = 47 70 µg/IIII)	2	Retail Chickens	0.070	0	0	0	0	0	0	0		0	0	0
		Chickens	HACCP		4.5% 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		O	Cecal												
		-	Retail Ground Turkey				0.0%							0.0%	
		eys			0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP		0	0	0	0				0	0	0	0.070
			Cecal												
			Retail Ground Beef					0.0% 0							
			HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
		Cattle			0	0	0	0	0	0		0	0	0	0
			Cecal (Beef)											2.00/	
			Cecal (Dairy)											0.0%	
			Retail Pork Chops											0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
		Š												0.0%	0.0%
Magralidas	Azithromusin	4	Cecal (Sows)									0.00/	0.00/	0	0
Macrolides	Azithromycin (MIC ≥32 μg/ml)		Humans									0.0%	0.0%	1.6%	0.0%
		ns	Retail Chickens										0.0% 0	0.0%	0.0% 0
		Chickens	HACCP									0.0%	0.0%	0.0%	0.0%
		Ö	Cecal												
		T.,	Retail Ground Turkey											0.0%	
		Turkeys	HACCP									0.0%	0.0%	0.0%	0.0%
		Tu	Cecal									0	0	0	0
		\vdash	Retail Ground Beef												
												0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP									0	0	0	0
		O	Cecal (Beef)											0.001	
			Cecal (Dairy)											0.0%	
			Retail Pork Chops											0.0% 0	0.0% 0
		ne	HACCP									0.0% 0			
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%
			,				tes prior to 2							0	0

¹ N/A = data not available. Antigenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004
² Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Table 33d. Antimicrobial Resistance among Salmonella I 4,[5],12:i:- Isolates, 2003-2014

Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted	S.	Humans	36	36	33	105	73	84	72	78	82	117	127	110
		cken	Retail Chickens HACCP	2 N/A ¹	4 44	9 102	9 79	2 49	4 29	8 21	2 17	0 6	6 17	3 21	2 37
		Pi	Cecal	14//		102	73	43	23	21	.,		.,	0	0
		eys	Retail Ground Turkey	0	0	0	2	0	0	0	0	0	0	6	0
		Ž	HACCP Cecal	N/A	4	2	3	6	1	1	0	2	3	5 0	7
			Retail Ground Beef	0	0	0	0	2	0	0	0	0	0	0	0
		Cattle	HACCP	N/A	4	2	3	6	1	1	0	2	3	5	7
		Ö	Cecal (Beef)											0	0
			Cecal (Dairy) Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	2	0 2
		Swine	Cecal (Market Swine)	0	0	0		O						4	9
	Antimicrobial	-	Cecal (Sows)											3	10
Autimiarabial Class	(Resistance		Isolate Source												
Antimicrobial Class Penicillins	Breakpoint) Ampicillin		Humans	8.3%	5.6%	6.1%	6.7%	5.5%	9.5%	11.1%	21.8%	25.6%	29.1%	49.6%	50.9%
	(MIC ≥ 32 μg/ml)		ı	0.0%	0.0%	0.0%	7 11.1%	0.0%	0.0%	8 0.0%	17 0.0%	21	34 33.3%	63 0.0%	56 0.0%
		ens	Retail Chickens	0	6.8%	0 8.8%	1 17.7%	0 20.4%	0 6.9%	0 9.5%	0 5.9%	16.7%	2 11.8%	0 4.8%	0 2.7%
		Chickens	HACCP		3	9	14	10	2	2	1	1	2	1	1
		Ŭ	Cecal												
		_ω	Retail Ground Turkey				0.0% 0							100.0% 6	
		Turkeys	HACCP		0.0%	50.0% 1	0.0%	0.0%				0.0% 0	100.0% 1	66.7% 4	83.3% 5
		₽	Cecal			'									<u> </u>
		-	Retail Ground Beef					0.0%							
					0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		50.0%	66.7%	80.0%	42.9%
		Cattle	HACCP		0	0	0	0	0	0		1	2	4	3
		Ö	Cecal (Beef)												
			Cecal (Dairy)											100.0%	
			Retail Pork Chops											100.0% 2	100.0% 2
		Swine	Cecal (Market Swine)											75.0%	88.9%
		Ś	Cecal (Sows)											33.3%	50.0%
Phenicols	Chloramphenicol			0.0%	2.8%	0.0%	1.9%	1.4%	6.0%	8.3%	1.3%	1.2%	0.0%	1 2.4%	5 3.6%
	(MIC ≥ 32 μg/ml)		Humans	0	1 0.0%	0.0%	0.0%	1 0.0%	5 0.0%	6	1 0.0%	1	0.0%	3 0.0%	4 0.0%
		us	Retail Chickens	0.0% 0	0	0	0	0	0	0	0		0	0	0
		Chickens	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0
		ō	Cecal												
			Retail Ground Turkey				0.0%							0.0%	
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
		Ţ	Cecal		0	0	0	0				0	0	0	0
		-						0.0%							
			Retail Ground Beef		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	33.3%	0.0%	0.0%
		Cattle	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	1	0.0%	0.0%
		Ö	Cecal (Beef)												
			Cecal (Dairy)											0.0%	
			Retail Pork Chops											0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
		Š	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.8%	0 1.8%
Quinoionioo	(MIC ≥ 1 μg/ml)		Humans	0	0	0	0	0	0	0	1	0	0	1	2
		us	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Chickens	HACCP		0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%
		Ō	Cecal												
			Retail Ground Turkey				0.0%							0.0%	
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
		Į			0	0	0	0				0	0	0	0
		<u> </u>	Cecal					0.0%							
			Retail Ground Beef		0.001	0.001	0.001	0	0.001	0.001		0.001	0.001	0.001	0.000
		Cattle	HACCP		0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0
		ပ္မ	Cecal (Beef)												
			Cecal (Dairy)											0.0%	
			Retail Pork Chops											0.0%	0.0%
		ine.												0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%

¹ N/A = data not available. Antiqenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004

Table 33e. Antimicrobial Resistance among Salmonella 14,[5],12:i:- Isolates, 2003-2014

Number of Isolates Tested	6 17 0 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0	127 111 3 2 21 33 0 0 6 0 6 0 7 0 0
Antimicrobial Class Antimicrobial Class Part Chops Cacal (Marker Swine) Cacal (Glary)	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
AACCP Cecal Control Cecal (Born)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 6 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Retail Ground Beef N/A 4 2 3 6 1 1 0 2 2 2 2 2 3 6 1 1 0 2 2 2 2 3 6 3 3 4 4 2 3 3 6 3 4 5 4 4 2 3 3 6 3 4 5 4 4 4 2 3 3 6 5 5 4 4 4 2 3 3 6 5 5 5 4 4 4 2 3 3 6 5 5 5 4 4 4 2 3 3 6 5 5 5 5 5 5 5 5 5	3 0 0.0% C 0.0% C 0 0.0% C	5 7 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
Antimicrobial (Resistance Secal (Sows) Solate Source Sou	0.0% C 0 0.0% C 0.0% C 0 0 C	4 S 3 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Resistance Breakpointy Source Sou	0 0.0% 0 0 0.0% 0 0	1 7 0.0% 0.0 0 0 0.0% 0.0 0 0
MIC ≥ 32 µg/ml) Retail Chickens 1	0 0.0% 0 0 0.0% 0 0	1 7 0.0% 0.0 0 0 0.0% 0.0 0 0
Retail Chickens	0 0.0% 0 0	0 0.0% 0.0% 0.00 0 0
HACCP	0.0% C	0.0% 0.0%
Retail Ground Turkey	0.0%	0.0%
HACCP	0.0% 1	
HACCP		
Cecal Retail Ground Beef Cecal	0	16.7% 0.0
HACCP		
HACCP		
Cecal (Dairy)	0.0%	0.0% 0.0
Retail Pork Chops		
Cecal (Market Swine) Cecal (Sows) Cecal (Sows	C	0.0%
Cecal (Sows)	C	0.0% 0.0
Cecal (Sows)	C	0.0% 0.0
	C	0.0% 0.0
Tetracyclines Tetracycline (MIC ≥ 16 μg/ml) Humans 0.0% 11.1% 3.0% 8.6% 9.6% 16.7% 16.7% 28.2% 25.6%		55.1% 53.0 70 5
Retail Chickens 0.0% 0.0% 11.1% 11.1% 0.0% 0.0% 25.0% 0.0%		0.0% 0.0
HACCP 11.4% 4.9% 3.8% 14.3% 3.4% 9.5% 11.8% 33.3% 5 5 3 7 1 2 2 2		19.0% 8.1 4 3
Cecal Cecal		
Retail Ground Turkey 0.0% 0	10	100.0%
	100.0% 10	100.0% 66.
Cecal Cecal		
Retail Ground Beef 0.0% 0		
0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	100.0% 10	100.0% 28.0 5 2
HACCP		
Cecal (Dairy)		0.0%
Retail Pork Chops	10	100.0% 100.
Cecal (Market Swine)		75.0% 100. 3 9
Cecal (Sows)		100.0% 80.0 3 8

¹ N/A = data not available. Antigenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004

Table 34a. Resistance Patte	rns	among Salmonella	I 4,[5],12:i	- Isolates, 2004	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	36	36	33	105	73	84	72	78	82	117	127	110
	sua	Retail Chickens	2	4	9	9	2	4	8	2	0	6	3	2
	Chickens	HACCP Cecal	N/A ²	44	102	79	49	29	21	17	6	17	21 0	37 0
	sys	Retail Ground Turkeys	0	0	0	2	0	0	0	0	0	0	6	0
	Turke	HACCP Cecal	N/A	1	2	1	1	0	0	0	1	1	6 0	6
		Retail Ground Beef	0	0	0	0	2	0	0	0	0	0	0	0
	Cattle	HACCP Cecal (Beef)	N/A	4	2	3	6	1	1	0	2	3	5 0	7 0
		Cecal (Dairy)											1	0
	Swine	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	2	2
	Sw	Cecal (Market Swine) Cecal (Sows)											4 3	9 10
Resistance Pattern		Source	77.8%	80.6%	87.9%	85.7%	82.2%	76.2%	76.4%	66.7%	65.9%	62.4%	39.4%	38.2%
1. No Resistance Detected		Humans	28 100.0%	29 100.0%	29 88.9%	90 55.6%	60 50.0%	64 100.0%	55 75.0%	52 100.0%	54	73 50.0%	50 100.0%	42 100.0%
	sus	Retail Chickens	2	4 77.3%	8 76.5%	5	1 65.3%	4 82.8%	6	70.6%	FO 00/	3 70.6%	3 76.2%	2
	Chickens	HACCP		34	76.5% 78	68.4% 54	32	24	76.2% 16	12	50.0% 3	12	16	86.5% 32
	U	Cecal												
	,	Retail Ground Turkeys				50.0% 1							0.0%	
	Turkeys	HACCP		0.0%	50.0% 1	0.0%	0.0% 0				0.0%	0.0%	0.0% 0	0.0% 0
	ĭ	Cecal		- Ů	·	- Ů	Ü					J	J	J
		Retail Ground Beef					50.0%							
		HACCP		75.0%	100.0%	100.0%	100.0%	100.0%	100.0%		50.0%	0.0%	0.0%	57.1%
	Cattle	Cecal (Beef)		3	2	3	6	1	1		1	0	0	4
		` '											0.0%	
		Cecal (Dairy)											0	0.00/
		Retail Pork Chops											0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)											25.0% 1	0.0%
	•,	Cecal (Sows)											0.0% 0	20.0% 2
O Bestetent to NO		Humans	5.6%	8.3%	3.0%	9.5%	5.5%	9.5%	12.5%	21.8%	26.8%	28.2%	51.2%	50.0%
2. Resistant to ≥ 3 Antimicrobial Classes		Retail Chickens	0.0%	0.0%	1 11.1%	10 22.2%	0.0%	0.0%	9 12.5%	0.0%	22	33 33.3%	65 0.0%	55 0.0%
	Chickens	HACCP	0	0 11.4%	9.8%	19.0%	20.4%	0 6.9%	9.5%	0 5.9%	33.3%	2 11.8%	0 9.5%	0 2.7%
	Chic			5	10	15	10	2	2	1	2	2	2	1
		Cecal				0.0%							100.0%	
	ys	Retail Ground Turkey		0.00/	50.00/	0	0.00/				0.00/	100.00/	6	02.20/
	Turkeys	HACCP		0.0%	50.0% 1	0.0%	0.0%				0.0%	100.0% 1	100.0% 6	83.3% 5
		Cecal												
		Retail Ground Beef					0.0%							
	tle tle	HACCP		0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0		50.0% 1	66.6% 2	100.0% 5	42.9% 3
	Cattle	Cecal (Beef)		- Ů	Ů	- Ů	Ü		Ů				J	J
		Cecal (Dairy)											100.0%	
		Retail Pork Chops											100.0%	100.0%
	ine												2 75.0%	2 88.9%
	Swine	Cecal (Market Swine)											3 66.7%	8 50.0%
		Cecal (Sows)	0.00/	2 00/	0.00/	2 00/	2 70/	7 40/	0.70/	10.20/	10 50/	26 50/	2	5
3. Resistant to ≥ 4		Humans	0.0%	2.8%	0.0%	3.8%	2.7%	7.1%	9.7%	19.2% 15	19.5% 16	26.5%	48.8% 62	47.3% 52
Antimicrobial Classes	SL	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		33.3% 2	0.0% 0	0.0% 0
	Chickens	HACCP		2.3%	0.0%	1.3% 1	0.0%	0.0%	4.8% 1	5.9% 1	0.0%	0.0%	4.8% 1	2.7% 1
	Ö	Cecal												
		Retail Ground Turkey				0.0%							100.0%	
	Turkeys	HACCP		0.0%	50.0%	0.0%	0.0%				0.0%	100.0%	66.7%	66.7%
	Ţ	Cecal		0	1	0	0				0	1	4	4
		Retail Ground Beef					0.0%							
	•	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	66.6%	80.0%	28.6%
	Cattle	Cecal (Beef)		0	0	0	0	0	0		0	2	4	2
													0.0%	
		Cecal (Dairy)											0 100.0%	100.0%
	ø	Retail Pork Chops											2	2
	Swine	Cecal (Market Swine)											75.0% 3	88.9% 8
		Cecal (Sows)											33.3% 1	50.0% 5
¹ Starting in 2011, testing included r	ino c	entimicrobial classes with	the addition	of the maeral	do ozithromy	oin Popouso	registence to	azithromusin	in low (in this	2000 -10/)	antimiarabial	alana rasista		

¹Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

² N/A = data not available. Antigenic formulas for monophasic *Salmonella* were not determined for food animal isolates prior to 2004

Year		Urmer	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	Su	Humans Retail Chickens	36 2	36 4	33 9	105 9	73 2	84 4	72 8	78 2	82 0	117 6	127 3	110 2
	Chickens	HACCP Cecal	N/A ²	44	102	79	49	29	21	17	6	17	21 0	37 0
	Turkeys	Retail Ground Turkey HACCP Cecal	0 N/A	0 1	0 2	2 1	0	0	0	0	0	0 1	6 6 0	0 6 0
	Cattle	Retail Ground Beef HACCP	0 N/A	0 4	0 2	0	2	0	0	0	0 2	0 3	0 5	0 7
	Ca	Cecal (Beef) Cecal (Dairy)											0	0
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	0	2 4 3	2 9 10
Resistance Pattern		Source	0.0%	2.8%	0.0%	2.9%	1.4%	4.8%	6.9%	3.8%	0.0%	0.9%	2.4%	7.3%
4. Resistant to ≥ 5 Antimicrobial Classes	_	Humans	0.0%	1 0.0%	0	3	1 0.0%	4 0.0%	5	3	0	1 33.3%	3	8
,	Chickens	Retail Chickens HACCP	0	0 2.3%	0.0%	1.3%	0.0%	0.0%	0 4.8%	0.0%	0.0%	2 0.0%	0 4.8%	0.0%
	Chic			1	0	1	0	0	1	0	0	0	1	0
	_	Cecal				0.0%							0.0%	
	eys	Retail Ground Turkey		0.0%	50.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP		0	1	0	0				0	0	0	0
	<u> </u>	Cecal Retail Ground Beef					0.0%							
				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	33.3%	0.0%	0.0%
	Cattle	HACCP		0	0	0	0	0	0		0	1	0	0
	_	Cecal (Beef)											0.0%	
	_	Cecal (Dairy)											0.0%	0.0%
	ne	Retail Pork Chops											0.0%	0 11.1%
	Swine	Cecal (Market Swine)											0.0%	1 0.0%
		Cecal (Sows)	0.0%	2.8%	0.0%	1.9%	1.4%	3.6%	6.9%	1.3%	0.0%	0.0%	0	0 3.6%
5. At Least ACSSuT ³ Resistant		Humans	0.0%	1 0.0%	0.0%	2 0.0%	1 0.0%	3	5	1 0.0%	0	0.0%	1 0.0%	4 0.0%
	ens	Retail Chickens	0.070	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
	Chickens	HACCP		0.078	0.078	0.078	0.078	0.076	0.078	0.078	0.078	0.078	0.078	0.078
		Cecal				0.0%							0.0%	
	sys	Retail Ground Turkey		0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
		Cecal					0.0%							
		Retail Ground Beef		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	33.3%	0.0%	0.0%
	Cattle	HACCP		0	0	0	0	0	0		0	1	0	0
	_	Cecal (Beef) Cecal (Dairy)											0.0%	
	_	Retail Pork Chops											0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
	Š	Cecal (Sows)											0.0%	0.0%
	_	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.9%
6. At Least ACT/S ⁴ Resistant	H	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%
	Chickens	HACCP	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ş	Cecal		0	0	0	0	0	0	0	0	0	0	0
	<u> </u>	Retail Ground Turkey				0.0%							0.0%	
	Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%				0.0%	0.0%	0.0%	0.0%
	۲	Cecal									Ť			
		Retail Ground Beef					0.0%							
	Cattle	HACCP		0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%		0.0%	0.0%	0.0%	0.0% 0
	Cal	Cecal (Beef)												
	L	Cecal (Dairy)											0.0% 0	
	_	Retail Pork Chops											0.0%	0.0% 0
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)						azithromycin					0.0%	0.0% 0

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

2 N/A = data not available. Antigenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004

3 ACSSUT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

4 ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 34c. Resistance Patterns among Salmonella I 4,[5],12:i:- Isolates, 2003-2014

Year		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Number of Isolates Tested	Humans		36	36	33	105	73	84	72	78	82	117	127	110
	Chickens	Retail Chickens HACCP Cecal	2 N/A ¹	4 44	9	9 79	2 49	4 29	8 21	2 17	0	6 17	3 21 0	2 37 0
	Turkeys	Retail Ground Turkey HACCP Cecal	0 N/A	0	0 2	2 1	0 1	0	0	0	0 1	0 1	6 6 0	0 6 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0 N/A	0 4	0 2	0 3	2 6	0	0 1	0	0 2	0 3	0 5 0 1	0 7 0
D. Land	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	0	2 4 3	2 9 10
Resistance Pattern		Source	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7. At Least ACSSuTAuCx ² Resistant		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%
Nesisiani	sue	Retail Chickens	0.078	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal												
	s	Retail Ground Turkey				0.0% 0							0.0%	
	Turkeys	HACCP		0.0% 0	0.0% 0	0.0% 0	0.0%				0.0% 0	0.0% 0	0.0% 0	0.0% 0
	ĭ	Cecal										-	-	
		Retail Ground Beef					0.0%							
	Cattle	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%
		Cecal (Beef)		0	0	0	0	0	0		0	0	0	0
		Cecal (Dairy)											0.0%	
	_	Retail Pork Chops											0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0%	0.0%
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
At Least Ceftriaxone and Nalidixic Acid Resistant	_	Humans	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0	0	0.0%	0.0%	0.0%
	ens	Retail Chickens	0	0 2.3%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0.0%	0	0.0%
	Chickens	HACCP		1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ľ	Cecal				0.624							0.001	
	۸s	Retail Ground Turkey				0.0%							0.0%	
	Turkeys	HACCP		0.0% 0	0.0% 0	0.0% 0	0.0% 0				0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Ľ	Cecal												
		Retail Ground Beef					0.0%							
	ţ	HACCP		0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0		0.0%	0.0% 0	0.0%	0.0% 0
	Cattle	Cecal (Beef)												
		Cecal (Dairy)											0.0%	
		Retail Pork Chops											0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
	ŝ	Cecal (Sows)											0.0%	0.0%
1 N/A data not available. Antigonia		1											0	0

¹ N/A = data not available. Antigenic formulas for monophasic Salmonella were not determined for food animal isolates prior to 2004 ² ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 35a. Antimicrobial Resistance among Salmonella Infantis Isolates, 2003-2014

	biai Resistance amo	ng a	Salmonella Infantis	solates, 2											
Year Humans					2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested Second Retail Chickens HACCP			31	29	30	22	26	51	44	53	63	90	76	73	
			0 27	0 19	0 17	1 16	1 16	5 14	3	3 4	4 16	3 31	8 35	4 43	
														1	1
			0	0	0	0	0	1	1	2	1	3	2	2	
			0	0	0	0	1	0	1	0	0	0	0	0	
			1	0	0	0	0	0	0	0	3	1	2	1	
			12	18	7	13	13	4	1	5	15	4	7	6	
		Ö	Cecal (Beef) Cecal (Dairy)											3	0 2
		0	Retail Pork Chops	0	0	1	2	5	1	2	1	1	1	1	5
		Swine	Cecal (Market Swine)				_	Ŭ	·	_	·	·	·	20	22
	Antimicrobial		Cecal (Sows)											27	36
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Aminoglycosides	Gentamicin		Humans	0.0%	0.0%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	3.9%	1.4%
	(MIC ≥ 16 μg/ml)	Cattle Turkeys Chickens	Retail	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3 12.5%	0.0%
				0.0%	5.3%	0.0%	0 6.3%	0.0%	0.0%	0.0%	0 25.0%	0.0%	0 16.1%	0.0%	0.0%
			HACCP	0	1	0	1	0	0	0	1	0	5	0	0
			Cecal											0.0% 0	0.0% 0
			Retail						0.0%	100.0% 1	100.0% 2	100.0% 1	100.0% 3	100.0% 2	100.0%
			HACCP					0.0% 0		0.0%					
			Cecal					Ů							
	Streptomycin		Retail	0.0%								0.0%	0.0%	0.0%	0.0%
				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			HACCP	0	0	0	0	0	0	0	0	0	0	0.0%	0
			Cecal (Beef)											0	
			Cecal (Dairy)											0.0%	0.0%
		Swine	Retail			0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
			Cecal (Market Swine)			-	-			-				0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%
			Humans	9.7%	0.0%	3.3%	4.5%	3.8%	2.0%	6.8%	1.9%	4.8%	0.0%	3.9%	0 6.8%
	(MIĈ ≥ 64 μg/ml)	Chickens	1	3	0	1	1 0.0%	1 0.0%	0.0%	0.0%	1 0.0%	3 0.0%	0.0%	0.0%	5 0.0%
			Retail	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 25.0%	0.0%	9.7%	2.9%	0 2.3%
			HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	3	1	1
			Cecal											0.0% 0	0.0%
		"	Retail						0.0%	100.0%	100.0% 2	100.0% 1	100.0% 3	100.0% 2	100.0% 2
		Swine Cattle Turkeys	HACCP					100.0%		100.0%			J	-	-
			Cecal					1							
			Retail	0.0%								0.0%	0.0%	0.0%	0.0%
				0 8.3%	0.0%	14.3%	15.4%	0.0%	0.0%	0.0%	0.0%	0 6.7%	0 25.0%	0.0%	0.0%
			HACCP	1	0	1	2	0	0	0	0	1	1	0.0%	0
			Cecal (Beef)											0	0.00
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.0% 2
			Cecal (Market Swine)											15.0% 3	9.1% 2
			Cecal (Sows)											11.1%	0.0%
β-Lactam/β-Lactamase	Amoxicillin-		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	3.8%	1.6%	1.1%	3.9%	0 1.4%
Inhibitor Combinations	Clavulanic Acid (MIC ≥ 32 / 16 μg/ml)	Chickens	I	0	0	0	0.0%	0.0%	0.0%	4 0.0%	2 0.0%	1 25.0%	1 0.0%	3 0.0%	1 0.0%
			Retail	0.0%	0.0%	5.9%	0 6.3%	0.0%	0.0%	0.0%	0 25.0%	1 6.3%	0.0%	0 5.7%	0 2.3%
			HACCP	0.0%	0.0%	1	1	0.0%	0.0%	0.0%	25.0%	1	0.0%	2	1
			Cecal											0.0% 0	0.0% 0
		Swine Cattle Turkeys	Retail						0.0% 0	100.0% 1	100.0% 2	100.0% 1	100.0% 3	50.0% 1	100.0% 2
			HACCP					100.0%		100.0%					
			Cecal					,		1					
			Retail	0.0%								0.0%	0.0%	0.0%	0.0%
				0 8.3%	0.0%	14.3%	23.1%	0.0%	0.0%	0.0%	0.0%	0 6.7%	0.0%	0.0%	0.0%
			HACCP	1	0.078	1	3	0.078	0.078	0.078	0.078	1	0.078	0	0.078
			Cecal (Beef)											0.0% 0	
			Cecal (Dairy)											0.0%	0.0%
			Retail			0.0%	0.0%	0.0%	0.0%	50.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%
			Cecal (Market Swine)			U	U	U	U		U	U	U	10.0%	0.0%
														7.4%	0.0%
		上	Cecal (Sows)											2	0.070

Table 35b. Antimicrobial Resistance among Salmonella Infantis Isolates, 2003-2014

Humans 31 29 30 22 26 51 44 53 63 90 76 73		obiai Resistance am	iong .	Salmonella Infantis												
March Charles Cond Cond	Year	atod		Humans	2003 31	2004	2005	2006	2007	2008 51	2009 44	2010 53	2011 63	2012 90	2013 76	2014 73
Second Control Contr	number of Isolates Tes	sted	SI		1											
Second Control Contr			icker													
			ర్	Cecal											1	1
			eys													
			直		0	0	0	0	1	0	1	0	0	0		
Ministration					1	0	0	0	0	0	0	0	3	1		
Control (Control (C			attle	HACCP										4		6
Control Cont			ő													
			_		-		4	2	-	4	2					
Contribution Cont			wine		0	0	'	2	5	'	2	'	'	'		
Residence Resi		Authological	S												27	36
California Miles 2 Experts California Californi		(Resistance		Isolate												
Mac 2 di pipelle Profession	Antimicrobial Class				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11 /10/-	3 9%	1.6%	1 10/	3 0%	1 /10/-
Mind	Серпеніз			Humans				0	0	0	5	2	1	1	3	1
Redail			SC	Retail												
Redail			icker	HACCP												
Bestal			င်	Cecal					Ů		Ü			Ů	0.0%	0.0%
Fig.										0.0%	100.0%	100.0%	100.0%	100.0%		
Coresi			ske						100.0%		1					
Coresi			Turk	HACCP												
MACCP 3.3% 0.0% 14.3% 23.1% 0.0%			Ľ	Cecal												
MACCP				Retail												
Control Cont			o o	HACCP	8.3%								6.7%	0.0%	0.0%	0.0%
Control (Chirpin) Cont			Cattl		1	0	1	3	0	0	0	0	1	0		0
Redail																0.0%
Month				Cecal (Dairy)			0.00/	0.00/	0.00/	0.00/	50.00/	2.00/	2.22/	2.00/	0	0
Certiful Control (Sowe)				Retail												
Certiful Control (Sowe)			wine	Cecal (Market Swine)												
Certification (MiC 2 8 μg/min) (MiC 2			0)	Cecal (Sows)											7.4%	0.0%
Retail		Ceftiofur		l	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	11.4%	3.8%	1.6%	2.2%		
Name		(MIC ≥ 8 μg/ml)		1	0	0	0									
Cecial			sus	Retail	0.00/	0.00/	E 00/	0	0	0	0	0	1	0	0	1
Cecial			hicke	HACCP											2	1
Retail			0	Cecal												
MACCP				Retail											50.0%	100.0%
Cocal			keys	HACCE					100.0%	0		2	1	3	1	2
Retail 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			Ţ						1		1					
Medical 0, 0				Cecal	0.00/								0.00/	0.00/	0.00/	0.00/
Cecal (Bairy)				Retail										0	0	0
Cecal (Cairy) Cecal (Cairy			e e	HACCP												
Cecal (Dairy)			Cat	Cecal (Beef)								-			0.0%	
Retail 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0				Cecal (Dairy)											0.0%	
Retail 0 0 0 0 1 0 0 0 0 0			-				0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%		
Cecal (Sows) Cetriaxone (MIC≥4 μg/ml)			Ф	Retail											0	0
Cecal (Sows) Cetriaxone (MIC≥4 μg/ml)			Swin	Cecal (Market Swine)											2	0
Ceftriaxone (MIC ≥ 4 µg/ml) Humans			\perp	Cecal (Sows)												
Retail				Humans											6.6%	4.1%
HACCP 0.0% 0.0% 5.9% 0.3% 0.0% 0.0% 0.0% 0.0% 6.3% 0.0%		(IVIIO = 4 μg/IΠΙ)		Retail	U	U	U	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	25.0%
Retail			ens		0.0%	0.0%	5.9%									
Retail			Yick	HACCP											2	1
Retail 0.0% 100.0% 100.0% 100.0% 100.0% 50.0% 100.0% 2 1 3 1 2 2 1 3 1 2 2 1 3 1 2 2 1 3 1 2 2 2 2 2 2 2 2 2				Cecal												
HACCP Cecal Retail O,0% 1 0.0% 1 0.0% 1 0.0% 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				Retail											50.0%	100.0%
Retail			keys	HACCP						U	100.0%			3		
Retail 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			Tut						1		1					
Retail			<u> </u>	Cecal											6	
HACCP 8.3% 0.0% 14.3% 23.1% 0.0% 0.0% 0.0% 0.0% 6.7% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0				Retail												
Cecal (Beef)			Φ	HACCP	8.3%								6.7%	0.0%	0.0%	0.0%
Cecal (Dairy)			Cattl		1	0	1	3	U	U	U	U	1	U		U
Retail 0.0% 0.0% 0.0% 50.0% 0.0% 0.0% 0.0% 0.0															0	0.00/
				Cecal (Dairy)											0	0
Cecal (Market Swine) Cecal (Market Swine) 10.0% 2 0 7.4% 0.0%				Retail												
Cocal (Sourc) 7.4% 0.0%			vine	Cecal (Market Swine)								Ů		Ů	10.0%	0.0%
			Š													
				Cecai (Sows)												

Table 35c. Antimicrobial Resistance among Salmonella Infantis Isolates, 2003-2014

	bial Resistance amo	ng a	Salmonella Infantis I												
Year			Humana	2003 31	2004	2005 30	2006 22	2007 26	2008	2009	2010 53	2011	2012 90	2013 76	2014 73
Number of Isolates Test	ed	S	Humans		29				51	44		63			
		Chickens	Retail Chickens HACCP	0 27	0 19	0 17	1 16	1 16	5 14	3	3 4	4 16	3 31	8 35	4 43
		S	Cecal							Ŭ	·		0.	1	1
		sys	Retail Ground Turkey	0	0	0	0	0	1	1	2	1	3	2	2
		Turkeys	HACCP	0	0	0	0	1	0	1	0	0	0	0	0
		Ė	Cecal Page 1		0			0		0	0			0	0
		ttle	Retail Ground Beef HACCP	1 12	0 18	0 7	0 13	0 13	0 4	0 1	0 5	3 15	1 4	2 7	1 6
		Cattle	Cecal (Beef)											3	0
			Cecal (Dairy)											0	2
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	1	2	5	1	2	1	1	1	1 20	5 22
		Š	Cecal (Sows)											27	36
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Folate Pathway Inhibitor	Sulfamethoxazole/ Sulfisoxazole 1		Humans	9.7% 3	3.4% 1	6.7% 2	9.1% 2	3.8% 1	3.9% 2	6.8% 3	7.5% 4	4.8% 3	3.3%	9.2% 7	5.5% 4
	(MIC ≥ 512 μg/ml)		Retail				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%
		Chickens	HACCP	0.0%	10.5%	0.0%	6.3%	0.0%	0.0%	0.0%	0 25.0%	0.0%	0 16.1%	0.0%	2.3%
		Chic	ПАССР	0	2	0	1	0	0	0	1	0	5	0.0%	0.0%
			Cecal											0	0
			Retail						0.0% 0	100.0% 1	100.0%	100.0% 1	100.0%	100.0% 2	100.0% 2
		Turkeys	HACCP					100.0%		100.0%					
		Ţ						1		1					
			Cecal	0.007								0.634	0.007	0.624	0.001
			Retail	0.0%								0.0% 0	0.0% 0	0.0% 0	0.0% 0
		<u>o</u>	HACCP	8.3% 1	0.0%	14.3% 1	15.4% 2	0.0%	0.0% 0	0.0%	0.0%	6.7% 1	25.0% 1	0.0%	0.0% 0
		Cattle	Cecal (Beef)		0			0	0	-	-		·	0.0%	0
														0.0%	0.0%
			Cecal (Dairy)											0	0
			Retail			0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											10.0% 2	4.5% 1
		Ó	Cecal (Sows)											7.4%	0.0%
	Trimethoprim-			3.2%	3.4%	0.0%	0.0%	0.0%	2.0%	2.3%	1.9%	1.6%	4.4%	3.9%	0 2.7%
	Sulfamethoxazole		Humans	1	1	0.070	0	0	1	1	1	1	4	3	2
	(MIC ≥ 4 / 76 μg/ml)	ω	Retail				0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		S	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
									0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		s/	Retail						0.070	0	0.070	0	0	0.070	0.070
		Turkeys	HACCP					0.0%		0.0% 0					
		-	Cecal												
			Retail	0.0%								0.0%	0.0%	0.0%	0.0%
				0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0 6.7%	0.0%	0.0%	0.0%
		Cattle	HACCP	0.078	0.078	0.078	1.776	0.070	0.078	0.078	0.078	1	0.078	0	0.078
		ပၱ	Cecal (Beef)											0.0% 0	
			Cecal (Dairy)											0.0%	0.0%
			Retail			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Эе				0	0	0	0	0	0	0	0	0.0%	0.0%
		Swine	Cecal (Market Swine)											0	0
			Cecal (Sows)											3.7% 1	0.0% 0
Macrolides	Azithromycin (MIC ≥32 µg/ml)		Humans									0.0% 0	0.0% 0	0.0% 0	0.0% 0
	15 7	s	Retail									0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP									0.0%	0.0%	0.0%	0.0%
		Ŗ	Cecal									0	0	0.0%	0.0%
			Retail									0.0%	0.0%	0.0%	0.0%
		eys										0.0%	0.0%	0.0%	0
		Turkeys	HACCP									0	0	0	
			Cecal									0.00/	0.00/	0.00/	0.00/
			Retail									0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP									0.0% 0	0.0% 0	0.0% 0	0.0% 0
		ပ္မ	Cecal (Beef)											0.0% 0	
			Cecal (Dairy)											0.0%	0.0%
			Retail									0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)									0	0	0.0%	0.0%
		Ś												0 3.7%	0.0%
			Cecal (Sows)											1	0

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Table 35d. Antimicrobial Resistance among Salmonella Infantis Isolates, 2003-2014

Table 35d. Antimicro	obial Resistance am	ong .	Salmonella Infantis	Isolates, 2	2003-2014	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted	T	Humans	31	29	30	22	26	51	44	53	63	90	76	73
		ens	Retail Chickens	0	0	0	1	1	5	3	3	4	3	8	4
		Chickens	HACCP	27	19	17	16	16	14	3	4	16	31	35	43
			Cecal Retail Ground Turkey	0	0	0	0	0	1	1	2	1	3	2	1 2
		Turkeys	HACCP	12	18	7	13	13	4	1	5	15	4	7	6
		F	Cecal											3	0
		<u>o</u>	Retail Ground Beef HACCP	1 12	0 18	0 7	0 13	0 13	0 4	0	0 5	3 15	1 4	2 7	1 6
		Cattle	Cecal (Beef)	12	10	,	13	13	4	'	5	15	4	3	0
			Cecal (Dairy)											0	2
		Swine	Retail Pork Chops	0	0	1	2	5	1	2	1	1	1	1	5
		Š	Cecal (Market Swine) Cecal (Sows)											20 27	22 36
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Penicillins	Ampicillin (MIC ≥ 32 µg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	3.8% 1	2.0% 1	13.6% 6	5.7% 3	1.6% 1	2.2% 2	9.2% 7	6.8% 5
		s	Retail				0.0% 0	0.0%	0.0%	0.0%	0.0%	25.0% 1	0.0%	0.0%	25.0% 1
		Chickens	HACCP	0.0% 0	0.0%	5.9% 1	18.8% 3	0.0%	0.0%	0.0%	25.0% 1	6.3% 1	0.0%	5.7% 2	2.3%
		ర్	Cecal				3	U	U		1		U	0.0%	0.0%
			Retail						0.0%	100.0%	100.0%	100.0%	100.0%	50.0%	100.0%
		eys						100.0%	0	100.0%	2	1	3	1	2
		Turkeys	HACCP					1		1					
			Cecal	0.00								0.00:	0.00	0.000	2.27
			Retail	0.0% 0								0.0% 0	0.0% 0	0.0% 0	0.0% 0
		te te	HACCP	8.3% 1	14.3% 1	23.1% 3	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	6.7% 1	0.0%	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0%	
			Cecal (Dairy)											0.0%	0.0%
			Retail			0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne				0	0	0	0	1	0	0	0	10.0%	0 9.1%
		Swine	Cecal (Market Swine)											7.4%	0.0%
			Cecal (Sows)											2	0
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	2.0%	4.5% 2	3.8%	1.6% 1	1.1% 1	3.9% 3	4.1% 3
		ω	Retail				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0% 1
		Chickens	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ပ်	Cecal	0	0	U	0	0	0		0	0	0	0.0%	0.0%
			Retail						0.0%	100.0%	100.0%	100.0%	100.0%	0 50.0%	0 100.0%
		eys						0.0%	0	0.0%	2	1	3	1	2
		Turkeys	HACCP					0		0					
		<u> </u>	Cecal												
			Retail	0.0% 0								0.0% 0	0.0% 0	0.0% 0	0.0% 0
		tle	HACCP	8.3% 1	0.0%	14.3% 1	15.4% 2	0.0%	0.0%	0.0%	0.0%	6.7% 1	0.0%	0.0% 0	0.0%
		Cattle	Cecal (Beef)											0.0%	
			Cecal (Dairy)											0.0%	0.0%
		-	Retail			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne				0	0	0	0	0	0	0	0	0 5.0%	0.0%
		Swine	Cecal (Market Swine)											1 7.4%	0.0%
Ouingle	Cinveflerent	_	Cecal (Sows)	0.007	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	2	0
Quinolones	Ciprofloxacin (MIC ≥ 1 µg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0
		SI.	Retail				0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ర్	Cecal				Ť			Ľ				0.0%	0.0%
		\vdash	Retail						0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP					0.0%	0	0.0%	0	0	0	0	0
		Ţ						0		0					
		<u> </u>	Cecal	0.0%								0.0%	0.0%	0.0%	0.0%
			Retail	0								0	0	0	0
		#e	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0%	
			Cecal (Dairy)											0.0%	0.0%
		\vdash	Retail			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne.				0	0	0	0	0	0	0	0	0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
		1	Cecal (Sows)											0.0%	0.0%

Table 35e. Antimicro	bial Resistance amo	ng :	Salmonella Infantis I												
Year Number of Isolates Test	ed		Humans	2003 31	2004 29	2005 30	2006 22	2007 26	2008 51	2009 44	2010 53	2011 63	2012 90	2013 76	2014 73
rumber of isolates rest	ou .	sus	Retail Chickens	0	0	0	1	1	5	3	3	4	3	8	4
		Chickens	HACCP Cecal	27	19	17	16	16	14	3	4	16	31	35 1	43 1
		Turkeys	Retail Ground Turkey HACCP Cecal	0	0	0	0	0 1	1 0	1 1	2 0	1 0	3 0	2 0 0	2 0 0
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	1 12	0 18	0 7	0 13	0 13	0 4	0	0 5	3 15	1 4	2 7 3 0	1 6 0 2
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	1	2	5	1	2	1	1	1	1 20 27	5 22 36
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	6.5% 2	3.4% 1	3.3% 1	0.0%	0.0% 0	2.0% 1	2.3% 1	0.0% 0	1.6% 1	4.4% 4	5.3% 4	4.1% 3
		s	Retail				0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	25.0% 1
		Chickens	HACCP	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.7% 2
		5	Cecal				-	-						0.0%	0.0%
			Retail						0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	HACCP					0.0%	0	0.0%		U		U	
		₽	Cecal												
			Retail	0.0%								0.0%	0.0%	0.0%	0.0%
		<u>0</u>	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	U	U	0	0	0	0	0	0	0	0	0.0%	
			Cecal (Dairy)											0.0%	0.0%
			Retail			0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
		0,	Cecal (Sows)											0.0%	0.0%
Tetracyclines	Tetracycline (MIC ≥ 16 µg/ml)		Humans	6.5% 2	0.0%	3.3% 1	4.5% 1	7.7% 2	3.9% 2	11.4% 5	3.8% 2	4.8% 3	4.4% 4	13.2% 10	8.2% 6
	, ,	S	Retail				0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	25.0% 1
		Chickens	HACCP	0.0% 0	5.3% 1	0.0% 0	12.5% 2	0.0% 0	0.0% 0	0.0% 0	25.0% 1	0.0% 0	0.0% 0	5.7% 2	9.3% 4
		ō	Cecal											0.0% 0	0.0% 0
		s	Retail						0.0% 0	100.0% 1	100.0% 2	100.0% 1	100.0% 3	100.0% 2	100.0% 2
		Turkeys	HACCP					100.0% 1		100.0% 1					
		-	Cecal												
			Retail	0.0%								0.0% 0	0.0%	0.0%	0.0% 0
		ttle	HACCP	8.3% 1	0.0% 0	28.6% 2	15.4% 2	0.0% 0	0.0% 0	0.0% 0	20.0% 1	6.7% 1	25.0% 1	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0%	
		L	Cecal (Dairy)											0.0%	0.0% 0
			Retail			0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	40.0% 2
		Swine	Cecal (Market Swine)											15.0% 3	13.6% 3
		"	Cecal (Sows)											11.1% 3	0.0% 0

Table 36a. Resistance Patte	1115 8	among samonena l	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	31	29	30	22	26	51	44	53	63	90	76	73
	Chickens	Retail Chickens HACCP Cecal	0 27	0 19	0 17	1 16	1 16	5 14	3 3	3 4	4 16	3 31	8 35 1	4 43 1
	Turkeys	Retail Ground Turkeys HACCP Cecal	0	0	0	0	0	1 0	1	2	1 0	3 0	2 0 0	2 0 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	1 12	0 18	0 7	0 13	0 13	0 4	0	0 5	3 15	1 4	2 7 1 3	1 6 0 2
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	1	2	5	1	2	1	1	1	1 20 27	5 22 36
Resistance Pattern		Source	83.9%	93.1%	90.0%	90.9%	92.3%	96.1%	84.1%	88.7%	93.7%	92.2%	81.6%	84.9%
1. No Resistance Detected		Humans	26	27	27	20	24	49	37	47	59	83	62	62
	SU	Retail Chickens				100.0% 1	100.0% 1	100.0% 5	100.0% 3	100.0% 3	75.0% 3	100.0% 3	87.5% 7	75.0% 3
	Chickens	HACCP	100.0% 27	89.5% 17	94.1% 16	81.3% 13	100.0% 16	100.0% 14	100.0% 3	75.0% 3	93.8% 15	83.9% 26	88.6% 31	88.4% 38
	0	Cecal											100.0% 1	100.0% 1
	(0	Retail Ground Turkeys						100.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP					0.0%		0.0%					
	-	Cecal												
		Retail Ground Beef	100.0%								100.0%	100.0%	100.0% 2	100.0%
	<u>o</u>	HACCP	91.7%	100.0%	71.4%	76.9%	100.00%	100.0%	100.0%	80.0%	93.3%	75.0%	100.0%	100.0%
	Cattle	Cecal (Beef)	11	18	5	10	13	4	1	4	14	3	100.0%	6
		Cecal (Dairy)											100.0%	100.0%
	<u> </u>	Retail Pork Chops			100.0%	100.0%	10.0%	100.0%	50.0%	100.0%	100.0%	100.0%	3 100.0%	60.0%
	Swine	Cecal (Market Swine)			1	2	5	1	1	1	1	1	80.0%	3 86.4%
	Ś	Cecal (Sows)											16 88.9%	19 100.0%
			3.2%	0.0%	3.3%	4.5%	7.7%	3.9%	13.6%	3.8%	6.3%	4.4%	24 10.5%	36 6.8%
2. Resistant to ≥ 3 Antimicrobial Classes		Humans	1	0	1	1 0.0%	2 0.0%	2 0.0%	6 0.0%	0.0%	4 25.0%	4 0.0%	8 0.0%	5 25.0%
	ens	Retail Chickens	0.0%	5.3%	5.9%	0 18.8%	0.0%	0.0%	0.0%	0 25.0%	1 6.3%	0.0%	0 5.7%	1 4.7%
	Chickens	HACCP	0	1	1	3	0	0	0	1	1	0.07.0	2 0.0%	2 0.0%
		Cecal						0.0%	100.0%	100.0%	100.0%	100.0%	0	0
	ys	Retail Ground Turkeys					400.00/	0.0%	1	2	100.0%	3	100.0% 2	100.0% 2
	Turkeys	HACCP					100.0% 1		100.0% 1					
		Cecal												
		Retail Ground Beef	0.0% 0								0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Cattle	HACCP	8.3% 1	0.0% 0	14.3% 1	23.1% 3	0.0% 0	0.0% 0	0.0% 0	0.0% 0	6.7% 1	25.0% 1	0.0% 0	0.0%
	ပိ	Cecal (Beef)											0.0% 0	
	L	Cecal (Dairy)											0.0% 0	0.0%
		Retail Pork Chops			0.0%	0.0% 0	0.0% 0	0.0% 0	50.0% 1	0.0% 0	0.0%	0.0%	0.0% 0	0.0%
	Swine	Cecal (Market Swine)											15.0% 3	9.1% 2
		Cecal (Sows)											7.4% 2	0.0%
3. Resistant to ≥ 4		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	6.8%	1.9%	3.2%	2.2%	5.3%	5.5% 4
Antimicrobial Classes	<i>"</i>	Retail Chickens				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0% 1
	Chickens	HACCP	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	25.0% 1	0.0%	0.0%	0.0%	2.3%
	S	Cecal	0	0	U		0	U	0	l	0	U	0.0%	0.0%
		Retail Ground Turkeys						0.0%	100.0%	100.0%	100.0%	100.0%	50.0%	100.0%
	Turkeys	HACCP					100.0%	0	100.0%	2	1	3	1	2
	Ţ	Cecal					1		1					
		Retail Ground Beef	0.0%								0.0%	0.0%	0.0%	0.0%
	<u>o</u>	HACCP	8.3%	0.0%	14.3%	15.4%	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	1	0	1	2	0	0	0	0	1	0	0.0%	0
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)			0	0	0	0	0	0	0	0	5.0%	0.0%
	Š												1 7.4%	0.0%
		Cecal (Sows)											2	0

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 36b. Resistance Patte	rns a	among Salmonella	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	31	29	30	22	26	51	44	53	63	90	76	73
	Chickens	Retail Chickens HACCP Cecal	0 27	0 19	0 17	1 16	1 16	5 14	3	3 4	4 16	3 31	8 35 1	4 43 1
	Turkeys	Retail Ground Turkeys HACCP	0	0	0	0 0	0	1 0	1	2	1 0	3 0	2	2
	Cattle Tu	Retail Ground Beef HACCP	1 12	0 18	0 7	0 13	0 13	0 4	0	0 5	3 15	1 4	0 2 7	0 1 6
	రొ	Cecal (Beef) Cecal (Dairy)		0	4	2	-	4	2	4		1	1 3 1	0 2
Decision Potters	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	1	2	5	1	2	1	1		20 27	5 22 36
Resistance Pattern		Source Humans	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	4.5%	1.9%	0.0%	1.1%	5.3%	4.1%
4. Resistant to ≥ 5 Antimicrobial Classes		Retail Chickens	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3 25.0%
	cens		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 25.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0	0	0	0	0	0	0	1	0	0	0.0%	0.0%
		Cecal						0.00/	400.00/	400.00/	400.00/	400.00/	0	0
	s,	Retail Ground Turkeys						0.0%	100.0% 1	100.0% 2	100.0% 1	100.0%	50.0% 1	100.0% 2
	Turkeys	HACCP					100.0% 1		100.0% 1					
	_	Cecal												
		Retail Ground Beef	0.0%								0.0% 0	0.0%	0.0%	0.0%
	<u>e</u>	HACCP	8.3% 1	0.0%	14.3% 1	15.4% 2	0.0% 0	0.0% 0	0.0% 0	0.0%	6.7% 1	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	1				- U	U	Ü			- O	0.0%	- O
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	e in				0	0	0	0	0	0	0	0	0 5.0%	0.0%
	Swine	Cecal (Market Swine)											1 7.4%	0.0%
		Cecal (Sows)	0.00/	0.0%	0.00/	0.0%	0.0%	2.0%	4.5%	1.9%	0.0%	0.0%	1.3%	0
5. At Least ACSSuT ² Resistant		Humans	0.0%	0.0%	0.0%	0	0	1	2	1	0	0	1	1
	SE.	Retail Chickens				0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Chickens	HACCP	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	25.0% 1	0.0% 0	0.0% 0	0.0%	0.0% 0
	O	Cecal											0.0%	0.0%
		Retail Ground Turkeys						0.0% 0	100.0% 1	100.0% 2	100.0% 1	100.0%	50.0% 1	100.0%
	Turkeys	HACCP					0.0%		0.0%		,	3	,	
	₽	Cecal					0		0					
		Retail Ground Beef	0.0%								0.0%	0.0%	0.0%	0.0%
	Φ	HACCP	8.3%	0.0%	14.3%	15.4%	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	1	0	1	2	0	0	0	0	1	0	0.0%	0
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)			0	0	0	0	0	0	0	0	0 5.0%	0.0%
	š	Cecal (Sows)											1 7.4%	0.0%
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0 2.7%
6. At Least ACT/S ³ Resistant		Humans	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%	0.0%
	ens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.076	0	0	0	0	0	0.070	0	0	0	0.0%	0.0%
		Cecal						0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ys	Retail Ground Turkeys					0.00/	0.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP					0.0% 0		0.0% 0					
		Cecal	0.00								0.00	0.00	0.00	0.07
		Retail Ground Beef	0.0%								0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	0.0%	0.0%	0.0%	7.7% 1	0.0% 0	0.0% 0	0.0% 0	0.0%	6.7% 1	0.0%	0.0%	0.0%
	ပိ	Cecal (Beef)											0.0% 0	
		Cecal (Dairy)											0.0% 0	0.0% 0
		Retail Pork Chops			0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
	,	Cecal (Sows)											3.7% 1	0.0%
1 Stanting in 2011 tenting included a	ino on	I ntimicrobial classes with t	he addition o	f the macroli	de azithromy	cin Bocauso	recietance t	o azithromyc	in is low (in th	nic case ~1º	4)		<u> </u>	Ū

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 36c. Resistance Patterns among Salmonella Infantis Isolates, 2003-2014

Year		Humans	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	ω		31	29	30	22	26	51	44	53	63	90	76	73
	Chickens	Retail Chickens HACCP	0 27	0 19	0 17	1 16	1 16	5 14	3	3 4	4 16	3 31	8 35	4 43
	S	Cecal	2,	13	.,,	10	10	1-7	0	7	10	01	1	1
	ys	Retail Ground Turkeys	0	0	0	0	0	1	1	2	1	3	2	2
	Turkeys	HACCP	0	0	0	0	1	0	1	0	0	0	0	0
	-	Cecal		^	^	_		^	•	•			0	0
	e e	Retail Ground Beef HACCP	1 12	0 18	0 7	0 13	0 13	0 4	0	0 5	3 15	1 4	2 7	6
	Cattle	Cecal (Beef)											1	0
		Cecal (Dairy)											3	2
	Swine	Retail Pork Chops Cecal (Market Swine)	0	0	1	2	5	1	2	1	1	1	1 20	5 22
	NS.	Cecal (Sows)											27	36
Resistance Pattern		Source	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	1.9%	0.0%	0.0%	1.3%	0.0%
7. At Least ACSSuTAuCx 1		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2	1.9%	0.0%	0.0%	1.3%	0.0%
Resistant	S	Retail Chickens				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%
	į	Cecal	0	0	0	0	0	0	0	1	0	0	0.0%	0.0%
	-							0.0%	100.0%	100.0%	100.0%	100.0%	0 50.0%	0 100.0%
	sk	Retail Ground Turkeys						0	1	2	1	3	1	2
	Turkeys	HACCP					0.0% 0		0.0%					
	-	Cecal												
		Retail Ground Beef	0.0%								0.0%	0.0%	0.0%	0.0%
	ije E	HACCP	8.3% 1	0.0%	14.3% 1	15.4% 2	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)					0			0	,	0	0.0%	U
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)											5.0% 1	0.0% 0
		Cecal (Sows)											7.4% 2	0.0% 0
8. At Least Ceftriaxone and		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	2.6%	2.7%
Nalidixic Acid Resistant		Retail Chickens	-		-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	SPI	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	<u> </u>	Retail Ground Turkeys						0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP					0.0%	0	0.0%	0	0	0	0	0
	₽	Cecal					0		0					
		Retail Ground Beef	0.0%								0.0%	0.0%	0.0%	0.0%
	<u>e</u>	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	0	0	0		0	0	0	J		U	0.0%	0
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0% 0 0.0%	0.0% 0 0.0%

² ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 37a. Antimicrobial Resistance among Salmonella Heidelberg Isolates, 2003-2014

Table 37a. Antimicrol	bial Resistance amo	ng :	Salmonella Heidelb	erg Isolate	es, 2003-20 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed		Humans	96	92	125	102	98	75	86	62	70	41	60	71
		Chickens	Retail Chickens HACCP Cecal	16 226	31 167	22 283	30 164	14 142	30 94	44 74	21 25	11 28	17 81	28 29 9	24 108 7
		Turkeys	Retail Ground Turkey HACCP Cecal	32 57	37 46	53 25	35 43	41 23	57 8	10 3	17 14	28 5	5 19	17 6 2	6 30 3
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 9	0	0 6	0 4	0	1 3	0 0	0 2	0	0 2	1 2 1	0 1 0
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	3	0	4	0	0	1	0	1	1	0 2 1	0 0 0
	Antimicrobial (Resistance		Cecal (Sows)											3	0
	Breakpoint)		Source	5.2%	4.3%	6.4%	4.9%	16.3%	14.7%	2.3%	8.1%	20.0%	7.3%	21.7%	15.5%
Aminoglycosides	Gentamicin (MIC ≥ 16 μg/ml)		Humans	5.2% 5 18.8%	4.3% 4 9.7%	8	4.9% 5 20.0%	16.3% 16 7.1%	11 26.7%	2.3%	5 4.8%	14 0.0%	7.5% 3 0.0%	13 21.4%	11 29.2%
		ens	Retail Chickens	3 7.5%	3 10.2%	3 9.2%	6 9.8%	1 11.3%	8 10.6%	23.0%	1 28.0%	0.0%	0 13.6%	6	7 12.0%
		Chickens	HACCP	17	17	26	16	16	10.0%	17	7	4	11	3	13
		_	Cecal	12.5%	35.1%	37.7%	31.4%	24.4%	57.9%	70.0%	29.4%	78.6%	100.0%	1 82.4%	0 83.3%
		ske	Retail Ground Turkey	4 12.3%	13 17.4%	20	11 32.6%	10	33 50.0%	7 33.3%	5 21.4%	22 60.0%	5 57.9%	14 50.0%	5 50.0%
		Turkeys	HACCP	7	8	9	14	3	4	1	3	3	11	3 50.0%	15 66.7%
			Cecal						100.0%					1 100.0%	2
			Retail	0.0%	0.0%	0.0%	0.0%		1 33.3%		50.0%		50.0%	1 0.0%	0.0%
		Cattle	HACCP	0	0	0	0		1		1		1	0.0%	0
			Cecal (Beef)											0	
			Cecal (Dairy)		0.0%		75.0%			0.0%		0.0%	100.0%	0.0%	
		ne	Retail		0		3			0		0	1	0.0%	
		Swine	Cecal (Market Swine)											33.3%	
-	Streptomycin		Cecal (Sows)	12.5%	15.2%	13.6%	11.8%	12.2%	30.7%	23.3%	25.8%	37.1%	17.1%	1 40.0%	25.4%
	(MIC ≥ 64 μg/mI)		Humans	12 12.5%	14 22.6%	17 18.2%	12 23.3%	12 21.4%	23	20	16 14.3%	26 9.1%	7 0.0%	24 28.6%	18 37.5%
		cens	Retail	2 17.7%	7 18.0%	4 15.5%	7 10.4%	3 13.4%	12 16.0%	6 27.0%	3 44.0%	1 14.3%	0 12.3%	8 10.3%	9 25.0%
		Chickens	HACCP Cecal	40	30	44	17	19	15	20	11	4	10	3 22.2%	27 0.0%
			Retail	37.5%	43.2%	47.2%	45.7%	39.0%	71.9%	60.0%	94.1%	92.9%	80.0%	2 70.6%	0 100.0%
		Turkeys	HACCP	12 28.1%	16 21.7%	25 44.0%	16 34.9%	16 26.1%	41 37.5%	6 66.7%	16 57.1%	26 60.0%	4 63.2%	12 50.0%	6 70.0%
		Tur	Cecal	16	10	11	15	6	3	2	8	3	12	3 50.0%	21 66.7%
			Retail						100.0%					1 0.0%	2
			HACCP	55.6%	100.0%	50.0%	0.0%		1 33.3%		50.0%		100.0%	0 50.0%	100.0%
		Cattle	Cecal (Beef)	5	1	3	0		1		1		2	100.0%	1
			Cecal (Dairy)											1	
			Retail		33.3%		0.0%			100.0%		100.0%	0.0%	100.0%	
		Swine	Cecal (Market Swine)		1		0			1		1	0	100.0%	
		Ś	Cecal (Sows)											33.3%	
β-Lactam/β-Lactamase	Amoxicillin-		Humans	5.2%	9.8%	8.8%	9.8%	7.1%	8.0%	20.9%	24.2%	10.0%	22.0%	13.3%	8.5%
Inhibitor Combinations	Clavulanic Acid (MIC ≥ 32 / 16 μg/ml)		Retail	6.3%	9.7%	13.6%	10.0%	21.4%	16.7%	18 31.8%	15 19.0%	0.0%	0.0%	0.0%	12.5%
		Chickens	HACCP	9.3%	10.2%	21.9%	3 15.9%	17.6%	5 8.5%	14 17.6%	32.0%	17.9%	7.4%	10.3%	8.3%
		S	Cecal	21	17	62	26	25	8	13	8	5	6	11.1%	0.0%
			Retail	9.4%	5.4% 2	9.4%	17.1%	9.8%	7.0%	10.0%	23.5%	39.6%	0.0%	23.5% 4	0.0% 0
		Turkeys	HACCP	0.0%	6.5%	0.0%	9.3% 4	26.1%	12.5%	33.3%	35.7% 5	20.0% 1	10.5%	66.7%	30.0%
		Ţ	Cecal	Ü	3	0	4	Ü			3	1		0.0%	100.0%
			Retail						0.0%					0.0%	3
		ē	HACCP	55.6% 5	100.0%	83.3% 5	0.0%		33.3% 1		50.0% 1		0.0%	50.0% 1	0.0%
		Cattle	Cecal (Beef)	5	-	3	U						U	100.0%	U
			Cecal (Dairy)												
			Retail		0.0%		0.0%			100.0%		0.0%	0.0%	0.0%	
		Swine	Cecal (Market Swine)				U					0	U	0.0%	
	dring		Cecal (Sows)											66.7%	

Year	obial Resistance an	nong :	Salmonella Heidelb	erg Isolate	es, 2003-20 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	96	92	125	102	98	75	86	62	70	41	60	71
		ens	Retail Chickens	16	31	22	30	14	30	44	21	11	17	28	24
		Chickens	HACCP Cecal	226	167	283	164	142	94	74	25	28	81	29 9	108 7
				32	37	53	35	41	57	10	17	28	5	17	6
		Turkeys	HACCP	57	46	25	43	23	8	3	14	5	19	6	30
		-	Cecal Retail Ground Beef		0	0	0	0	1	0	0	0	0	2	3
		Cattle	HACCP	0 9	0	0 6	0 4	0	3	0	0 2	0	0 2	1 2	0
		రి	Cecal (Beef)											1	0
			Cecal (Dairy)	0	3	0		0	0	4	0	1	1	0 2	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	3	U	4	U	0	1	U	'	'	1	0
	Antimicrobial	0)	Cecal (Sows)											3	0
Autimierahial Class	(Resistance Breakpoint)		Isolate Source												
Antimicrobial Class Cephems	Cefoxitin		Humans	5.2%	7.6%	8.8%	8.8%	7.1%	8.0%	19.8%	24.2%	8.6%	22.0%	15.0%	8.5%
	(MIC ≥ 32 μg/ml)		Retail	5 6.3%	7 9.7%	11 9.1%	9 10.0%	7 21.4%	6 16.7%	17 31.8%	15 14.3%	6 0.0%	9 0.0%	9	6 12.5%
		kens	HACCP	7.1%	3 10.2%	2 21.6%	3 15.2%	3 16.9%	5 8.5%	14 17.6%	3 32.0%	0 17.9%	0 6.2%	0 6.9%	3 7.4%
		Chickens		16	17	61	25	24	8	13	8	5	5	2 11.1%	8 0.0%
			Cecal	0.0%	5.4%	9.4%	17.1%	9.8%	3.5%	10.0%	23.5%	35.7%	0.0%	1 23.5%	0.0%
		s/s	Retail	0	2	5	6	4	2	1	4	10	0	4	0
		Turkeys	HACCP	0.0% 0	6.5% 3	0.0% 0	9.3% 4	17.4% 4	12.5% 1	33.3% 1	35.7% 5	20.0% 1	10.5% 2	66.7% 4	30.0% 9
		-	Cecal											0.0% 0	100.0% 3
			Retail						0.0%					0.0%	
		0	HACCP	44.4%	100.0%	66.7%	0.0%		33.3%		50.0%		0.0%	50.0%	0.0%
		Cattle	Cecal (Beef)	4	1	4	0		1		1		0	100.0%	0
														1	
		_	Cecal (Dairy)		0.0%		0.0%			100.0%		0.0%	2.0%	0.0%	
		9	Retail		0.070		0.070			1		0	0	0	
		Swine	Cecal (Market Swine)											0.0%	
			Cecal (Sows)											66.7% 2	
	Ceftiofur (MIC ≥ 8 µg/ml)		Humans	5.2% 5	8.7% 8	8.8% 11	9.8% 10	7.1% 7	8.0% 6	20.9% 18	24.2% 15	8.6% 6	22.0% 9	15.0% 9	8.5% 6
	(о _ о ру)		Retail	6.3% 1	9.7%	9.1%	10.0%	21.4%	16.7% 5	31.8% 14	19.0% 4	0.0%	0.0%	0.0%	12.5%
		Chickens	HACCP	9.3%	10.2%	21.9%	15.9%	16.9%	8.5%	17.6%	32.8%	17.9%	7.4%	10.3%	8.3%
		ş	Cecal	21	17	62	26	24	8	13	8	5	6	3 11.1%	9 0.0%
				0.0%	5.4%	9.4%	17.1%	9.8%	3.5%	10.0%	23.5%	39.3%	0.0%	23.5%	0.0%
		ske	Retail	0.0%	2 6.5%	5 0.0%	6 9.3%	4 26.1%	2 12.5%	1 33.3%	4 35.7%	11 20.0%	0 10.5%	4 66.7%	0 30.0%
		Turkeys	HACCP	0	3	0	4	6	1	1	5	1	2	4 0.0%	9
			Cecal											0	100.0%
			Retail						0.0% 0					0.0% 0	
		tle	HACCP	55.6% 5	100.0%	83.3% 5	0.0%		33.3% 1		50.0% 1		0.0%	50.0% 1	0.0%
		Cattle	Cecal (Beef)											100.0% 1	
			Cecal (Dairy)												
			Retail		0.0%		0.0%			100.0%		0.0%	0.0%	0.0%	
		Swine	Cecal (Market Swine)		0		0			1		0	0	0.0%	
		Š												0 66.7%	
	Ceftriaxone	-	Cecal (Sows)	5.2%	8.7%	8.8%	9.8%	7.1%	8.0%	20.9%	24.2%	8.6%	22.0%	2 15.0%	8.5%
	(MIC ≥ 4 µg/mI)		Humans	5	8	11	10	7	6	18	15	6	9	9	6
		St	Retail	6.3% 1	9.7% 3	9.1% 2	10.0% 3	21.4% 3	16.7% 5	31.8% 14	23.8% 5	0.0% 0	0.0% 0	0.0% 0	12.5% 3
		Chickens	HACCP	9.3% 21	10.2% 17	21.9% 62	15.9% 26	17.6% 25	8.5% 8	17.6% 13	32.0% 8	17.9% 5	7.4% 6	10.3% 3	8.3% 9
		٥	Cecal											11.1%	0.0%
		H	Retail	0.0%	5.4%	9.4%	17.1%	9.8%	3.5%	10.0%	23.5%	39.3%	0.0%	23.5%	0.0%
		eys		0.0%	2 6.5%	5 0.0%	6 9.3%	4 26.1%	2 12.5%	1 33.3%	4 35.7%	11 20.0%	0 10.5%	4 66.7%	0 30.0%
		Turkeys	HACCP	0	3	0	4	6	1	1	5	1	2	4 0.0%	9
			Cecal											0	100.0% 3
			Retail						0.0% 0					0.0%	
		<u>o</u>	HACCP	55.6% 5	100.0% 1	83.3% 5	0.0% 0		33.3% 1		50.0% 1		0.0% 0	50.0% 1	0.0%
		Cattle	Cecal (Beef)	Ü		3							U	100.0%	J
			Cecal (Dairy)											1	
		\vdash			0.0%		0.0%			100.0%		0.0%	0.0%	0.0%	
		0	Retail		0.0%		0.0%			100.0%		0.0%	0.0%	0	
		Swine	Cecal (Market Swine)											0.0% 0	
		"	Cecal (Sows)											66.7% 2	
	ı	_	<u> </u>												

Table 37c. Antimicrobial Resistance among Salmonella Heidelberg Isolates, 2003-2014

Table 37c. Antimicro	bial Resistance amo	ong S	Salmonella Heidelbe				0000	0007	0000	0000	0040	0044	0040	0040	0044
Year Number of Isolates Test	tad		Humans	2003 96	2004 92	2005 125	2006 102	2007 98	2008 75	2009 86	2010 62	2011 70	2012 41	2013 60	2014 71
Number of Isolates Test	ieu	su	Retail Chickens	16	31	22	30	14	30	44	21	11	17	28	24
		Chicker	HACCP	226	167	283	164	142	94	74	25	28	81	29	108
			Cecal											9	7
		urkeys	Retail Ground Turkey	32	37	53	35	41	57	10	17	28	5	17	6
		H Z	HACCP Cecal	57	46	25	43	23	8	3	14	5	19	6 2	30 3
			Retail Ground Beef	0	0	0	0	0	1	0	0	0	0	1	0
		Cattle	HACCP	9	1	6	4	0	3	0	2	0	2	2	1
		ပိ	Cecal (Beef)											1	0
			Cecal (Dairy)											0	0
		vine	Retail Pork Chops Cecal (Market Swine)	0	3	0	4	0	0	1	0	1	1	2	0
		Sw	Cecal (Sows)											3	0
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Folate Pathway Inhibito	Sulfamethoxazole/ Sulfisoxazole 1		Humans	7.3% 7	7.6% 7	8.0% 10	4.9% 5	18.4% 18	12.0% 9	7.0% 6	11.3% 7	7.1% 5	2.4%	15.0% 9	15.5% 11
	(MIC ≥ 512 μg/ml)		Retail	12.5%	12.9%	13.6%	26.7%	7.1%	26.7%	2.3%	9.5%	0.0%	0.0%	17.9%	29.2%
		kens	HACCP	2 11.1%	4 12.6%	3 10.6%	8 7.9%	13.4%	8 12.8%	1 21.6%	2 36.0%	0 17.9%	0 13.6%	5 10.3%	7 11.1%
		Chickens		25	21	30	13	19	12	16	9	5	11	3 11.1%	12 0.0%
			Cecal											1	0
		1	Retail	15.6% 5	37.8% 14	35.8% 19	37.1% 13	26.8% 11	29.8% 17	50.0% 5	35.3% 6	32.1% 9	20.0%	29.4% 5	83.3% 5
		Turkeys	HACCP	19.3%	26.1%	52.0%	30.2%	34.8%	37.5%	0.0%	28.6%	40.0%	21.1%	50.0%	43.3%
		Ţ		11	12	13	13	8	3	0	4	2	4	3 50.0%	13 100.0%
			Cecal											1	3
			Retail						100.0% 1					100.0% 1	
		Ф	HACCP	44.4%	100.0%	50.0%	0.0%		33.3%		50.0%		50.0%	50.0%	100.0%
		Cattle	Cecal (Beef)	4	1	3	0		1		1		1	100.0%	1
														1	
			Cecal (Dairy)												
			Retail		0.0%		100.0% 4			100.0%		0.0%	0.0%	0.0%	
		Swine	Cecal (Market Swine)									Ĭ		0.0%	
		Š												33.3%	
	Tring oth	1	Cecal (Sows)	0.45	0.00:	0.00:	0.05:	0.05:	0.70	0.55	0.05:	4.45	0.00	1	0.07
	Trimethoprim- Sulfamethoxazole	L	Humans	2.1% 2	0.0% 0	0.8% 1	0.0% 0	0.0% 0	2.7% 2	3.5% 3	0.0% 0	1.4% 1	0.0% 0	1.7% 1	2.8% 2
	(MIC ≥ 4 / 76 µg/ml)	"	Retail	0.0% 0	0.0% 0	0.0% 0	6.7% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Chickens	HACCP	0.9%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%
		Shi		2	0	1	0	0	0	0	0	0	0	0.0%	0.0%
		<u> </u>	Cecal									4		0	0
		(0	Retail	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	10.7% 3	0.0% 0	0.0%	0.0% 0
		Turkeys	HACCP	3.5%	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%
		Ē	Cecal	2	0	0	0	1	0	0	0	0	0	0.0%	33.3%
		<u> </u>							0.0%					0.0%	1
			Retail						0					0	
		<u>e</u>	HACCP	55.6% 5	100.0%	50.0% 3	0.0%		0.0%		0.0%		50.0% 1	0.0%	0.0% 0
		Cattle	Cecal (Beef)	, ,		j	Ů		L		Ŭ			100.0%	Ŭ
			, ,											1	
		<u></u>	Cecal (Dairy)		0.004		100.007			100.00/		0.007	0.007	0.007	
			Retail		0.0% 0		100.0% 4			100.0% 1		0.0% 0	0.0% 0	0.0% 0	
		Swine	Cecal (Market Swine)											0.0%	
		S	Cecal (Sows)											0.0%	
Macrolides	Azithromycin	1	Humans									0.0%	0.0%	0.0%	0.0%
	(MIC ≥32 µg/ml)	-										0.0%	0.0%	0.0%	0.0%
		ens	Retail									0.0%	0.0%	0.0%	0
		Chickens	HACCP									0.0%	0.0%	0	0
		0	Cecal											0.0%	0.0%
		Ş	Retail									0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Turkeys	HACCP									0.0%	0.0%	0.0%	3.3%
		٦	Cecal									Ť		0.0%	33.3%
		-	Retail											0.0%	1
			HACCP										0.0%	0.0%	0.0%
		Cattle											0	0.0%	0
		٥	Cecal (Beef)											0.0%	
			Cecal (Dairy)												
	i e											0.0%	0.0% 0	0.0%	
		Reta													
		wine	Cecal (Market Swine)											0.0%	
		Swine													

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Number of Isolates Te	stad		Humans	2003 96	2004 92	2005 125	2006 102	2007 98	2008 75	2009 86	2010 62	2011 70	2012 41	2013 60	201 71
Number of Isolates Te	Sieu	su	Retail Chickens	16	31	22	30	14	30	44	21	11	17	28	24
		Chickens	HACCP	226	167	283	164	142	94	74	25	28	81	29	108
			Cecal			F0.	0.5			40			_	9	7
		Turkeys	Retail Ground Turkey HACCP	32 9	37 1	53 6	35 4	41 0	57 3	10 0	17 2	28 0	5 2	17 2	6 30
		2	Cecal											1	3
		9	Retail Ground Beef	0	0	0	0	0	1	0	0	0	0	1	0
		Cattle	HACCP Cecal (Beef)	9	1	6	4	0	3	0	2	0	2	2 1	1 0
			Cecal (Dairy)											0	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	3	0	4	0	0	1	0	1	1	2	0
		Š	Cecal (Narket Swiffe) Cecal (Sows)											3	0
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Penicillins	Breakpoint) Ampicillin	-	Source	10.4%	25.0%	20.0%	18.6%	18.4%	28.0%	27.9%	38.7%	30.0%	26.8%	33.3%	22.5
i eniciiins	(MIC ≥ 32 μg/ml)		Humans	10	23	25	19	18	21	24	24	21	11	20	16
		sus	Retail	18.8% 3	25.8% 8	27.3% 6	16.7% 5	21.4% 3	23.3% 7	14	19.0% 4	0.0% 0	0.0% 0	3.6% 1	20.8 5
		Chickens	HACCP	19.0% 43	16.2% 27	25.1% 71	16.5% 27	20.4% 29	13.8% 13	20.3% 15	40.0% 10	21.4% 6	9.9% 8	24.1% 7	12.0 13
		O	Cecal											33.3% 3	0.0
			Retail	9.4% 3	13.5% 5	18.9% 10	31.4% 11	53.7% 22	82.5% 47	80.0% 8	70.6% 12	96.4% 27	100.0% 5	82.4% 14	33.3
		Turkeys	HACCP	3.5%	17.4%	24.0%	37.2%	65.2%	50.0%	66.7%	57.1%	60.0%	57.9%	66.7%	43.3
		Ţ	Cecal	2	8	6	16	15	4	2	8	3	11	50.0%	100.
		-	Retail						0.0%					1 0.0%	3
				55.6%	100.0%	83.3%	0.0%		0 66.7%		50.0%		0.0%	0 50.0%	0.0
		Cattle	HACCP	5	1	5	0.078		2		1		0.078	1 100.0%	0.0
		0	Cecal (Beef)											100.0%	
			Cecal (Dairy)												
			Retail		0.0% 0		0.0% 0			100.0% 1		0.0% 0	100.0% 1	50.0% 1	
		Swine	Cecal (Market Swine)											0.0% 0	
			Cecal (Sows)											66.7% 2	
Phenicols	Chloramphenicol		Humans	0.0%	1.1%	0.8%	0.0%	3.1%	1.3%	4.7%	1.6%	4.3%	0.0%	6.7%	9.9
	(MIC ≥ 32 μg/ml)		Retail	0.0%	1 3.2%	0.0%	0.0%	7.1%	3.3%	0.0%	0.0%	0.0%	0.0%	3.9%	20.8
		Chickens	HACCP	0 3.1%	1 4.2%	0 3.2%	0 2.4%	1 4.2%	1 4.3%	0 5.4%	0 20.0%	0 3.6%	0 6.2%	1 3.4%	5.6
		Chic		7	7	9	4	6	4	4	5	1	5	1 0.0%	0.0
			Cecal	0.0%	5.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	0.0%	0.0
		ys	Retail	0	2	0	0	0	0	0	0	3	0	0	0
		Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	4.7% 2	4.3% 1	12.5% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	3.3 ¹
			Cecal											0.0%	33.3 1
			Retail						0.0% 0					0.0% 0	
		9	HACCP	44.4% 4	100.0% 1	50.0% 3	0.0% 0		0.0% 0		0.0% 0		50.0% 1	50.0% 1	100. 1
		Cattle	Cecal (Beef)	7	•	3					J		•	100.0%	
			Cecal (Dairy)											1	
		-	Retail		0.0%		0.0%			0.0%		0.0%	0.0%	0.0%	
		ine	Cecal (Market Swine)		0		0			0		0	0	0.0%	
		Swine												33.3%	
Quinolones	Ciprofloxacin	-	Cecal (Sows)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%	0.0
eamornes	(MIC ≥ 1 μg/ml)		Humans	0	0	0	0	0	0	0	0	0	0	0	0
		su	Retail	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0
		Chickens	HACCP	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0
		Ò	Cecal											0.0%	0.0
			Retail	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
		Ţ	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0
		\vdash	Retail						0.0%					0.0%	0
				0.0%	0.0%	0.0%	0.0%		0.0%		0.0%		0.0%	0.0%	0.0
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%		0.0%	0	0.0
		Ö	Cecal (Beef)											0.0% 0	
			Cecal (Dairy)												
			Retail		0.0% 0		0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0	
		Swine	Cecal (Market Swine)											0.0%	
		Ó	Cecal (Sows)											0.0%	
														0	

	bial Resistance amo	ong :	Salmonella Heidelb												
Year Number of Isolates Test	and .		Humans	2003 96	2004 92	2005 125	2006 102	2007 98	2008 75	2009 86	2010 62	2011 70	2012 41	2013 60	2014 71
Number of isolates fest	ea	Chickens	Retail Chickens HACCP	16 226	31 167	22 283	30 164	14 142	30 94	44 74	21 25	11 28	17 81	28 29	24 108
		Turkeys	Retail Ground Turkey HACCP Cecal	32 57	37 46	53 25	35 43	41 23	57 8	10 3	17 14	28 5	5 19	9 17 6 2	7 6 30 3
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0 9	0	0 6	0 4	0	1 3	0	0 2	0	0 2	1 2 1 0	0 1 0
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	3	0	4	0	0	1	0	1	1	2 1 3	0 0 0
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	1.0% 1	0.0%	0.8%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	4.2% 3
	(MIC 2 32 µg/III)	su	Retail	0.0% 0	0.0% 0	0.0% 0	3.3% 1	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%
		Ö	Cecal											0.0% 0	0.0% 0
			Retail	0.0%	0.0%	1.9% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		1	Cecal	0	0	0	0	0	0	0	0	0	0	0 0.0% 0	0 0.0% 0
			Retail						0.0%					0.0%	
		e #	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											100.0% 1	
			Cecal (Dairy)												
			Retail		0.0% 0		0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0	
		Swine	Cecal (Market Swine)											0.0% 0	
			Cecal (Sows)											33.3% 1	
Tetracyclines	Tetracycline (MIC ≥ 16 μg/ml)		Humans	16.7% 16	19.6% 18	18.4% 23	13.7% 14	22.4% 22	36.0% 27	27.9% 24	22.6% 14	34.3% 24	14.6% 6	33.3% 20	15.5% 11
		SL	Retail	0.0%	6.5% 2	4.5% 1	3.3% 1	7.1% 1	26.7% 8	15.9% 7	19.0% 4	9.1% 1	0.0%	26.9% 7	20.8% 5
		Chickens	HACCP	16.4% 37	15.0% 25	14.5% 41	12.2% 20	12.7% 18	13.8% 13	14.9% 11	32.0% 8	10.7% 3	12.3% 10	3.4% 1	15.7% 17
		O	Cecal											22.2% 2	0.0%
		S	Retail	43.8% 14	70.3% 26	56.6% 30	68.6% 24	70.7% 29	79.0% 45	60.0% 6	82.4% 14	92.9% 26	100.0% 5	88.2% 15	50.0% 3
		Turkeys	HACCP	84.2% 48	73.9% 34	64.0% 16	62.8% 27	65.2% 15	87.5% 7	66.7% 2	100.0% 14	80.0% 4	57.9% 11	16.7% 1	43.3% 13
		ľ	Cecal											100.0%	66.7% 2
			Retail						100.0%					100.0%	
		tle	HACCP	55.6% 5	100.0% 1	66.7% 4	0.0%		33.3% 1		50.0% 1		100.0% 2	50.0% 1	100.0% 1
		Cattle	Cecal (Beef)											100.0% 1	
		L	Cecal (Dairy)												
			Retail		100.0% 3		0.0% 0			100.0% 1		100.0% 1	100.0% 1	100.0% 2	
		Swine	Cecal (Market Swine)											100.0% 1	
			Cecal (Sows)											33.3% 1	

Table 38a. Resistance Patte	erns a	among Salmonella					0007	2000	0000	0040	0044	2042	2042	004.4
Year Number of Isolates Tested		Humans	2003 96	2004 92	2005 125	2006 102	2007 98	2008 75	2009 86	2010 62	2011 70	2012 41	2013 60	2014 71
	Chickens	Retail Chickens HACCP Cecal	16 226	31 167	22 283	30 164	14 142	30 94	44 74	21 25	11 28	17 81	28 29 9	24 108 7
	Turkeys	Retail Ground Turkey HACCP Cecal	32 57	37 46	53 25	35 43	41 23	57 8	10 3	17 14	28 5	5 19	17 6 2	6 30 3
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0 9	0 1	0 6	0 4	0	1 3	0	0 2	0	0 2	1 2 1 0	0 1 0
Paris and Paris	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	3	0	4	0	0	1	0	1	1	2 1 3	0 0 0
Resistance Pattern		Source Humans	68.8%	56.5%	62.4%	67.6%	58.2%	57.3%	60.5%	53.2%	55.7%	61.0%	46.7%	62.0%
1. No Resistance Detected		Retail Chickens	66 62.5%	52 58.1%	78 54.5%	69 50.0%	57 50.0%	43 50.0%	52 61.4%	33 61.9%	39 100.0%	25 100.0%	28 71.7%	44 58.3%
	sens		10 62.8%	18 68.3%	12 59.4%	15 67.1%	7 65.5%	15 70.2%	27 55.4%	13 36.0%	11 71.4%	17 76.5%	20 65.5%	14 67.6%
	Chickens	HACCP	142	114	168	110	93	66	41	9	20	62	19 55.6%	73
		Cecal											5	100.0% 7
	s.	Retail Ground Turkey	50.0% 16	16.2% 6	20.8% 11	8.6% 3	9.8% 4	1.8% 1	10.0% 1	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Turkeys	HACCP	8.8% 5	15.2% 7	16.0% 4	23.3% 10	17.4% 4	0.0% 0	33.3% 1	0.0% 0	0.0% 0	26.3% 5	0.0% 0	10.0% 3
		Cecal											0.0% 0	0.0%
		Retail Ground Beef						0.0% 0					0.0%	
	ē	HACCP	44.4% 4	0.0% 0	0.0% 0	100.0% 4		33.3% 1		50.0%		0.0%	50.0%	0.0%
	Cattle	Cecal (Beef)	4	0	0	4						U	0.0%	0
		Cecal (Dairy)											0	
		Retail Pork Chops		0.0%		0.0%			0.0%		0.0%	0.0%	0.0%	
	Swine	Cecal (Market Swine)		0		0			0		0	0	0.0%	
	Š												0 33.3%	
		Cecal (Sows)	10.4%	13.0%	15.2%	12.7%	17.3%	28.0%	25.6%	33.9%	30.0%	26.8%	1 33.3%	21.1%
2. Resistant to ≥ 3 Antimicrobial Classes		Humans	10	12 12.9%	19	13	17 28.6%	21 33.3%	22 34.1%	21 23.8%	21	11 0.0%	20	15 20.8%
Anumicropial Classes	sus	Retail Chickens	1	4	3	4	4	10	15	5	0	0	4	5
	Chickens	HACCP	13.3% 30	15.6% 26	24.4% 69	17.1% 28	20.4% 29	12.8% 12	24.3% 18	36.0% 9	17.9% 5	11.1% 9	10.3% 3	13.0% 14
		Cecal											11.1% 1	0.0% 0
	"	Retail Ground Turkey	12.5% 4	27.0% 10	34.0% 18	40.0% 14	43.9% 18	80.7% 46	70.0% 7	64.7% 11	92.9% 26	100.0% 5	88.2% 15	50.0% 3
	Turkeys	HACCP	14.0% 8	23.9% 11	36.0% 9	44.2% 19	65.2% 15	50.0% 4	66.7% 2	57.1% 8	60.0%	57.9% 11	66.7% 4	46.7% 14
	-	Cecal											50.0% 1	100.0% 3
		Retail Ground Beef						100.0% 1					100.0%	Ü
	<u>o</u>	HACCP	55.6%	100.0%	83.3%	0.0%		66.7%		50.0%		50.0%	50.0%	100.0%
	Cattle	Cecal (Beef)	5	1	5	0		2		1		1	100.0%	1
		Cecal (Dairy)											1	
		Retail Pork Chops		0.0%		0.0%			100.0%		0.0%	100.0%	50.0%	
	Swine	Cecal (Market Swine)		0		0			1		0	1	0.0%	
	Š	Cecal (Sows)											0 66.7%	
		` '	0.0%	4.3%	4.0%	2.0%	5.1%	13.3%	17.4%	11.3%	4.3%	2.4%	2 8.3%	12.7%
3. Resistant to ≥ 4 Antimicrobial Classes		Humans	0	4 6.5%	5 0.0%	2 0.0%	5	10	15 9.1%	7 4.8%	3 0.0%	1 0.0%	5 3.6%	9 20.8%
Antimicrobial Glasses	sus	Retail Chickens	0.0%	7.8%	0.0%	0.0%	0.0%	4 4.2%	4 8.1%	1 20.0%	0.0%	0.0%	1 3.4%	5 7.4%
	Chickens	HACCP	12	13	19	7	9	4.276	6	5	3	5	1	8
		Cecal											11.1% 1	0.0% 0
	s,	Retail Ground Turkey	9.4% 3	10.8% 4	7.6% 4	17.1% 6	14.6% 6	19.3% 11	30.0% 3	29.4% 5	35.7% 10	20.0% 1	29.4% 5	16.7% 1
	Turkeys	HACCP	1.8% 1	6.5% 3	8.0% 2	14.0% 6	21.7% 5	25.0% 2	33.3% 1	35.7% 5	20.0% 1	15.8% 3	16.7% 1	26.7% 8
	_	Cecal											0.0% 0	100.0% 3
		Retail Ground Beef						0.0% 0					0.0%	
	ite E	HACCP	55.6% 5	100.0% 1	50.0% 3	0.0% 0		33.0% 1		50.0% 1		50.0% 1	50.0% 1	100.0% 1
	Cattle	Cecal (Beef)											100.0%	
		Cecal (Dairy)												
		Retail Pork Chops		0.0%		0.0%			100.0%		0.0%	0.0%	0.0%	
	Swine	Cecal (Market Swine)											0.0%	
	Ś	Cecal (Sows)											33.3%	
1 Ctarting in 2014, tasting included a		2 3001 (00110)											1	

1 Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 38b. Resistance Patte			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	St	Humans Beteil Chiefean	96	92	125	102	98	75	86	62	70	41	60	71
	Chickens	Retail Chickens HACCP Cecal	16 226	31 167	22 283	30 164	14 142	30 94	44 74	21 25	11 28	17 81	28 29 9	24 108 7
	Turkeys	Retail Ground Turkey HACCP Cecal	32 57	37 46	53 25	35 43	41 23	57 8	10 3	17 14	28 5	5 19	17 6 2	6 30 3
		Retail Ground Beef	0	0	0	0	0	1	0	0	0	0	1	0
	Cattle	HACCP Cecal (Beef) Cecal (Dairy)	9	1	6	4	0	3	0	2	0	2	2 1 0	1 0 0
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	3	0	4	0	0	1	0	1	1	2 1 3	0 0 0
Resistance Pattern		Humans	0.0%	3.3%	1.6%	2.0%	4.1%	6.7%	11.6%	9.7%	4.3%	0.0%	6.7%	11.3%
4. Resistant to ≥ 5 Antimicrobial Classes		Retail Chickens	0.0%	3.2%	0.0%	0.0%	0.0%	5 6.7%	10 9.1%	6 4.8%	3 0.0%	0.0%	4 3.6%	8 16.7%
	kens	HACCP	0 4.4%	1 3.6%	0 4.6%	0 4.3%	0 5.6%	2 4.2%	4 8.1%	20.0%	0 10.7%	0 6.2%	1 3.4%	4 7.4%
	Chickens		10	6	13	7	8	4	6	5	3	5	1 11.1%	8 0.0%
		Cecal	6.3%	5.4%	0.0%	5.7%	0.0%	1.8%	10.0%	23.5%	28.6%	0.0%	1 17.6%	0.0%
	sys	Retail Ground Turkey	2 0.0%	2.2%	0.0%	9.3%	0 4.3%	1 25.0%	1 33.3%	4 35.7%	8	0	3	0 20.0%
	Turkeys	HACCP	0.078	1	0.078	4	1	2	1	5	0.078	2	1 0.0%	6
		Cecal						0.0%					0.0%	3
		Retail Ground Beef	55.00/	100.00/	50.00/	0.00/		0		50.00/		0.00/	0	0.00/
	Cattle	HACCP	55.6% 5	100.0% 1	50.0% 3	0.0%		0.0% 0		50.0% 1		0.0% 0	50.0%	0.0% 0
	O	Cecal (Beef)											100.0% 1	
		Cecal (Dairy)												
	_	Retail Pork Chops		0.0% 0		0.0% 0			100.0% 1		0.0% 0	0.0%	0.0% 0	
	Swine	Cecal (Market Swine)											0.0%	
		Cecal (Sows)											33.3% 1	
5. At Least ACSSuT ² Resistant		Humans	0.0% 0	1.1% 1	0.0%	0.0%	3.1% 3	1.3% 1	3.5% 3	1.6% 1	1.4% 1	0.0%	6.7% 4	9.9% 7
		Retail Chickens	0.0%	3.2% 1	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	3.6% 1	12.5% 3
	Chickens	HACCP	2.2% 5	2.4%	2.8%	1.8%	4.2% 6	4.2% 4	4.1% 3	16.0% 4	3.6%	3.7%	0.0%	2.8%
	ర్	Cecal	J	7	0	<u> </u>	<u> </u>	7	J		•	J	0.0%	0.0%
		Retail Ground Turkey	0.0%	5.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	4.7%	4.3%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%
	₽	Cecal	0	0	0	2	1	1	0	0	0	0	0.0%	33.3%
		Retail Ground Beef						0.0%					0.0%	1
	e.	HACCP	33.3%	100.0%	50.0%	0.0%		0 0.0% 0		0.0%		0.0%	50.0%	0.0%
	Cattle	Cecal (Beef)	3		3	0		0		U		0	100.0%	0
		Cecal (Dairy)												
		Retail Pork Chops		0.0%		0.0%			0.0%		0.0%	0.0%	0.0%	
	Swine	Cecal (Market Swine)				0						0	0.0%	
	S	Cecal (Sows)											33.3%	
6. At Least ACT/S ³ Resistant		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	0.0%	1.4%	0.0%	1.7%	1.4%
O. AL LEAST ACT/S RESISTANT	,,	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
	Chi	Cecal	U	U	U	U	U	U	U	U	U	0	0.0%	0.0% 0
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.7%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%
	Ţ	Cecal	0	0	0		0	U	U		U	0	0.0%	33.3%
		Retail Ground Beef						0.0%					0.0%	
	ē.	HACCP	44.4% 4	100.0%	50.0%	0.0%		0.0%		0.0%		0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)			,								100.0%	
		Cecal (Dairy)												
		Retail Pork Chops		0.0%		0.0%			0.0%		0.0%	0.0%	0.0%	
	Swine	Cecal (Market Swine)		U		U			U		U	U	0.0%	
	Ó	Cecal (Sows)											0.0%	
	1	1											v	

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 38c. Resistance Patterns among Salmonella Heidelberg Isolates, 2003-2014

Year	11113 6	among Samonena	2003	2004	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	96	92	125	102	98	75	86	62	70	41	60	71
	Chickens	Retail Chickens HACCP	16 226	31 167	22 283	30 164	14 142	30 94	44 74	21 25	11 28	17 81	28 29	24 108
	Turkeys Ch	Retail Ground Turkey HACCP	32 57	37 46	53 25	35 43	41 23	57 8	10 3	17 14	28 5	5 19	9 17 6	7 6 30
		Cecal Retail Ground Beef HACCP	0	0	0	0 4	0	1	0	0 2	0	0	1 2	3 0
	Cattle	Cecal (Beef) Cecal (Dairy)	9	,	6	4	0	3	0	2	0	2	1 0	1 0 0
Resistance Pattern	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Source	0	3	0	4	0	0	1	0	1	1	2 1 3	0 0 0
Resistance Pattern			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	1.4%	0.0%	1.7%	0.0%
7. At Least ACSSuTAuCx ¹ Resistant		Humans Retail Chickens	0 0.0% 0	0 3.2% 1	0 0.0% 0	0 0.0% 0	0 0.0% 0	0 0.0% 0	0.0% 0	0 0.0% 0	0.0% 0	0 0.0% 0	0.0% 0	0 8.3% 2
	Chickens	HACCP	2.2%	2.4%	2.8%	1.8%	4.2% 6	2.1%	4.1% 3	16.0% 4	3.6% 1	2.5%	0.0%	0.0% 0
	O	Cecal											0.0%	0.0%
	s/	Retail Ground Turkey	0.0%	5.4% 2	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	10.7% 3	0.0%	0.0%	0.0% 0
	Turkeys	HACCP	0.0%	0.0%	0.0%	4.7% 2	4.3% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3% 1
	Ī	Cecal											0.0%	33.3% 1
		Retail Ground Beef						0.0%					0.0%	
	Cattle	HACCP	33.3% 3	100.0% 1	50.0% 3	0.0% 0		0.0%		0.0%		0.0%	50.0% 1 100.0%	0.0% 0
	0	Cecal (Beef)											100.0%	
		Cecal (Dairy)												
	9	Retail Pork Chops		0.0% 0		0.0% 0			0.0% 0		0.0% 0	0.0%	0.0% 0 0.0%	
	Swine	Cecal (Market Swine) Cecal (Sows)											0.0%	
		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%
8. At Least Ceftriaxone and Nalidixic Acid Resistant	s	Retail Chickens	0 0.0% 0	0.0% 0										
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ŗ	Cecal											0.0% 0	0.0% 0
	,n	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0
	-	Cecal											0.0%	0.0%
		Retail Ground Beef						0.0%					0.0%	
	Cattle	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%		0.0%		0.0%	0.0%	0.0%
	Ca	Cecal (Beef)											100.0% 1	
		Cecal (Dairy)												
	9	Retail Pork Chops		0.0%		0.0%			0.0%		0.0%	0.0%	0.0%	
	Swine	Cecal (Market Swine)											0.0% 0	
		Cecal (Sows)											33.3% 1	

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 39a. Antimicrobial Resistance among Salmonella Derby Isolates, 2003-2014

Year			Humana	2003 5	2004 8	2005	2006	2007 8	2008	2009	2010	2011	2012 7	2013 5	2014 7
Number of Isolates Test	ed	S	Humans	1						13					
		Chickens	Retail Chickens HACCP	0	0	0 2	0	0	0	0	0	0	0	0 1	0
		S	Cecal											0	0
		seys	Retail Ground Turkey	0	3	1	2	1	6	5	2	2	1	0	0
		Turkeys	HACCP Cecal	0	15	3	7	1	0	4	1	1	1	2 0	0
			Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	0
		Cattle	HACCP	13	12	6	2	1	0	0	1	2	0	1	5
		O	Cecal (Beef) Cecal (Dairy)											0 2	2
		m)	Retail Pork Chops	0	0	0	0	4	0	3	6	2	1	5	5
		Swine	Cecal (Market Swine)											38	49
	Antimicrobial		Cecal (Sows)											24	26
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Aminoglycosides	Gentamicin	1	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 16 μg/ml)			0	0	0	0	0	100.0%	0	1	0	0	0	0
		ens	Retail			0.0%	0.0%		1					0.0%	
		Chickens	HACCP			0.078	0.076							0.078	
			Cecal												
		s	Retail		0.0%	0.0% 0	100.0% 2	0.0%	66.7% 4	60.0% 3	50.0% 1	100.0% 2	0.0%		
		Turkeys	HACCP		20.0%	0.0%	0.0% 0	0.0%		25.0% 1	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0
		ř	Cecal		Ŭ.	Ĭ		J				, ,			Ü
			Retail												
			HACCP	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle		0	0	0	0	0			0	0		0	0.0%
			Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0	0
			Retail					0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	6.1% 3
			Cecal (Sows)											0.0%	0.0%
	Streptomycin		Humans	40.0%	50.0%	0.0%	66.7%	62.5%	27.3%	46.2%	50.0%	50.0%	57.1%	40.0%	57.1%
	(MIC ≥ 64 μg/mI)		Retail	2	4	0	2	5	3 100.0%	6	1	3	4	2	4
		ens				100.0%	0.0%		1					0.0%	
		Chickens	HACCP			2	0							0	
			Cecal		0.00/	0.00/	2.20/	0.00/	22.22	00.00/	E0.00/	100.00/	2.22/		
		s.	Retail		0.0% 0	0.0% 0	0.0% 2	0.0% 0	83.3% 5	60.0% 3	50.0% 1	100.0% 2	0.0% 0		
		Turkeys	HACCP		40.0% 6	33.3% 1	14.3% 1	0.0%		25.0% 1	0.0%	0.0%	0.0%	50.0% 1	0.0%
		-	Cecal												
			Retail												
		0	HACCP	46.2%	66.7%	66.7%	50.0%	0.0%			0.0%	0.0%		100.0%	80.0%
		Cattle	Cecal (Beef)	6	8	4	1	0			0	0		1	4 50.0%
														0.0%	0.0%
			Cecal (Dairy)					0.0%		33.3%	50.0%	0.0%	100.0%	0 40.0%	0 20.0%
		Φ	Retail					0.0%		1	30.0%	0.0%	1	2	1
		Swine	Cecal (Market Swine)											57.9% 22	53.1% 26
			Cecal (Sows)											50.0% 12	23.1% 6
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	7.7% 1	0.0%	0.0% 0	14.3% 1	0.0% 0	0.0% 0
illibitor Combinations	(MIC ≥ 32 / 16 μg/ml)		Retail	U	0	Ü	U	U	0.0%	,	U	0		0	U
		Chickens	HACCP			50.0%	0.0%		0					0.0%	
		Chic				1	0							0	
			Cecal		66.7%	0.0%	0.0%	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%		
		ys	Retail		2	0	0	0	0.076	2	0	0	0	0.00/	0.00/
		Turkeys	HACCP		0.0% 0	0.0% 0	0.0% 0	0.0% 0		25.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
			Cecal												
			Retail												
		Φ	HACCP	15.4%	0.0%	16.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle	Cecal (Beef)	2	0	1	0	0			0	0		0	0.0%
														0.0%	0.0%
			Cecal (Dairy)					0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ø	Retail					0.0%		0.0%	0.0%	0.0%	0.0%	0	0
		Swine	Cecal (Market Swine)											0.0%	2.0%
		1	Cecal (Sows)											0.0% 0	3.8% 1

Year	obiai Resistance an	nong	Salmonella Derby Is	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted		Humans	5	8	3	3	8	11	13	2	6	7	5	7
		kens	Retail Chickens	0	0	0	0	0	1	0	0	0	0	0	0
		Chickens	HACCP Cecal	0	0	2	1	0	0	0	0	0	0	0	0
		_	Retail Ground Turkey	0	3	1	2	1	6	5	2	2	1	0	0
		Turkeys	HACCP	0	15	3	7	1	0	4	1	1	1	2	1
		<u> </u>	Cecal											0	0
		tle	Retail Ground Beef HACCP	0 13	0 12	0 6	0 2	0	0	0	0	0 2	0	0	0 5
		Cattle	,				_	· ·	Ŭ	ŭ	·	_	Ů	0	2
		_	Cecal (Dairy)											2	1
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	4	0	3	6	2	1	5 38	5 49
		Ś	Cecal (Sows)											24	26
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Cephems	Breakpoint) Cefoxitin	_	Source	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	14.3%	0.0%	0.0%
Серпеніз	(MIC ≥ 32 μg/ml)		Humans	0.070	0	0.070	0	0.070	0.0%	1	0.076	0.070	1	0	0.070
		Su	Retail						0.0%						
		Chickens	HACCP			50.0% 1	0.0%							0.0%	
		0	Cecal												
			Retail		66.7%	0.0%	0.0%	0.0%	0.0% 0	40.0% 2	0.0%	0.0%	0.0% 0		
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	U	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ţ	Cecal		0	0	0	0		1	0	0	0	0	0
		\vdash													
			Retail	15.4%	0.0%	16.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle	HACCP	2	0.0%	10.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0
		ő	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail					0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
		Swine	Cecal (Market Swine)								,		<u> </u>	0.0%	2.0%
		Ó	Cecal (Sows)											0.0%	3.8%
	Ceftiofur		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	14.3%	0.0%	0.0%
	(MIC ≥ 8 μg/ml)		ı	0	0	0	0	0	0.0%	1	0	0	1	0	0
		ens	Retail			50.0%	0.0%		0					0.0%	
		Chickens	HACCP			1	0.076							0.076	
			Cecal												
		s s	Retail		66.7% 2	0.0%	0.0%	0.0%	0.0%	40.0% 2	0.0%	0.0%	0.0% 0		
		Turkeys	HACCP		0.0% 0	0.0%	0.0% 0	0.0% 0		25.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%
		F	Cecal								,		<u> </u>		
		-	Retail												
				15.4%	0.0%	16.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle		2	0	1	0	0			0	0		0	0.0%
			Occar (Beci)											0.0%	0.0%
			Cecal (Dairy)					0.001		0.001	0.001	0.001	0.001	0	0
			Retail					0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											0.0%	2.0%
			Cecal (Sows)											0.0% 0	3.8% 1
	Ceftriaxone		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	14.3%	0.0%	0.0%
	(MIC ≥ 4 μg/ml)		Retail	0	0	0	0	0	0.0%	1	0	0	1	0	0
		Chickens	HACCE			50.0%	0.0%		0					0.0%	
		Chic	HACCP			1	0							0	
			Cecal												
		S	Retail		66.7% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	40.0% 2	0.0% 0	0.0% 0	0.0% 0		
		Turkeys	HACCP		0.0% 0	0.0%	0.0%	0.0%		25.0% 1	0.0%	0.0%	0.0%	0.0%	0.0% 0
		Ĭ	Cecal		Ť						L				
			Retail												
				15.4%	0.0%	16.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle	HACCP	2	0.076	1	0.076	0.076			0.078	0.076		0.076	0
		ď	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail					0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		1	1					0		0	0	0	0	0	0 4.1%
		ine	Cecal (Market Swine)											0.0%	4.170
		Swine	Cecal (Market Swine) Cecal (Sows)											0.0% 0 0.0%	3.8%

Table 39c. Antimicrobial Resistance among Salmonella Derby Isolates, 2003-2014

Second S		olal Resistance amo	ong a	Salmonella Derby Is			0005	0000	0007	0000	0000	0040	0044	0040	0040	0044
	Year Number of legistes Tests	ad.		Humans	2003 5	2004 8	2005	2006	2007 8	2008	2009	2010	2011	2012 7	2013 5	2014 7
Part	Number of Isolates Teste	u	ns		1											0
Part March March			icke	HACCP												0
Red Part P			_													0
			keys													0
			Turk		0	15	3	7	1	0	4	1	1	1		0
Marie					0	0	0	0	0	0	0	0	0	0		0
Part			attle	HACCP												5
			ő													2
			-					^		0	0	•	0			1
Minimization Mini			wine		0	0	0	0	4	0	3	6	2	1		5 49
Mathematical Math			S													26
Marcoland Parlinery Printed Statements processed (APC a 673 printed Statements) Marcoland (APC a 673 printe				Isolate												
Section 2016 Color (State String part) Final Final Color (State String part) Final Color			<u> </u>	Source	40.007	00.50/	00.00/	00 70/	00.50/	00.40/	04.50/	50.00/	50.00/	57.40/	40.007	E7 404
		Sulfisoxazole 1		Humans						4						57.1% 4
MICCR MICC		(MIC ≥ 512 μg/ml)	"	Retail												
Part			kens	HACCP												
Part			Chic				2	0							0	
Microsoft Micr			_	Cecal												
Macceloides			10	Retail												
Cocal Coca			rkey	HACCP		33.3%	33.3%	14.3%	0.0%		75.0%	0.0%	0.0%	0.0%		0.0%
Part			₽	Cecal		5		1	U		3	U	U	U	1	0
MACCP			\vdash													
Marcelides				Retail												
Macrolides			te	HACCP												80.0% 4
Resultable			Cat	Cecal (Beef)												50.0%
Microfides															0.0%	0.0%
Macrolides				Cecal (Dairy)					0.00/		20.00/	50.00/	0.00/	400.00/	0	0
Coral (Sows)				Retail											2	20.0% 1
Coral (Sows)			wine	Cecal (Market Swine)												51.0% 25
Trendsportion			0)	Cecal (Sows)											50.0%	15.4%
Milc 44 78 (pym) Retail	-	Trimethoprim-	+		0.0%	25.0%	0.0%	33.3%	0.0%	0.0%	7.7%	0.0%	0.0%	14.3%		0.0%
Macrolides			-		0	2	0	1	0		1	0	0	1	0	0
Cocal Coca		(MIC 24 / 76 µg/III)	SL	Retail												
Cocal Coca			icke	HACCP												
Retail			ò	Cecal												
Macrolides			-			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Retail			sk			0	0	0	0		0	0	0	0	0.00/	0.0%
Retail			Luke	HACCP												0.0%
HACCP				Cecal												
HACCP				Retail												
Macrolides					0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
Cecal (Dairy) Cecal (Market Swine) Cecal (Market			attle	НАССР												0
Retail			Ö	Cecal (Beef)												0.0% 0
Retail				Cecal (Dairy)												0.0%
Retail HACCP HA				Retail									0.0%		0.0%	20.0%
Cecal (Sows) Ceca			ne						U		U	U	U	U		2.0%
Azithromycin (MIC > 32 µg/ml)			Sw												0	0.0%
MIC 232 µg/ml) Retail HACCP Material Material				Cecal (Sows)											0	0
Retail HACCP HAC				Humans												0.0%
Retail		. 19 /		Retail												
Retail			kens	HACCP												
Retail			Chic												0	
HACCP			<u></u>										0.007	0.007		
Retail			S)	Retail									0	0		
Retail			urke	HACCP												0.0%
Retail			F	Cecal												
HACCP			\vdash													
Part													0.0%		0.0%	0.0%
Cecal (Dairy)			attle	HACCP												0
Retail			ď	Cecal (Beef)												0.0% 0
Retail 0.0% 0.0% 0.0% 0 0 0 0 0 0 0 0 0 0 0 0				Cecal (Dairy)												0.0% 0
Cecal (Market Swine)				Retail											0.0%	0.0%
S Cecai (wainet Switte)			ine										0	0		0.0%
1 1 0 00/1			Sw													0.0%
Cecal (Sows) Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004																0.0%

Table 39d. Antimicrobial Resistance among Salmonella Derby Isolates, 2003-2014

Year	DDIAI RESISTANCE AND	ong .	Salmonella Derby Is	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ted		Humans	5	8	3	3	8	11	13	2	6	7	5	7
		ens	Retail Chickens	0	0	0	0	0	1	0	0	0	0	0	0
		Chickens	HACCP	0	0	2	1	0	0	0	0	0	0	1	0
		-	Cecal Retail Ground Turkey	0	3	1	2	1	6	5	2	2	1	0	0
		Turkeys	HACCP	0	15	3	7	1	0	4	1	1	1	2	1
		F	Cecal											0	0
		e e	Retail Ground Beef HACCP	0 13	0 12	0 6	0 2	0	0	0	0	0 2	0	0	0 5
		Cattle	Cecal (Beef)	13	12	0	2	'	0			2	0	0	2
			Cecal (Dairy)											2	1
		Swine	Retail Pork Chops	0	0	0	0	4	0	3	6	2	1	5	5
		Š	Cecal (Market Swine) Cecal (Sows)											38 24	49 26
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source	0.00/	0.00/	0.00/	2 22/	0.00/	0.404	===	0.00/	40.70	44.00/	0.00/	44.00/
Penicillins	Ampicillin (MIC ≥ 32 μg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	9.1% 1	7.7% 1	0.0% 0	16.7% 1	14.3% 1	0.0% 0	14.3% 1
		S	Retail						0.0%						
		Chickens	HACCP			50.0% 1	0.0% 0							0.0% 0	
			Cecal				Ü								
			Retail		66.7%	0.0%	0.0%	0.0%	16.7%	40.0%	0.0%	0.0%	0.0%		
		Turkeys	HACCP		2 6.7%	0.0%	0.0%	0.0%	1	2 50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turk			1	0	0	0		2	0	0	0	0	0
			Cecal												
			Retail												
		tte	HACCP	15.4% 2	0.0%	16.7% 1	0.0%	0.0%			0.0% 0	0.0%		0.0%	0.0%
		Cattle	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0%	0.0%
		-	Retail					0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	20.0%
		ine	Cecal (Market Swine)					0		0	0	0	0	0 2.6%	6.1%
		Swine												0.0%	3.8%
	Oblamanhanian		Cecal (Sows)	0.00/	40.50/	0.00/	00.00/	0.00/	0.00/	0.00/	0.00/	0.00/	00.00/	0	1
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	0.0% 0	12.5% 1	0.0% 0	33.3% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	28.6% 2	0.0% 0	0.0% 0
		SL	Retail						0.0% 0						
		Chickens	HACCP			0.0%	0.0%							0.0%	
		Ö	Cecal												
			Retail		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0 25.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Tul			0	0	0	0	0	1	0	0	0	0	0
			Cecal												
			Retail	7.70/	0.00/	10.70/	2.20/	0.00/			0.00/	2.00/		0.00/	2.004
		Cattle	HACCP	7.7% 1	0.0% 0	16.7% 1	0.0% 0	0.0% 0			0.0% 0	0.0% 0		0.0% 0	0.0% 0
		ပိ	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0% 0	0.0%
			Retail					0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	20.0%
		Swine	Cecal (Market Swine)					0		0	0	0	0	0.0%	2.0%
		Š	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin	+		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 1 μg/ml)		Humans	0	0	0	0	0	0.0%	0	0	0	0	0	0
		sus	Retail			0.001	0.001		0.0%					0.001	
		Chickens	HACCP			0.0% 0	0.0% 0							0.0% 0	
		10	Cecal												
			Retail		0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	Ť	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ľ	Cecal		0	0	0	0		0	0	0	0	0	0
		\vdash	Retail												
				0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%		0.0%	0
		Ö	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0%	0.0% 0
			Retail					0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	20.0%
		Swine	Cecal (Market Swine)										0	0.0%	0.0%
		Ś	Cecal (Sows)											0.0%	0.0%
		_	(==)											0	0

Year	obial Resistance am	Jg		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted	T	Humans	5	8	3	3	8	11	13	2	6	7	5	7
		sus	Retail Chickens	0	0	0	0	0	1	0	0	0	0	0	0
		Chickens	HACCP	0	0	2	1	0	0	0	0	0	0	1	0
		_	Cecal							_				0	0
		Turkeys	Retail Ground Turkey HACCP	0	3 15	3	2 7	1 1	6 0	5 4	2 1	2 1	1	0 2	0
		ī	Cecal											0	0
		<u>o</u>	Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	0
		Cattle	HACCP Cecal (Beef)	13	12	6	2	'	0	0	1	2	0	0	5 2
			Cecal (Dairy)											2	1
		Swine	Retail Pork Chops	0	0	0	0	4	0	3	6	2	1	5	5
		Š	Cecal (Market Swine) Cecal (Sows)											38 24	49 26
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 μg/ml)		Humans	0.0% 0	12.5% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	7.7% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		S.	Retail						0.0% 0						
		Chickens	HACCP			0.0% 0	0.0%							0.0%	
		ర్	Cecal				Ü								
		-	Retail		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ţ			0	0	0	0		0	0	0	0	0	0
		С	Cecal												
			Retail												
		Cattle	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0			0.0% 0	0.0% 0		0.0% 0	0.0%
		ပိ	Cecal (Beef)												0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail					0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	20.0%
		Swine	Cecal (Market Swine)							0	0	0	0	0.0%	0.0%
		Ó	Cecal (Sows)											0.0%	3.8%
Tetracyclines	Tetracycline	-		60.0%	50.0%	33.3%	66.7%	62.5%	36.4%	69.2%	0.0%	83.3%	71.4%	0 60.0%	71.4%
	(MIC ≥ 16 μg/ml)	_	Humans	3	4	1	2	5	4 100.0%	9	0	5	5	3	5
		sus	Retail			100.0%	100.0%		1					0.00/	
		Chickens	HACCP			2	100.0%							0.0% 0	
			Cecal												
		s	Retail		100.0% 3	10.0% 1	100.0% 2	100.0% 1	83.3% 5	10.0% 5	100.0% 2	100.0% 2	100.0% 1		
		Turkeys	HACCP		20.0%	66.7% 2	85.7% 6	100.0% 1		100.0% 4	100.0% 1	0.0% 0	0.0% 0	100.0% 2	0.0% 0
		ř	Cecal		J					7	,	J	J		
		-	Retail												
			HACCP	69.2%	66.7%	66.7%	50.0%	100.0%			0.0%	0.0%		0.0%	80.0%
		Cattle	Cecal (Beef)	9	8	4	1	1			0	0		0	50.0%
														0.0%	1 0.0%
			Cecal (Dairy)					100.09/		22 20/	66 79/	E0.09/	100.0%	0 60.0%	0
		an an	Retail					100.0% 4		33.3% 1	66.7% 4	50.0% 1	100.0%	3	20.0%
		Swine	Cecal (Market Swine)											78.9% 30	75.5% 37
			Cecal (Sows)											62.5% 15	42.3% 11

Table 40a. Resistance Patte	erns a	amonella	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	5	8	3	3	8	11	13	2	6	7	5	7
	Chickens	Retail Chickens HACCP Cecal	0	0	0 2	0	0	1 0	0	0	0	0	0 1 0	0 0 0
	Turkeys	Retail Ground Turkey HACCP Cecal	0 0	3 15	1 3	2 7	1 1	6 0	5 4	2	2	1	0 2 0	0 1 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0 13	0 12	0 6	0 2	0 1	0	0	0	0 2	0	0 1 0 2	0 5 2
Resistance Pattern	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Source	0	0	0	0	4	0	3	6	2	1	5 38 24	5 49 26
		Humans	40.0%	37.5%	66.7%	33.3%	37.5%	45.5%	23.1%	50.0%	16.7%	28.6%	40.0%	28.6%
1. No Resistance Detected		Retail Chickens	2	3	2	1	3	5 0.0%	3	1	1	2	2	2
	Chickens	HACCP			0.0%	0.0%		0					100.0%	
	Chic				0	0							1	
		Cecal		0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%		
	ske	Retail Ground Turkey		0 53.3%	0 33.3%	0	0	1	0	0	0	0	0.0%	100.0%
	Turkeys	HACCP		8	1	14.5%	0.078		0.078	0.078	1	1	0.0%	1
		Cecal												
		Retail Ground Beef												
	Cattle	HACCP	30.8% 4	33.3% 4	33.3% 2	50.0% 1	0.0%			100.0% 1	100.0% 2		0.0%	
	ပ္မ	Cecal (Beef)												50.0% 1
		Cecal (Dairy)											100.0% 2	100.0%
		Retail Pork Chops					0.0%		66.7%	33.3%	50.0%	0.0%	40.0%	20.0%
	Swine	Cecal (Market Swine)					0		2	2	1	0	21.1%	20.4%
	Ó	Cecal (Sows)											8 37.5%	10 53.8%
		Humans	40.0%	37.5%	0.0%	66.7%	62.5%	18.2%	46.2%	0.0%	50.0%	57.1%	9 40.0%	14 57.1%
2. Resistant to ≥ 3 Antimicrobial Classes	 	Retail Chickens	2	3	0	2	5	100.0%	6	0	3	4	2	4
	sues				100.0%	0.0%		1					0.0%	
	Chickens	HACCP			2	0							0	
		Cecal		66.70/	0.09/	100.09/	0.09/	66.70/	100.09/	EQ.09/	100.09/	0.09/		
	s,	Retail Ground Turkey		66.7%	0.0%	100.0%	0.0%	66.7% 4	100.0%	50.0%	100.0%	0.0%		
	Turkeys	HACCP		20.0% 3	33.3% 1	14.3% 1	0.0%		50.0% 2	0.0% 0	0.0% 0	0.0% 0	50.0% 1	0.0% 0
		Cecal												
		Retail Ground Beef												
	age .	HACCP	38.5% 5	66.7% 8	66.7% 4	50.0% 1	0.0%			0.0%	0.0%		0.0%	80.0% 4
	Cattle	Cecal (Beef)												50.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops					0.0%		33.3%	50.0%	0.0%	100.0%	40.0%	20.0%
	Swine	Cecal (Market Swine)					0		1	3	0	1	55.3%	46.9%
	(ý	Cecal (Sows)											50.0%	19.2%
		Humans	0.0%	12.5%	0.0%	33.3%	0.0%	0.0%	7.7%	0.0%	16.7%	28.6%	12 0.0%	5 14.3%
3. Resistant to ≥ 4 Antimicrobial Classes	<u> </u>	Retail Chickens	0	1	0	1	0	0.0%	1	0	1	2	0	1
	sue:				50.0%	0.0%		0					0.0%	
	Chickens	HACCP			1	0							0	
	<u> </u>	Cecal		66.7%	0.0%	0.0%	0.0%	16.7%	40.00/	0.0%	0.0%	0.0%		
	ys	Retail Ground Turkey		2	0	0	0	16.7%	40.0%	0	0	0	0.001	0.001
	Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%		50.0% 2	0.0%	0.0%	0.0%	0.0%	0.0%
	<u> </u>	Cecal												
		Retail Ground Beef												
	Cattle	HACCP	15.4% 2	0.0%	16.7% 1	0.0% 0	0.0%			0.0% 0	0.0% 0		0.0%	0.0% 0
	ő	Cecal (Beef)												0.0% 0
	L	Cecal (Dairy)											0.0%	0.0% 0
		Retail Pork Chops					0.0%		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	20.0%
	Swine	Cecal (Market Swine)											2.6%	6.1%
	U)	Cecal (Sows)											0.0%	3.8%
	<u> </u>	ntimicrobial classes with	de e e dell'elem	. (()	Cata a seleta sa sa	-i- D.			la la lacción de				0	1

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 40b. Resistance Patterns among Salmonella Derby Isolates, 2003-2014

Minimary of Isolates State Section Secti	Table 40b. Resistance Patte	erns	among Salmonella	Derby Iso 2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Best Count Intervent 0			Humans												7
Second Ground Turkey 0 3 3 1 2 1 6 5 2 2 1 1 1 2		sue													0
Second Ground Turkey 0 3 3 1 2 1 6 5 2 2 1 1 1 2		Chick		0	0	2	1	0	0	0	0	0	0		0
Record Course Section		sys						1	6		2	2	1		0
Real Ground Steph Cool C		Turke		0	15	3	7	1	0	4	1	1	1		1 0
Control (Control (C				0	0	0	0	0	0	0	0	0	0	0	0
Cocci (Despit) Cocci (Despit) Cocci (Despit) Cocci (Market Server) Cocci (Market Server) Cocci (Market Server) Cocci (Server)		attle		13	12	6	2	1	0	0	1	2	0		5 2
Resistance Patern Secret (Sees) Source S															1
Resistance Patients		e		0	0	0	0	4	0	3	6	2	1		5
### Architectrial Classes ### Architectrial Cla		Swi	Cecal (Sows)												49 26
A Residucivotat Classes Antimicrobial Classes April Apri	Resistance Pattern		•	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	7.7%	0.0%	0.0%	14.3%	0.0%	0.0%
Note			1						0						0
Cecal	Anumiciobiai Classes	sus	Retail Chickens			50.00/	2.00/							0.004	
Cecal		Chicke	HACCP												
Name			Cecal												
MACCP			Retail Ground Turkey												
Resid Ground Bear		ırkeys	HACCP		0.0%	0.0%	0.0%	0.0%		25.0%	0.0%	0.0%	0.0%		0.0%
HACCP		ř	Cecal					0			0	Ū	U	U	0
HACCP			Retail Ground Beef												
Cocal (Berl)				15.4%	0.0%	16.7%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
Cecul (Cairy)		Cattle													0.0%
Retail Pork Chops														0.004	0.0%
Retail Clickens			Cecal (Dairy)											0	0
Cecal (Sows)			Retail Pork Chops											0	20.0% 1
Cecal (Sows)		Swine	Cecal (Market Swine)												4.1% 2
S. At Least ACSSuT Resistant			Cecal (Sows)											0.0%	0.0%
Retail Chickens 0.0% 0.0	- · · · · · · · · · · · · · · · · · · ·		Humans											0.0%	0.0%
HACCP	5. At Least ACSSUI Resistant		Retail Chickens	0	0	0	0	0	0.0%	0	0	0	1	0	0
Cecal		kens				0.0%	0.0%		0					0.0%	
Retail Ground Turkey		Chic				0	0							0	
Retail Glound Turkey					0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Retail Ground Beef		ys	Retail Ground Turkey		0	0	0	0		0	0	0	0	0.004	0.00/
Retail Ground Beef HACCP		Turke	HACCP												0.0% 0
HACCP			Cecal												
PACCP 0 0 1 0 0 0 0 0 0 0			Retail Ground Beef												
Cecal (Beer) Ceca		ittle	HACCP	0.0%	0.0%	16.7% 1	0.0% 0	0.0%			0.0% 0	0.0%		0.0%	0.0% 0
Retail Pork Chops		ပိ	Cecal (Beef)												0.0% 0
Retail Pork Chops			Cecal (Dairy)												0.0%
Cecal (Market Swine)			Retail Pork Chops											0.0%	20.0%
Cecal (Sows)		wine	Cecal (Market Swine)											0.0%	2.0%
6. At Least ACT/S³ Resistant Humans 0.0%		v)	Cecal (Sows)											0.0%	0.0%
6. At Least ACT/S* Resistant	0.4414.407/037		Humans											0.0%	0.0%
	b. At Least ACT/S*Resistant			U	U	U	U	U	0.0%	U	U	U	U	U	0
HACCP 0.0% 0.0% 0.0%		Chickens							0						
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Shi				0	0							0	
Retail Ground Turkey 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0					0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Real Glound Turkey		eys							0					0.0%	0.0%
		Ę													0
Cecal															
Retail Ground Beef 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%		0.0%	0.0%
9 PACCP 0 0 0 0 0 0 0 0 0		attle													0
Lecal (Beer)		٥	Cecal (Beef)												0.0%
Cecal (Dairy) 0.0% 0			Cecal (Dairy)											0	0.0%
Retail Pork Chops 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			Retail Pork Chops											0	0.0% 0
Cecal (Market Swine)		Swine	Cecal (Market Swine)											0	2.0%
Cecal (Sows) 0.0% 0			Cecal (Sows)												0.0% 0

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 40c. Resistance Patterns among Salmonella Derby Isolates, 2003-2014

Year		imong Saimonella	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	5	8	3	3	8	11	13	2	6	7	5	7
	us	Retail Chickens	0	0	0	0	0	1	0	0	0	0	0	0
	Chickens	HACCP	0	0	2	1	0	0	0	0	0	0	1	0
		Cecal											0	0
	Turkeys	Retail Ground Turkey HACCP	0	3 15	1 3	2 7	1	6	5 4	2	2	1	0 2	0
	Tur	Cecal	0	15	3	,	'	0	4	'	'	'	0	0
		Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	0
	Cattle	HACCP	13	12	6	2	1	0	0	1	2	0	1	5
	ပိ	Cecal (Beef) Cecal (Dairy)											0 2	2
		Retail Pork Chops	0	0	0	0	4	0	3	6	2	1	5	5
	Swine	Cecal (Market Swine)				· ·	,		3		_	·	38	49
	Ś	Cecal (Sows)											24	26
Resistance Pattern		Source	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%
7. At Least ACSSuTAuCx 1		Humans	0	0	0	0	0	0	0	0	0	1	0	0
Resistant	s	Retail Chickens						0.0%						
	Chickens	HACCP			0.0%	0.0%							0.0%	
	S	Cecal			0	0							0	
				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
	ys	Retail Ground Turkey		0	0	0	0	0	0	0	0	0	0.004	0.004
	Turkeys	HACCP		0.0% 0	0.0%	0.0% 0	0.0% 0		25.0% 1	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%
		Cecal												
		Retail Ground Beef												
	<u>e</u>	HACCP	0.0%	0.0%	16.7% 1	0.0%	0.0% 0			0.0% 0	0.0%		0.0%	0.0%
	Cattle	Cecal (Beef)	J		1		-			-				0.0%
		Cecal (Dairy)											0.0% 0	0.0%
		Retail Pork Chops					0.0% 0		0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0% 0	0.0%
8. At Least Ceftriaxone and		Humans	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%
Nalidixic Acid Resistant		Retail Chickens	0	0	0	0	0	0.0%	0	U	0	0	0	0
	sue				0.0%	0.0%		0					0.0%	
	Chickens	HACCP			0	0							0	
		Cecal												
		Retail Ground Turkey		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0		
	Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ţ	Cecal		0	0	0	0		0	0	0	0	0	0
		Retail Ground Beef												
			0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%		0.0%	0.0%
	Cattle	HACCP	0	0	0	0	0			0	0		0	0.0%
		Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)					0.004		0.004	0.004	0.004	0.004	0	0
	_	Retail Pork Chops					0.0% 0		0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 41a. Antimicrobial Resistance among Salmonella Montevideo Isolates, 2003-2014

Table 41a. Antimicro	biai Resistance anno	nig .	Samionella Wontevic	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed		Humans	43	50	48	62	51	68	57	58	65	60	53	44
		ens	Retail Chickens	1	3	1	2	6	4	4	0	1	4	1	0
		Chickens	HACCP Cecal	30	29	62	21	20	13	10	5	1	9	4 0	16 0
		<u> </u>	Retail Ground Turkey	2	2	4	8	2	1	4	1	1	1	0	1
		Turkeys	HACCP	1	4	3	3	3	1	1	3	2	5	0	17
		F	Cecal											0	1
		e	Retail Ground Beef HACCP	2 64	0 82	2 43	6 63	3 95	2 104	4 59	1 61	1 99	1 84	4 89	2 91
		Cattle	Cecal (Beef)	04	02	45	03	93	104	39	01	99	04	21	14
			Cecal (Dairy)											56	38
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	1	0	0	0 2	0 2
		Š	Cecal (Sows)											4	5
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source	0.0%	0.0%	27.1%	17.7%	7.8%	2.9%	7.0%	3.4%	0.0%	1.7%	0.0%	0.0%
Aminoglycosides	Gentamicin (MIC ≥ 16 μg/ml)		Humans	0	0	13	11	4	2	4	3.4% 2	0	1	0	0.0%
		S	Retail Chickens	100.0% 1	33.3% 1	100.0% 1	0.0%	50.0% 3	0.0%	25.0% 1		0.0%	0.0%	0.0%	
		Chickens	HACCP	30.0% 9	27.6% 8	11.3% 7	9.5% 2	20.0% 4	53.8% 7	10.0% 1	0.0% 0	0.0% 0	33.3% 3	0.0%	0.0%
			Cecal	J	0	,		7	,		Ü		<u> </u>		Ů
			Retail Ground Turkey	0.0%	100.0%	0.0%	37.5%	50.0%	0.0%	25.0%	0.0%	0.0%	0.0%		0.0%
		eys	HACCP	0.0%	0.0%	0.0%	0.0%	1 66.7%	0.0%	100.0%	100.0%	50.0%	0 40.0%		11.8%
		Turkeys		0	0	0	0	2	0	1	3	1	2		0.0%
		<u> </u>	Cecal	0.00/		0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0
			Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ħe	HACCP	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops					100.0%			0.0%			0	0
		ine	Cecal (Market Swine)					1			0			0.0%	0.0%
		Swine												0.0%	0.0%
	Ctrontomonia		Cecal (Sows)	0.0%	4.0%	27.1%	19.4%	7.8%	2.9%	5.3%	3.4%	3.1%	1.7%	0.0%	0.0%
	Streptomycin (MIC ≥ 64 µg/ml)		Humans	0	2	13	12	4	2	3	2	2	1	0	0.0%
		SL	Retail Chickens	100.0% 1	33.3% 1	100.0% 1	0.0% 0	50.0% 3	0.0% 0	25.0% 1		0.0%	0.0%	0.0%	
		Chickens	HACCP	36.7% 11	27.6% 8	9.7% 6	9.5% 2	10.0% 2	46.2% 6	10.0% 1	0.0% 0	0.0%	33.3% 3	0.0%	0.0%
		Ö	Cecal												
			Retail Ground Turkey	100.0%	50.0%	50.0%	75.0%	50.0%	0.0%	75.0%	100.0%	100.0%	0.0%		100.0%
		ceys	HACCP	0.0%	0.0%	33.3%	6 33.3%	0.0%	100.0%	3 100.0%	100.0%	1 50.0%	0 60.0%		11.8%
		Turkeys		0	0	1	1	0	1	1	3	1	3		0.0%
			Cecal	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef	0	0.40/	0	0	0	0	0	0	0	0	0	0
		Cattle	HACCP	1.6% 1	2.4% 2	2.3% 1	1.6% 1	0.0% 0	1.0% 1	1.7% 1	3.3% 2	5.1% 5	2.4% 2	3.4% 3	2.2% 2
		ပိ	Cecal (Beef)											4.8% 1	7.1% 1
			Cecal (Dairy)											3.6% 2	5.3% 2
			Retail Pork Chops					100.0%			0.0%				
		Swine	Cecal (Market Swine)					1			0			0.0%	50.0%
		Š	Cecal (Sows)											0.0%	0.0%
β-Lactam/β-Lactamase	Amoxicillin-		l	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	0 2.3%
Inhibitor Combinations	Clavulanic Acid	<u> </u>	Humans	0.0%	0	0.0%	0	0	0.0%	0	0.078	1	0	0.0%	1
	(MIC ≥ 32 / 16 µg/ml)	ns	Retail Chickens	0	0.0%	0	0.0%	0.0%	0	0.0%		0.0%	0.0%	0	
		Chickens	HACCP	3.3% 1	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		ō	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0% 1		100.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		Ţ	Cecal	0	0	0	0	0	0	0	0	0	0		0.0%
				0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef	0 1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 4.0%	0 2.4%	0 2.2%	0
		Cattle	HACCP	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	4.0%	2.4%	2	1
		ပၱ	Cecal (Beef)											4.8% 1	0.0% 0
			Cecal (Dairy)											3.6% 2	2.6% 1
			Retail Pork Chops					0.0%			0.0%				
		ø	HACCP	0.0%		0.0%		0.0%	0.0%	0.0%	0				
		Swine	Cecal (Market Swine)	0		0		0	0	0				0.0%	0.0%
		,												0.0%	0.0%
			Cecal (Sows)											0.078	0.078

Year			II	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	SL	Humans Potail Chickens	43	50	48	62	51	68	57	58	65	60	53	44
		Chickens	Retail Chickens HACCP	30	3 29	1 62	2 21	6 20	4 13	4 10	0 5	1	9	1 4	0 16
		_	Cecal											0	0
		Turkeys	Retail Ground Turkey HACCP	2	2 4	3	8	2	1	4 1	3	1 2	1 5	0	1 17
		1	Cecai											0	1
		tle	Retail Ground Beef HACCP	2 64	0 82	2 43	6 63	3 95	2 104	4 59	1 61	1 99	1 84	4 89	2 91
		Cattle	Cecal (Beef)	04	02	45	03	93	104	33	01	33	04	21	14
		_	Cecal (Dairy)	-										56	38
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	1	0	0	0 2	0 2
	Antimicrobial	0)	Cecal (Sows)											4	5
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Cephems	Cefoxitin		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	2.3%
	(MIC ≥ 32 μg/ml)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	1
		Chickens	HACCP	3.3%	0.0%	0.0%	0 4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic	Cecal	1	0	0	1	0	0	0	0	0	0	0	0
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		100.0%
		eys		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		Turkeys	HACCP	0	0	0	0	0	0	0	0	0	0		0.0%
			Cecal	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 1.7%	0.0%	0 4.0%	0 2.4%	0 2.2%	0.0%
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.776	0.0%	4.0%	2.4%	2.2%	1 0.0%
		0	Cecal (Beef)											4.8% 1 3.6%	0.0%
			Cecal (Dairy)					0.004			2.00/			2	1
		0	Retail Pork Chops					0.0% 0			0.0% 0				
		Swine	Cecal (Market Swine)											0.0% 0	0.0%
			Cecal (Sows)											0.0% 0	0.0% 0
	Ceftiofur (MIC ≥ 8 µg/ml)		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5% 1	0.0%	0.0%	2.3%
		ω	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	
		Chickens	HACCP	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		5	Cecal								-	-		-	
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		100.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		₽	Cecal	0	0	0	0	0	0	0	0	0	0		0.0%
			Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0	HACCP	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	1.7%	0.0%	4.0%	2.4%	2.2%	1.1%
		Cattle	Cecal (Beef)	0	0	0	1	0	0	1	0	4	2	2 4.8%	0.0%
			Cecal (Dairy)											3.6%	2.6%
			Retail Pork Chops					0.0%			0.0%			2	1
		Swine	Cecal (Market Swine)					0			0			0.0%	0.0%
		Sw												0.0%	0.0%
	Ceftriaxone	-	Cecal (Sows)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	2.3%
	(MIC ≥ 4 μg/ml)	_	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.070	1 0.0%	0.0%	0.0%	1
		sus	Retail Chickens	0	0	0	0	0	0	0	0.00	0	0	0	
		Chickens	HACCP	3.3% 1	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%
			Cecal												
			Retail Ground Turkey	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	100.0% 1		100.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		T	Cecal			0		0			0				0.0%
		\vdash	Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			HACCP	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	4.0%	2.4%	2.2%	1.1%
		Cattle		1	0	0	0	0	0	1	0	4	2	2 4.8%	0.0%
			Cecal (Beef)											1 3.6%	0 2.6%
			Cecal (Dairy)					0.004			0.001			2	1
			Retail Pork Chops					0.0% 0			0.0%				
		Swine	Cecal (Market Swine)											0.0%	0.0%
															0.0%

Table 41c. Antimicrobial Resistance among Salmonella Montevideo Isolates, 2003-2014

Year	biai Nesistance and	Jilg .	Salmonella Montevi	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ted		Humans	43	50	48	62	51	68	57	58	65	60	53	44
		Chickens	Retail Chickens HACCP	1 30	3 29	1 62	2 21	6 20	4 13	4	0 5	1	4 9	1 4	0 16
		Turkeys	Retail Ground Turkey HACCP	2 1	2 4	4 3	8	2	1	4	1 3	1 2	1 5	0 0	0 1 17
		Ţ	Cecal Retail Ground Beef	2	0	2	6	3	2	4	1	1	1	0 4	1 2
		Cattle	HACCP Cecal (Beef) Cecal (Dairy)	64	82	43	63	95	104	59	61	99	84	89 21 56	91 14 38
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	1	0	0	0 2	0 2
	Antimicrobial (Resistance		Cecal (Sows)											4	5
Antimicrobial Class	Breakpoint) Sulfamethoxazole/		Source	0.0%	0.0%	25.0%	19.4%	7.8%	4.4%	7.0%	3.4%	3.1%	1.7%	1.9%	0.0%
Folate Pathway Inhibito	Sulfisoxazole 1		Humans	0	0	12	12	4	3	4	2	2	1	1	0.076
	(MIC ≥ 512 μg/ml)	us	Retail Chickens	100.0% 1	0.0% 0	100.0% 1	0.0% 0	50.0% 3	0.0%	75.0% 3		0.0% 0	0.0% 0	0.0% 0	
		Chickens	HACCP	16.7% 5	24.1% 7	9.7% 6	14.3% 3	10.0% 2	23.1% 3	10.0% 1	0.0% 0	0.0% 0	11.1% 1	0.0% 0	0.0%
		0	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%	12.5% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	33.3% 1	0.0%	0.0%	0.0%	66.7% 2	0.0%	60.0% 3		0.0%
		ľ	Cecal												0.0%
			Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ф	HACCP	0.0%	1.2%	0.0%	1.6%	1.1%	1.9%	1.7%	0.0%	4.0%	2.4%	2.2%	1.1%
		Cattle	Cecal (Beef)	0	1	0	1	1	2	1	0	4	2	4.8%	7.1%
			Cecal (Dairy)											5.4%	2.6%
		-	Retail Pork Chops					100.0%			0.0%			3	1
		ine						1			0			0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
	Trimethoprim-		Cecal (Sows)	0.0%	2.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0 1.9%	0.0%
	Sulfamethoxazole	_	Humans	0	1	0	1	0	0	0	0.0%	1	0	1	0.0%
	(MIC ≥ 4 / 76 μg/ml)	su	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%		0.0% 0	0.0% 0	0.0% 0	
		Chickens	HACCP	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%
		0	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		ĭ	Cecal								Ů				0.0%
			Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			HACCP	0.0%	0.0%	0.0%	0.0%	1.1%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	0	1	1	0	0	0	0	0.0%	0.0%
														1.8%	2.6%
			Cecal (Dairy)					0.0%			0.0%			1	1
		J.e	Retail Pork Chops					0			0			0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
Macrolidas	Azithromycin	-	Cecal (Sows)									0.007	0.007	0	0.0%
Macrolides	Azithromycin (MIC ≥32 μg/ml)		Humans									0.0%	0.0%	0.0%	0.0%
		ns	Retail Chickens									0.0%	0.0%	0.0%	
		Chickens	HACCP									0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Ö	Cecal												
		,^	Retail Ground Turkey									0.0% 0	0.0% 0		0.0%
		Turkeys	HACCP									0.0%	0.0%		0.0%
		1	Cecal									Ů	Ľ		0.0%
			Retail Ground Beef									0.0%	0.0%	0.0%	0.0%
		0	HACCP									0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)									0	0	0.0%	0.0%
														0.0%	0 2.6%
			Cecal (Dairy)											0	1
		J.	Retail Pork Chops											0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
10.0			Cecal (Sows)											0.0%	0.0%
Sulfamethoxazole was tes	sted from 1996-2003 and wa	as rep	laced by sulfisoxazole in 20	004											

Table 41d. Antimicro	bial Resistance am	ong .	Salmonella Montevi	deo Isolate	es, 2003-2 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted		Humans	43	50	48	62	51	68	57	58	65	60	53	44
		Chickens	Retail Chickens HACCP	1 30	3 29	1 62	2 21	6 20	4 13	4 10	0 5	1	4 9	1 4	0 16
		_	Cecal	2	2	4	8	2	1	4	1	1	1	0	0
		Turkeys	Retail Ground Turkey HACCP Cecal	1	4	3	3	3	1	1	3	2	5	0	17
		Ф	Retail Ground Beef	2	0	2	6	3	2	4	1	1	1	4	2
		Cattle	HACCP Cecal (Beef) Cecal (Dairy)	64	82	43	63	95	104	59	61	99	84	89 21 56	91 14 38
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	1	0	0	0 2	0 2
	Autimiarabial	Ś	Cecal (Sows)											4	5
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Penicillins	Breakpoint) Ampicillin	1	Source Humans	0.0%	2.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	2.3%
	(MIC ≥ 32 μg/ml)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 25.0%	0	0.0%	0.0%	0.0%	1
		Chickens	HACCP	3.3%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic		1	0	1	0	0	0	0	0	0	0	0	0
			Cecal	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		100.0%
		eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0 33.3%	0.0%	0.0%	0.0%	0 33.3%	0 50.0%	1 20.0%		1 5.9%
		Turkeys	HACCP	0	0	0	1	0	0	0	1	1	1		1 0.0%
			Cecal	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef	0 1.6%	0.0%	0.0%	0.0%	0.0%	0 1.0%	0.076	0.0%	0 4.0%	0 2.4%	0 2.2%	0
		Cattle	HACCP	1.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.7%	0.0%	4.0%	2.4%	2.2%	1 0.0%
		O	Cecal (Beef)											1	0
			Cecal (Dairy)											3.6% 2	2.6% 1
		Φ.	Retail Pork Chops					0.0% 0			0.0% 0				
		Swine	Cecal (Market Swine)											0.0% 0	0.0%
			Cecal (Sows)											0.0% 0	0.0% 0
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	0.0% 0	0.0%	0.0% 0	1.6% 1	0.0%	0.0%	0.0%	0.0%	1.5% 1	0.0% 0	0.0%	0.0%
		SI	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	
		Chickens	HACCP	0.0%	0.0%	1.6% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ö	Cecal												
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0		0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		F	Cecal				-	-							0.0%
			Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		<u>o</u>	HACCP	0.0%	1.2%	0.0%	1.6% 1	0.0%	1.0%	1.7%	0.0%	4.0% 4	2.4%	2.2%	1.1%
		Cattle	Cecal (Beef)	U	1	0	-	0	'	· ·	0	4		4.8%	7.1%
			Cecal (Dairy)											3.6%	2.6%
		\vdash	Retail Pork Chops					0.0%			0.0%			2	1
		Swine	Cecal (Market Swine)					0			0			0.0%	0.0%
		Ś	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin	+	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 1 μg/ml)	\vdash	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic		0	0	0	0	0	0	0	0	0	0	0	0
		-	Cecal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
		Turkeys	HACCP	0	0	0	0	0	0	0	0	0	0		0.0%
		-	Cecal	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
		Ö	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0% 0	0.0%
			Retail Pork Chops					0.0%			0.0%				
		Swine	Cecal (Market Swine)											0.0% 0	0.0%
			Cecal (Sows)											0.0%	0.0% 0

Nalidotic Acid (MIC 2 32 jugins)	Year			Salmonella Montevio	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Section Control Turkey 2	Number of Isolates Tes	sted		Humans			48				57				53	44
Section Control Turkey 2			sus		1	3	1	2	6	4	4	0	1	4	1	0
Section Control Turkey 2			jcke		30		62	21	20	13	10	5	1	9	4	16
Resid Ground Event 2			Ö	Cecal											0	0
Resid Ground Event 2			eys												_	
### SECOND Second Group Second G			直		1	4	3	3	3	1	1	3	2	5		
## MICCP 644 822 433 633 95 104 590 611 990 84 89 91 14 14 15 14 15 15 14 15 15					2	0	2	6	3	2	4	1	1	1		1
Casid (Dassy) Bill Casid (Dassy) Casid (Bill (Dassy)			#											84		
Result Prof. Chaps			ပိ													
### Cocast Banker Same) Cocast Banker Same)																
Antimicrobial class Intercolate Resistance Intercolate Interco			ine	· ·	0	0	0	0	1	0	0	1	0	0		
Natificacional Class Souther S			Š													
Mindocade Servator																
Nalidacie Acid (MiC 2 32 µg/m²) Humans 0.0% 2.2% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0% 1.5% 0.0%	Antimicrobial Class															
Retail Chiskens	Quinolones			Humans		2.0%										
MacCP		(IVIIC ≥ 3∠ μg/mi)	-	Retail Chickens		0.0%						U	0.0%			U
Gecal Retail Ground Turkey			ens									0.0%				0.0%
Gecal Retail Ground Turkey			ķ	HACCP												
MacCP			0	Cecal												
MACCP				Retail Ground Turkey												
Cecal			eys	НАССВ												
Petail Ground Beef			į		0	0	0	0	0	0	0	0	0	0		
Metal Chickens O				Cecal												0
Tetracyclines Tetracycline MIC ≥ 16 µg/ml) Market Swine Cecal Color Cecal Ceca				Retail Ground Beef												
Cecal (Dairy) Cecal (Market Swine) Cecal (Market Swine) Cecal (Market Swine) Cecal (Swas) Cecal (Market Swine) Cecal (Swas) C			Φ	HACCP												
Cecal (Dairy) Cecal (Market Swine) Cecal (Market Swine) Cecal (Market Swine) Cecal (Swas) Cecal (Market Swine) Cecal (Swas) C			Catt	Cecal (Reef)	U	U	U	0	U	U	U	U	U	U	0.0%	0.0%
Retail Pork Chops																
Retail Chickens				Cecal (Dairy)												
Etracyclines Tetracycline (MIC≥16 µg/ml) Humans				Retail Pork Chops												
Tetracycline MiC≥16 μg/ml) Humans 2.3% 2.0% 25.0% 19.4% 7.8% 1.5% 1.8% 5.2% 6.2% 5.0% 0.0% 0.0% 2.3% 1.1% 1 1 1 1 1 1 1 1 3 4 3 0 1 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 0 1 1 1 3 4 3 3 4 3 3 4 3 3			wine	Cecal (Market Swine)												
Tetracycline (MIC ≥ 16 μg/ml)			Ó	Cecal (Sows)											0.0%	0.0%
MIC ≥ 16 μg/ml) Retail Chickens 1	Tetracyclines	Tetracycline		<u>l</u>	2.3%	2.0%	25.0%	19.4%	7.8%	1.5%	1.8%	5.2%	6.2%	5.0%		
Retail Crinckers 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0	Tettadyomics	(MIC ≥ 16 μg/ml)		Humans	1	1	12	12	4	1	1		4	3	0	
HACCP 13.3% 3.4% 4.8% 9.5% 10.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.			S	Retail Chickens												
Retail Ground Turkey			cker	HACCP			4.8%									
Retail Ground Turkey 0.0% 0.0% 50.0% 0.0% 0.0% 0.0% 0.0% 0.0			ج. اخ	Cecal	4		3			U	U	0	U	0	U	0
Retail Ground Beef 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0					0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Retail Ground Beef			s/	Retail Ground Turkey	0	0	2	0	0	0	0	0	0	0		0
Retail Ground Beef			urke	HACCP												
Retail Ground Beef 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			-	Cecal												
HACCP 12.5% 9.8% 9.3% 4.8% 7.4% 7.7% 6.8% 11.5% 17.2% 21.4% 11.2% 9.9% Cecal (Beef) 19.0% 28.6% 13.2% 5 5 5 8				Retail Ground Beef												0.0%
Part						9,8%										
Cecal (Dairy) 4 4 4 4 4 4 4 4 4			attle												10	9
Retail Pork Chops			ő	Cecal (Beef)												
Retail Pork Chops				Cecal (Dairy)												13.2%
Cecal (Market Swine) Cecal (Market Swine) Cecal (Sous) 0.0% 50.0% 0 1 0.0% 0.0%				Retail Pork Chops											5	3
Cecal (Market Swine) 0 1 Cecal (Sowe)			Je							0			0		0.0%	50.0%
			Swii	Cecal (Market Swine)											0	1
				Cecal (Sows)												

Table 42a. Resistance Patte			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	43	50	48	62	51	68	57	58	65	60	53	44
	Chickens	Retail Chickens HACCP Cecal	1 30	3 29	1 62	2 21	6 20	4 13	4 10	0 5	1	4 9	1 4 0	0 16 0
	Turkeys	Retail Ground Turkey HACCP Cecal	2	2 4	4 3	8 3	2	1	4 1	1 3	1 2	1 5	0 0 0	1 17 1
	e te	Retail Ground Beef HACCP	2 64	0 82	2 43	6 63	3 95	2 104	4 59	1 61	1 99	1 84	4 89	2 91
	Cattle	Cecal (Beef) Cecal (Dairy)											21 56	14 38
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	1	0	0	1	0	0	0 2 4	0 2 5
Resistance Pattern		Source Humans	97.7%	0.9%	0.7%	79.0%	92.2%	95.6%	93.0%	94.8%	93.8%	93.3%	96.2%	95.5%
1. No Resistance Detected		1	42 0.0%	44 66.7%	34 0.0%	49 100.0%	47 50.0%	65 100.0%	53 25.0%	55	61 100.0%	56 100.0%	51 100.0%	42
	ens	Retail Chickens	0 56.7%	2 65.5%	0 87.1%	2 76.2%	3 80.0%	4 46.2%	90.0%	100.0%	1 100.0%	4 66.7%	1 100.0%	100.0%
	Chickens	HACCP	17	19	54	16	16	6	9	5	1	6	4	16
		Cecal	0.09/	0.09/	E0.09/	25.00/	E0.09/	100.0%	0.00/	0.09/	0.00/	0.0%		0.09/
	şk	Retail Ground Turkey	0.0%	0.0%	50.0%	25.0%	50.0% 1 33.3%	100.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	Turkeys	HACCP	100.0% 1	75.0% 3	66.7% 2	33.3% 1	1	0.0%	0.0%	0.0%	50.0% 1	40.0% 2		94.1%
		Cecal												100.0% 1
		Retail Ground Beef	100.0% 2		100.0% 2	100.0% 6	100.0% 3	100.0% 2	100.0% 4	100.0% 1	100.0% 1	100.0% 1	75.0% 3	100.0% 2
	Cattle	HACCP	85.9% 55	90.2% 74	90.7% 39	95.2% 60	92.6% 88	92.3% 96	93.2% 55	86.9% 53	81.8% 81	78.6% 66	88.8% 79	88.9% 80
	రొ	Cecal (Beef)											81.0% 17	71.4% 10
		Cecal (Dairy)											89.3% 50	86.8% 33
		Retail Pork Chops					0.0% 0			100.0% 1				
	Swine	Cecal (Market Swine)					J			·			100.0%	50.0%
	o	Cecal (Sows)											100.0%	100.0%
		Humans	0.0%	0.0%	2.5%	17.7%	7.8%	0.0%	1.8%	3.4%	3.1%	0.0%	0.0%	5 2.3%
2. Resistant to ≥ 3 Antimicrobial Classes		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 25.0%	2	0.0%	0.0%	0.0%	1
	Chickens	HACCP	3.3%	0.0%	0 6.5%	0 4.8%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	SPi	Cecal	1	0	4	1	2	0	0	0	0	0	0	0
	_		0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		100.0%
	eys	Retail Ground Turkey	0.0%	0.0%	2 0.0%	0 33.3%	0.0%	0.0%	0.0%	0 66.7%	0.0%	1 60.0%		1 5.9%
	Turkeys	HACCP	0	0	0	1	0	0	0	2	0	3		0.0%
		Cecal	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
		Retail Ground Beef	0	1.20/	0	0	0	0	0	0	0	0 2.4%	0	0 2.2%
	Cattle	HACCP	1.6% 1	1.2% 1	0.0%	1.6%	0.0%	1.0% 1	1.7% 1	0.0%	4.0% 4	2.4%	2.2%	2
	0	Cecal (Beef)											4.8% 1	7.1% 1
		Cecal (Dairy)											3.6% 2	2.6% 1
		Retail Pork Chops						0.0%			0.0% 0			
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0
3. Resistant to ≥ 4		Humans	0.0%	0.0%	0.0%	3.2% 2	0.0%	0.0%	0.0%	0.0%	1.5% 1	0.0%	0.0%	0.0%
Antimicrobial Classes	**	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0% 1		0.0%	0.0%	0.0%	
	Chickens	HACCP	3.3%	0.0%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ర్	Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		100.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	20.0%		0.0%
	P	Cecal	0	0	0	0	0	0	0	1	0	1		0.0%
	\vdash	Retail Ground Beef	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ф	HACCP	1.6%	1.2%	0.0%	1.6%	0.0%	1.0%	1.7%	0.0%	4.0%	2.4%	2.2%	1.1%
	at —	Cecal (Beef)	1	1	0	1	0	1	1	0	4	2	4.8%	7.1%
		Cecal (Dairy)											3.6%	2.6%
	-	Retail Pork Chops					0.0%			0.0%			2	1
	Swine	Cecal (Market Swine)					0			0			0.0%	0.0%
	Sw												0.0%	0.0%
		Cecal (Sows)	4 184										0	0

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 42b. Resistance Patterns among Salmonella Montevideo Isolates, 2003-2014¹

Table 42b. Resistance Patte	1115	among Saimonella		eo isolates	2003-201		2007	2000	2000	2010	2011	2012	2012	2014
Year Number of Isolates Tested		Humans	2003 43	50	48	2006 62	2007 51	2008 68	2009 57	2010 58	2011 65	2012 60	2013 53	2014 44
	sue	Retail Chickens	1	3	1	2	6	4	4	0	1	4	1	0
	Chickens	HACCP Cecal	30	29	62	21	20	13	10	5	1	9	4	16 0
		Retail Ground Turkey	2	2	4	8	2	1	4	1	1	1	0	1
	Turkeys	HACCP	1	4	3	3	3	1	1	3	2	5	0	17
	F	Cecal											0	1
	et e	Retail Ground Beef HACCP	2 64	0 82	2 43	6 63	3 95	2 104	4 59	1 61	1 99	1 84	4 89	2 91
	Cattle	Cecal (Beef)											21	14
		Cecal (Dairy)											56	38
	Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	1	0	0	0 2	0 2
	Ś	Cecal (Sows)											4	5
Resistance Pattern		Source Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%
4. Resistant to ≥ 5 Antimicrobial Classes		ı	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
Antimoropiai Glasses	Su	Retail Chickens	0	0	0	0	0	0	0		0	0	0	
	Chickens	HACCP	0.0%	0.0%	1.6% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0	Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	į		0	0	0	0	0	0	0	0	0	0		0.0%
		Cecal												0
		Retail Ground Beef	0.0%		0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%
	<u>e</u>	HACCP	0.0%	0.0%	0.0%	1.6%	0.0%	1.0%	1.7%	0.0%	4.0%	2.4%	2.2%	0.0%
	Cattle	Cecal (Beef)		U			0			Ü	7		4.8%	0.0%
		Cecal (Dairy)											1 3.6%	0 2.6%
							0.0%			0.0%			2	1
		Retail Pork Chops					0.078			0.078				
	Swine	Cecal (Market Swine)											0.0% 0	0.0%
		Cecal (Sows)											0.0% 0	0.0%
		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%
5. At Least ACSSuT ² Resistant		I	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
	sue	Retail Chickens	0.0%	0.0%	0 1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0		0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	2	Cecal	0	0	0	0	0	0	0	0	0	0		0.0%
			0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0 1.0%	0 1.7%	0.0%	0 4.0%	0 2.4%	0 2.2%	0.0%
	Cattle	HACCP	0.078	0.0%	0.0%	0.078	0.078	1.0%	1.776	0.078	4.076	2.476	2	0
	O	Cecal (Beef)											4.8% 1	0.0% 0
		Cecal (Dairy)											3.6% 2	2.6% 1
		Retail Pork Chops					0.0%			0.0%				
	Swine	Cecal (Market Swine)					,			Ü			0.0%	0.0%
	Ó	Cecal (Sows)											0.0%	0.0%
	-		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6. At Least ACT/S ³ Resistant		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
	SUS	Retail Chickens	0	0	0	0	0	0	0	0.004	0	0	0	0.007
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	٥	Cecal												
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
	Ē	Cecal	0	0	0	0	0	0	0	0	0	0		0.0%
	-		0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
	O	Cecal (Beef)											0.0% 0	0.0% 0
		Cecal (Dairy)											0.0%	2.6%
		Retail Pork Chops					0.0%			0.0%				
	Swine	Cecal (Market Swine)					J			U			0.0%	0.0%
	Ø	Cecal (Sows)											0.0%	0.0%
¹ Starting in 2011, testing included n	<u> </u>		the sector of the sec		11.	i. B.			in law (in this	10()			0	0

Testarting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 42c. Resistance Patterns among Salmonella Montevideo Isolates, 2003-2014

Number of headests Tested Section Sectio	rable 42c. Resistance Patte		og caooa						2000	2222	2010	2011	2010		
Residence Parison	Year Number of Isolates Tested		Humans	2003 43	2004 50	2005 48	2006 62	2007 51	2008 68	2009 57	2010 58	2011 65	2012 60	2013 53	2014 44
MoCCP	Humber Of Isolates Tested	S													
Residence Person Part Coccidence Part Par		cken													
Repair Ground Bear 1		S	Cecal											0	0
Recision Part Par		ys	Retail Ground Turkey	2	2	4	8	2	1	4	1	1	1	0	1
Recision Part Par		urke		1	4	3	3	3	1	1	3	2	5	-	
Contact Cont		-													
Best Price Chapse Part P		Φ													
Residence Pattern		Cattl		04	02	45	03	33	104	33	01	33	04		
Control Cont			Cecal (Dairy)											56	38
Package Patient Control State Control St		Φ		0	0	0	0	1	0	0	1	0	0	0	0
New York Secretary Secre		Swir													
Number	Resistance Pattern													4	5
Real Cholerina			Humans									1.5%			
March Marc		-	B . 7 0								0	0.0%			0
Retail Ground Turkey		sus	Retail Chickens	0	0		0			0	0.007		0		0.004
Retail Ground Turkey		hicke	HACCP												
Note		O	Cecal												
MacCP			Retail Ground Turkey												
Cocal		ske													
Retail Ground Beel		출	HACCP												0
MACCP			Cecal												
MACCP			Retail Ground Beef												
Page Care		_	НАССР		0.0%										
Cecal (Daily)		Cattle		0	0	0	0	0	0	1	0	4	2		
Retail Pork Chops		Ŭ	Cecal (Beef)											1	0
Retail Fork Clubs			Cecal (Dairy)												
Part Cecal (Market Swine) Cecal (Sows) Cecal (Market Swine) Cecal (Marke			Retail Pork Chops												
Cacal (Sows) Cacal (Gality) Cacal (Swine	Cecal (Market Swine)												
Retail Cround Turkey		0,	Cecal (Sows)												
Retail Chickens	9 At Loget Coffriavono and		Humans												
HACCP			Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	U	0.0%	0.0%	0.0%	
Cecal Retail Ground Turkey		kens									0.0%				0.0%
Cecal Retail Ground Turkey		Chic													
Retail Ground Turkey			Cecal												
HACCP 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0		m	Retail Ground Turkey												
Cecal Ceca		ırkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
Retail Ground Beef 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0		F	Cecal		J	Ü	, ,			J					0.0%
HACCP 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			Retail Ground Beef												0.0%
Cecal (Dairy)		a te	HACCP	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cecal (Dairy)		Cat	Cecal (Beef)			-								0.0%	0.0%
Retail Pork Chops		L	Cecal (Dairy)												
Caral (Sous) 0.0% 0.0%			Retail Pork Chops												
Caral (Sous) 0.0% 0.0%		Swine	Cecal (Market Swine)											0	0
			Cecal (Sows)											0.0% 0	0.0% 0

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Resistance by Year

Table 43a. Antimicrobial Resistance among Salmonella Anatum Isolates, 2003-2014

Year	biai Resistance amo	ng .	Salmonella Anatum	1 Isolates, 2003	2003-2014	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed		Humans	18	16	12	10	18	14	13	19	16	16	2013	13
Number of isolates rest	eu	Chickens	Retail Chickens HACCP	0 2	0 4	1	1 6	0	2	0	1	1	1 0	0	0
		S	Cecal											0	0
		eys	Retail Ground Turkey	1	0	1	0	1	7	1	0	0	2	2	2
		Turkeys	HACCP Cecal	0	1	1	9	1	1	2	6	0	3	2	12 4
			Retail Ground Beef	0	0	0	2	1	0	0	1	0	1	1	1
		Cattle	HACCP	61	68	22	26	23	34	7	14	18	18	16	18
		ပိ	Cecal (Beef) Cecal (Dairy)											18 18	25 15
			Retail Pork Chops	0	0	2	0	0	0	0	1	0	0	0	1
		Swine	Cecal (Market Swine)	O		2		0					0	33	29
	Antimicrobial	0)	Cecal (Sows)											43	67
	(Resistance		Isolate												
Antimicrobial Class Aminoglycosides	Breakpoint) Gentamicin		Source Humans	0.0%	0.0%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%
	(MIC ≥ 16 μg/mI)		1	0	0	0.0%	0.0%	0	1 0.0%	0	0.0%	0.0%	2 100.0%	0	0
		ens	Retail Chickens	0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	0.0%	1		0.0%
		Chickens	HACCP	0.078	0.078	0.078	0.078		0.078	1	0.078	0.078			0.078
		U	Cecal												
		s	Retail Ground Turkey	0.0% 0		0.0%		100.0% 1	14.3% 1	0.0% 0			100.0% 2	0.0% 0	0.0%
		Turkeys	HACCP		0.0%	0.0%	22.2% 2	0.0% 0	0.0% 0	0.0%	66.7% 4		0.0% 0	0.0%	0.0%
		ĭ	Cecal												0.0%
			Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle		0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
			Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)			2.00/					400.00/			0.078	0
			Retail Pork Chops			0.0% 0					100.0% 1				0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
		0,	Cecal (Sows)											0.0% 0	0.0%
	Streptomycin		Humans	0.0%	6.3%	0.0%	0.0%	0.0%	7.1%	0.0%	10.5%	6.3%	12.5%	0.0%	7.7%
	(MIC ≥ 64 μg/mI)		Retail Chickens	0	1	100.0%	0.0%	0	0.0%	0	0.0%	100.0%	100.0%	0	1
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	100.0%	0.0%	0.0%	1		16.7%
		Chic		0	0	0	0		0	1	0	0			1
			Cecal	0.0%		0.0%		0.0%	14.3%	0.0%			100.0%	0.0%	0.0%
		ys	Retail Ground Turkey	0.070	0.00/	0	44.40/	0	1	0	0.00/		2	0	0
		Turkeys	HACCP		0.0% 0	0.0% 0	44.4% 4	0.0% 0	100.0% 1	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0
		-	Cecal												0.0%
			Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		Ф	HACCP	3.3% 2	1.5%	0.0%	7.7% 2	4.3% 1	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)		•	Ů	2		Ů			Ů		0.0%	4.0%
			Cecal (Dairy)											0.0%	6.7%
			Retail Pork Chops			0.0%					100.0%			0	1 0.0%
		ne				0					1			0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0
0.1	Am ovioit!:-		Cecal (Sows)	0.001	0.301	0.001	0.007	0.001	7.40/	0.007	0.001	0.001	0.001	0	1
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	0.0% 0	6.3% 1	0.0% 0	0.0%	0.0% 0	7.1% 1	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0
	(MIC ≥ 32 / 16 μg/ml)	St	Retail Chickens			100.0% 1	0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0% 0		
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
		ဌ	Cecal		Ť	Ť			Ť	Ť	Ť	Ť			Ť
		_	Retail Ground Turkey	0.0%		0.0%		0.0%	42.9%	0.0%			0.0%	0.0%	0.0%
		Turkeys	HACCP	0	0.0%	0.0%	0.0%	0.0%	3 0.0%	0 50.0%	0.0%		0 33.3%	0.0%	0 16.7%
		Tur	Cecal		0	0	0	0	0	1	0		1	0	0.0%
							0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			Retail Ground Beef	3.3%	1.5%	0.0%	0 3.8%	0 4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP	2	1.5%	0.0%	3.8%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
		ပိ	Cecal (Beef)											0.0% 0	0.0%
			Cecal (Dairy)											5.6% 1	0.0% 0
			Retail Pork Chops			0.0%					0.0%				0.0%
		Swine	Cecal (Market Swine)			J								0.0%	0.0%
		Ś	Cecal (Sows)											0.0%	0.0%
		1												0	0

Table 43b. Antimicro	ooiai Nesistance ame	ong	Gainionella Allatuli	2003	2003-2014	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ted	E	Humans	18	16	12	10	18	14	13	19	16	16	20	13
		Chickens	Retail Chickens HACCP Cecal	0 2	0 4	1	1 6	0	1	0 1	1	1	1 0	0 0 0	0 6 0
		Turkeys	Retail Ground Turkey HACCP Cecal	1 0	0	1	0 9	1 1	7	1 2	0 6	0	2 3	2 2 0	2 12 4
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 61	0 68	0 22	2 26	1 23	0 34	0 7	1 14	0 18	1 18	1 16 18	1 18 25
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	2	0	0	0	0	1	0	0	18 0 33 43	15 1 29 67
	Antimicrobial (Resistance		Isolate											40	01
Antimicrobial Class Cephems	Breakpoint) Cefoxitin		Source	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 32 μg/ml)		Humans Retail Chickens	0	1	0 100.0%	0.0%	0	0.0%	0	0.0%	0.0%	0.0%	0	0
		Chickens	HACCP	0.0%	0.0%	1 0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0		0.0%
		Chic	Cecal	0	0	0	0		0	0	0	0			0
			Retail Ground Turkey	0.0%		0.0%		0.0%	42.9%	0.0%			0.0%	0.0%	0.0%
		Turkeys	HACCP	0	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%		33.3%	0.0%	16.7%
		Τū	Cecal		0	0	0	0	0	1	0		1	0	0.0%
			Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0 0.0% 0
		e	HACCP	3.3%	1.5% 1	0.0%	3.8%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)		,	Ü			J	J	<u> </u>	Ü	<u> </u>	0.0%	0.0%
			Cecal (Dairy)											5.6% 1	0.0%
			Retail Pork Chops			0.0% 0					0.0% 0				0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0% 0	0.0% 0
	Ceftiofur (MIC ≥ 8 μg/mI)		Humans	0.0%	6.3% 1	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
		sue	Retail Chickens	0.00/	0.00/	100.0%	0.0%		0.0%	0.00/	0.0%	0.0%	0.0%		0.00/
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
			Cecal	0.0%		0.0%		0.0%	42.9%	0.0%			0.0%	0.0%	0.0%
		eys	Retail Ground Turkey	0	0.0%	0.0%	0.0%	0.0%	3	0 50.0%	0.0%		0 33.3%	0.0%	0
		Turkeys	HACCP Cecal		0	0	0	0	0	1	0		1	0	0.0%
		-	Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			HACCP	3.3%	1.5%	0.0%	0 3.8%	0 4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	2	1	0	1	1	0	0	0	0	0	0.0%	0.0%
			Cecal (Dairy)											5.6%	0.0%
			Retail Pork Chops			0.0%					0.0%			1	0.0%
		Swine	Cecal (Market Swine)			0					0			0.0%	0 0.0% 0
		Ó	Cecal (Sows)											0.0%	0.0%
	Ceftriaxone (MIC ≥ 4 µg/mI)		Humans	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ο = 4 μg/iiii)	"	Retail Chickens	3		100.0%	0.0%	3	0.0%		0.0%	0.0%	0.0%		
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
		S	Cecal	,	0		,			3		0			
			Retail Ground Turkey	0.0%		0.0%		0.0%	42.9% 3	0.0%			0.0%	0.0%	0.0%
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%		33.3% 1	0.0%	16.7% 2
		1	Cecal					3							0.0%
			Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		<u>e</u>	HACCP	3.3%	1.5%	0.0%	3.8%	8.7% 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	2		U		2	U	U	U	U	U	0.0%	0.0%
			Cecal (Dairy)											5.6%	0.0%
		-	Retail Pork Chops			0.0%					0.0%			1	0.0%
		Swine	Cecal (Market Swine)			0					0			0.0%	0.0%
		Ø	Cecal (Sows)											0.0%	0.0%
	<u> </u>	1	1 ,/											0	0

Table 43c. Antimicrobial Resistance among Salmonella Anatum Isolates, 2003-2014

March Charles September	Year		J	Salmonella Anatun	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Section Content Cont		ed		Humans												13
			sua:													0
			Chick		2	4	1	6	0	1	1	1	1	0		6 0
Control (Control (C					1	0	1	0	1	7	1	0	0	2		2
Part			urkey													12
Maintenance Part			F												0	4
			<u>e</u>													1 18
Part			Catt		61	00	22	26	23	34	,	14	10	10		25
Application			_	Cecal (Dairy)											18	15
Missing Column Miss			ine		0	0	2	0	0	0	0	1	0	0		1
Marchitecton Class Section Sec			Ś													29 67
Parabeta Close				Isolate												
Sulfiperance Sulf	Antimicrobial Class	Breakpoint)														
MacCip		Sulfisoxazole 1		Humans			0	0		1		1	0	2		0.0% 0
MoCCP 0.0% 0.0% 0.0% 0.0% 0.0% 0.00%		(MIC ≥ 512 μg/ml)	s s	Retail Chickens												
Part			cken	HACCP			0.0%	0.0%		0.0%		0.0%	0.0%	- J		0.0%
Retail Ground Turkey			S	Cocal	0	0	0	0		0	1	0	0			0
Packed Procession Control (1998) Packed Process			-		0.0%		0.0%		100.0%	14.3%	0.0%			0.0%	0.0%	0.0%
Cocal Coca			ys			0.004	0	20.001	1	1	0	E0.001		0	0	0
Cocal Coca			Turke	HACCP												0.0% 0
Marcolidad				Cecal												0.0%
MacCip 3.3% 1.5% 0.0% 3.8% 4.2% 0.0%				Retail Ground Beef												0.0%
Part				HACCP				3.8%	4.3%			0.0%		0.0%	0.0%	0.0%
Resid Pork, Chops			Sattle		2	1	0	1	1	0	0	0	0	0		0.0%
Classic (Change)			ľ												0	0.0%
Macrolides				Cecal (Dairy)												0
Part				Retail Pork Chops												0.0%
Cecal (Sown)			wine	Cecal (Market Swine)												0.0%
Trimethoperion Sufferenderocolog (MIC 2 4 / 76 µg/ml) Humans 0.0% 0.0			0)	Cecal (Sows)											0.0%	0.0%
Nation N	-	Trimethoprim-			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%
Macroides			-	1	0	0			0		0				0	0
Retail Ground Turkey		(mio = 17 70 pg/m)	sus	Retail Chickens	0.00/	0.00/	0	0		0	0.00/	0	0			0.00/
Retail Ground Turkey			hicke	HACCP												0.0% 0
Macrolides Macrolides MacCP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0	Cecal												
Macrolides Azithromycin (MC 232 μg/mi) AZithromycin (MC 262 μg/mi) AZithromycin				Retail Ground Turkey												0.0%
Retail Ground Beef 0.0%			keys	HACCP	0		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
Retail Ground Beef 0.0%			Ţ			0	0	0	0	0	0	0		0	0	0.0%
Macrolides			-					0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
Macrolides Azithromycin (MiC 232 µg/ml) Humans O.0% O.0				Retail Ground Beef				0	0			0		0	0	0
Cecal (Dairy)			#e	HACCP												0.0% 0
Cecal (Dairy) Cecal (Dairy) Cecal (Dairy) Cecal (Market Swine) Cecal (Market Swine) Cecal (Sows)			Ca	Cecal (Beef)												0.0%
Retail Pork Chops Retail Pork Chops 0.0% 0.0				Cecal (Dairy)												0.0%
Macrolides Azithromycin (MiC ≥ 32 μg/ml) Humans 0.0% 0			\vdash									0.0%			0	0.0%
Macrolides			ine				0					0			0.0%	0.0%
Azithromycin (MiC 232 µg/ml) Humans			Sw													0.0%
MIIC 232 μg/mI) Retail Chickens	Manadid	Azithrom											0.007	0.001	0	0
Retail Critickeris	wacrolides	A∠iinromycin (MIC ≥32 μg/ml)											0	0		0.0% 0
Retail Ground Turkey			ns	Retail Chickens									0			
Retail Ground Turkey			icke	HACCP												0.0%
Retail Ground Turkey			Ö	Cecal												
### HACCP Cecal			, 0	Retail Ground Turkey												0.0%
Cecal			rkeys	HACCP										0.0%	0.0%	0.0%
Retail Ground Beef			T	Cecal										0	U	0.0%
HACCP 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0			-													0.0%
Cecal (Beef) 0.0%			_											0.0%	0.0%	0.0%
Cecal (Dairy) 0.0% 0.0% 0			Sattle										0	0	0.0%	0.0%
Cecal (Lany)															0	0.0%
Retail Pork Chops			<u> </u>	-												0.0%
			16	Retail Pork Chops											0.09/	0.0%
Cecual (Maintet Switter)			Swir												0	0
Cecal (Sows) 0.0% 0				Cecal (Sows)												0.0% 0

¹ Sulfamethoxazole was tested from 1996-2003 and was replaced by sulfisoxazole in 2004

Table 43d. Antimicro	bial Resistance am	ong	Salmonella Anatun	1 Isolates, 2003	2003-2014	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ted		Humans	18	16	12	10	18	14	13	19	16	16	20	13
		Chickens	Retail Chickens HACCP Cecal	0 2	0 4	1	1 6	0	2	0 1	1 1	1 1	1 0	0 0 0	0 6 0
		Turkeys	Retail Ground Turkey HACCP	1 0	0 1	1 1	0 9	1	7 1	1 2	0 6	0	2 3	2 2	2 12
		Cattle	Retail Ground Beef HACCP	0 61	0 68	0 22	2 26	1 23	0 34	0 7	1 14	0 18	1 18	0 1 16	4 1 18
		_	Cecal (Beef) Cecal (Dairy)											18 18	25 15
	I Antimicrobial	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	2	0	0	0	0	1	0	0	0 33 43	1 29 67
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Penicillins	Ampicillin (MIC ≥ 32 μg/ml)		Humans	0.0%	6.3% 1	0.0%	0.0%	0.0%	14.3% 2	0.0%	5.3% 1	0.0%	0.0%	0.0%	0.0% 0
	(о = от ру)	s	Retail Chickens	J		100.0%	0.0%	J	0.0%	Ü	0.0%	0.0%	0.0%	J	Ü
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	J		0.0%
		ਠ	Cecal			-				-	-				
		s	Retail Ground Turkey	0.0%		0.0% 0		100.0% 1	42.9% 3	0.0% 0			100.0% 2	0.0%	0.0% 0
		Turkeys	HACCP		0.0%	0.0%	33.3% 3	0.0%	100.0% 1	50.0% 1	33.3% 2		33.3% 1	0.0%	16.7% 2
		-	Cecal												0.0% 0
			Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		e H	HACCP	3.3% 2	1.5% 1	0.0%	3.8% 1	4.3% 1	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	0.0% 0
			Cecal (Dairy)											5.6% 1	0.0% 0
			Retail Pork Chops			0.0%					100.0% 1				0.0% 0
		Swine	Cecal (Market Swine)											3.0% 1	0.0% 0
			Cecal (Sows)											0.0% 0	0.0% 0
Phenicols	Chloramphenicol (MIC ≥ 32 µg/ml)		Humans	0.0% 0	6.3% 1	0.0%	0.0%	0.0% 0	14.3% 2	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0
		SL	Retail Chickens			0.0%	0.0%		0.0%		0.0%	0.0%	0.0%		
		Chickens	HACCP	0.0% 0	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0% 0
		O	Cecal												
		ş	Retail Ground Turkey	0.0% 0		0.0% 0		0.0%	0.0%	0.0% 0			0.0% 0	0.0% 0	0.0% 0
		Turkeys	HACCP		0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0
			Cecal												0.0% 0
			Retail Ground Beef				0.0% 0	0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Cattle	HACCP	3.3% 2	1.5% 1	0.0% 0	3.8% 1	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0
		පී	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0% 0	0.0% 0
		Ф	Retail Pork Chops			0.0% 0					0.0% 0				0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
	Ciarette ve s'		Cecal (Sows)	E 00/	0.007	0.007	0.007	0.007	0.004	0.007	0.007	0.007	0.024	0.0%	0.0%
Quinolones	Ciprofloxacin (MIC ≥ 1 µg/mI)		Humans	5.6% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		3ns	Retail Chickens	0.001	0.001	0.0%	0.0%		0.0%	0.001	0.0%	0.0%	0.0%		0.001
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0% 0
		Ľ	Cecal	0.09/		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
		ski	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0% 0 0.0%	0.0% 0 0.0%	0.0% 0 0.0%	0.0%		0.0% 0 0.0%	0.0% 0 0.0%	0.0% 0 0.0%
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
			Cecal				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		0	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)			0.0%					0.0%			0.0%	0.0%
		ЭС	Retail Pork Chops			0.0%					0.0%			0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0% 0 1.5%
			Cecal (Sows)											0.0%	1.5%

Table 43e. Antimicrobial Resistance among Salmonella Anatum Isolates, 2003-2014

Year		_	Uman	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	(0	Humans	18	16	12	10	18	14	13	19	16	16	20	13
		kens	Retail Chickens	0	0	1	1	0	2	0	1	1	1	0	0
		Chic	HACCP Cecal	2	4	1	6	0	1	1	1	1	0	0	6
		s,	Retail Ground Turkey	1	0	1	0	1	7	1	0	0	2	2	2
		rkey	HACCP	0	1	1	9	1	1	2	6	0	3	2	12
		1	Cecal											0	4
			Retail Ground Beef	0	0	0	2	1	0	0	1	0	1	1	1
		Cattle	HACCP	61	68	22	26	23	34	7	14	18	18	16	18
		0	Cecal (Beef) Cecal (Dairy)											18 18	25 15
		_	Retail Pork Chops	0	0	2	0	0	0	0	1	0	0	0	1
		Swine	Cecal (Market Swine)	· ·				o o						33	29
		Ø	Cecal (Sows)											43	67
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	0.0% 0	0.0%	0.0%	0.0%	0.0%	7.1% 1	0.0%	0.0%	0.0%	0.0%	5.0% 1	7.7% 1
	(= 1= pg)		Retail Chickens			0.0%	0.0%		0.0%	-	0.0%	0.0%	0.0%		
		éens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0		0.0%
		Chickens		0	0	0	0		0	0	0	0			0
		Ĺ	Cecal												
			Retail Ground Turkey	0.0%		0.0% 0		0.0%	0.0%	0.0%			0.0% 0	0.0%	0.0%
		Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
		ī	Cecal		0	0	0	0	0	0	0		0	0	0.0%
							0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			Retail Ground Beef				0	0			0		0	0	0
		⊕	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0%
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0%	0.0%
						0.0%					0.0%			0	0.0%
		Φ	Retail Pork Chops			0.070					0.070				0
		Swine	Cecal (Market Swine)											3.0%	0.0%
		,	Cecal (Sows)											0.0%	1.5%
Tetracyclines	Tetracycline		Humans	5.6%	12.5%	0.0%	10.0%	16.7%	21.4%	7.7%	0.0%	12.5%	18.8%	0.0%	0.0%
	(MIC ≥ 16 μg/mI)	-		1	2	0 100.0%	100.0%	3	0.0%	1	0.0%	0.0%	3 100.0%	0	0
		sus	Retail Chickens	0.00/	50.00/	1	1		0	400.00/	0	0	1		0.00/
		Chickens	HACCP	0.0%	50.0% 2	0.0%	33.3% 2		0.0%	100.0% 1	0.0%	0.0% 0			0.0%
		ਹ	Cecal												
			Retail Ground Turkey	0.0%		100.0%		0.0%	42.9%	0.0%			100.0%	100.0%	50.0%
		eys	HACCP	0	100.0%	100.0%	55.6%	100.0%	3 100.0%	0.0%	33.3%		2 33.3%	2 50.0%	1 100.0%
		Turkeys			1	1	5	1	1	0	2		1	1	12 75.0%
			Cecal												3
			Retail Ground Beef				50.0% 1	0.0%			0.0%		0.0%	0.0%	100.0%
		Ф	HACCP	29.5%	29.4%	31.8%	26.9%	26.1%	14.7%	28.6%	7.1%	11.1%	0.0%	12.5%	22.2%
		Cattle	Cecal (Beef)	18	20	7	7	6	5	2	1	2	0	2 5.6%	4 12.0%
														1 11.1%	0.0%
		<u> </u>	Cecal (Dairy)											2	0
			Retail Pork Chops			50.0% 1					0.0%				0.0% 0
		Swine	Cecal (Market Swine)											36.4% 12	72.4% 21
		Ó	Cecal (Sows)											39.5%	40.3%
			55531 (55W5)											17	27

Table 44a. Resistance Patte	erns	among Salmonella	Anatum Is	olates, 20 2004	03-2014 ¹	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	18	16	12	10	18	14	13	19	16	16	20	13
	Chickens	Retail Chickens HACCP	0	0	1	1	0	2	0	1	1	1	0	0
	Chic	Cecal	2	4	1	6	0	1	1	1	1	0	0	6 0
	eys	Retail Ground Turkey	1	0	1	0	1	7	1	0	0	2	2	2
	Turkeys	HACCP Cecal	0	1	1	9	1	1	2	6	0	3	2 0	12 4
		Retail Ground Beef	0	0	0	2	1	0	0	1	0	1	1	1
	Cattle	HACCP Cecal (Beef)	61	68	22	26	23	34	7	14	18	18	16 18	18 25
	Ĺ	Cecal (Dairy)											18	15
	Swine	Retail Pork Chops Cecal (Market Swine)	0	0	2	0	0	0	0	1	0	0	0 33	1 29
Resistance Pattern	Ó	Cecal (Sows) Source											43	67
		Humans	94.4%	87.5%	100.0%	90.0%	83.3%	78.6%	92.3%	89.5%	81.3%	81.3%	95.0%	84.6%
1. No Resistance Detected	_	Retail Chickens	17	14	12 0.0%	9	15	1100.0%	12	17 100.0%	13 0.0%	13 0.0%	19	11
	kens		100.0%	50.0%	0 100.0%	0 66.7%		100.0%	0.0%	1 100.0%	0 100.0%	0		83.3%
	Chickens	HACCP	2	2	1	4		1	0	1	1			5
		Cecal	400.00/		0.0%		0.0%	42.9%	100.0%			0.00/	0.0%	F0.00/
	s/s	Retail Ground Turkey	100.0% 1		0		0	3	3			0.0%	0	50.0%
	Turkeys	HACCP		0.0% 0	0.0% 0	22.2% 2	0.0% 0	0.0% 0	50.0% 1	16.7% 1		33.3% 1	50.0% 1	0.0% 0
	ľ	Cecal												25.0% 1
		Retail Ground Beef				50.0% 1	100.0%			100.0%		100.0%	100.0%	0.0%
	e E	HACCP	70.5% 43	70.6% 48	68.2% 15	69.2% 18	73.9% 17	85.3% 29	71.4% 5	92.9% 13	88.9% 16	100.0% 18	87.5% 14	77.8% 14
	Cattle	Cecal (Beef)	45	40	13	10	- 17	23	3	13	10	10	94.4%	84.0%
		Cecal (Dairy)											17 83.3%	93.3%
	_	Retail Pork Chops			50.0%					0.0%			15	14 100.0%
	ne				1					0			63.6%	1 27.6%
	Swine	Cecal (Market Swine)											21 60.5%	8 59.7%
	_	Cecal (Sows)	0.00/	0.20/	0.00/	0.00/	0.00/	44.20/	0.00/	F 20/	0.00/	42.50/	26	40
2. Resistant to ≥ 3		Humans	0.0%	6.3% 1	0.0%	0.0%	0.0%	14.3%	0.0%	5.3%	0.0%	12.5%	0.0%	0.0%
Antimicrobial Classes	SL	Retail Chickens			100.0% 1	0.0% 0		0.0%		0.0% 0	0.0% 0	100.0% 1		
	Chickens	HACCP	0.0% 0	0.0% 0	0.0%	0.0% 0		0.0%	100.0% 1	0.0%	0.0%			0.0% 0
	ō	Cecal												
		Retail Ground Turkey	0.0%		0.0% 0		100.0% 1	42.9% 3	0.0%			100.0% 2	0.0%	0.0%
	Turkeys	HACCP	0	0.0%	0.0%	33.3%	0.0%	100.0%	50.0%	33.3%		33.3%	0.0%	16.7%
	₽	Cecal		0	0	3	0	1	1	2		1	0	0.0%
	_	Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		HACCP	3.3%	1.5%	0.0%	0 3.8%	0 4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle		2	1	0	1	1	0	0	0	0	0	0.0%	0.0%
	-	Cecal (Beef)											0 5.6%	0.0%
		Cecal (Dairy)			0.00/					100.00/			1	0
	o.	Retail Pork Chops			0.0%					100.0% 1				0.0% 0
	Swine	Cecal (Market Swine)											3.0% 1	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0
3. Resistant to ≥ 4		Humans	0.0% 0	6.3% 1	0.0%	0.0%	0.0%	14.3% 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Antimicrobial Classes		Retail Chickens			100.0%	0.0%		0.0%		0.0%	0.0%	0.0%		
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
	S	Cecal	0	U	U	0			0	0	U			U
	_	Retail Ground Turkey	0.0%		0.0%		0.0%	42.9%	0.0%			0.0%	0.0%	0.0%
	Turkeys	HACCP	0	0.0%	0.0%	11.1%	0.0%	3 100.0%	0.0%	0.0%		0.0%	0.0%	0 16.7%
	Ţ	Cecal		0	0	1	0	1	0	0		0	0	0.0%
	<u> </u>					0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		Retail Ground Beef	3.3%	1.5%	0.0%	0 3.8%	0 4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	2	1	0	1	1	0	0	0	0	0	0.0%	0.0%
	Ĭ	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)			0.00/					0.00/			0.0%	0
	ø.	Retail Pork Chops			0.0%					0.0%				0.0%
	Swine	Cecal (Market Swine)											3.0% 1	0.0% 0
		Cecal (Sows)											0.0%	0.0% 0
1 Starting in 2011, testing included r	nine 1	antimicrobial classes with	the addition	of the macrol	ide azithromy	nin Panausa	ronintanno to	azithromunin	is low (in this	2000 -10/)	ontimiorobial			

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Year		among Salmonella	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	18	16	12	10	18	14	13	19	16	16	20	13
	Chickens	Retail Chickens HACCP Cecal	0 2	0 4	1 1	1 6	0	2 1	0 1	1	1	1 0	0 0 0	0 6 0
) 8/	Retail Ground Turkey	1	0	1	0	1	7	1	0	0	2	2	2
	urke	HACCP	0	1	1	9	1	1	2	6	0	3	2	12
	_	Cecal Retail Ground Beef	0	0	0	2	1	0	0	1	0	1	0	1
	Cattle	HACCP	61	68	22	26	23	34	7	14	18	18	16	18
	Ca	Cecal (Beef) Cecal (Dairy)											18 18	25 15
	Ф	Retail Pork Chops	0	0	2	0	0	0	0	1	0	0	0	1
	Swine	Cecal (Market Swine) Cecal (Sows)											33 43	29 67
Resistance Pattern		Source												
4. Resistant to ≥ 5		Humans	0.0% 0	6.3% 1	0.0% 0	0.0% 0	0.0% 0	7.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Antimicrobial Classes	s	Retail Chickens			100.0% 1	0.0%		0.0%		0.0%	0.0%	0.0%		
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
	ਨ	Cecal		U	- U				U					
		Retail Ground Turkey	0.0%		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
	eys		0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
	Turkeys	HACCP		0	0	0	0	0	0	0		0	0	0.0%
		Cecal				2.22/	2.00/			2.00/		2.00/	2.00/	0
		Retail Ground Beef				0.0% 0	0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0
	ttle	HACCP	3.3% 2	1.5% 1	0.0% 0	3.8% 1	4.3% 1	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%
	Ca	Cecal (Beef)											0.0%	0.0%
	I	Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops			0.0%					0.0%			0	0.0%
	Swine	Cecal (Market Swine)			0					0			0.0%	0.0%
	Sw												0.0%	0.0%
		Cecal (Sows)	0.0%	6.3%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5. At Least ACSSuT ² Resistant		Humans	0.0%	1	0	0	0.0%	1	0.0%	0	0	0	0.0%	0.0%
	SL	Retail Chickens			0.0% 0	0.0% 0		0.0% 0		0.0% 0	0.0% 0	0.0% 0		
	Chickens	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0%		0.0%	0.0% 0	0.0%	0.0%			0.0% 0
	ō	Cecal												
		Retail Ground Turkey	0.0%		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
	Turkeys	HACCP	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
	Tu	Cecal		0	0	0	0	0	0	0		0	0	0.0%
		Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			3.3%	1.5%	0.0%	0 3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	2	1	0	1	0	0	0	0	0	0	0.0%	0.0%
		Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)			0.0%					0.0%			0.078	0.0%
	Ф	Retail Pork Chops			0.0%					0.0%				0
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0% 0	0.0% 0
6. At Least ACT/S ³ Resistant		Humans	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	S	Retail Chickens			0.0% 0	0.0% 0		0.0%		0.0% 0	0.0% 0	0.0% 0		
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			0.0%
	S	Cecal		0	U				0					
		Retail Ground Turkey	0.0%		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
	Turkeys	HACCP	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
	Tur	Cecal		0	0	0	0	0	0	0		0	0	0.0%
		Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)			0.007					0.007			0.0%	0
	Ф	Retail Pork Chops			0.0%					0.0% 0			0.007	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
	1	Cecal (Sows)											0.0%	0.0%

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 44c. Resistance Patterns among Salmonella Anatum Isolates, 2003-2014

Table 44c. Resistance Patte	:1115	among Saimonella												
Year		Humans	2003 18	2004 16	2005 12	2006	2007 18	2008	2009 13	2010 19	2011 16	2012 16	2013 20	2014 13
Number of Isolates Tested	92													
	ken	Retail Chickens HACCP	0 2	0 4	1 1	1 6	0	2	0	1	1	1 0	0	0
	Chi	Cecal	_	·				·	·		·		0	0
	δ	Retail Ground Turkey	1	0	1	0	1	7	1	0	0	2	2	2
	rke	HACCP	0	1	1	9	1	1	2	6	0	3	2	12
	Ţ	Cecal											0	4
		Retail Ground Beef	0	0	0	2	1	0	0	1	0	1	1	1
	Cattle	HACCP	61	68	22	26	23	34	7	14	18	18	16 18	18 25
	O	Cecal (Beef) Cecal (Dairy)											18	15
		Retail Pork Chops	0	0	2	0	0	0	0	1	0	0	0	1
	wine	Cecal (Market Swine)	Ů	Ů	-	Ů		Ů		·		Ů	33	29
	Ś	Cecal (Sows)											43	67
Resistance Pattern	-	Source	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7. At Least ACSSuTAuCx 1		Humans	0.0%	1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Resistant	S	Retail Chickens			0.0% 0	0.0% 0		0.0% 0		0.0%	0.0% 0	0.0% 0		
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0% 0		0.0% 0	0.0% 0	0.0%	0.0%			0.0% 0
	ਠੇ	Cecal												
		Retail Ground Turkey	0.0%		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0% 0
	Turkeys	HACCP		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
	ř	Cecal											_	0.0%
		Retail Ground Beef				0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
	Cattle	HACCP	3.3% 2	1.5% 1	0.0%	3.8%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%
	Ca	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
	_	Retail Pork Chops			0.0% 0					0.0% 0				0.0% 0
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0
8. At Least Ceftriaxone and		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Nalidixic Acid Resistant	SI	Retail Chickens			0.0% 0	0.0%		0.0%		0.0% 0	0.0% 0	0.0%		
	Chickens	HACCP	0.0%	0.0%	0.0% 0	0.0%		0.0%	0.0% 0	0.0%	0.0% 0			0.0% 0
	ပ်	Cecal	J	J	Ü			<u> </u>	, ,	Ü	, ,			
		Retail Ground Turkey	0.0%		0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%
	Turkeys	HACCP		0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
	F	Cecal												0.0% 0
		Retail Ground Beef				0.0%	0.0%			0.0% 0		0.0% 0	0.0% 0	0.0% 0
	Cattle	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	ပၱ	Cecal (Beef)											0.0%	0.0% 0
		Cecal (Dairy)											0.0%	0.0%
	Φ	Retail Pork Chops			0.0%					0.0%			2.00/	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0%	0.0% 0

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 45a. Antimicro				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed	(0	Humans	2	2	3	0	7	3	5	2	1	5	1	4
		Chickens	Retail Chickens HACCP	0 3	0	0 3	1 2	0	0	0	0 8	0 6	0	0	0 2
		S	Cecal Retail Ground Turkey	0	0	1	0	0	0	0	0	0	0	0	0
		Turkey	HACCP Cecal	0	0	1	2	1	0	1	0	0	2	0	0
			Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
		Cattle	HACCP Cecal (Beef)	0	2	0	1	0	0	0	1	0	2	2 0	1 0
		ЭС	Cecal (Dairy) Retail Pork Chops	2	0	0	0	0	2	0	0	0	0	3	0
		Swine	Cecal (Market Swine) Cecal (Sows)											21 33	28 42
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Aminoglycosides	Breakpoint) Gentamicin	1	Source	0.0%	0.0%	0.0%		14.3%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%
	(MIC ≥ 16 μg/ml)		Humans	0	0	0	0.0%	1	0	0	0	0	1	0	0
		sue	Retail Chickens	66.70/		100.0%	0 50.0%	100.0%			62.5%	66.7%	0.0%		50.0%
		Chickens	HACCP	66.7% 2		3	1	100.0%			5	4	0.0%		1
			Cecal												0.0% 0
		s,	Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			0.0%	50.0% 1	0.0%		100.0% 1			100.0% 2		
		-	Cecal												
			Retail Ground Beef				0.0% 0								
		<u>0</u>	HACCP		0.0%		0.0%				0.0%		0.0%	50.0% 1	0.0% 0
		Cattle	Cecal (Beef)		0						0		U		U
			Cecal (Dairy)												0.0%
			Retail Pork Chops	0.0%					0.0%					0.0%	0
		ine	Cecal (Market Swine)	0					0					0.0%	0.0%
		Swine												0.0%	0 2.4%
	Streptomycin	-	Cecal (Sows)	0.0%	0.0%	0.0%		14.3%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	1 0.0%
	(MIC ≥ 64 μg/ml)		Humans	0.070	0.070	0.078	0.00/	1	0.070	0.078	0.078	0.078	1	0.078	0.078
		sus	Retail Chickens				0.0% 0								
		Chickens	HACCP	66.7% 2		100.0% 3	50.0% 1	100.0% 1			62.5% 5	66.7% 4	0.0% 0		50.0% 1
		0	Cecal												0.0% 0
		s	Retail Ground Turkey			0.0%									
		Turkeys	HACCP			100.0% 1	0.0% 0	0.0% 0		0.0%			50.0% 1		
		F	Cecal												
			Retail Ground Beef				0.0%								
		o o	HACCP		0.0%		0.0%				100.0%		0.0%	100.0%	0.0%
		Cattle	Cecal (Beef)		0		0				1		0	2	0
			Cecal (Dairy)												0.0%
			·	0.0%					0.0%					0.0%	0
		Je J	Retail Pork Chops	0					0					0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0
	A		Cecal (Sows)	2.00/	2.00/	0.00/		0.00/	0.004	0.00/	0.00/	2.22/	0.00/	0	2
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	(MIC ≥ 32 / 16 μg/ml)	ls.	Retail Chickens				0.0% 0								
		Chickens	HACCP	0.0% 0		0.0%	0.0%	0.0%			0.0%	0.0%	0.0% 0		0.0%
		ō	Cecal												0.0% 0
			Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			0.0%	0.0%	100.0%		0.0%			0.0%		
		Ţ	Cecal			0	0	1		0			0		
			Retail Ground Beef				0.0%								
			HACCP		0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)		0		0				1		0	0	0
															0.0%
		_	Cecal (Dairy)	0.0%					0.0%					0.0%	0
		ЭС	Retail Pork Chops	0.078					0.070					0.0%	3.6%
		Swine	Cecal (Market Swine)											1 0.0%	1
			Cecal (Sows)											0.0%	0.0% 0

Table 45b. Antimicro	obial Resistance amo	ong	Salmonella Johanne												
Year			Uman	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted	S	Humans Batail Chialrana	2	2	3	0	7	3	5	2	1	5	1	4
		Chickens	Retail Chickens HACCP	0 3	0	0 3	1 2	0	0	0	0	0 6	0	0	0 2
		ਨੁ	Cecal											0	1
		eys	Retail Ground Turkey	0	0	1	0	0	0	0	0	0	0	0	0
		Turkeys	HACCP Cecal	0	0	1	2	1	0	1	0	0	2	0	0
			Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
		Cattle	HACCP	0	2	0	1	0	0	0	1	0	2	2	1
		Ö	Cecal (Beef) Cecal (Dairy)											0	0
			Retail Pork Chops	2	0	0	0	0	2	0	0	0	0	3	0
		Swine	Cecal (Market Swine)											21	28
	Antimicrobial	•,	Cecal (Sows)											33	42
Authorizontial Olana	(Resistance Breakpoint)		Isolate												
Antimicrobial Class Cephems	Cefoxitin	+	Source Humans	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 32 μg/ml)	-	1	0	0	0	0.0%	0	0	0	0	0	0	0	0
		ens	Retail Chickens	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
		Chickens	HACCP	0.076		0.070	0.070	0.076			0.070	0.078	0.076		0
		Ľ	Cecal												0.0% 0
		S	Retail Ground Turkey			0.0%									
		Turkeys	HACCP			0.0%	0.0%	0.0% 0		0.0% 0			0.0% 0		
		12	Cecal				U								
			Retail Ground Beef				0.0%								
					0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	HACCP		0		0				1		0	0	0
		0	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0% 0					0.0%					0.0%	
		Swine	Cecal (Market Swine)	- J										4.8%	3.6%
		Ś	Cecal (Sows)											0.0%	0.0%
	Ceftiofur	+		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 8 μg/mI)		Humans	0	0	0	0.0%	0	0	0	0	0	0	0	0
		sus	Retail Chickens	0.00/		0.00/	0	0.00/			0.00/	0.00/	0.00/		0.00/
		Chickens	HACCP	0.0% 0		0.0% 0	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0% 0		0.0% 0
		0	Cecal												0.0% 0
			Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			0.0%	0.0%	100.0%		0.0%			0.0%		
		12	Cecal			0	0	1		0			0		
			Retail Ground Beef				0.0%								
					0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	HACCP		0.070		0.070				1		0.076	0.070	0
		Ö	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0%					0.0% 0					0.0% 0	
		Swine	Cecal (Market Swine)											4.8%	3.6%
		Ś	Cecal (Sows)											0.0%	0.0%
	Ceftriaxone	-		0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 4 µg/mI)		Humans	0	0	0	0.00/	0	0	0	0	0	0	0	0
		ns	Retail Chickens				0.0% 0								
		Chickens	HACCP	0.0% 0		0.0% 0	0.0%	0.0%			0.0% 0	0.0% 0	0.0% 0		0.0% 0
		Ö	Cecal												0.0%
			Retail Ground Turkey			0.0%									0
		eys	LIACOR			0.0%	0.0%	100.0%		0.0%			0.0%		
		Turkeys				0	0	1		0			0		
			Cecal												
			Retail Ground Beef				0.0% 0								
		Ф	HACCP		0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)		0		0				1		0	0	0
															0.0%
			Cecal (Dairy)	6					6						0.0%
			Retail Pork Chops	0.0% 0					0.0% 0					0.0% 0	
		Swine	Cecal (Market Swine)											4.8% 1	3.6% 1
		S	Cecal (Sows)											0.0%	0.0%
			,											0	113

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Table 45c. Antimicrobial Resistance among Salmonella Johannesburg Isolates, 2003-2014

Year	Diai Nesistance and	nig (Saimoneila Jonanne	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed		Humans	2	2	3	0	7	3	5	2	1	5	1	4
		sue	Retail Chickens	0	0	0	1	0	0	0	0	0	0	0	0
		Chickens	HACCP	3	0	3	2	1	0	0	8	6	1	0	2
		s	Cecal Retail Ground Turkey		0		0	0	0	0	0	0	0	0	1
		ırkey	HACCP	0	0	1	0 2	0	0	0 1	0	0	2	0	0
		J_	Cecal											0	0
		Ф	Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
		Cattle	HACCP Cecal (Beef)	0	2	0	1	0	0	0	1	0	2	2 0	0
			Cecal (Dairy)											0	1
		ne	Retail Pork Chops	2	0	0	0	0	2	0	0	0	0	3	0
		Swine	Cecal (Market Swine) Cecal (Sows)											21 33	28 42
	Antimicrobial													- 00	
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Folate Pathway Inhibitor	Sulfamethoxazole/ Sulfisoxazole 1		Humans	0.0%	0.0%	0.0%		0.0% 0	0.0%	0.0%	0.0% 0	0.0%	20.0%	0.0%	0.0% 0
	(MIC ≥ 512 μg/ml)		Retail Chickens	-	-	-	0.0%	-	-					-	
		Chickens	HACCP	66.7%		100.0%	0 100.0%	100.0%			25.0%	66.7%	0.0%		0.0%
		Chic		2		3	2	1			2	4	0		0.0%
			Cecal												0
		ç	Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			100.0% 1	50.0% 1	0.0% 0		100.0% 1			100.0% 2		
		ř	Cecal												
			Retail Ground Beef				0.0%								
				0.0%	0.0%		0.0%				100.0%		0.0%	50.0%	0.0%
		Cattle	HACCP	0.0%	0.0%		0.0%				100.0%		0.0%	1	0.0%
		ő	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0%					0.0%					0.0%	
		ine		0					0					0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0	0
	Trimethoprim- Sulfamethoxazole		Humans	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 4 / 76 µg/ml)		Retail Chickens				0.0%								
		Chickens	HACCP	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
		Chic		0		0	0	0			0	0	0		0.0%
			Cecal			0.00/									0
		õ	Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			0.0%	0.0% 0	0.0% 0		0.0% 0			0.0% 0		
		-	Cecal												
			Retail Ground Beef				0.0%								
					0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	HACCP		0		0				1		0	0	0
		0	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0%					0.0%					0.0%	
		Swine	Cecal (Market Swine)											0.0%	0.0%
		Ś	Cecal (Sows)											0.0%	0.0%
Macrolides	Azithromycin											0.0%	0.0%	0.0%	0.0%
	(MIC ≥32 μg/ml)		Humans									0	0	0	0
		ens	Retail Chickens									0.0%	0.0%		0.0%
		Chickens	HACCP									0.076	0.0%		0.0%
		L	Cecal												0.0%
		ys	Retail Ground Turkey										6.71		
		Turkeys	HACCP										0.0% 0		
		L	Cecal												
			Retail Ground Beef												
		‡	HACCP										0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)												
			Cecal (Dairy)												0.0%
			Retail Pork Chops											0.0%	0
		Swine	Cecal (Market Swine)											0.0%	0.0%
		Š	Cecal (Sows)											0.0%	0.0%
1 Culfornath avariate was too	ted from 1996-2003 and w	oo ror		2004										0	11/

Table 45d. Antimicrobial Resistance among Salmonella Johannesburg Isolates, 2003-2014

Table 45d. Antimicro	obial Resistance am	ong .	Salmonella Johann				2006	2007	2000	2000	2010	2011	2012	2012	2014
Year Number of Isolates Tes	sted		Humans	2003	2004	2005	2006 0	2007 7	2008	2009 5	2010	2011	2012 5	2013	2014 4
Tumber of isolates Tes		su	Retail Chickens	0	0	0	1	0	0	0	0	0	0	0	0
		Chickens	HACCP	3	0	3	2	1	0	0	8	6	1	0	2
		_	Cecal											0	1
		Turkeys	Retail Ground Turkey HACCP	0	0	1	0 2	0	0	0	0	0	0 2	0	0
		In	Cecal			·	_		ŭ	·			_	0	0
			Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
		Cattle	HACCP Cecal (Beef)	0	2	0	1	0	0	0	1	0	2	2	1 0
			Cecal (Bairy)											0	1
		e	Retail Pork Chops	2	0	0	0	0	2	0	0	0	0	3	0
		Swine	Cecal (Market Swine)											21	28
	Antimicrobial		Cecal (Sows)											33	42
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Penicillins	Ampicillin		Humans	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 32 μg/ml)	-	1	0	0	0	0.0%	0	0	0	1	0	0	0	0
		ens	Retail Chickens	0.0%		0.0%	0.0%	0.0%			0.0%	16.7%	0.0%		0.0%
		Chickens	HACCP	0.076		0.076	0.076	0.070			0.076	1	0.076		0
			Cecal												0.0% 0
		,,	Retail Ground Turkey			0.0%									
		Turkeys	HACCP			0.0%	0.0%	100.0% 1		0.0% 0			0.0%		
		Τu	Cecal			0	0			0			0		
		-	Retail Ground Beef				0.0%								
					0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
		Cattle	HACCP		0.070		0.076				1		0.076	0	0.070
		Ö	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0%					0.0%					0.0%	
		Swine	HACCP	0.0%	0.0%	6.7%	10.3%	9.1%	0.0%	9.1%	0.0%	0.0%			3.6%
		Š		0	0	1	3	2	0	1	0	0		0.0%	2.4%
Phenicols	Chloramphenicol	_	Cecal (Sows)	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%
THEHICOIS	(MIC ≥ 32 μg/ml)		Humans	0	0.070	0.076	2.22/	0.070	0.070	0.070	0.076	0.070	0	0	0.070
		SL	Retail Chickens				0.0% 0								
		Chickens	HACCP	0.0% 0		0.0% 0	0.0% 0	0.0% 0			0.0% 0	0.0%	0.0% 0		0.0% 0
		Ö	Cecal												0.0% 0
			Retail Ground Turkey			0.0%									
		Turkeys	HACCP			0 100.0%	0.0%	0.0%		0.0%			0.0%		
		ž				1	0	0		0			0		
			Cecal				0.00/								
			Retail Ground Beef				0.0% 0								
		tle	HACCP	0.0%	0.0%		0.0%				100.0% 1		0.0%	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)												
			Cecal (Dairy)												0.0%
			Retail Pork Chops	0.0%					0.0%					0.0%	0
		Je Je	•	0					0					0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)								6.51	,		0	0
Quinolones	Ciprofloxacin (MIC ≥ 1 µg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0
		s	Retail Chickens				0.0% 0								
		Chickens	HACCP	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
		Chi	Cecal	0		0	0	0			0	0	0		0.0%
		\vdash				0.0%									0
		3ys	Retail Ground Turkey			0.0%	0.0%	0.0%		0.0%			0.0%		
		Turkeys	HACCP			0.0%	0.076	0.078		0.0%			0.0%		
		Ĺ	Cecal												
			Retail Ground Beef				0.0% 0								
		Θ.	HACCP		0.0%		0.0%				0.0%		0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)		0		0				0		0	0	0
															0.0%
			Cecal (Dairy)	0.0%					0.0%					0.0%	0
		0	Retail Pork Chops	0.0%					0.0%					0	0.05:
		Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		-	Cecal (Sows)											0.0% 0	0.0% 0
			1												

Table 45e. Antimicrobial Resistance among Salmonella Johannesburg Isolates, 2003-2014

Table 45e. Antimicro	biai Resistance amo	ong .	Saimonella Jonanne	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed		Humans	2	2	3	0	7	3	5	2	1	5	1	4
		Chickens	Retail Chickens HACCP Cecal	0 3	0	0 3	1 2	0 1	0	0	0 8	0 6	0 1	0 0 0	0 2 1
		Turkeys	Retail Ground Turkey HACCP Cecal	0	0	1 1	0 2	0 1	0	0	0	0	0 2	0 0 0	0 0 0
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0	0 2	0	1	0	0	0	0 1	0	0 2	0 2 0	0 1 0 1
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	2	0	0	0	0	2	0	0	0	0	3 21 33	0 28 42
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 μg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0
	(о 2 ог ру)	SI	Retail Chickens	J		-	0.0%					J	J		
		Chickens	HACCP	0.0% 0		0.0% 0	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0% 0		0.0% 0
		Ō	Cecal												0.0% 0
		S	Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			0.0% 0	0.0%	0.0%		0.0% 0			0.0% 0		
		-	Cecal												
			Retail Ground Beef				0.0% 0								
		Cattle	HACCP		0.0% 0		0.0%				0.0% 0		0.0%	0.0% 0	0.0% 0
		S	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
			Retail Pork Chops	0.0% 0					0.0% 0					0.0% 0	
		Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
			Cecal (Sows)											0.0% 0	0.0% 0
Tetracyclines	Tetracycline (MIC ≥ 16 μg/ml)		Humans	50.0% 1	0.0% 0	33.3% 1		28.6% 2	66.7% 2	60.0%	50.0% 1	100.0% 1	20.0% 1	0.0% 0	0.0% 0
		us	Retail Chickens				0.0% 0								
		Chickens	HACCP	33.3% 1		100.0% 3	50.0% 1	0.0% 0			0.0% 0	16.7% 1	0.0% 0		0.0% 0
		O	Cecal												0.0% 0
		S/	Retail Ground Turkey			0.0% 0									
		Turkeys	HACCP			100.0% 1	50.0% 1	100.0% 1		0.0% 0			100.0% 2		
		_	Cecal												
			Retail Ground Beef				100.0% 1								
		Cattle	HACCP		0.0% 0		0.0% 0				100.0% 1		0.0% 0	100.0% 2	100.0% 1
		Ca	Cecal (Beef)												
			Cecal (Dairy)												0.0% 0
		_	Retail Pork Chops	100.0% 2					50.0% 1					0.0% 0	
		Swine	Cecal (Market Swine)											0.0% 0	7.1% 2
			Cecal (Sows)											9.1% 3	9.5% 4

Table 46a. Resistance Patte	erns	among Salmonella	Johannes 2003	sburg Isola	tes, 2003-2	2014 ¹	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	2	2	3	0	7	3	5	2	1	5	1	4
	Chickens	Retail Chickens HACCP Cecal	0 3	0	0 3	1 2	0 1	0	0	0 8	0 6	0 1	0 0 0	0 2 1
		Retail Ground Turkey	0	0	1	0	0	0	0	0	0	0	0	0
	Turkeys	HACCP Cecal	0	0	1	2	1	0	1	0	0	2	0	0
	Ė	Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
	Cattle	HACCP Cecal (Beef)	0	2	0	1	0	0	0	1	0	2	2	1 0
	_	Cecal (Dairy)											0	1
	Swine	Retail Pork Chops Cecal (Market Swine)	2	0	0	0	0	2	0	0	0	0	3 21	0 28
Resistance Pattern	S	Cecal (Sows) Source											33	42
1. No Resistance Detected		Humans	50.0% 1	100.0% 2	66.7% 2		57.1% 4	33.3% 1	40.0% 2	50.0% 1	0.0% 0	80.0% 4	100.0% 1	100.0% 4
		Retail Chickens			_	100.0% 1	·		_					·
	Chickens	HACCP	33.3% 1		0.0%	0.0%	0.0%			37.5% 3	16.7% 1	100.0%		50.0% 1
		Cecal	•		J	Ü	J			J	,	•		100.0%
		Retail Ground Turkey			100.0%									
	Turkeys	HACCP			0.0%	50.0%	0.0%		0.0%			0.0%		
	2	Cecal			0	1	0		0			0		
	H	Retail Ground Beef				0.0%								
	Ф	HACCP		100.0%		100.0%				0.0%		100.0%	0.0%	0.0%
	Cattle	Cecal (Beef)		2		1				0		2	0	0
		Cecal (Dairy)												100.0%
	_	Retail Pork Chops	0.0%					50.0%					100.0%	1
	Swine	Cecal (Market Swine)	0					1					1 95.2%	89.3%
	Sw												20 90.9%	25 88.1%
		Cecal (Sows)	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	30 0.0%	37 0.0%
2. Resistant to ≥ 3 Antimicrobial Classes	_	Humans	0	0	0	0.0%	0	0	0	0	0	1	0	0
	ens	Retail Chickens	33.3%		100.0%	0 50.0%	0.0%			0.0%	0.0%	0.0%		0.0%
	Chickens	HACCP	1		3	1	0			0	0	0		0.0%
		Cecal			0.0%									0
	sys	Retail Ground Turkey			0.0%	50.0%	100.0%		0.0%			100.0%		
	Turkeys	HACCP			1	1	1		0.0%			2		
	_	Cecal				0.00/								
		Retail Ground Beef		0.00/		0.0%				100.00/		0.00/	=0.00/	2.00/
	Cattle	HACCP		0.0%		0.0%				100.0%		0.0%	50.0%	0.0%
	0	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops	0.0% 0					0.0% 0					0.0% 0	
	Swine	Cecal (Market Swine)											4.8% 1	3.6% 1
		Cecal (Sows)											0.0% 0	2.4% 1
3. Resistant to ≥ 4		Humans	0.0%	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%
Antimicrobial Classes	St	Retail Chickens				0.0% 0								
	Chickens	HACCP	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
	ō	Cecal												0.0%
	s	Retail Ground Turkey			0.0%									
	Turkeys	HACCP			100.0% 1	0.0%	100.0% 1		0.0% 0			0.0%		
	Ľ	Cecal												
		Retail Ground Beef				0.0% 0								
	Cattle	HACCP		0.0%		0.0%				100.0% 1		0.0%	0.0% 0	0.0%
	ပိ	Cecal (Beef)												
	L	Cecal (Dairy)												0.0% 0
	_	Retail Pork Chops	0.0% 0					0.0% 0					0.0% 0	
	Swine	Cecal (Market Swine)											0.0% 0	0.0%
		Cecal (Sows)											0.0%	0.0%
Starting in 2011, testing included in	nino	antimicrobial classes with	the addition	of the macrol	do ozithrom	oin Possuss	ronintanno to	azithramyain	io low (in this	2000 -10/)	ontimiorobial			

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 46b. Resistance Patte			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	36	Humans Potoil Chickops	2	2	3	0	7	3	5	2	1	5	1	4
	Chickens	Retail Chickens HACCP Cecal	0 3	0	0 3	1 2	0	0	0	0	6	0	0 0 0	0 2 1
	ske	Retail Ground Turkey	0	0	1	0	0	0	0	0	0	0	0	0
	Turkeys	HACCP Cecal	0	0	1	2	1	0	1	0	0	2	0	0
		Retail Ground Beef	0	0	0	1	0	0	0	0	0	0	0	0
	Cattle	HACCP Cecal (Beef)	0	2	0	1	0	0	0	1	0	2	2	1 0
	0	Cecal (Beer) Cecal (Dairy)											0	1
	ne	Retail Pork Chops	2	0	0	0	0	2	0	0	0	0	3	0
	Swine	Cecal (Market Swine) Cecal (Sows)											21 33	28 42
Resistance Pattern		Source	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4. Resistant to ≥ 5		Humans	0	0	0	0.0%	0	0	0	0	0	0	0	0
Antimicrobial Classes	ns	Retail Chickens				0								
	Chickens	HACCP	0.0% 0		0.0% 0	0.0% 0	0.0% 0			0.0% 0	0.0%	0.0%		0.0% 0
	O	Cecal												0.0%
		Retail Ground Turkey			0.0%									-
	Turkeys	HACCP			0.0%	0.0%	0.0%		0.0%			0.0%		
	Tur	Cecal			0	0	0		0			0		
						0.0%								
		Retail Ground Beef		0.004	2.00/	0				100.00/		2.00/	2.00/	2.00/
	Cattle	HACCP		0.0% 0	0.0% 0	0.0% 0				100.0% 1		0.0% 0	0.0% 0	0.0% 0
		Cecal (Beef)												
		Cecal (Dairy)												0.0%
		Retail Pork Chops	0.0%					0.0%					0.0%	0
	Swine	Cecal (Market Swine)	0					0					0.0%	0.0%
	Sw												0.0%	0.0%
		Cecal (Sows)	0.00/	0.00/	0.00/		0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.0%	0
5. At Least ACSSuT ² Resistant		Humans	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0
	S	Retail Chickens				0.0% 0								
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
	ਠੇ	Cecal				-	-			-	-	-		0.0%
		Retail Ground Turkey			0.0%									0
	Turkeys	HACCP			0.0%	0.0%	0.0%		0.0%			0.0%		
	Tur				0	0	0		0			0		
		Cecal				0.0%								
		Retail Ground Beef		0.0%		0.0%				100.0%		0.0%	0.0%	0.0%
	attle	HACCP		0.0%		0.0%				1		0.0%	0.0%	0.0%
	ပိ	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops	0.0% 0					0.0%					0.0% 0	
	Swine	Cecal (Market Swine)											0.0% 0	0.0%
	0)	Cecal (Sows)											0.0%	0.0%
2		Humans	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6. At Least ACT/S ³ Resistant		Retail Chickens	0	0	0	0.0%	0	0	0	0	0	0	0	0
	kens	HACCP	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0%		0.0%
	Chickens		0		0	0	0			0	0	0		0.0%
		Cecal			0.0%									0
	ys	Retail Ground Turkey			0.0%	0.0%	0.0%		0.00/			0.00/		
	Turkeys	HACCP			0.0%	0.0%	0.0%		0.0%			0.0%		
	Ċ	Cecal												
		Retail Ground Beef				0.0% 0								
	E E	HACCP		0.0%		0.0%				100.0% 1		0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)		<u> </u>						·		J	J	
		Cecal (Dairy)												0.0%
	_	Retail Pork Chops	0.0%					0.0%					0.0%	0
	ine	Cecal (Market Swine)	0					0					0.0%	0.0%
	Swine												0.0%	0.0%
4 :	<u> </u>	Cecal (Sows) antimicrobial classes with	the addition	of the many	ido o-ist-	oin Pass	ropiotas	anish sa musik	in law (- th.)	100	antinolo t-1		0	0

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

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

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

Table 46c. Resistance Patterns among Salmonella Johannesburg Isolates, 2003-2014

Table 46c. Resistance Patte	ms	among Saimonella					0007	0000	1 0000	0040	1 0044	0040	0040	1 0044
Year Number of Isolates Tested	1	Humans	2003	2004	2005	2006	2007 7	2008	2009 5	2010	2011	2012 5	2013	2014 4
Number of Isolates rested	Chickens	Retail Chickens HACCP Cecal	0	0 0	0	1 2	0	0	0	0 8	0	0	0 0	0 2 1
	Turkeys	Retail Ground Turkey HACCP Cecal	0	0	1 1	0 2	0	0	0 1	0	0	0 2	0 0	0 0
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0	0 2	0	1	0	0	0	0 1	0	0 2	0 2 0 0	0 1 0
Designation Destroy	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	2	0	0	0	0	2	0	0	0	0	3 21 33	0 28 42
Resistance Pattern			0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7. At Least ACSSuTAuCx 1		Humans	0	0	0	0.00/	0	0	0	0	0	0	0	0
Resistant	sus	Retail Chickens			2 22/	0.0%	0.00/			0.00/		2.00/		0.00/
	Chickens	HACCP	0.0%		0.0%	0.0% 0	0.0% 0			0.0% 0	0.0% 0	0.0% 0		0.0% 0
	0	Cecal												0.0% 0
	ပ္	Retail Ground Turkey			0.0% 0									
	Turkeys	HACCP			0.0%	0.0% 0	0.0%		0.0%			0.0% 0		
	-	Cecal												
		Retail Ground Beef				0.0% 0								
	Cattle	HACCP		0.0% 0		0.0% 0				100.0% 1		0.0% 0	0.0% 0	0.0%
	Ca	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops	0.0%					0.0%					0.0%	
	Swine	Cecal (Market Swine)	-					-					0.0%	0.0%
	0)	Cecal (Sows)											0.0%	0.0%
8. At Least Ceftriaxone and		Humans	0.0%	0.0% 0	0.0%		0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%
Nalidixic Acid Resistant	s	Retail Chickens	Ü	Ů	J	0.0%	Ü	Ü	J	Ü	J	Ü	Ů	
	Chickens	HACCP	0.0%		0.0%	0.0%	0.0%			0.0%	0.0%	0.0% 0		0.0% 0
	Ö	Cecal												0.0%
		Retail Ground Turkey			0.0%									
	Turkeys	HACCP			0.0%	0.0% 0	0.0% 0		0.0% 0			0.0% 0		
	F	Cecal												
		Retail Ground Beef				0.0% 0								
	Cattle	HACCP		0.0% 0		0.0%				0.0% 0		0.0% 0	0.0% 0	0.0% 0
	ပ္မ	Cecal (Beef)												
		Cecal (Dairy)												0.0% 0
		Retail Pork Chops	0.0%					0.0%					0.0%	
	Swine	Cecal (Market Swine)											0.0%	0.0%
	,	Cecal (Sows)											0.0%	0.0%
		•												

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 47a. Antimicrobial Resistance among Salmonella Kentucky Isolates, 2003-2014

Year	biai Resistance amo	nig .	Salmonella Kentuck	y isolates, 2003	2003-2014	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed		Humans	2003	2004	3	3	2007	5	3	6	4	7	6	9
		sue	Retail Chickens	20	42	60	59	23	30	44	21	45	62	44	35
		Chickens	HACCP	418	570	919	674	443	219	214	243	227	301	237	361
		_	Cecal Retail Ground Turkey	4	1	2	1	2	0	2	2	2	1	15 2	27 0
		Turkeys	HACCP	9	6	5	8	1	1	2	0	2	1	0	7
		Ĭ	Cecal											1	2
		le le	Retail Ground Beef HACCP	0 30	0 25	9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14	0 13
		Cattle	Cecal (Beef)	30	20		1-7	12	22	10	10	10	12	6	3
		_	Cecal (Dairy)											15	7
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	1	0	0
	Antimiavahial	Ó	Cecal (Sows)											3	2
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Aminoglycosides	Breakpoint) Gentamicin	<u> </u>	Source	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	16.7%	25.0%	28.6%	50.0%	11.1%
Ammogryoosides	(MIC ≥ 16 μg/ml)		Humans	0	0	0	0	0	0	1	1	1	2	3	1
		Su	Retail Chickens	5.0% 1	2.4% 1	0.0% 0	8.5% 5	0.0% 0	6.7% 2	2.3% 1	4.8% 1	4.4% 2	6.5% 4	0.0% 0	0.0%
		Chickens	HACCP	2.6% 11	2.1% 12	1.4% 13	5.5% 37	3.4% 15	3.2% 7	2.3% 5	1.6% 4	1.3% 3	2.7% 8	0.8% 2	1.1% 4
		ਹ	Cecal											0.0% 0	0.0% 0
			Retail Ground Turkey	25.0%	0.0%	0.0%	0.0%	0.0%		50.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	HACCP	1 22.2%	0.0%	20.0%	0 37.5%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0	0.0%
		Ţ		2	0	1	3	0	0	0		0	0	0.0%	0.0%
			Cecal						0.0%			0.0%	0.0%	0.0%	0
			Retail Ground Beef						0			0	0	0	
		tte e	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%	0	0
		ne	·										0	0.0%	
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0	0
	Streptomycin (MIC ≥ 64 µg/ml)		Humans	50.0% 1	0.0% 0	0.0% 0	0.0%	0.0%	20.0% 1	33.3% 1	66.7% 4	25.0% 1	28.6% 2	0.0% 0	22.2% 2
		s	Retail Chickens	65.0% 13	52.4% 22	50.0% 30	69.5% 41	60.9% 14	66.7% 20	70.5% 31	81.0% 17	80.0% 36	87.1% 54	79.6% 35	88.6% 31
		Chickens	HACCP	21.5%	33.7%	36.3%	34.9%	32.5%	51.6%	54.7%	67.9%	69.2%	75.1%	81.0%	82.0%
		S	Cecal	90	192	334	235	144	113	117	165	157	226	192 60.0%	296 66.7%
			Retail Ground Turkey	50.0%	0.0%	50.0%	0.0%	50.0%		0.0%	0.0%	100.0%	0.0%	9 100.0%	18
		ske		2 44.4%	0 16.7%	1 40.0%	0 25.0%	1 0.0%	0.0%	0 50.0%	0	2 0.0%	0 100.0%	2	85.7%
		Turkeys	HACCP	4	1	2	2	0	0.070	1		0	1	0.00/	6
			Cecal											0.0% 0	100.0% 2
			Retail Ground Beef						0.0% 0			100.0% 3	0.0% 0	0.0%	
		<u>e</u>	HACCP	3.3% 1	4.0% 1	0.0% 0	14.3% 2	0.0% 0	4.5% 1	0.0% 0	23.1% 3	16.7% 3	8.3% 1	7.1% 1	7.7% 1
		Cattle	Cecal (Beef)					Ů		Ü	J	J	•	0.0%	0.0%
			Cecal (Dairy)											6.7%	0 14.3%
													100.0%	1	1
		e	Retail Pork Chops										1	0.0%	
		Swine	Cecal (Market Swine)											0	
			Cecal (Sows)											0.0% 0	50.0% 1
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	0.0%	0.0% 0	0.0% 0	33.3% 1	0.0%	20.0%	0.0%	16.7% 1	0.0%	14.3% 1	33.3% 2	0.0%
	(MIC ≥ 32 / 16 µg/ml)	<i>-</i>	Retail Chickens	25.0%	26.2%	21.7%	22.0%	8.7%	20.0%	36.4%	19.0%	28.9%	21.0%	15.9%	8.6%
		Chickens	HACCP	5 7.2%	9.6%	13 13.5%	13 15.4%	19.9%	6 11.0%	16 19.2%	4 15.2%	13 8.8%	13 18.3%	7 14.8%	3 11.6%
		Chic		30	55	124	104	88	24	41	37	20	55	35 6.7%	42 18.5%
		-	Cecal	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	5
		sk	Retail Ground Turkey	0	0	0	0	0	0.007	0	0.078	0	0	0.076	44.001
		Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	100.0% 1		14.3% 1
		Ľ	Cecal											0.0% 0	0.0% 0
			Retail Ground Beef						0.0%			33.3% 1	0.0% 0	0.0%	
		m	HACCP	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	2	0	0	0	0	0	1	0.0%	0.0%
		1												0.0%	0.0%
			Cecal (Dairy)										0.001	0.0%	0.0%
			Retail Pork Chops										0.0% 0		
		Swine	Cecal (Market Swine)											0.0% 0	
		0)	Cecal (Sows)											0.0%	0.0%
			I											0	0

Table 47b. Antimicrobial Resistance among Salmonella Kentucky Isolates, 2003-2014

Table 47b. Antimicro	obial Resistance an	nong .	Salmonella Kentuck	y Isolates, 2003	2003-201	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	ted	L	Humans	2	2	3	3	2	5	3	6	4	7	6	9
		Chickens	Retail Chickens HACCP	20 418	42 570	60 919	59 674	23 443	30 219	44 214	21 243	45 227	62 301	44 237	35 361
		Turkeys	Retail Ground Turkey	4	1	2	1	2	0	2	2	2	1	15	0
		Turk	HACCP Cecal	9	6	5	8	1	1	2	0	2	1	1	7 2
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 30	0 25	9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14 6	0 13 3
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	1	15 0 1	7 0 0
	Antimicrobial	Ś	Cecal (Sows)											3	2
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Cephems	Cefoxitin (MIC ≥ 32 µg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0	33.3% 1	0.0% 0	20.0% 1	0.0% 0	16.7% 1	0.0% 0	14.3% 1	16.7% 1	11.1% 1
		Su	Retail Chickens	25.0% 5	26.2% 11	21.7% 13	22.0% 13	8.7% 2	20.0% 6	36.4% 16	19.0% 4	31.1% 14	16.1% 10	13.6% 6	5.7% 2
		Chickens	HACCP	5.7% 24	9.6% 55	13.3% 122	15.1% 102	16.3% 72	10.5% 23	17.3% 37	14.8% 36	8.8% 20	14.6% 44	12.7% 30	9.7% 35
		0	Cecal											0.0% 0	14.8% 4
		s/s	Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	
		Turkeys	HACCP	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%		0.0% 0	0.0% 0		14.3%
			Cecal											0.0%	0.0%
			Retail Ground Beef						0.0% 0			0.0% 0	0.0% 0	0.0% 0	
		Cattle	HACCP	0.0% 0	0.0% 0	0.0%	14.3% 2	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%
		ပိ	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops										0.0%		
		Swine	Cecal (Market Swine)											0.0% 0	
			Cecal (Sows)											0.0% 0	0.0% 0
	Ceftiofur (MIC ≥ 8 µg/ml)		Humans	0.0% 0	0.0%	0.0%	33.3% 1	0.0% 0	20.0% 1	0.0% 0	16.7% 1	0.0%	0.0% 0	16.7% 1	0.0%
		SL	Retail Chickens	25.0% 5	26.2% 11	21.7% 13	22.0% 13	8.7% 2	20.0% 6	36.4% 16	19.0% 4	28.9% 13	19.4% 12	15.9% 7	8.6% 3
		Chickens	HACCP	7.4% 31	9.6% 55	13.5% 124	15.3% 103	19.9% 88	11.0% 24	18.7% 40	15.2% 37	8.4% 19	15.6% 47	13.1% 31	10.8% 39
		ō	Cecal											6.7% 1	18.5% 5
		ç	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0% 0		0.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0		14.3% 1
		-	Cecal											0.0% 0	0.0%
			Retail Ground Beef						0.0% 0			33.3% 1	0.0% 0	0.0% 0	
		ttle	HACCP	0.0% 0	0.0%	0.0%	14.3% 2	0.0%	0.0%	0.0% 0	0.0%	0.0%	8.3% 1	0.0% 0	0.0%
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops										0.0% 0		
		Swine	Cecal (Market Swine)											0.0% 0	
			Cecal (Sows)											0.0%	0.0%
	Ceftriaxone (MIC ≥ 4 µg/mI)		Humans	0.0% 0	0.0% 0	0.0% 0	33.3% 1	0.0% 0	20.0%	0.0%	16.7% 1	0.0% 0	0.0%	16.7% 1	0.0%
	(6	Retail Chickens	25.0% 5	26.2% 11	23.3% 14	22.0% 13	8.7% 2	20.0%	36.4% 16	19.0%	28.9% 13	21.0% 13	15.9% 7	8.6%
		Chickens	HACCP	7.2% 30	9.5% 54	13.6% 125	15.3% 103	19.9% 88	11.0% 24	19.2% 41	15.2% 37	8.8% 20	18.3%	14.3% 34	11.6% 42
		ر د	Cecal	30	34	123	103	88	24	41	37	20	55	6.7%	18.5%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	5
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	100.0%	0	14.3%
		TuT	Cecal	0	0	0	0	0	0	0		0	1	0.0%	0.0%
		\vdash	Retail Ground Beef						0.0%			33.3%	0.0%	0.0%	0
				0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	1 0.0%	0 8.3%	0.0%	0.0%
		Cattle	HACCP	0	0	0	2	0	0	0	0	0	1	0.0%	0.0%
			Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)										0.007	0.0%	0.0%
		Φ.	Retail Pork Chops										0.0%	0.001	
		Swine	Cecal (Market Swine)											0.0%	
			Cecal (Sows)											0.0% 0	0.0% 0

Table 47c. Antimicro		Ť		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ed	S	Humans	2	2	3	3	2	5	3	6	4	7	6	9
		Chickens	Retail Chickens HACCP Cecal	20 418	42 570	60 919	59 674	23 443	30 219	44 214	21 243	45 227	62 301	44 237 15	35 361 27
		Turkeys	Retail Ground Turkey HACCP Cecal	4 9	1 6	2 5	1 8	2	0 1	2 2	2 0	2 2	1	2 0 1	0 7 2
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 30	0 25	0 9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14 6	0 13 3
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	1	15 0 1	7 0 0
	Antimicrobial		Cecal (Sows)											3	2
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Folate Pathway Inhibitor	Sulfamethoxazole/ Sulfisoxazole ¹		Humans	50.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	33.3% 1	16.7% 1	25.0% 1	28.6% 2	50.0% 3	11.1% 1
	(MIC ≥ 512 μg/ml)	SL	Retail Chickens	5.0% 1	4.8% 2	0.0% 0	8.5% 5	4.3% 1	6.7% 2	4.6% 2	0.0% 0	8.9% 4	4.8% 3	0.0%	0.0% 0
		Chickens	HACCP	3.8% 16	3.3% 19	2.2% 20	6.2% 42	3.8% 17	4.1% 9	2.3% 5	1.6% 4	1.3%	3.7% 11	2.1% 5	1.7% 6
		ō	Cecal											6.7% 1	3.7% 1
			Retail Ground Turkey	25.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0%	0.0% 0	0.0% 0	100.0% 1	0.0% 0	
		Turkeys	HACCP	22.2%	66.7% 4	20.0%	87.5% 7	0.0%	100.0%	100.0%		0.0%	0.0%		0.0%
		12	Cecal		7	'	,						0	0.0%	50.0%
			Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	
		m	HACCP	0.0%	4.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	1	0	1	0	0	0	0	0	1	0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
		-	Retail Pork Chops										0.0%	0	0
		ine	Cecal (Market Swine)										0	0.0%	
		Swine												0.0%	0.0%
	Trimethoprim-		Cecal (Sows)	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%
	Sulfamethoxazole (MIC ≥ 4 / 76 µg/ml)		Humans	1 0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%	0 2.2%	0.0%	0.0%	0.0%
	(WIIC 247 76 µg/IIII)	sus	Retail Chickens	0	0.0%	0	0	0	0	0	0	1 0.0%	0	0.0%	0.6%
		Chickens	HACCP	0.0%	1	0.0%	0.1% 1	0.0% 0	0.0%	0.0%	0.0%	0.0%	1.0% 3	1	2
			Cecal											6.7% 1	3.7% 1
		s/	Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	
		Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	12.5% 1	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0		0.0% 0
			Cecal											0.0% 0	50.0% 1
			Retail Ground Beef						0.0% 0			0.0% 0	0.0% 0	0.0%	
		tle	HACCP	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%	Ť	
		Swine	Cecal (Market Swine)											0.0%	
		S	Cecal (Sows)											0.0%	0.0%
Macrolides	Azithromycin (MIC ≥32 µg/ml)		Humans									0.0%	0.0%	0.0%	0.0%
		SU	Retail Chickens									2.2% 1	0.0% 0	0.0% 0	0.0% 0
		Chickens	HACCP									0.0%	0.0%	0.0% 0	0.0% 0
		Ö	Cecal											0.0%	0.0% 0
		ys	Retail Ground Turkey									0.0%	0.0%	0.0%	0.001
		Turkeys	HACCP									0.0%	0.0%	0.0%	0.0% 0 0.0%
		Ŀ	Cecal									0.0%	0.0%	0.0%	0.0%
			Retail Ground Beef									0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP									0.078	0.078	0.0%	0.0%
			Cecal (Beef) Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%	0	0
		Swine	Cecal (Market Swine)										0	0.0%	
		S	Cecal (Sows)											0.0%	0.0%
Culfomothovozolo was too	tod from 1006-2003 and w	as ren	laced by sulfisoxazole in 20	004										L	

Table 47d. Antimicrobial Resistance among Salmonella Kentucky Isolates, 2003-2014

	obial Resistance an	ong .	Salmonella Kentuck				2006	1 2007	2008	2000	1 2010	1 2011	1 2012	1 2012	2014
Year Number of Isolates Test	ted		Humans	2003	2004	2005	2006	2007	2008 5	2009	2010 6	2011 4	2012 7	2013 6	2014 9
		sue	Retail Chickens	20	42	60	59	23	30	44	21	45	62	44	35
		Chickens	HACCP	418	570	919	674	443	219	214	243	227	301	237	361
			Cecal Retail Ground Turkey	4	1	2	1	2	0	2	2	2	1	15 2	27 0
		Turkeys	HACCP	9	6	5	8	1	1	2	0	2	1	0	7
		Ĕ	Cecal											1	2
		<u>e</u>	Retail Ground Beef HACCP	0 30	0 25	0	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14	0
		Cattle	Cecal (Beef)	30	25	9	14	12	22	10	13	10	12	6	13 3
			Cecal (Dairy)											15	7
		Swine	Retail Pork Chops	0	0	0	0	0	0	0	0	0	1	0	0
		Š	Cecal (Market Swine) Cecal (Sows)											1 3	0 2
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source												
Penicillins	Ampicillin (MIC ≥ 32 µg/ml)		Humans	0.0% 0	0.0%	0.0% 0	33.3% 1	0.0% 0	20.0% 1	33.3% 1	33.3% 2	25.0% 1	71.4% 5	50.0% 3	22.2% 2
		s	Retail Chickens	25.0% 5	28.6% 12	21.7% 13	22.0% 13	8.7% 2	20.0% 6	38.6% 17	19.1% 4	28.9% 13	22.6% 14	15.9% 7	8.6% 3
		Chickens	HACCP	8.4% 35	10.9% 62	14.4% 132	16.2% 109	20.1% 89	11.4%	19.6% 42	15.2% 37	8.8% 20	19.3% 58	14.8% 35	11.9% 43
		S.	Cecal	33	02	132	109	89	25	42	31	20	36	6.7%	18.5%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		50.0%	0.0%	0.0%	0.0%	0.0%	5
		eys	-	0 11.1%	0.0%	20.0%	0 12.5%	0.0%	0.0%	0.0%	0	0.0%	0 100.0%	0	28.6%
		Turkeys	HACCP	1	0.070	1	1	0	0.070	0.070		0.076	1	0.0%	2 0.0%
			Cecal											0	0.0%
			Retail Ground Beef						0.0% 0			33.3% 1	0.0% 0	0.0% 0	
		e te	HACCP	0.0%	0.0%	0.0%	14.3% 2	0.0%	0.0%	0.0% 0	0.0%	0.0%	8.3% 1	0.0%	0.0%
		Cattle	Cecal (Beef)	J		Ü		<u> </u>		Ů	Ü	- U		0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%	0	0
		ne											0	0.0%	
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)	2.20/	0.00/	0.00/	0.00/	2.00/	2.22/	0.00/	0.00/	0.00/	11.00/	0	0
Phenicols	Chloramphenicol (MIC ≥ 32 µg/mI)		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	14.3% 1	0.0% 0	0.0% 0
		2	Retail Chickens	0.0%	0.0%	0.0%	6.8% 4	0.0%	0.0%	0.0% 0	0.0%	2.2%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.2% 1	0.7% 4	0.5% 5	1.8% 12	2.0% 9	2.3% 5	1.9% 4	1.2% 3	0.4%	0.0%	0.4% 1	0.0% 0
		5	Cecal	•		<u> </u>	1.2				<u> </u>			0.0%	0.0%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	- 0
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0	0.0%
		Ţ		0	0	0	0	0	0	0		0	0	0.0%	0 50.0%
			Cecal						0.0%			0.0%	0.0%	0.0%	1
			Retail Ground Beef						0			0	0	0	
		Cattle	HACCP	0.0% 0	0.0% 0	0.0% 0	7.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		ပိ	Cecal (Beef)											0.0% 0	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%		
		Swine	Cecal (Market Swine)										0	0.0%	
		Š	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin	+		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.3%	16.7%	25.0%	42.9%	0 50.0%	0 33.3%
	(MIC ≥ 1 μg/ml)	<u> </u>	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1 0.0%	1 0.0%	1 0.0%	3	3	3
		sus	Retail Chickens	0	0	0	0	0	0	0	0	0	0	0	0
		Chickens	HACCP	0.2% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		0	Cecal											0.0%	0.0% 0
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	
		Furkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	Ů	0.0%	0.0%	Ŭ	0.0%
		Tu	Cecal	0	0	0	0	0	0	0		0	0	0.0%	0.0%
		\vdash	Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	0
				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0
		Ö	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops										0.0%		
		Swine	Cecal (Market Swine)											0.0%	
		Ó	Cecal (Sows)											0.0%	0.0%
			(0	0

Table 17a /	\ mainminunhinl	Resistance among	Calmanalla	Vantualo	· laalataa	2002 204
Table 4/e. F	Antimicrobiai	Resistance amond	Sammonena	Kentuck	v isolates.	. 2003-2014

	obiai Resistance an	nong .	Salmonella Kentuck						2222	2222	2010			2010	
Year Number of Isolates Te	sted		Humans	2003	2004	2005	2006	2007	2008 5	2009	2010	2011 4	2012 7	2013 6	2014 9
		Chickens	Retail Chickens HACCP	20 418	42 570	60 919	59 674	23 443	30 219	44 214	21 243	45 227	62 301	44 237	35 361
		Turkeys	Retail Ground Turkey HACCP Cecal	4 9	1 6	2 5	1 8	2 1	0 1	2 2	2 0	2 2	1	15 2 0 1	27 0 7 2
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 30	0 25	0 9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14 6	0 13 3
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	0	0	0	0	0	1	15 0 1 3	7 0 0 2
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 µg/ml)		Humans	0.0% 0	50.0% 1	0.0% 0	33.3% 1	0.0% 0	0.0%	33.3% 1	16.7% 1	25.0% 1	42.9% 3	50.0% 3	33.3% 3
	(1 1 7 7	s	Retail Chickens	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%
		Chickens	HACCP	0.7%	0.2%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ਠ	Cecal	3	,	0							U	0.0%	0.0%
		-	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0	0.0%
		Ţ	Cecal	0	0	0	0	0	0	0		0	0	0.0%	0.0%
			Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	0
		0	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0% 0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops										0.0%	0	0
		Swine	Cecal (Market Swine)										0	0.0%	
		Ó	Cecal (Sows)											0 0.0% 0	0.0%
Tetracyclines	Tetracycline (MIC ≥ 16 μg/mI)		Humans	50.0%	0.0%	0.0%	33.3%	0.0%	40.0%	33.3%	66.7%	100.0%	42.9% 3	33.3%	11.1%
	(WIIC E 10 µg/IIII)		Retail Chickens	60.0% 12	54.8% 23	53.3%	72.9%	73.9% 17	56.7% 17	68.2% 30	71.4% 15	75.6% 34	40.3%	63.6%	65.7%
		Chickens	HACCP	32.5%	37.5%	43.9% 403	43 47.2%	56.9%	51.1%	57.5%	69.5%	72.2%	25 59.1%	70.5%	67.3%
		Chi	Cecal	136	214	403	318	252	112	123	169	164	178	20.0%	243 37.0%
			Retail Ground Turkey	50.0%	0.0%	100.0%	100.0%	100.0%		50.0%	50.0%	100.0%	100.0%	0.0%	10
		Turkeys	HACCP	100.0%	100.0%	60.0%	87.5%	0.0%	100.0%	100.0%	1	50.0%	0.0%	0	71.4%
		T.	Cecal	9	6	3	7	0	1	2		1	0	0.0%	100.0%
			Retail Ground Beef						0.0%			100.0%	0.0%	0.0%	2
		Φ	HACCP	10.0%	48.0% 12	22.2%	35.7% 5	0.0%	13.6%	0.0%	53.8%	3 38.9% 7	0 16.7% 2	14.3%	53.8%
		Cattle	Cecal (Beef)	3	12	2	5	U	3	U	,	,	2	50.0% 3	33.3%
			Cecal (Dairy)											13.3%	0.0%
			Retail Pork Chops										0.0%	2	0
		Swine	Cecal (Market Swine)										0	0.0%	
		Ś	Cecal (Sows)											0.0%	50.0%

Table 48a. Resistance Patte	erns	among Salmonell	a Kentuck	y Isolates, 2004	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	2	2	3	3	2	5	3	6	4	7	6	9
	Chickens	Retail Chickens HACCP Cecal	20 418	42 570	60 919	59 674	23 443	30 219	44 214	21 243	45 227	62 301	44 237 15	35 361 27
	Turkeys	Retail Ground Turkey HACCP Cecal	4 9	1 6	2 5	1 8	2	0 1	2 2	2	2 2	1 1	2 0 1	0 7 2
	Cattle	Retail Ground Beef HACCP Cecal (Beef)	0 30	0 25	0 9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	1 14 6	0 13 3
	Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	1	15 0 1	7 0 0
Resistance Pattern	Ó	Cecal (Sows) Source											3	2
		Humans	0.0%	50.0%	100.0%	66.7%	100.0%	60.0%	66.7%	33.3%	0.0%	28.6%	33.3%	55.6%
1. No Resistance Detected		Retail Chickens	0 35.0%	1 45.2%	3 43.3%	2 25.4%	2 26.1%	3 26.7%	2 15.9%	2 14.3%	0 8.9%	11.3%	13.6%	5 11.4%
	kens	HACCP	7 63.2%	19 56.3%	26 49.3%	15 42.4%	6 33.4%	8 39.7%	7 34.6%	3 19.3%	4 18.1%	7 15.0%	6 13.1%	4 16.1%
	Chickens		264	321	453	286	148	87	74	47	41	45	31 33.3%	58 25.9%
		Cecal	50.0%	100.0%	0.0%	0.0%	0.0%		50.0%	50.0%	0.0%	0.0%	5	7
	ys	Retail Ground Turkey	2	1	0	0	0	0.004	1	1	0	0	0.078	44.00/
	Turkeys	HACCP	0.0%	0.0%	40.0% 2	12.5% 1	100.0% 1	0.0%	0.0%		50.0% 1	0.0%		14.3% 1
		Cecal											100.0% 1	0.0% 0
		Retail Ground Beef						100.0% 1			0.0%	100.0% 1	100.0% 1	
	te	HACCP	86.7% 26	48.0% 12	77.8% 7	64.3% 9	100.0% 12	81.8% 18	100.0% 10	46.2% 6	55.6% 10	75.0% 9	78.6% 11	38.5% 5
	Cattle	Cecal (Beef)	2.0	12		J	12			,		3	50.0%	66.7% 2
		Cecal (Dairy)											80.0%	85.7%
	_	Retail Pork Chops										0.0%	12	6
	Swine	Cecal (Market Swine)										0	100.0%	
	Š	Cecal (Sows)											1 100.0%	50.0%
			0.0%	0.0%	0.0%	33.3%	0.0%	20.0%	33.3%	33.3%	25.0%	28.6%	3 66.7%	1 11.1%
2. Resistant to ≥ 3 Antimicrobial Classes		Humans	0 30.0%	0 31.0%	0 23.3%	1 22.0%	0	1 26.7%	1 38.6%	19.0%	1 33.3%	2 24.2%	4 15.9%	1 8.6%
Antimicrobial Classes	sus	Retail Chickens	6	13	14	13	3	8	17	4	15	15	7	3
	Chickens	HACCP	9.6% 40	12.3% 70	15.2% 140	17.4% 117	21.2% 94	13.2% 29	19.6% 42	16.0% 39	9.3% 21	20.3% 61	14.8% 35	12.5% 45
		Cecal											6.7% 1	18.5% 5
		Retail Ground Turkey	25.0% 1	0.0%	0.0%	0.0%	0.0%		50.0% 1	0.0%	0.0%	0.0%	0.0%	
	Turkeys	HACCP	33.3% 3	0.0%	40.0% 2	37.5% 3	0.0%	0.0%	50.0% 1		0.0%	100.0%		28.6% 2
	-	Cecal											0.0%	50.0% 1
		Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	'
	<u>e</u>	HACCP	0.0%	0.0%	0.0%	14.3% 2	0.0%	0.0%	0.0%	0.0%	0.0%	8.3% 1	0.0%	0.0%
	Cattle	Cecal (Beef)	U	0	U	2	0	0	0	0	0	1	0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
	_	Retail Pork Chops										0.0%	0	0
	Swine	Cecal (Market Swine)										0	0.0%	
	Sw												0.0%	0.0%
		Cecal (Sows)	0.0%	0.0%	0.0%	33.3%	0.0%	20.0%	33.3%	33.3%	25.0%	28.6%	0 50.0%	0 11.1%
3. Resistant to ≥ 4 Antimicrobial Classes		Humans	0 25.0%	0 28.6%	20.0%	1 22.0%	0 8.7%	1 13.3%	1 27.3%	2 19.0%	1 11.1%	2 22.6%	3 8.6%	1 8.6%
, and an order of the order of	sus	Retail Chickens	5	12 7.4%	12	13	2 18.3%	4 9.6%	12 19.2%	4 14.0%	5 7.9%	14	4 11.8%	3
	Chickens	HACCP	25	42	105	92	81	21	41	34	18	31	28	39
		Cecal											6.7% 1	18.5% 5
	s/	Retail Ground Turkey	0.0%	0.0% 0	0.0%	0.0%	0.0%		0.0% 0	0.0%	0.0%	0.0%	0.0%	
	Turkeys	HACCP	0.0% 0	0.0% 0	0.0% 0	12.5% 1	0.0% 0	0.0% 0	0.0% 0		0.0% 0	100.0% 1		28.6% 2
	Ĺ	Cecal											0.0% 0	50.0% 1
		Retail Ground Beef						0.0% 0			0.0% 0	0.0% 0	0.0% 0	
	Cattle	HACCP	0.0%	0.0% 0	0.0%	14.3% 2	0.0% 0	0.0%	0.0%	0.0%	0.0%	8.3% 1	0.0%	0.0% 0
	ပ္မ	Cecal (Beef)											0.0%	0.0% 0
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops										0.0%		
	Swine	Cecal (Market Swine)											0.0%	
	S	Cecal (Sows)											0.0%	0.0%
1 Starting in 2011, testing included a	<u> </u>												0	0

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 48b. Resistance Patterns among Salmonella Kentucky Isolates, 2003-2014

Table 48b. Resistance Patte	11113	alliong Sallionell	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	2	2	3	3	2	5	3	6	4	7	6	9
	ens	Retail Chickens	20	42	60	59	23	30	44	21	45	62	44	35
	Chickens	HACCP Cecal	418	570	919	674	443	219	214	243	227	301	237 15	361 27
		Retail Ground Turkey	4	1	2	1	2	0	2	2	2	1	2	0
	Turkeys	HACCP Cecal	9	6	5	8	1	1	2	0	2	1	0	7 2
		Retail Ground Beef	0	0	0	0	0	1	0	0	3	1	1	0
	Cattle	HACCP	30	25	9	14	12	22	10	13	18	12	14	13
	ပိ	Cecal (Beef) Cecal (Dairy)											6 15	3 7
		Retail Pork Chops	0	0	0	0	0	0	0	0	0	1	0	0
	Swine	Cecal (Market Swine)											1	0
Resistance Pattern	0,	Cecal (Sows) Source											3	2
4. Resistant to ≥ 5		Humans	0.0%	0.0%	0.0%	33.3% 1	0.0%	20.0%	33.3% 1	33.3% 2	25.0% 1	28.6%	33.3% 2	11.1% 1
Antimicrobial Classes		Retail Chickens	20.0%	26.2%	18.3%	20.3%	4.3%	10.0%	25.0%	9.5%	8.9%	8.1%	9.1%	5.7%
	kens		3.1%	11 5.3%	11 6.5%	12 6.8%	1 8.4%	3 6.8%	11 12.6%	2 9.9%	5.3%	5 5.3%	4 8.9%	2 8.6%
	Chickens	HACCP	13	30	60	46	37	15	27	24	12	16	21 0.0%	31 11.1%
		Cecal											0	3
	"	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0% 0	
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0		0.0%	0.0%		14.3% 1
	Ĕ	Cecal	,	,	,	J	,	,			0	,	0.0%	0.0%
		Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	0
			0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	0.0%	0.0%	0.0%	2	0.0%	0.0%	0.0%	0.0%	0.078	0.0 %	0	0
	J	Cecal (Beef)											0.0% 0	0.0%
		Cecal (Dairy)											0.0% 0	0.0%
		Retail Pork Chops										0.0%		-
	Swine	Cecal (Market Swine)										0	0.0%	0.0%
	Ś												0.0%	0.0%
		Cecal (Sows)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%
5. At Least ACSSuT ² Resistant		Humans	0	0	0	0	0	0	0	0	0	1	0	0
	s	Retail Chickens	0.0%	0.0%	0.0%	6.8% 4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.2% 1	0.5% 3	0.5% 5	1.8% 12	1.6% 7	1.8% 4	1.9% 4	1.2% 3	0.4% 1	0.0%	0.4% 1	0.0%
	ប់	Cecal		J	J	12	,	-	4	3	•	Ů	0.0%	0.0%
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0
	eys		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0	0.0%
	Turkeys	HACCP	0	0	0	0	0	0	0		0	0	0.0%	0.0%
		Cecal						0.00/			0.00/	0.00/	0	0.0%
		Retail Ground Beef						0.0% 0			0.0% 0	0.0% 0	0.0% 0	
	ttle	HACCP	0.0%	0.0%	0.0%	7.1% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Catt	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops										0.0%	U	U
	Swine	Cecal (Market Swine)										0	0.0%	
	S,	Cecal (Sows)											0.0%	0.0%
		` '	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6. At Least ACT/S ³ Resistant		Humans	0	0	0	0	0	0	0	0	0	0	0	0
	us	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.2% 1	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%
	O	Cecal											0.0%	0.0% 0
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%		0.0%
	1	Cecal	0	0	0	0	0	0	0		0	0	0.0%	0.0%
		Retail Ground Beef						0.0%			0.0%	0.0%	0.0%	0
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	HACCP	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Ĭ	Cecal (Beef)											0	0
		Cecal (Dairy)											0.0%	0.0% 0
		Retail Pork Chops										0.0%		
	Swine	Cecal (Market Swine)											0.0%	
	,	Cecal (Sows)											0.0%	0.0%
¹ Starting in 2011, testing included r	nine a	antimicrobial classes wi	ith the additio	n of the macr	olide azithron	rycin. Becaus	e resistance	to azithromyo	in is low (in th	nis case. <1%	3)		J	U

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

² ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline
³ ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

Table 48c. Resistance Patterns among Salmonella Kentucky Isolates, 2003-2014

Table 48c. Resistance Patte	erns	amonell	a Kentuck 2003	y isolates, 2004	2003-2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	2	2	3	3	2	5	3	6	4	7	6	9
	Chickens	Retail Chickens HACCP Cecal	20 418	42 570	60 919	59 674	23 443	30 219	44 214	21 243	45 227	62 301	44 237 15	35 361 27
	Turkeys	Retail Ground Turkey HACCP Cecal	4 9	1 6	2 5	1 8	1	0	2 2	0	2 2	1	2 0 1	0 7 2
	Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0 30	0 25	0 9	0 14	0 12	1 22	0 10	0 13	3 18	1 12	2 14 6 15	0 13 3 7
Resistance Pattern	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Source	0	0	0	0	0	0	0	0	0	1	0 1 3	0 0 2
7. At Least ACSSuTAuCx 1		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Resistant	"	Retail Chickens	0.0%	0.0%	0.0%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%
	Ö	Cecal						-			-		0.0%	0.0%
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0		0.0%	0.0%		0.0%
	۲	Cecal											0.0%	0.0% 0
		Retail Ground Beef						0.0% 0			0.0% 0	0.0% 0	0.0% 0	
	Cattle	HACCP	0.0%	0.0%	0.0% 0	7.1% 1	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	ర	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)											0.0% 0	0.0% 0
		Retail Pork Chops										0.0% 0		
	Swine	Cecal (Market Swine)											0.0% 0	
		Cecal (Sows)											0.0% 0	0.0% 0
8. At Least Ceftriaxone and		Humans	0.0%	0.0% 0	0.0% 0	33.3% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Nalidixic Acid Resistant	us	Retail Chickens	0.0%	0.0%	1.7% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0
	Chickens	HACCP	0.2% 1	0.0%	0.4% 4	1.8% 12	1.6% 7	1.8% 4	1.9% 4	1.2% 3	0.4% 1	0.0% 0	0.0% 0	0.0% 0
	Ĺ	Cecal											0.0%	0.0%
	ys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0% 0	0.0%	0.0%	0.0%	
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0% 0	0.004	0.0%
		Cecal						0.004			0.004	0.00/	0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0 0.0%	0.0%	0.0%	0.0% 0 0.0%	0.0% 0 0.0%	0.0% 0 0.0%	0.0%
	Cattle	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	U	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)										0.0%	0.0%	0.0%
	ē	Retail Pork Chops										0.0%	0.0%	
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0%	0.0%

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Table 49a. Antimicrobial Resistance among Salmonella Hadar Isolates, 2003-2014

Year Number of Isolates Test	ed		Humans	2003 18	2004 10	2005 11	2006 22	2007 13	2008 19	2009 20	2010 17	2011 14	2012 18	2013 11	2014 8
realiber of isolates rest	eu	sus	Retail Chickens	2	8	9	1	2	1	2	2	1	0	1	0
		Chickens	HACCP	51	11	17	8	2	3	6	2	0	6	1	7
		_	Cecal Retail Turkey	11	11	13	25	54	71	21	20	23	8	1 14	1 13
		Turkeys	HACCP	44	31	48	98	118	40	32	30	20	31	12	34
		1	Cecal											4	7
		e	Retail Ground Beef HACCP	0	0 2	0	0	0 2	0 1	0 1	0	0	0	0	0
		Cattle	Cecal (Beef)	U	2	'		2	'	'	'	0	'	0	1
			Cecal (Dairy)											0	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	0	8	0	0	0
		ŝ	Cecal (Sows)											3	2
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint)		Source	F 00/	40.00/	0.40/	0.00/	0.00/	0.00/	0.00/	5.00/	0.00/	0.00/	0.00/	0.00/
Aminoglycosides	Gentamicin (MIC ≥ 16 μg/ml)		Humans	5.6% 1	10.0% 1	9.1% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	5.9% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		S	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	
		Chickens	HACCP	5.9%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
		윤	Cecal	3	0	1	0	0	0	0	0		0	0.0%	0.0%
				9.1%	0.0%	0.0%	20.0%	22.2%	14.1%	9.5%	5.0%	21.7%	37.5%	0 7.7%	7.7%
		şķs	Retail Ground Turkey	1 18.2%	0 29.0%	0 12.5%	5 12.2%	12 9.3%	10 15.0%	3.1%	1 10.0%	5 20.0%	3 3.2%	1 16.7%	1 2.9%
		Turkeys	HACCP	18.2% 8	29.0%	12.5% 6	12.2% 12	9.3%	15.0% 6	3.1%	10.0%	20.0%	3.2%	2	1
		[Cecal											0.0% 0	0.0%
			Retail Ground Beef												
		m	HACCP		0.0%	0.0%		50.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	Cecal (Beef)		0	0		1	0	0	0		0		0.0%
															0
			Cecal (Dairy)												
		_	Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)												
		S	Cecal (Sows)											0.0%	0.0%
	Streptomycin		Humans	88.9%	50.0%	45.5%	31.8%	38.5%	78.9%	45.0%	58.8%	71.4%	88.9%	0 81.8%	75.0%
	(MIC ≥ 64 μg/ml)		1	16 50.0%	5 87.5%	5 88.9%	7 100.0%	5 100.0%	15 100.0%	9 100.0%	10 100.0%	10 100.0%	16	9 100.0%	6
		sus	Retail Chickens	1	7	8	1	2	1	2	2	1	00 70/	1	74.40/
		Chickens	HACCP	54.9% 28	81.8% 9	70.6% 12	62.5% 5	0.0% 0	100.0% 3	100.0% 6	50.0% 1		66.7% 4	100.0% 1	71.4% 5
		O	Cecal											100.0%	100.0%
			Retail Ground Turkey	90.9%	90.9%	92.3%	84.0%	81.5%	98.6%	71.4%	85.0%	100.0%	100.0%	92.9%	100.0%
		Turkeys	HACCP	10 56.8%	10 74.2%	12 66.7%	21 40.8%	44 48.3%	70 75.0%	15 68.8%	17 50.0%	23 50.0%	93.5%	13 83.3%	97.1%
		Ę		25	23	32	40	57	30	22	15	10	29	10 100.0%	33 85.7%
			Cecal											1	6
			Retail Ground Beef												
		te te	HACCP		0.0%	0.0% 0		50.0% 1	100.0% 1	0.0% 0	100.0% 1		100.0% 1		
		Cattle	Cecal (Beef)												0.0%
			Cecal (Dairy)												0
			1 11					100.0%				100.0%			
		e	Retail Pork Chops					1				8			
		Swine	Cecal (Market Swine)												
		1	Cecal (Sows)											33.3% 1	100.0% 2
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin- Clavulanic Acid		Humans	5.6% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	5.3% 1	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0
minulation Combinations	(MIC ≥ 32 / 16 µg/ml)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3	100.0%	U
		Chickens		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%
		Chic	HACCP	0	0	0	0	0	0	0	0		0	0.0%	0.0%
		Ĺ	Cecal									4		0	0
		ço	Retail Ground Turkey	0.0% 0	0.0% 0	7.7% 1	0.0% 0	0.0% 0	1.4% 1	0.0% 0	5.0% 1	13.0% 3	0.0% 0	0.0% 0	7.7% 1
		Turkeys	HACCP	0.0%	0.0% 0	0.0% 0	2.0% 2	1.7% 2	0.0% 0	0.0% 0	0.0% 0	10.0% 2	0.0% 0	8.3% 1	0.0% 0
		ļ	Cecal		Ľ	Ľ			Ü					0.0%	0.0%
		\vdash	Retail Ground Beef											0	0
					0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		ő	Cecal (Beef)												0.0% 0
			Cecal (Dairy)												
			Retail Pork Chops					0.0%				0.0%			
		ine	Cecal (Market Swine)					0				0			
		Swine												0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%

Year			Humans	2003 18	2004 10	2005 11	2006 22	2007 13	2008 19	2009 20	2010 17	2011 14	2012 18	2013 11	2014 8
Number of Isolates Tes	sted	S	Humans Retail Chiekens	1											
		Chickens	Retail Chickens HACCP Cecal	2 51	8 11	9 17	8	2 2	3	6	2 2	0	0 6	1 1 1	0 7 1
		Turkeys	Retail Turkey HACCP	11 44	11 31	13 48	25 98	54 118	71 40	21 32	20 30	23 20	8 31	14 12	13 34
		Tur	Cecal											4	7
		Cattle	Retail Ground Beef HACCP Cecal (Beef)	0	0 2	0	0	0 2	0	0	0	0	0 1	0 0	0 0 1
			Cecal (Dairy)	0	0	0	0		0	0	0	0	0	0	0
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	1	0	0	0	8	Ü	0 0 3	0 0 2
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Cephems	Breakpoint) Cefoxitin (MIC ≥ 32 µg/ml)		Source Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(ΝΙΙΟ Ε 32 μg/ΙΙΙΙ)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0	0.0%	
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	'	0.0%	0.0%	0.0%
		S	Cecal	0	0	0	0	0	0	0	0		0	0.0%	0.0%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	4.3%	0.0%	0.0%	0 7.7%
		eys		0.0%	0.0%	0.0%	1.0%	0 1.7%	0.0%	0.0%	0.0%	10.0%	0.0%	0 8.3%	0.0%
		Turkeys	HACCP	0	0	0	1	2	0	0	0	2	0	0.0%	0.0%
			Cecal											0	0
			Retail Ground Beef		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	HACCP		0.078	0.078		0.076	0.076	0.070	0.070		0.078		0.0%
		0	Cecal (Beef)												0.0%
			Cecal (Dairy)												
			Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)												
			Cecal (Sows)											0.0% 0	0.0% 0
	Ceftiofur (MIC ≥ 8 μg/ml)		Humans	0.0% 0	0.0%										
	(····· = pg·····)		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		0.0%	
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%
		S	Cecal	0	U			0	0	Ü	0		0	0.0%	0.0%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	5.0%	13.0%	0.0%	0.0%	7.7%
		Turkeys	HACCP	2.3%	0.0%	0.0%	1.0%	1.7%	0.0%	0.0%	0.0%	3 10.0%	0.0%	0 8.3%	0.0%
		Ţū	Cecal	1	0	0	1	2	0	0	0	2	0	0.0%	0.0%
														0	0
			Retail Ground Beef		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	HACCP		0	0		0	0	0	0		0		0.0%
			Cecal (Beef)												0.078
			Cecal (Dairy)					0.00/				0.00/			
			Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)												
			Cecal (Sows)											0.0% 0	0.0% 0
	Ceftriaxone (MIC ≥ 4 µg/ml)		Humans	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%
	,		Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		0.0%	
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	- '-	0.0%	0.0%	0.0%
		Shir	Cecal	0	0	0	0	0	0	0	0		0	0.0%	0.0%
		\vdash		0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	5.0%	17.4%	0.0%	0.0%	7.7%
		ske	Retail Ground Turkey	0.0%	0.0%	0.0%	0	0	1 0.0%	0.0%	1 0.0%	10.0%	0.0%	0 8.3%	1 0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	1.0%	2	0.076	0.0%	0.0%	2	0.0%	1	0
			Cecal											0.0% 0	0.0% 0
			Retail Ground Beef												
		e te	HACCP		0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0		
		Cattle	Cecal (Beef)												0.0%
			Cecal (Dairy)												0
		\vdash	Retail Pork Chops					0.0%				0.0%			
		e e	ļ					0				0			
		Swine	Cecal (Market Swine)											0.00/	0.00/
			Cecal (Sows)											0.0% 0	0.0% 0

Table 49c. Antimicrobial Resistance among Salmonella Hadar Isolates, 2003-2014

Year	bial Resistance amo			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Test	ted		Humans	18	10	11	22	13	19	20	17	14	18	11	8
		Chickens	Retail Chickens HACCP	2 51	8 11	9 17	1 8	2 2	1 3	2 6	2 2	1 0	0 6	1	0 7
		Chic	Cecal	31	- ''	17	0	2	3	0	2	O	0	1	1
		ske	Retail Turkey	11	11	13	25	54	71	21	20	23	8	14	13
		Turkeys	HACCP	44	31	48	98	118	40	32	30	20	31	12	34
		Ė	Cecal Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	7
		Cattle	HACCP	0	2	1	0	2	1	1	1	0	1	0	0
		ပိ	Cecal (Beef)											0	1
			Cecal (Dairy)		0	0	0	_	0	0	0			0	0
		Swine	Retail Pork Chops Cecal (Market Swine)	0	0	0	0	1	0	0	0	8	0	0	0
		S	Cecal (Sows)											3	2
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Folate Pathway Inhibitor	Breakpoint) Sulfamethoxazole/		Source	16.7%	10.0%	9.1%	0.0%	0.0%	0.0%	0.0%	5.9%	7.1%	0.0%	0.0%	0.0%
,	Sulfisoxazole 1		Humans	3	1	1	0	0	0	0	1	1	0	0	0
	(MIC ≥ 512 μg/ml)	Sc	Retail Chickens	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	
		Chickens	HACCP	3.9% 2	0.0%	5.9% 1	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0		0.0%	0.0%	0.0%
		ò	Cecal				Ů	- V	Ü	Ü	Ü		- V	0.0%	0.0%
		-	Retail Ground Turkey	9.1%	0.0%	7.7%	24.0%	29.6%	26.8%	9.5%	15.0%	30.4%	37.5%	0.0%	7.7%
		ske	-	1 18.2%	0 29.0%	1 10.4%	6 15.3%	16 11.0%	19 17.5%	2 3.1%	3 6.7%	7 20.0%	3.2%	0 16.7%	1 2.9%
		Turkeys	HACCP	8	9	5	15	13	7	1	2	4	1	2	1
			Cecal											0.0% 0	0.0% 0
			Retail Ground Beef												
		Ф	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	Cecal (Beef)		0	0		0	0	0	0		0		0.0%
															0
			Cecal (Dairy)					0.004				0.004			
			Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)												
		0)	Cecal (Sows)											0.0%	0.0%
	Trimethoprim-		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%
	Sulfamethoxazole (MIC ≥ 4 / 76 µg/ml)			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0
	(= pg)	sus	Retail Chickens	0	0	0	0	0	0	0	0	0	0.00/	0	0.00/
		Chickens	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0
		0	Cecal											0.0% 0	0.0%
			Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	1.9% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		urkeys	HACCP	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ţ		0	0	0	1	0	0	0	0	0	0	0	0.0%
			Cecal											0.0%	
			Retail Ground Beef											0.0%	0
														0	0
		tle:	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%			0
		Cattle	HACCP Cecal (Beef)											0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	
		Cattle	Cecal (Beef) Cecal (Dairy)					0.0%				0.0%		0.0%	0.0%
			Cecal (Beef) Cecal (Dairy) Retail Pork Chops					0				0		0.0%	0.0%
		Swine Cattle	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)					0.0%				0.0%		0.0%	0.0%
			Cecal (Beef) Cecal (Dairy) Retail Pork Chops					0.0%				0.0%		0.0%	0.0% 0
Macrolides	Azithromycin (MIC ≥32 µg/ml)		Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)					0.0%				0.0%	0.0%	0 0.0% 0 0 0.0% 0 0.0%	0.0%
Macrolides		Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows)					0.0%				0.0%	0	0.0% 0 0.0% 0 0.0% 0.0% 0	0.0% 0 0 0.0% 0.0% 0
Macrolides		Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans					0.0%				0.0% 0.0% 0		0.0% 0 0.0% 0 0.0% 0.0%	0.0% 0 0 0.0% 0 0.0%
Macrolides			Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens					0.0%				0.0% 0.0% 0	0.0%	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%	0.0% 0 0.0% 0 0.0% 0 0.0%
Macrolides		Chickens	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP					0.0%				0.0% 0.0% 0 0.0% 0	0.0%	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%	0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0%
Macrolides		Chickens	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0 0.0% 0 0.0% 0 0.0%	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%	0.0% 0 0.0% 0.0% 0.0% 0 0.0% 0.0%
Macrolides		Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey					0.0%				0.0% 0.0% 0 0.0% 0	0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%
Macrolides		Chickens	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0 0.0% 0 0.0% 0 0.0%	0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	0.0% 0 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%
Macrolides		Turkeys Chickens Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%
Macrolides		Turkeys Chickens Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef HACCP					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0
Macrolides		Chickens	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef HACCP Cecal Retail Ground Beef					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0%
Macrolides		Turkeys Chickens Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0 0.0% 0
Macrolides		Cattle Turkeys Chickens Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy) Retail Pork Chops					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.
Macrolides		Turkeys Chickens Swine	Cecal (Beef) Cecal (Dairy) Retail Pork Chops Cecal (Market Swine) Cecal (Sows) Humans Retail Chickens HACCP Cecal Retail Ground Turkey HACCP Cecal Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)					0.0%				0 0.0% 0 0.0% 0 0.0% 0	0.0% 0 0.0% 0 0.0% 0	0.0% 0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.	0.0% 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.

Table 49d. Antimicrobial Resistance among Salmonella Hadar Isolates, 2003-2014

Table 49d. Antimicr				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	· ·	Humans	18	10	11	22	13	19	20	17	14	18	11	8
		Chickens	Retail Chickens HACCP	2 51	8 11	9 17	1 8	2 2	1 3	2 6	2 2	1 0	0 6	1	7
		Chi	Cecal	01		.,	Ü	_	J	Ü	_		Ŭ	1	1
		eys	Retail Turkey	11	11	13	25	54	71	21	20	23	8	14	13
		Turkeys	HACCP Cecal	44	31	48	98	118	40	32	30	20	31	12 4	34 7
			Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	0
		Cattle	HACCP	0	2	1	0	2	1	1	1	0	1	0	0
		Ö	Cecal (Beef) Cecal (Dairy)											0	1 0
		-	Retail Pork Chops	0	0	0	0	1	0	0	0	8	0	0	0
		Swine	Cecal (Market Swine)	0	0	O	0		0	0		0		0	0
	Antimicrobial	0)	Cecal (Sows)											3	2
	(Resistance		Isolate												
Antimicrobial Class Penicillins	Breakpoint) Ampicillin		Source	27.8%	10.0%	18.2%	22.7%	0.0%	15.8%	20.0%	29.4%	0.0%	11.1%	9.1%	12.5%
	(MIC ≥ 32 μg/ml)		Humans	5 50.0%	0.0%	33.3%	5 0.0%	0.0%	3 0.0%	4 50.0%	5 0.0%	0 100.0%	2	0.0%	1
		SU	Retail Chickens	1	0	3	0	0	0	1	0	1		0	
		Chickens	HACCP	11.8% 6	0.0% 0	17.6% 3	12.5% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0%	0.0% 0
		O	Cecal											0.0%	0.0% 0
			Retail Ground Turkey	27.3% 3	9.1% 1	23.1%	12.0% 3	50.0% 27	63.4% 45	57.1% 12	15.0% 3	60.9% 14	25.0% 2	14.3%	38.5% 5
		Turkeys	HACCP	9.1%	9.7%	14.6%	19.4%	33.1%	42.5%	53.1%	40.0%	35.0%	32.3%	16.7%	44.1%
		Ţ	Cecal	4	3	7	19	39	17	17	12	7	10	0.0%	15 71.4%
		\vdash												0	5
			Retail Ground Beef		0.0%	0.0%		50.0%	0.0%	0.0%	100.0%		0.0%		
		Cattle	HACCP		0.0%	0.0%		1	0.0%	0.0%	100.0%		0.0%		
		ပိ	Cecal (Beef)												0.0% 0
			Cecal (Dairy)												
			Retail Pork Chops					0.0% 0				100.0% 8			
		Swine	Cecal (Market Swine)					0				0			
		ý	Cecal (Sows)											0.0%	0.0%
Phenicols	Chloramphenicol		l.	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 12.5%
T Hemoors	(MIC ≥ 32 μg/ml)		Humans	1 0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.0%	1
		SU	Retail Chickens	0	0	0	0	0	0	0	0	0.0% 0		0	
		Chickens	HACCP	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%		0.0% 0	0.0%	0.0% 0
		O	Cecal											0.0%	0.0%
			Retail Ground Turkey	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%
		μ̈́	Cecal	0	0	0	1	0	0	0	1	0	0	0.0%	0.0%
														0	0
			Retail Ground Beef		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0 %		0.0%		
		Ö	Cecal (Beef)												0.0% 0
			Cecal (Dairy)												
			Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)									Ŭ			
		Š	Cecal (Sows)											0.0%	0.0%
Quinolones	Ciprofloxacin	-		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 1 μg/ml)	-	Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0
		sus	Retail Chickens	0	0	0	0	0	0	0	0	0.0%	0.007	0	0.007
		Chickens	HACCP	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0
			Cecal											0.0%	0.0%
			Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%
		Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Ţ	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		\vdash	Retail Ground Beef											0	0
					0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
		Cattle	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		0.004
		ő	Cecal (Beef)												0.0% 0
			Cecal (Dairy)												
			Retail Pork Chops					0.0%				0.0%			
		Swine	Cecal (Market Swine)					U				0			
		Š	Cecal (Sows)											0.0%	0.0%
			Jour (Jows)											0	0

Year	obiai Resistance an	nong	Salmonella Hadar Is	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Te	sted		Humans	18	10	11	22	13	19	20	17	14	18	11	8
		Chickens	Retail Chickens HACCP	2 51	8 11	9 17	1 8	2 2	1 3	2 6	2 2	1 0	0	1	0 7
		_	Cecal	31		17	0			0	2	O		1	1
		Turkeys	Retail Turkey HACCP Cecal	11 44	11 31	13 48	25 98	54 118	71 40	21 32	20 30	23 20	8 31	14 12 4	13 34 7
		Cattle	Retail Ground Beef HACCP Cecal (Beef) Cecal (Dairy)	0	0 2	0 1	0	0 2	0	0 1	0 1	0 0	0 1	0 0 0	0 0 1 0
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	1	0	0	0	8	0	0 0 3	0 0 2
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid		Humans	11.1%	10.0%	0.0%	4.5%	7.7%	5.3%	5.0%	11.8%	14.3%	5.6%	0.0%	12.5%
	(MIC ≥ 32 μg/ml)	S	Retail Chickens	0.0% 0	0.0% 0	0 0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	1	0 0.0% 0	1
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		16.7% 1	0.0%	0.0%
		ပ်	Cecal	J			Ů			J	Ü		·	0.0%	0.0%
		0	Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	3.7% 2	1.4% 1	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%
		Turkeys	HACCP	2.3% 1	3.2% 1	4.2% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		-	Cecal											0.0% 0	0.0% 0
			Retail Ground Beef												
		Cattle	HACCP		0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0		
		ပိ	Cecal (Beef)												0.0% 0
			Cecal (Dairy)					0.00/				0.00/			
		Ф	Retail Pork Chops					0.0% 0				0.0% 0			
		Swine	Cecal (Market Swine)											0.0%	0.00/
Tatasasallasa	Tetracuelina		Cecal (Sows)	100.0%	90.0%	100.0%	86.4%	02.20/	84.2%	80.0%	94.1%	78.6%	88.9%	0.0% 0 81.8%	0.0%
Tetracyclines	Tetracycline (MIC ≥ 16 μg/ml)		Humans	18 100.0%	90.0% 9 87.5%	100.0% 11 100.0%	19 100.0%	92.3% 12 100.0%	16 100.0%	16 100.0%	16 100.0%	11 100.0%	16	9	75.0% 6
		ens	Retail Chickens	94.1%	7 72.7%	9 88.2%	1 87.5%	100.0%	1 100.0%	100.0%	2 100.0%	1	66.7%	1 100.0%	71.4%
		Chickens	HACCP	48	8	15	7	2	3	6	2		4	1	5 0.0%
			Cecal	100.0%	100.0%	92.3%	96.0%	92.6%	97.2%	85.7%	100.0%	100.0%	87.5%	92.9%	0
		eys	Retail Ground Turkey HACCP	11 97.7%	11 83.9%	12 95.8%	24 89.8%	50 98.3%	69 90.0%	18 100.0%	20 93.3%	23 85.0%	7 96.8%	13 91.7%	13 94.1%
		Turkeys	Cecal	43	26	46	88	116	36	32	28	17	30	11 100.0%	32 100.0%
			Retail Ground Beef											4	7
			HACCP		0.0%	100.0%		100.0%	100.0%	100.0%	100.0%		100.0%		100.0%
		Cattle	Cecal (Beef)		0	1		2	1	1	1		1		1
			Cecal (Dairy)												
			Retail Pork Chops					100.0%				12.5% 1			
		Swine	Cecal (Market Swine)												
		Ø	Cecal (Sows)											100.0%	100.0%

Table 50a. Resistance Patte			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	s)	Humans Retail Chickens	18 2	10 8	11 9	22 1	13 2	19 1	20	17 2	14 1	18 0	11	8
	Chickens	HACCP	51	11	17	8	2	3	6	2	0	6	1	7
		Cecal Retail Ground Turkey	11	11	13	25	54	71	21	20	23	8	1 14	1 13
	Turkeys	HACCP	44	31	48	98	118	40	32	30	20	31	12	34
	-	Cecal Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0	7
	Cattle	HACCP	0	2	1	0	2	1	1	1	0	1	0	0
	Ö	Cecal (Beef) Cecal (Dairy)											0	0
	ne	Retail Pork Chops	0	0	0	0	1	0	0	0	8	0	0	0
	Swine	Cecal (Market Swine) Cecal (Sows)											0 3	0 2
Resistance Pattern		Source	0.0%	10.0%	0.0%	13.6%	7.7%	15.8%	20.0%	5.9%	14.3%	5.6%	18.2%	25.0%
1. No Resistance Detected	_	Humans	0.0%	1 0.0%	0.0%	3 0.0%	1 0.0%	3 0.0%	4 0.0%	1 0.0%	0.0%	1	2 0.0%	2
	ens	Retail Chickens	0 3.9%	0 18.2%	0 11.8%	0 12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	28.6%
	Chickens	HACCP	2	2	2	1	0	0	0	0	0.076	1	0.0%	2 0.0%
	_	Cecal	0.00/	0.00/	7 70	4.00/	1.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0	0
	s,	Retail Ground Turkey	0.0% 0	0.0%	7.7% 1	4.0% 1	1.9% 1	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	7.1% 1	0.0% 0
	Turkeys	HACCP	2.3% 1	9.7% 3	4.2% 2	9.2% 9	0.8% 1	0.0%	0.0%	6.7% 2	0.0% 0	3.2% 1	8.3% 1	2.9% 1
	L	Cecal											0.0% 0	0.0% 0
		Retail Ground Beef												
	Cattle	HACCP		100.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	Cat	Cecal (Beef)												100.0%
		Cecal (Dairy)												
		Retail Pork Chops					0.0%				0.0%			
	Swine	Cecal (Market Swine)					0				0			
	Š	Cecal (Sows)											0.0%	0.0%
		Humans	33.3%	20.0%	9.1%	18.2%	0.0%	21.1%	15.0%	35.3%	7.1%	11.1%	9.1%	0 25.0%
2. Resistant to ≥ 3 Antimicrobial Classes	-	Retail Chickens	6 0.0%	0.0%	1 22.2%	4 0.0%	0.0%	4 0.0%	3 50.0%	6	0.0%	2	1 0.0%	2
	sens		9.8%	0.0%	2 5.9%	0 12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens	HACCP	5	0	1	1	0	0	0	0	0	0	0.0%	0
	_	Cecal	00.40/	0.40/	00.40/	00.00/	50.00/	00.00/	22.20/	45.00/	50.00/	05.00/	0	0
	s,	Retail Ground Turkey	36.4% 4	9.1% 1	23.1% 3	28.0% 7	50.0% 27	69.0% 49	33.3% 7	15.0% 3	52.2% 12	25.0% 2	14.3% 2	38.5% 5
	Turkeys	HACCP	20.5% 9	29.0% 9	20.8% 10	17.3% 17	23.7% 28	35.0% 14	34.4% 11	23.3% 7	25.0% 5	35.5% 11	25.0% 3	44.1% 15
		Cecal											0.0% 0	57.1% 4
		Retail Ground Beef												
	Cattle	HACCP		0.0%	0.0%		50.0% 1	0.0%	0.0%	100.0%		0.0%		
	Cat	Cecal (Beef)												0.0% 0
		Cecal (Dairy)												
	Г	Retail Pork Chops					0.0%				12.5%			
	Swine	Cecal (Market Swine)					0				1			
	Ó	Cecal (Sows)											0.0%	0.0%
		Humans	16.7%	10.0%	9.1%	0.0%	0.0%	5.3%	0.0%	11.8%	7.1%	0.0%	0.0%	0 12.5%
3. Resistant to ≥ 4 Antimicrobial Classes	<u> </u>	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	1
	kens	HACCP	0 2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Chickens		1	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	<u> </u>	Cecal	0.0%	0.0%	7.7%	8.0%	16.7%	19.7%	0.0%	15.0%	4.4%	25.0%	0.0%	0.0%
	sys.	Retail Ground Turkey	0	0 3.2%	1 4.2%	2 11.2%	9 7.6%	14 7.5%	0	3 6.7%	1 15.0%	2 0.0%	0	1 44.1%
	Turkeys	HACCP	3	1	2	11	9	3	0.0%	2	3	0.0%	2 0.0%	15
	<u> </u>	Cecal											0.078	0.0%
		Retail Ground Beef		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	Cattle	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		0.0%
	٥	Cecal (Beef)												0.0%
	_	Cecal (Dairy)												
	_	Retail Pork Chops					0.0% 0				0.0%			
	Swine	Cecal (Market Swine)												
		Cecal (Sows)				nycin. Becaus							0.0%	0.0%

¹ Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 50b. Resistance Patterns among Salmonella Hadar Isolates. 2003-2014¹

Year			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	18	10	11	22	13	19	20	17	14	18	11	8
	Chickens	Retail Chickens HACCP Cecal	2 51	8 11	9 17	1 8	2 2	1 3	2 6	2 2	1 0	0 6	1 1 1	0 7 1
	Turkeys	Retail Ground Turkey HACCP	11 44	11 31	13 48	25 98	54 118	71 40	21 32	20 30	23 20	8 31	14 12	13 34
	ĭ	Cecal Retail Ground Beef									0		4 0	7
	Cattle	HACCP	0	0 2	0 1	0	0 2	0 1	0	0 1	0	0 1	0	0
	Ö	Cecal (Beef) Cecal (Dairy)											0	0
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	0	0	0	0	1	0	0	0	8	0	0 0 3	0 0 2
Resistance Pattern		Source (Sows)												
4. Resistant to ≥ 5		Humans	11.1% 2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0
Antimicrobial Classes	SL	Retail Chickens	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0		0.0% 0	
	Chickens	HACCP	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%
	0	Cecal											0.0%	0.0%
		Retail Ground Turkey	0.0%	0.0%	7.7% 1	0.0%	0.0%	1.4% 1	0.0%	5.0% 1	0.0%	0.0%	0.0%	7.7% 1
	Turkeys	HACCP	2.3%	0.0%	2.1% 1	1.0% 1	0.8% 1	0.0%	0.0%	3.3% 1	10.0% 2	0.0%	0.0%	0.0%
	-	Cecal											0.0%	0.0%
		Retail Ground Beef												
	9	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	Cattle	Cecal (Beef)		0	0		0	0	0	0		0		0.0%
		Cecal (Dairy)												0
		Retail Pork Chops					0.0%				0.0%			
	Swine	Cecal (Market Swine)					0				0			
	Sw												0.0%	0.0%
		Cecal (Sows)	5.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5. At Least ACSSuT ² Resistant		Humans	1 0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0.0%	0.070
	sus	Retail Chickens	0	0	0	0	0	0	0	0	0	0.00/	0	0.00/
	Chickens	HACCP	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%
		Cecal											0.0% 0	0.0% 0
	ş	Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Turkeys	HACCP	0.0%	0.0% 0	0.0% 0	1.5% 1	0.0% 0	0.0% 0	0.0%	3.3% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Cecal											0.0% 0	0.0% 0
		Retail Ground Beef												
	attle	HACCP		0.0% 0	0.0% 0		0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0		
	Cat	Cecal (Beef)												0.0% 0
		Cecal (Dairy)												
		Retail Pork Chops					0.0%				0.0% 0			
	Swine	Cecal (Market Swine)												
		Cecal (Sows)											0.0% 0	0.0% 0
6. At Least ACT/S ³ Resistant		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0
	SL	Retail Chickens	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0		0.0% 0	
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0
		Cecal											0.0% 0	0.0% 0
	Ş	Retail Ground Turkey	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0
	Turkeys	HACCP	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0							
		Cecal											0.0% 0	0.0% 0
		Retail Ground Beef												
	Cattle	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	ర	Cecal (Beef)												0.0% 0
		Cecal (Dairy)												
		Retail Pork Chops					0.0% 0				0.0% 0			
	Swine	Cecal (Market Swine)												
¹ Starting in 2011, testing included n		Cecal (Sows)											0.0%	0.0% 0

1 Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

 $^{^2 \} ACSSuT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline \\ ^3 \ ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole$

Table 50c. Resistance Patterns among Salmonella Hadar Isolates, 2003-2014

Year	,,,,,	among Jamonen	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Humans	18	10	11	22	13	19	20	17	14	18	11	8
	ens	Retail Chickens	2	8	9	1	2	1	2	2	1	0	1	0
	충	HACCP	51	11	17	8	2	3	6	2	0	6	1	7
	ပ်	Cecal											1	1
	sys.	Retail Ground Turkey	11	11	13	25	54	71	21	20	23	8	14	13
	lurke.	HACCP Cecal	44	31	48	98	118	40	32	30	20	31	12 4	34 7
	F													
	<u>e</u>	Retail Ground Beef HACCP	0	0 2	0	0	0 2	0	0	0	0	0	0	0
	Cattle	Cecal (Beef)		_			_	·					0	1
		Cecal (Dairy)											0	0
	Φ	Retail Pork Chops	0	0	0	0	1	0	0	0	8	0	0	0
	Swine	Cecal (Market Swine)											0	0
Resistance Pattern	٠,	Cecal (Sows) Source											3	2
Resistance Fattern		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7. At Least ACSSuTAuCx 1	<u> </u>	Tullialis	0	0	0	0	0	0	0	0	0	0	0	0
Resistant	s	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ş		0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	<u> </u>	Cecal											0	0
		Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	HACCP	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ē		0	0	0	1	0	0	0	0	0	0	0.0%	0.0%
		Cecal											0	0
		Retail Ground Beef												
	Ф	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	Cattle			0	0		0	0	0	0		0		0.0%
	Ĭ	Cecal (Beef)												0
		Cecal (Dairy)												
		Retail Pork Chops					0.0%				0.0%			
	e						0				0			
	Swine	Cecal (Market Swine)												
		Cecal (Sows)											0.0%	0.0%
		Humans	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8. At Least Ceftriaxone and Nalidixic Acid Resistant	_	ı	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%	0
	SL	Retail Chickens	0	0	0	0	0	0	0	0	0		0	
	Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Ö	Cecal											0.0%	0.0%
	<u> </u>	B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	s/s	Retail Ground Turkey	0	0	0	0	0	0	0	0	0	0	0	0
	Turkeys	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	-	Cecal											0.0%	0.0%
	<u> </u>												0	0
		Retail Ground Beef						0		0				
	₽	HACCP		0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%		
	Cattle	Cecal (Beef)												0.0%
														0
		Cecal (Dairy)					0							
		Retail Pork Chops					0.0%				0.0%			
	Swine	Cecal (Market Swine)												
	Ś												0.0%	0.0%
		Cecal (Sows)											0	0

¹ ACSSuTAuCx = ACSSuT, amoxicillin-clavulanic acid, and ceftriaxone

Campylobacter Data

Campylobacter jejuni and Campylobacter coli Isolates Tested

Table 51. Number of Campylobacter jejuni Isolates Tested, 1997-2014¹

										Ye	ar								
	Source	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Humans	209	297	293	306	365	329	303	320	788	709	991	1033	1350	1159	1282	1190	1183	1251
sus	Retail Chickens						198	325	510	403	426	332	329	404	355	393	421	428	369
Chickens	HACCP					64 ²	526	374	508	567	228	166	78	117	208	344	1348	788 ³	418
	Cecal																	11	8
Turkeys	Retail Ground Turkey						2	4	7	10	12	20	10	9	5	13	3	7	0
Tur	Cecal																	0	1
Cattle	Cecal (Beef)																	531	574
S	Cecal (Dairy)																	542	395
Swine	Cecal (Market Swine)																	4	9
Sw	Cecal (Sows)																	6	12

¹ Beginning in 2008, ground beef and pork chops were no longer tested for Campylobacter due to low isolation in previous years. Data for these retail meats can be found in prior reports

Table 52. Number of Campylobacter coli Isolates Tested, 1997-2014¹

										Ye	ar								
	Source	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	Humans	6	8	20	12	17	25	22	25	98	96	104	115	141	115	149	134	142	146
ens	Retail Chickens						90	142	196	151	145	143	181	176	148	210	193	198	149
Chicke	HACCP					52 ²	288	247	186	380	123	76	28	81	100	233	693	393 ³	156
င်	Cecal																	50	62
Turkeys	Retail Ground Turkey						2	1	5	9	10	14	19	16	7	18	3	5	0
Tur	Cecal																	18	15
attle	Cecal (Beef)																	131	180
Ca	Cecal (Dairy)																	98	55
wine	Cecal (Market Swine)																	190	174
Sw	Cecal (Sows)																	163	148

¹ Beginning in 2008, ground beef and pork chops were no longer tested for Campylobacter due to low isolation in previous years. Data for these retail meats can be found in prior reports.

² These isolates were recovered from July through December, 2001, when the new ARS isolation method was used

 $^{^{3}}$ Isolates were susceptibility tested by ARS from Jan-Sept 2013 and by FSIS from Oct-Dec 2013

² These isolates were recovered from July through December, 2001, when the new ARS isolation method was used

³ Isolates were susceptibility tested by ARS from Jan-Sept 2013 and by FSIS from Oct-Dec 2013

Isolation of Campylobacter from Retail Meats

Table 53. Number and Percent of Retail Meat Samples Culture Positive for Campylobacter, 2014¹

Oumpyrobactor, 2014		
	Retail Chickens	Retail Ground Turkey
Number of Meat Samples Tested	1570	1557
Number Positive for Campylobacter	518	0
Percent Positive for Campylobacter	33.0%	0.0%

¹ Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

Figure 6. Percent of Retail Meat Samples Culture Positive for Campylobacter, 2014

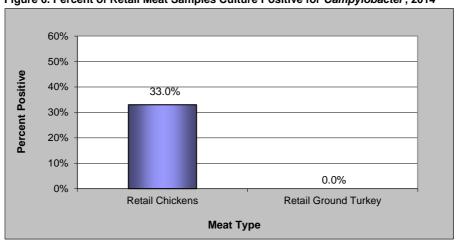
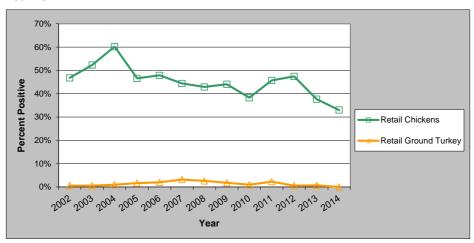


Figure 7. Percent of Retail Meat Samples Culture Positive for *Campylobacter*, 2002-2014



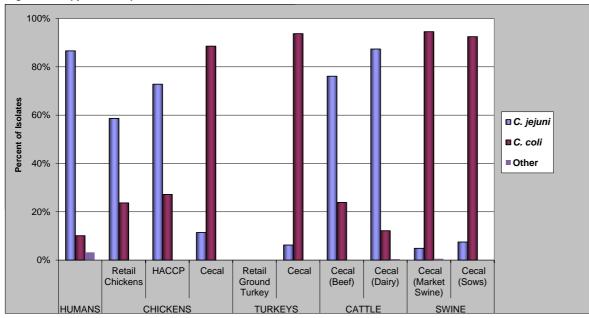
Campylobacter Species

Table 54. Campylobacter Species Isolated, 2014¹

	Humans		Chickens		Turk	reys	Cat	tle	Sw	ine
	Humans (N=1444)	Retail Chickens (N=518)	HACCP (N=574)	Cecal (N=70)	Retail Ground Turkey (N=0)	Cecal (N=16)	Cecal (Beef) (N=754)	Cecal (Dairy) (N=452)	Cecal (Market Swine) (N=184)	Cecal (Sows) (N=160)
Campylobacter Species		Ì	. ,	, ,		, ,	,			. ,
C. jejuni	86.6%	58.7%	72.8%	11.4%	0.0%	6.3%	76.1%	87.4%	4.9%	7.5%
o. jejum	1251	369	418	8	0	1	574	395	9	12
C. coli	10.1%	23.7%	27.2%	88.6%	0.0%	93.8%	23.9%	12.2%	94.6%	92.5%
C. COII	146	149	156	62	0	15	180	55	174	148
Other	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.5%	0.0%
Other	47	0	0	0	0	0	0	2	1	0

¹ Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

Figure 8. Campylobacter Species Isolated, 2014



Antimicrobial Susceptibility among Campylobacter jejuni

MIC Distributions

Table 55a. Distribution of MICs and Occurrence of Resistance among Campylobacter jejuni Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source	%R ²		0.015	0.03	0.06	0.125	0.25	0.50	Distributio 1	n (%) of MI 2	Cs (µg/ml)	8	16	32	64	128	256
Aminoglycosides	Gentamicin	(# of Isolates) ¹ Humans (1251)	%R=	[95% CI] ³ [0.8 - 2.2]	0.015	0.03	0.06	0.125	0.23	31.7	63.9	3.0	1	•	10	32	1.4	120	236
, , , , , , , , , , , , , , , , , , , ,			0.0	[0.0 - 1.0]				0.5	0.5	38.2	59.9	0.8							
		은 Retail Chickens (369) 는 HACCP (418)	0.2	[0.0 - 1.3]				15.1	40.9	41.1	2.6						0.2		
		00001 (0)	0.0	[0.0 - 36.9]					25.0	50.0	25.0								
		Retail Ground Turkey (0) Cecal (1)	N/A	N/A									,						
		☐ Cecal (1)	0.0	[0.0 - 97.5]						100.0									
		© Cecal (Beef) (574)	0.0	[0.0 - 0.6]				3.7	23.9	62.9	9.4	0.2							
		Cecal (Dairy) (395)	0.3	[0.0 - 1.4]				4.6	24.3	62.0	8.9		0.3						
		© Cecal (Market Swine) (9) Cecal (Sows) (12)	0.0	[0.0 - 33.6]					33.3	44.4	22.2								
		Ο Cecal (Sows) (12)	0.0	[0.0 - 26.5]					25.0	58.3	16.7								
Ketolides	Telithromycin	Humans (1251)	1.8	[1.2 - 2.7]				0.1	3.2	19.3	54.6	19.4	1.5	0.1	1.8				
		Retail Chickens (369)	0.0	[0.0 - 1.0]					8.7	47.2	34.7	9.2	0.3						
		g Retail Chickens (369) HACCP (418) Cecal (8)	0.0 0.0	[0.0 - 0.9] [0.0 - 36.9]	1.2	0.5	1.2	8.9	43.5 25.0	35.6 50.0	8.6 25.0	0.5							
		(-)	N/A	N/A															
		Retail Ground Turkey (0)	0.0	[0.0 - 97.5]						100.0									
			0.2	[0.0 - 1.0]	0.4	0.2		0.9	16.9	54.4	23.0	4.2		0.2					
		© Cecal (Beef) (574) Cecal (Dairy) (395)	0.3	[0.0 - 1.4]	0.3		0.5	1.0	20.3	53.4	22.5	1.8			0.3				
		2 Cecal (Market Swine) (9)	0.0	[0.0 - 33.6]					33.3	11.1	33.3		22.2						
		Cecal (Sows) (12)	0.0	[0.0 - 26.5]					25.0	25.0	33.3	16.7							
Lincosamides	Clindamycin	Humans (1251)	2.6	[1.8 - 3.6]		0.1	8.1	57.5	26.9	5.0	0.6	0.1	0.3	0.6	0.3	0.7			
		ළ Retail Chickens (369)	0.3	[0.0 - 1.5]		0.3	5.2	42.3	47.2	4.9						0.3			
		은 Retail Chickens (369) 전 HACCP (418)	0.2	[0.0 - 1.3]		17.7	40.9	30.6	9.8	0.7						0.2			
		000di (0)	0.0	[0.0 - 36.9]			50.0	37.5	12.5										
		Retail Ground Turkey (0) Cecal (1)	N/A	N/A							I								
			0.0	[0.0 - 97.5]				100.0											
		© Cecal (Beef) (574)	1.4	[0.6 - 2.7]		3.1	36.9	40.1	16.7	1.7	0.9			0.4		0.2			
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1.0	[0.3 - 2.6]		6.1	34.9	38.7	17.5	1.8	0.3	0.3	0.3	0.3					
		© Cecal (Market Swine) (9)	33.3 16.7	[7.5 - 70.1]		11.1	22.2 25.0	22.2 33.3	11.1 25.0		8.3	22.2	11.1 8.3						
				[2.1 - 48.4]						ı	8.3		8.3						
Macrolides	Azithromycin	Humans (1251)	1.8	[1.2 - 2.7]	0.1	13.4	54.0	27.7	3.0									1.8	
		g Retail Chickens (369)	0.3 0.5	[0.0 - 1.5] [0.1 - 1.7]	3.0 40.4	45.3 42.3	48.0 13.6	3.5 2.9	0.2	0.2		0.3	0.2						
		ਹੁੰ Cecal (8)	0.0	[0.0 - 36.9]	25.0	62.5	12.5												
		Retail Ground Turkey (0) Cecal (1)	N/A	N/A						ı									
		E Cecal (1)	0.0	[0.0 - 97.5]		100.0													
		© Cecal (Beef) (574) Cecal (Dairy) (395)	0.7	[0.2 - 1.8]	16.6	50.9	26.7	4.5	0.7		0.2	0.2						0.3	
		Cecal (Dairy) (395)	1.0	[0.3 - 2.6]	16.5	50.1	27.9	4.1	0.5	0.5		0.3						0.3	
		e Cecal (Market Swine) (9)	22.2	[2.8 - 60.0]	33.3	11.1	33.3											22.2	
		Cecal (Sows) (12)	0.0	[0.0 - 26.5]	16.7	16.7	58.3	8.3											
	Erythromycin	Humans (1251)	1.8	[1.2 - 2.7]			0.1	1.6	21.9	52.2	20.1	2.2	0.2					1.8	
		g Retail Chickens (369)	0.3	[0.0 - 1.5]				1.1	41.7	44.4	12.2	0.3		0.3					
		g Retail Chickens (369) HACCP (418) Cecal (8)	0.5 0.0	[0.1 - 1.7] [0.0 - 36.9]		1.9	5.3	26.8	47.6 75.0	16.5 25.0	1.4			0.5					
		(-)	– 0.0 N/A	N/A					70.0	20.0									
		Retail Ground Turkey (0) Cecal (1)	0.0	[0.0 - 97.5]					100.0										
			0.3	[0.0 - 1.3]			0.7	10.5	64.1	21.3	2.4	0.7					0.2	0.2	
		© Cecal (Beef) (574) Cecal (Dairy) (395)	0.3	[0.0 - 1.4]			1.3	12.4	60.8	23.0	2.0	0.3						0.3	
			_	[0.0 - 100.0]															
		Cecal (Market Swine) (9)	22.2	[2.8 - 60.0]				11.1	33.3	33.3	00.0					11.1	11.1		
		Cecal (Sows) (12)	0.0	[0.0 - 26.5]				8.3	41.7	16.7	33.3								

¹ Beginning in 2008, ground beef and pork chops were no longer tested for Campy/lobacter due to low isolation in previous years. Data for these retail meats can be found in prior reports.

² Percent resistant; Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

 $^{^3\,95\%}$ confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 55b. Distribution of MICs and Occurrence of Resistance among Campylobacter jejuni Isolates, 2014

Antimicrobial C	Antimionable A	Isolate Source	2		0.045	0.00	0.00	0.405	0.05		Distribution			•	40	20		400	050
Antimicrobial Class Phenicols	Antimicrobial Agent	(# of Isolates) 1	%R ²	[95% CI] ³	0.015	0.03	0.06	0.125	0.25	0.50	75.7	2	4	8	16	32	64	128	256
nemeois	Florfenicol	Humans (1251)	1.0	[0.5 - 1.7]						2.7	75.7	17.1	3.5	1.0					
		Retail Chickens (369) HACCP (418) Cecal (8)	0.0	[0.0 - 1.0] [0.0 - 0.9]		1.0	1.9	2.9	3.8	1.1 54.1	87.3 34.7	11.1 1.2	0.5 0.5						
		Cecal (8)	0.0	[0.0 - 0.9]		1.0	1.5	2.5	3.0	50.0	50.0	1.2	0.5						
			N/A	N/A									Į.						
		Retail Ground Turkey (0) Cecal (1)	0.0	[0.0 - 97.5]						100.0									
			-				4.4	0.0	1.4		34.8	1.0	0.4	0.2					
		© Cecal (Beef) (574) Cecal (Dairy) (395)	0.2	[0.0 - 1.0] [0.0 - 1.4]			1.1	0.9 1.0	1.4 4.3	59.4 56.2	36.0	1.9	0.4	0.2	0.3				
		(, , (,	-				1.0	1.0				1.5			0.5				
		© Cecal (Market Swine) (9)	0.0	[0.0 - 33.6]					11.1	44.4	44.4								
		Cecal (Sows) (12)	0.0	[0.0 - 26.5]					8.3	50.0	41.7								
uinolones	Ciprofloxacin	Humans (1251)	26.7	[24.3 - 29.2]		0.3	19.5	44.9	7.4	1.1	0.1	0.2	0.6	10.4	9.0	3.7	1.8	0.9	
		g Retail Chickens (369)	14.9	[11.4 - 19.0]			14.4	59.6	10.8	0.3				5.7	8.7	0.5			
		은 Retail Chickens (369) 첫 HACCP (418)	28.0 25.0	[23.7 - 32.6] [3.2 - 65.1]	0.7	6.2	44.7 37.5	18.2 37.5	1.7	0.5	0.2	0.7	2.9	17.2 25.0	6.5	0.5			
		Occai (6)	_				37.3	37.3			1			25.0					
		Retail Ground Turkey (0) Cecal (1)	N/A 0.0	N/A [0.0 - 97.5]				100.0			1								
			-																
		© Cecal (Beef) (574)	16.2	[13.3 - 19.5]	0.2	4.7	51.4	26.0	1.4	0.2	0.4	0.4	3.7	9.8	1.6	0.5			
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	8.4	[5.8 - 11.5]	0.3	10.4	57.5	21.5	2.0		0.3	0.8	3.3	3.3	0.8				
		© Cecal (Market Swine) (9)	11.1	[0.3 - 48.2]			44.4	44.4							11.1				
		ි Cecal (Sows) (12)	0.0	[0.0 - 26.5]			58.3	41.7								ı			
	Nalidixic acid	Humans (1251)	26.5	[24.1 - 29.1]									58.3	13.4	1.8	0.2	0.2	26.2	
		g Retail Chickens (369)	14.9	[11.4 - 19.0]									64.5	20.3	0.3		0.3	14.6	
		은 Retail Chickens (369) HACCP (418)	27.8	[23.5 - 32.3]									60.8	10.3	1.2	2.9	15.3	9.6	
		555di. (5)	25.0	[3.2 - 65.1]									75.0				25.0		
		Retail Ground Turkey (0) Cecal (1)	N/A	N/A										400.0		I			
			0.0	[0.0 - 97.5]										100.0					
		© Cecal (Beef) (574)	16.4	[13.4 - 19.7]									65.5	17.4	0.7	1.0	3.7	11.7	
		Cecal (Dairy) (395)	8.1	[5.6 - 11.2]									76.5	13.7	1.8	0.8	2.5	4.8	
		© Cecal (Market Swine) (9)	11.1	[0.3 - 48.2]									66.7	22.2				11.1	
		Ο Cecal (Sows) (12)	0.0	[0.0 - 26.5]									58.3	41.7					
etracyclines	Tetracycline	Humans (1251)	48.6	[45.8 - 51.4]			0.2	17.7	26.5	5.0	2.0	0.5	0.1	0.1	0.1	0.6	6.1	41.2	
		g Retail Chickens (369)	44.4	[39.3 - 49.7]				9.2	34.4	7.9	4.1	1.1			8.0	1.4	10.8	30.4	
		은 Retail Chickens (369) HACCP (418)	67.7	[63.0 - 72.2]			3.3	16.5	7.2	3.6	1.7	1.2	1.0	1.9	4.1	22.5	24.9	12.2	
		Occai (6)	50.0	[15.7 - 84.3]				25.0	12.5		12.5				12.5	12.5	25.0		
		Retail Ground Turkey (0) Cecal (1)		! [0.0 - 100.0]															
			100.0															100.0	
		© Cecal (Beef) (574)	76.1	[72.4 - 79.6]			3.3	13.9	4.0	2.3	0.4	0.4	0.7	0.7	5.2	11.0	28.6	29.6	
		. ,,,,	61.8	[56.8 - 66.6]			5.8	22.5	7.6	2.0	0.3	0.8	1.3	1.5	3.0	9.9	25.1	20.3	
		e Cecal (Market Swine) (9) Cecal (Sows) (12)	100.0	[66.4 - 100.0]												33.3	22.2	44.4	
		ර් Cecal (Sows) (12)	50.0	[21.1 - 78.9]			8.3	25.0	8.3	8.3				8.3	8.3	25.0		8.3	

Beginning in 2008, ground beef and pork chops were no longer tested for Campylobacter due to low isolation in previous years. Data for these retail meats can be found in prior reports.

² Percent resistant; Discrepancies between %R and sums of distribution %s, to the right of the double vertical bars, are due to rounding ³ 95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Resistance by Year

Table 56a. Antimicrobial Resistance among Campylobacter jejuni Isolates, 2003-2014

	obiai Resistance	amo	ong Campylobacter												
Year	4 - 4		11	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted	(0	Humans	303	320	788	709	991	1033	1350	1159	1282	1190	1183	1251
		Chickens	Retail Chickens	325	510	403	426	332	329	404	355	393	421	428	369
		Chic	HACCP	374	508	567	228	166	78	117	208	344	1348	788	418
			Cecal	1										11	8
		Turkeys	Retail Ground Turkey Cecal	4	7	10	12	20	10	9	5	13	3	7	0
		Cattle	Cecal (Beef) Cecal (Dairy)											531 542	574
		Swine	Cecal (Market Swine)	1										4	395 9
	Antimicrobial (Resistance	S	Cecal (Sows)											6	12
Antimicrobial Class	Breakpoint) 1		Isolate Source ²												
Aminoglycosides	Gentamicin		Humans	0.0%	2.2%	0.1%	0.0%	0.8%	1.1%	0.6%	0.6%	1.0%	1.0%	1.6%	1.4%
	(MIC > 2 μg/ml)		l	0.3%	7 0.0%	0.0%	0.0%	0.0%	11 0.0%	8 0.0%	7 0.0%	13 0.0%	12 0.2%	19 0.5%	17 0.0%
		SC	Retail Chickens	1	0	0	0	0	0	0	0	0	1	2	0
		Chickens	HACCP	0.0%	0.2% 1	0.0%	0.0% 0	0.0%	1.3% 1	0.9%	0.5%	0.3%	0.4% 6	0.4% 3	0.2% 1
		ວົ	Cecal	0	-	0	0		1	1	1	1	- 6	0.0%	0.0%
			Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
		Turkeys	Retail Ground Turkey	0	0	0	0	0	0	0	0	0	0	0	
		Ī	Cecal												0.0%
		<u>e</u>	Cecal (Beef)											0.0%	0.0%
		Cattle	Cecal (Dairy)											0.0%	0.3%
		_	Cecal (Market Swine)											0.0%	0.0%
		Swine	Cecal (Sows)											0.0%	0.0%
Ketolides	Telithromycin		, ,			0.8%	1.0%	1.3%	2.2%	1.9%	2.4%	2.6%	1.4%	0 2.0%	0 1.8%
Retolides	(MIC > 4 μg/ml)		Humans			6	7	1.376	23	25	2.476	33	17	2.076	23
		s	Retail Chickens		0.8% 4	0.5% 2	0.9% 4	0.6% 2	1.2% 4	0.7% 3	0.9% 3	0.5% 2	0.7% 3	0.9% 4	0.0% 0
		Chickens	HACCP			0.9% 5	0.4% 1	0.0%	0.0%	0.0%	0.0%	0.6% 2	0.5% 7	1.9% 15	0.0% 0
		Ö	Cecal				·		-		J			0.0%	0.0%
		ske	Retail Ground Turkey		0.0%	0.0%	0.0%	5.0% 1	10.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	Cecal		0	0	0	'	1	0	0	0	0	0	0.0%
		m	Cecal (Beef)											0.2%	0.2%
		Cattle	Cecal (Dairy)											0.7%	0.3%
		\vdash	Cecal (Market Swine)											0.0%	0.0%
		Swine	Cecal (Sows)											0 33.3%	0.0%
Lincosamides	Clindamycin	<u> </u>	, ,	4.3%	5.6%	3.2%	2.4%	3.4%	3.8%	2.9%	14.1%	21.4%	10.8%	2 3.2%	0 2.6%
Lincosamilues	(MIC > 0.5 µg/ml)	L	Humans	4.3%	5.6% 18	3.2% 25	2.4% 17	3.4% 34	3.8%	2.9% 39	14.1%	21.4% 274	10.8%	3.2%	32
	,	' 0	Retail Chickens		2.2% 11	1.2% 5	0.7% 3	0.6% 2	1.8% 6	1.5% 6	0.6% 2	1.0% 4	1.2% 5	1.2% 5	0.3% 1
		Chickens	HACCP	2.7% 10	1.8%	1.1%	0.4%	0.0%	1.3%	0.0%	0.0%	1.2%	1.0%	2.4% 19	0.2%
		Ö	Cecal	10	Ŭ.				,	J		•	. 7	0.0%	0.0%
		ys	Retail Ground Turkey		14.3%	0.0%	0.0%	5.0%	10.0%	11.1%	0.0%	0.0%	0.0%	0.0%	U
		Turkeys	Cecal		1	0	0	1	1	1	0	0	0	0	0.0%
		•	Cecal (Beef)											1.3%	0 1.4%
		Cattle	Cecal (Dairy)											7 1.3%	1.0%
			, ,,											7 0.0%	4 33.3%
		Swine	Cecal (Market Swine)											0 33.3%	3 16.7%
		U)	Cecal (Sows)											2	2

Percent resistance for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published percentages because breakpoints have been revised for these antimicrobials

² Beginning in 2008, retail ground beef and retail pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

Table 56b. Antimicrobial Resistance among Campylobacter jejuni Isolates, 2003-2014

	obial Resistance	amo	ong Campylobacter							2222	2010	2211	2212	2010	2211
Year Number of Isolates Teste	d		Humans	2003 303	2004 320	2005 788	2006 709	2007 991	2008 1033	2009 1350	2010 1159	2011 1282	2012 1190	2013 1183	2014 1251
istamber of isolates reste		SI													
		Chickens	Retail Chickens	325	510	403	426	332	329	404	355	393	421	428	369
		Chic	HACCP	374	508	567	228	166	78	117	208	344	1348	788	418
			Cecal	ł										11	8
		Turkeys	Retail Ground Turkey	4	7	10	12	20	10	9	5	13	3	7	0
		_	Cecal											0	1
		Cattle	Cecal (Beef)											531	574
		O	Cecal (Dairy)											542	395
		Swine	Cecal (Market Swine)											4	9
		Š	Cecal (Sows)											6	12
	Antimicrobial (Resistance														
Antimicrobial Class	Breakpoint) 1		Isolate Source 2												
Macrolides	Azithromycin		Humans	1.3%	9.4%	2.7%	1.3%	1.8%	2.6%	1.9%	2.7%	4.9%	1.8%	2.2%	1.8%
	(MIC > 0.25 μg/ml)		I	4	30 1.8%	21 5.0%	9 0.9%	18 0.6%	27 1.2%	26 1.0%	31 0.6%	63 0.5%	21 1.2%	26 1.6%	23 0.3%
		S	Retail Chickens		9	2	4	2	4	4	2	2	5	7	1
		Chickens	HACCP	1.6%	1.8%	1.8%	1.3%	0.6%	1.3%	0.0%	0.0%	0.9%	1.0%	2.3%	0.5%
		Shi		6	9	10	3	1	1	0	0	3	14	18	2
			Cecal											0.0% 0	0.0% 0
		"	Retail Ground Turkey		0.0%	0.0%	0.0%	5.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	Netali Gibullu Turkey		0	0	0	1	1	0	0	0	0	0	
		ī	Cecal												0.0%
														0.0%	0.7%
		Cattle	Cecal (Beef)											0	4
		Cal	Cecal (Dairy)											0.4%	1.0%
														2	4
		e e	Cecal (Market Swine)											0.0% 0	22.2% 2
		Swine	Cecal (Sows)											33.3%	0.0%
			Cecai (30ws)											2	0
	Erythromycin (MIC > 4 μg/ml)		Humans	0.3% 1	0.9%	1.5%	0.8% 6	1.6%	2.2%	1.5%	1.2% 14	1.8%	1.5% 18	2.2% 26	1.8%
	(WIIC > 4 μg/IIII)		Data'l Obiatana	0.0%	3 0.8%	12 0.5%	0.9%	16 0.6%	23 1.2%	20 1.0%	0.6%	23 0.6%	0.7%	1.6%	23 0.3%
		SI	Retail Chickens	0	4	2	4	2	4	4	2	2	3	7	1
		Chickens	HACCP	1.6%	1.6%	1.1%	0.4%	0.0%	1.3%	0.0%	0.0%	0.6%	1.1%	2.3%	0.5%
		S		6	8	6	1	0	1	0	0	2	15	18 0.0%	0.0%
			Cecal											0.078	0.078
		S	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	5.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		Turkeys	,	0	0	0	0	1	1	0	0	0	0	0	0.00/
		1	Cecal												0.0%
			Cecal (Beef)											0.0%	0.3%
		Cattle												0	2
		ő	Cecal (Dairy)											0.4% 2	0.3%
														0.0%	22.2%
		Swine	Cecal (Market Swine)											0	2
		Š	Cecal (Sows)											33.3%	0.0%
Phenicols	Florfenicol		<u> </u>			0.4%	0.0%	0.0%	0.6%	0.6%	1.5%	2.1%	1.4%	1.2%	1.0%
	(MIC > 4) 3,4		Humans			3	0.078	0.078	6	8	1.5%	2.176	17	1.278	1.0%
			Retail Chickens		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Sus		0.00/	0	0	0	0	0	0	0	0	0	0	0
		Chickens	HACCP	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%
		Ö	Cecal											0.0%	0.0%
										0 -:				0	0
		ske	Retail Ground Turkey		0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	
		Turkeys	Cocol		0	0	0		0	J		J	J	0	0.0%
			Cecal												0
		ø.	Cecal (Beef)											0.0%	0.2%
		Cattle												0.0%	0.3%
			Cecal (Dairy)											0.0%	1
			Cecal (Market Swine)											0.0%	0.0%
		Swine	- III (Mino)											0	0
		Ó	Cecal (Sows)											0.0% 0	0.0%
			hramusia aruthramusia n												

Resistance figures for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published figures because breakpoints have been revised for these antimicrobials

Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

For Humans and Chickens at HACCP, results prior to 2005 are for Chloramphenicol

Table 56c. Antimicrobial Resistance among Campylobacter ieiuni Isolates, 2003-2014

Year		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
Number of Isolates Tested Huma		Humans	303	320	788	709	991	1033	1350	1159	1282	1190	1183	1251	
		sue	Retail Chickens	325	510	403	426	332	329	404	355	393	421	428	369
		Chickens	HACCP	374	508	567	228	166	78	117	208	344	1348	788	418
		Ö	Cecal											11	8
		Turkeys	Retail Ground Turkey	4	7	10	12	20	10	9	5	13	3	7	0
를 Cecal												0	1		
		tle	Cecal (Beef)	Ì										531	574
Cecal (Dain													542	395	
		Cecal (Market Swine)	†												
		Swine	Cecal (Sows)											6	9 12
	Antimicrobial	0,	- Cood. (Como)											0	12
	(Resistance Breakpoint) ¹		Isolate Source 2												
Antimicrobial Class Quinolones	Ciprofloxacin	<u> </u>	•	17.5%	18.1%	21.6%	19.6%	26.0%	22.6%	23.1%	22.0%	24.1%	25.3%	22.2%	26.7%
4	(MIC > 0.5 μg/ml)		Humans	53	58	170	139	258	233	312	255	309	301	263	334
		Chickens	Retail Chickens	14.8% 48	15.1% 77	16.7% 61	17.2% 71	14.6% 57	21.3% 48	22.5% 86	22.7% 80	16.4% 89	16.4% 69	11.2% 48	14.9% 55
			HACCP	14.7%	21.5%	15.0%	9.6%	22.3%	32.1%	19.7%	23.1%	19.5%	22.6%	24.2%	28.0%
				55	109	85	22	37	25	23	48	67	305	191 36.4%	117 25.0%
			Cecal											4	23.0%
		Cattle Turkeys	Retail Ground Turkey	0.0%	28.6% 2	10.0% 1	50.0% 6	30.0% 6	60.0% 6	44.4% 4	40.0% 2	46.2% 6	33.3% 1	14.3% 1	
			Cecal	U		ı	8	8	О	4	2	0		1	0.0%
			Cecai											12 00/	0
			Cecal (Beef)											13.8% 73	16.2% 93
			Cecal (Dairy)											8.5%	8.4%
		Swine	Casal (Market Curina)											46 25.0%	33 11.1%
			Cecal (Market Swine)											1	1
		Ś	Cecal (Sows)											0.0% 0	0.0%
	Nalidixic acid		Humans	17.8%	19.1%	22.5%	19.5%	26.4%	22.8%	23.1%	22.1%	24.1%	25.5%	22.1%	26.5%
	(MIC ≥ 16 μg/ml)		1	54	61 15.3%	177 15.1%	138 16.7%	.171.	236 14.6%	312 21.3%	256 22.8%	309 21.6%	303 16.4%	262 11.2%	332 14.9%
		sus	Retail Chickens		78	61	71	57	48	86	81	85	69	48	55
		Chickens	HACCP	15.5% 58	21.7% 110	16.9% 96	8.8% 20	22.3% 37	33.3% 26	19.7% 23	23.1% 48	20.3% 70	22.8% 307	24.4% 192	27.8% 116
		ਠ	Cecal					<u> </u>						36.4%	25.0%
		Cattle Turkeys			28.6%	10.0%	50.0%	30.0%	60.0%	44.4%	40.0%	46.2%	33.3%	4 14.3%	2
			Retail Ground Turkey		2	1	6	6	6	4	2	6	1	1	
			Cecal												0.0%
			Cecal (Beef)											13.7%	16.4%
														73 8.5%	94 8.1%
			Cecal (Dairy)											46	32
		e	Cecal (Market Swine)											25.0% 1	11.1% 1
		Swine	Cecal (Sows)											0.0%	0.0%
Totropyolinos	Tetracycline ³		CCCar (CCWC)	40.9%	47.5%	43.7%	48.7%	45.6%	45.3%	44.1%	44.2%	48.4%	47.8%	0 49.1%	0 48.6%
Tetracyclines	(MIC > 1 µg/ml)		Humans	124	47.5% 152	344	48.7% 345	45.6% 452	45.3%	595	512	48.4% 621	47.8% 569	49.1% 581	608
		<u></u>	Retail Chickens	50.2%	50.4%	46.9%	48.4%	48.8%	50.5%	46.7%	36.3%	50.1%	49.6%	48.4%	44.4%
		kens	HACCP	163 50.3%	257 43.5%	189 44.8%	206 58.3%	162 57.8%	166 55.1%	188 51.3%	129 49.5%	197 45.9%	209 50.7%	207 59.9%	164 67.7%
		Chickens	ПАССР	188	221	254	133	96	43	60	103	158	684	472	283
			Cecal											45.5% 5	50.0% 4
				75.00/	42.9%	70.0%	75.0%	90.0%	100.0%	100.0%	80.0%	92.3%	100.0%	42.9%	
		iys	Retail Ground Turkey	75.0%											
		urkeys		75.0%	3	7	9	18	10	9	4	12	3	3	100.0%
		Turkeys	Retail Ground Turkey Cecal			7	9	18	10	9	4	12	3		1
						7	g	18	10	9	4	12	3	68.0% 361	
		Cattle Turkeys	Cecal			7	9	18	10	9	4	12	3	68.0% 361 62.0%	1 76.1% 437 61.8%
		Cattle	Cecal (Beef) Cecal (Dairy)			7	9	18	10	y	4	12	3	68.0% 361	1 76.1% 437
			Cecal Cecal (Beef)			7	9	18	10	9	4	12	3	68.0% 361 62.0% 336	1 76.1% 437 61.8% 244

¹ Resistance figures for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published figures because breakpoints have been revised for these antimicrobials
² Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.
³ For Retail Chickens and Retail Ground Turkey, results for 2002 and 2003 are for Doxycycline

Antimicrobial Susceptibility among Campylobacter coli

MIC Distributions

Table 57a. Distribution of MICs and Occurrence of Resistance among Campylobacter coli Isolates, 2014

		Isolate Source									Distributio				40	20	64	400	250
Antimicrobial Class Aminoglycosides	Antimicrobial Agent	1	%R ²	[95% CI] ³	0.015	0.03	0.06	0.125	0.25	0.50	1 07.0	19.9	4	8	16	32	3.4	128	256
, anningly coolade	Gentamicin	Humans (146)	3.4	[1.1 - 7.8]				0.7		8.9	67.8	19.9				4.7	3.4		
		g Retail Chickens (149) ဗီ HACCP (156)	4.7 4.5	[1.9 - 9.4] [1.8 - 9.0]				0.7 3.8	15.4	39.6 66.0	55.0 9.6	0.6				4.7	4.5		
		HACCP (156) Cecal (62)	12.9	[5.7 - 23.9]				0.0	8.1	54.8	24.2	0.0				12.9			
		® Retail Ground Turkey (0)	N/A	N/A															
		Cecal (15)	13.3	[1.7 - 40.5]					13.33	66.67	6.67						13.3		
		⊕ Cecal (Beef) (180)	1.7	[0.3 - 4.8]					6.67	70	21.67					1.7			
		Cecal (Dairy) (55)	1.8	[0.0 - 9.7]					7.27	63.64	27.27						1.8		
		© Cecal (Market Swine) (174)	0.6	[0.0 - 3.2]					1.15	40.23	57.47	0.6	0.6						
		⊙ Cecal (Sows) (148)	0.0	[0.0 - 2.5]					0.68	42.57	56.08	0.7							
Ketolides	Telithromycin	Humans (146)	0.0	[0.0 - 2.5]				1.4	11.6	15.1	15.1	18.5	18.5	9.6	10.3				
		g Retail Chickens (149)	11.4	[6.8 - 17.6]					15.4	8.1	26.9	32.2	6.0	2.7	8.7				
		은 Retail Chickens (149) 한 HACCP (156) Cecal (62)	2.6	[0.7 - 6.4]			0.6	7.1	16.0	24.4	42.3	5.8	1.3	1.3	1.3				
		O Cecal (62)	9.7	[3.6 - 19.9]				6.5	24.2	4.8	30.7	17.7	6.5	6.5	3.2				
		Retail Ground Turkey (0) Cecal (15)	N/A	N/A															
		Ē Cecal (15)	6.7	[0.2 - 31.9]					20.0	13.3	40.0	13.3	6.7		6.7				
		은 Cecal (Beef) (180)	2.8	[0.9 - 6.4]				0.6	1.7	3.3	14.4	71.7	5.6	0.6	2.2				
		ී Cecal (Dairy) (55)	7.3	[2.0 - 17.6]					1.8	1.8	18.2	67.3	3.6	1.8	5.5				
		୍ର Cecal (Market Swine) (174)	33.9	[26.9 - 41.5]			0.6	1.2	5.2	10.9	24.7	16.7	6.9	13.8	20.1				
		Cecal (Sows) (148)	17.6	[11.8 - 24.7]				1.4	4.1	14.2	37.8	20.3	4.7	7.4	10.1				
Lincosamides	Clindamycin	Humans (146)	13.7	[8.6 - 20.4]				11.0	28.8	30.8	15.8	2.7	0.7	6.2	2.7	1.4			
		g Retail Chickens (149)	11.4	[6.8 - 17.6]				16.8	54.4	16.1	1.3	1.3	4.7	4.0	1.3				
		e Retail Chickens (149)	3.8	[1.4 - 8.2]		2.6	7.7	55.1	30.1	0.6		3.2	0.6						
		00001 (02)	11.3	[4.7 - 21.9]			6.5	45.2	30.7	4.8	1.6	4.8	6.5						
		Retail Ground Turkey (0) Cecal (15)	N/A 6.7	N/A [0.2 - 31.9]			26.7	26.7	33.3	6.7		1	6.7						
			•																
		© Cecal (Beef) (180)	10.0 9.1	[6.0 - 15.3]			1.7 3.6	5.0 3.6	29.4 34.6	43.9 43.6	10.0 5.5	2.2 1.8	2.8 7.3	0.6		4.4			
		0.000. (0.000)		[3.0 - 20.0]															
		© Cecal (Market Swine) (174)	46.0	[38.4 - 53.7]			1.2	14.4	23.6	8.6	6.3	9.8	14.9	14.4	5.8	1.1			
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	21.6	[15.3 - 29.1]			1.4	18.2	33.8	21.0	4.1	4.1	6.1	9.5	2.0				
Macrolides	Azithromycin	Humans (146)	10.3	[5.9 - 16.4]		2.1	13.7	37.7	31.5	4.8								10.3	
		은 Retail Chickens (149) 전 HACCP (156)	11.4 4.5	[6.8 - 17.6] [1.8 - 9.0]	0.7 3.2	8.7 28.8	55.0 58.3	22.2 5.1	2.0			0.6						11.4 3.8	
		G Cecal (62)	11.3	[4.7 - 21.9]	3.2	16.1	46.8	21.0	1.6									11.3	
		Retail Ground Turkey (0)	N/A	N/A							ı								
		는 Cecal (15)	6.7	[0.2 - 31.9]		26.7	46.7	20.0										6.7	
		⊕ Cecal (Beef) (180)	3.3	[1.2 - 7.1]	2.2	2.8	16.1	75.0	0.6				0.6					2.8	
		Cecal (Dairy) (55)	9.1	[3.0 - 20.0]		7.3	21.8	61.8										9.1	
		g Cecal (Market Swine) (174)	40.2	[32.9 - 47.9]	1.7	9.2	31.0	15.5	2.3									40.2	
		Cecal (Sows) (148)	20.9	[14.7 - 28.4]	0.7	10.1	50.0	17.6	0.7									21.0	
	Erythromycin	Humans (146)	10.3	[5.9 - 16.4]					4.1	28.8	19.9	21.9	14.4	0.7				10.3	
		g Retail Chickens (149)	11.4	[6.8 - 17.6]					18.1	26.2	31.5	10.1	2.7				1.3	10.1	
		HACCP (156) Cecal (62)	3.8	[1.4 - 8.2]			0.6	7.1	26.9	47.4	12.8	1.3	2.0			0.6	0.6	2.6	
			11.3	[4.7 - 21.9]				6.5	25.8	33.9	14.5	4.8	3.2				3.2	8.1	
		Retail Ground Turkey (0) Cecal (15)	N/A 6.7	N/A [0.2 - 31.9]					33.3	20.0	40.0							6.7	
			•	-								05.							
		© Cecal (Beef) (180)	3.3	[1.2 - 7.1]			1.0	2.2	2.8	3.9	61.7	25.0	1.1			0.6	0.6	2.2	
		Coodi (Edily) (CO)	9.1	[3.0 - 20.0]			1.8		1.8	5.5	67.3	14.6	_					9.1	
		Cecal (Market Swine) (174)	40.2	[32.9 - 47.9]			1.2	1.2	9.8	21.8	23.6	1.7	0.6			0.6	4.0	35.6	
		ර් Cecal (Sows) (148)	20.9	[14.7 - 28.4]				1.4	10.1	35.1	30.4	2.0			0.7		2.7	17.6	

¹ Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.
² Percent resistant; Discrepancies between %R and sums of distribution %s, to the right of the double vertical bars, are due to rounding

^{3 95%} conflidence intervals for percent resistant, (%R) were calculated using the Clopper-Pearson exact method

4 The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 57b. Distribution of MICs and Occurrence of Resistance among Campylobacter coli Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates) ¹	%R ²	[95% CI] ³	0.015	0.03	0.06	0.125	0.25	0.50	Distribution 1	n (%) of MI 2	Cs (µg/ml)	8	16	32	64	128	256
Phenicols	Florfenicol	Humans (146)	0.0	[0.0 - 2.5]						4.1	43.8	37.7	14.4						
		Retail Chickens (149)	0.0 0.0 0.0	[0.0 - 2.4] [0.0 - 2.3] [0.0 - 5.8]					1.6	2.0 9.7	66.4 82.3	30.2 6.5	1.3						
		Retail Ground Turkey (0)	N/A 0.0	N/A [0.0 - 21.8]						6.7	86.7	6.7							
		Сесаl (Beef) (180) Сесаl (Dairy) (55)	4.4 0.0	[1.9 - 8.6] [0.0 - 6.5]			0.6		0.6	2.8 14.6	82.2 83.6	8.9 1.8	0.6	1.1	2.8	0.6			
		© Cecal (Market Swine) (174) Cecal (Sows) (148)	0.0	[0.0 - 2.1] [0.0 - 2.5]		0.6			2.3 1.4	35.6 31.1	58.1 64.9	3.5 2.7							
Quinolones	Ciprofloxacin	Humans (146)	35.6	[27.9 - 44.0]			8.2	26.0	20.5	9.6		0.7	1.4	6.8	15.1	8.2	3.4		
		Retail Chickens (149) HACCP (156) Cecal (62)	20.8 7.1 19.4	[14.6 - 28.2] [3.6 - 12.3] [10.4 - 31.4]		1.9	7.4 27.6 19.4	37.6 55.1 51.6	31.5 7.7 9.7	2.7 0.6			1.3 1.6	5.4 2.6 4.8	11.4 2.6 6.5	4.0 0.6 6.5			
		Retail Ground Turkey (0) Cecal (15)	N/A 40.0	N/A [16.3 - 67.7]			20.0	40.0			" 			13.3	26.7				
		© Cecal (Beef) (180) Cecal (Dairy) (55)	62.2 47.3	[54.7 - 69.3] [33.7 - 61.2]		1.1	6.7 9.1	27.2 38.2	2.2 5.5	0.6				30.6 21.8	27.2 23.6	4.4 1.8			
		© Cecal (Market Swine) (174) O Cecal (Sows) (148)	16.1 8.1	[11.0 - 22.4] [4.3 - 13.7]		1.7 0.7	16.7 25.0	51.2 50.0	13.2 15.5	1.2 0.7		0.6	0.6 0.7	9.8 4.7	5.2 2.7				
	Nalidixic acid	Humans (146)	35.6	[27.9 - 44.0]									21.9	35.6	6.8		2.1	33.6	
		Retail Chickens (149) HACCP (156) Cecal (62)	20.8 7.1 21.0	[14.6 - 28.2] [3.6 - 12.3] [11.7 - 33.2]									47.7 72.4 48.4	30.9 17.3 30.7	0.7 3.2	1.6	10.1 6.4 16.1	10.7 0.6 3.2	
		Retail Ground Turkey (0) Cecal (15)	N/A 40.0	N/A [16.3 - 67.7]									33.3	26.7			40.0		
		© Cecal (Beef) (180) Cecal (Dairy) (55)	62.2 47.3	[54.7 - 69.3] [33.7 - 61.2]									6.7 12.7	23.9 34.6	7.2 5.5		2.2 5.5	60.0 41.8	
		© Cecal (Market Swine) (174) Cecal (Sows) (148)	16.7 8.1	[11.5 - 23.1] [4.3 - 13.7]									25.9 34.5	52.3 54.7	5.2 2.7	1.2 0.7	9.8 5.4	5.7 2.0	
Tetracyclines	Tetracycline	Humans (146)	50.0	[41.6 - 58.4]				3.4	18.5	17.8	8.2	2.1		0.7	0.7	1.4		47.3	
		Retail Chickens (149) HACCP (156) Cecal (62)	55.7 50.6 53.2	[47.3 - 63.8] [42.5 - 58.7] [40.1 - 66.0]			0.6	0.7 11.5 6.5	18.8 28.8 22.6	17.4 7.7 14.5	6.7 3.2	0.7 0.6			2.6	4.5 3.2	2.7 16.0 16.1	53.0 27.6 33.9	
		Retail Ground Turkey (0)	N/A 66.7	N/A [38.4 - 88.2]				6.7	20.0	6.7								66.7	
		한 Cecal (Beef) (180) Cecal (Dairy) (55)	78.3 76.4	[71.6 - 84.1] [63.0 - 86.8]			0.6	1.8	2.2 1.8	11.7 12.7	7.2 7.3			1.1	1.1 1.8	3.6	8.3 7.3	67.8 63.6	
		© Cecal (Market Swine) (174)	82.2 79.7	[75.7 - 87.6] [72.3 - 85.9]				5.2 2.7	4.6 6.8	1.7 7.4	2.9 1.4	3.5 2.0	4.0 5.4	6.9 12.2	9.2 10.8	11.5 12.2	19.0 19.6	31.6 19.6	

Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports. Percent resistant; Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

^{395%} confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

4 The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Resistance by Year

Table 58a. Antimicr	- Liai ittosistailte	anne	Gampyiobacter	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tes	sted		Humans	22	25	98	96	104	115	141	115	149	134	142	146
		sus	Retail Chickens	142	196	151	145	143	181	176	148	210	193	198	149
		Chickens	HACCP	247	186	380	123	76	28	81	100	233	693	393	156
		-	Cecal											50	62
		Turkeys	Retail Ground Turkey	1	5	9	10	14	19	16	7	18	3	5	0
			Cecal											18	15
		Cattle	Cecal (Beef)											131	180
		_	Cecal (Dairy)											98	55
		Swine	Cecal (Market Swine) Cecal (Sow)											190	174
	Antimicrobial	S	Cecai (Sow)											163	148
Antimicrobial Class	(Resistance Breakpoint) 1		Isolate Source ²												
Aminoglycosides	Gentamicin		Humans	4.5%	4.0%	3.1%	1.0%	0.0%	1.7%	3.5%	12.2%	12.1%	6.0%	2.1%	3.4%
	(MIC > 2 μg/ml)		numans	1	1	3	1	0	2	5	14	18	8	3	5
			Retail Chickens	0.0%	0.0% 0	0.0% 0	0.0% 0	0.7% 1	1.7% 3	5.7% 10	12.8% 19	18.1% 38	4.1% 8	5.6% 11	4.7% 7
		Chickens	HACCP	0.0%	0.0%	0.3%	0.0%	1.3%	3.6%	2.5%	5.0%	5.6%	3.9%	2.3%	4.5%
		Chic		0	0	1	0	1	1	2	5	13	27	9 18.0%	7 12.9%
			Cecal											9	8
		ys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
		urke	01	0	0	0	0	0	0	0	0	0	0	22.2%	13.3%
		_	Cecal											4	2
		te te	Cecal (Beef)											1.5% 2	1.7% 3
		Swine Cattle	Cecal (Dairy)											0.0%	1.8%
														0.0%	1 0.6%
			Cecal (Market Swine)											0.0%	1
			Cecal (Sow)											0.0%	0.0%
Ketolides	Telithromycin					8.2%	8.3%	9.6%	10.4%	7.1%	13.9%	10.7%	11.2%	21.8%	0 19.9%
	(MIC > 4 μg/ml)		Humans			8	8	10	12	10	16	16	15	31	29
			Retail Chickens		10.7% 21	9.9% 15	5.5% 8	7.0% 10	9.4% 17	5.1% 9	4.1% 6	5.7% 12	14.0% 27	11.1% 22	11.4 17
		kens	HACCP		21	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	7.1%	6.9%	2.6%
		Chic				29	15	11	1	5	4	7	49	27	4
			Cecal											10.0% 5	9.7% 6
		/s	Retail Ground Turkey		0.0%	22.2%	0.0%	0.0%	5.3%	0.0%	14.3%	5.6%	0.0%	0.0%	
		Turkeys			0	2	0	0	1	0	1	1	0	0 16.7%	6.7%
		_	Cecal											3	1
		<u>e</u>	Cecal (Beef)											3.8% 5	2.8% 5
		Cattle	Cecal (Dairy)											7.1%	7.3%
			, ,,											7	4 33.9%
		Swine	Cecal (Market Swine)											32.6% 62	53.9% 59
		Sw	Cecal (Sow)											17.2%	17.6%
Lincosamides	Clindamycin	-	Ulumana	18.2%	12.0%	8.2%	13.5%	9.6%	14.8%	7.8%	17.4%	16.8%	16.4%	28 21.1%	26 13.7%
	(MIC > 1 μg/ml)		Humans	4	3	8	13	10	17	11	20	25	22	30	20
			Retail Chickens		9.2% 18	10.6% 16	10.3% 15	0.6% 9	8.8% 16	8.0% 14	5.4% 8	5.2% 11	12.4% 24	10.1% 20	11.4% 17
		Chickens	HACCP	16.6%	9.7%	10.0%	12.2%	14.5%	10.7%	7.4%	5.0%	2.6%	8.5%	10.4%	3.8%
		Chic		41	18	38	15	11	3	6	5	6	59	41 14.0%	6 11.3%
		L	Cecal											7	7
		ys	Retail Ground Turkey		0.0%	22.2%	10.0%	21.4%	10.5%	0.0%	14.3%	5.6%	0.0%	0.0%	
		Turkeys	Canal		0	2	1	3	2	0	1	1	0	0 16.7%	6.7%
		_	Cecal											3	1
		ā	Cecal (Beef)											8.4% 11	10.0% 18
		Cattle	Cecal (Dairy)											4.1%	9.1%
		-												4 37.9%	5 46.0%
		Swine	Cecal (Market Swine)											72	46.0% 80
		Sw	Cecal (Sow)											19.6%	21.6%
¹ Registence figures for a			thromyoin on thromyoin											32	32

¹ Resistance figures for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published figures because breakpoints have been revised for these antimicrobials

² Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

Table 58b. Antimicrobial Resistance among Campylobacter coli Isolates, 2003-2014

Table 58b. Antimicro	Jan Registance	anne	Gampyiobacter	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	1		Humans	22	25	98	96	104	115	141	115	149	134	142	146
		ens	Retail Chickens	142	196	151	145	143	181	176	148	210	193	198	149
		Chickens	HACCP	247	186	380	123	76	28	81	100	233	693	393	156
			Cecal											50	62
		Turkeys	Retail Ground Turkey Cecal	1	5	9	10	14	19	16	7	18	3	5 18	0 15
		microbial istance ikpoint) 1 mromycin C > 0.5 µg/ml)	Cecal (Beef) Cecal (Dairy)											131 98	180 55
			Cecal (Market Swine)											190	174
	Antimicrobial		Cecal (Sow)											163	148
Antimicrobial Class	(Resistance Breakpoint) ¹		Isolate Source ²												
Macrolides	Azithromycin		Humans	13.6%	4.0%	4.1%	9.4%	5.8%	10.4%	3.5%	7.0%	5.4%	9.0%	16.9%	10.3%
	(MIC > 0.5 µg/ml)			3	1 9.7%	4 9.9%	9 6.2%	6 7.0%	12 9.9%	5 4.6%	8 4.1%	8 4.3%	12 11.9%	24 9.6%	15 11.4%
		SI	Retail Chickens		19	15	9	10	18	8	6	9	23	19	17
		Chickens	HACCP	20.2% 50	9.1% 17	8.7% 33	9.8% 12	14.5% 11	10.7% 3	6.2% 5	4.0% 4	3.9% 9	8.7% 60	10.7% 42	4.5% 7
		ਠੋ	Cecal	30	17	33	12	- ''	J	3	7	3	00	14.0%	11.3%
		Turkeys			0.0%	22.2%	0.0%	0.0%	5.3%	0.0%	14.3%	5.6%	0.0%	7 0.0%	7
		keys	Retail Ground Turkey		0.070	2	0	0	1	0	1	1	0	0	
		In	Cecal											16.7% 3	6.7% 1
		m	Cecal (Beef)											4.6%	3.3%
		ne Cattle	OI (D-:)											6 1.0%	6 9.1%
			Cecal (Dairy)											1	5
		-	Cecal (Market Swine)											31.6% 60	40.2% 70
			Cecal (Sow)											17.2% 28	21.0%
	Erythromycin		Humans	9.1%	4.0%	4.1%	8.3%	5.8%	10.4%	3.5%	5.2%	2.7%	9.0%	17.6%	31 10.3%
	(MIC > 8 μg/ml)			7.8%	9.2%	9.9%	8 5.5%	6 7.0%	12 9.9%	5 4.6%	6 4.1%	4 5.2%	12 11.4%	25 9.6%	15 11.4%
		us	Retail Chickens	11	18	15	8	10	18	8	6	11	22	19	17
		Chickens	HACCP	20.2% 50	9.1% 17	8.4% 32	8.9% 11	14.5% 11	10.7% 3	6.2% 5	4.0% 4	3.4% 8	8.5% 59	10.7% 42	3.8% 6
		O	Cecal											14.0%	11.3%
		ro.	Retail Ground Turkey	0.0%	0.0%	22.2%	0.0%	0.0%	5.3%	0.0%	14.3%	5.6%	0.0%	0.0%	7
		Turkeys	rtetaii Ground Turkey	0	0	2	0	0	1	0	1	1	0	0 16.7%	6.7%
		ĭ	Cecal											3	1
		tle	Cecal (Beef)											4.6% 6	3.3% 6
		Cattle	Cecal (Dairy)											1.0%	9.1% 5
		ne	Cecal (Market Swine)											31.6% 60	40.2% 70
		Swine	Cecal (Sow)											17.2% 28	21.0% 31
Phenicols	Florfenicol (MIC> 16 µg/ml) 3,4		Humans			1.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.7% 1	1.5% 2	0.7% 1	0.0%
	(wiles to µg/illi)		Retail Chickens		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	HACCP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chi	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		(0			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
		Turkeys	Retail Ground Turkey		0	0	0	0	0	0	0	0	0	0.0%	0.0%
		_	Cecal											0	0 4.4%
		Cattle	Cecal (Beef)											2	8
	l	O	Cecal (Dairy)											0.0% 0	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%

¹ Resistance figures for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published figures because breakpoints have been revised for these antimicrobials

² Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

³ For Humans and Chickens at HACCP, results prior to 2005 are for Chloramphenicol

 $^{^4}$ For florfenicol, only a susceptible breakpoint (\leq 4 μ g/ml) has been established. In this report, isolates with an MIC \geq 8 μ g/ml are categorized as resistant.

Table 58c. Antimicrobial Resistance among Campylobacter coli Isolates, 2003-2014

		u	ong Campylobacter				2006	2007	2000	2000	2010	2011	2012	2012	2014
Year Number of Isolates Tested	1		Humans	2003 22	2004 25	2005 98	2006 96	2007 104	2008 115	2009 141	2010 115	2011 149	2012 134	2013 142	2014 146
		SL													
		Chickens	Retail Chickens HACCP	142 247	196 186	151 380	145 123	143 76	181 28	176 81	148 100	210 233	193 693	198 393	149 156
		S	Cecal	241	100	300	125	10	20	01	100	200	033	50	62
		eys	Retail Ground Turkey	1	5	9	10	14	19	16	7	18	3	5	0
		Turkeys	Cecal	'	3	9	10	14	19	16	,	10	3	18	15
			Cecal (Beef)											131	180
		Cattle	Cecal (Dairy)											98	55
		e e	Cecal (Market Swine)												
		Swine	Cecal (Sow)											190 163	174 148
	Antimicrobial	0,	,											100	140
Antimicrobial Class	(Resistance Breakpoint) ¹		Isolate Source 2												
Quinolones	Ciprofloxacin		Humans	22.7%	32.0%	25.5%	21.9%	28.8%	29.6%	24.1%	30.4%	36.2%	33.6%	34.5%	35.6%
	(MIC > 0.5 μg/ml)		Tumans	5	8	25	21	30	34	34	35	54	45	49	52
			Retail Chickens	13.4% 19	16.8% 33	29.8% 45	22.1% 32	25.9% 37	20.4% 37	18.2% 32	13.5% 20	18.1% 38	31.1% 60	20.2% 40	20.8%
		Chickens	HACCP	20.2%	26.9%	22.1%	15.4%	15.8%	14.3%	22.2%	23.0%	27.9%	23.2%	21.9%	7.1%
		Chic	HACCE	50	50	84	19	12	4	18	23	65	161	86	11
		ľ	Cecal											24.0% 12	19.4% 12
			Retail Ground Turkey	100.0%	0.0%	55.6%	30.0%	50.0%	47.4%	43.8%	57.1%	50.0%	66.7%	0.0%	12
		Turkeys	Retail Ground Turkey	1	0	5	3	7	9	7	4	9	2	0	
		Ĭ	Cecal											66.7% 12	40.0% 6
			01(D6)											52.7%	62.2%
		Cattle	Cecal (Beef)											69	112
		ပိ	Cecal (Dairy)											30.6%	47.3%
		swine	On and (Mandant Outline)											30 7.4%	26 16.1%
			Cecal (Market Swine)											14	28
		Š	Cecal (Sow)											3.7%	8.1%
	Nalidixic acid		<u> </u>	22.7%	32.0%	26.5%	22.9%	29.8%	29.6%	24.1%	30.4%	36.2%	33.6%	6 35.2%	12 35.6%
	(MIC > 16 μg/ml)		Humans	5	8	26	22	31	34	34	35	54	45	50	52
			Retail Chickens		16.3%	29.1%	20.7%	25.9%	20.4%	18.2%	14.2%	18.1%	31.1%	20.2%	20.8%
		ens		21.9%	32 28.0%	44 22.4%	30 15.4%	37 15.8%	37 14.3%	32 22.2%	21 23.0%	38 27.9%	60 23.5%	40 22.1%	31 7.1%
		Chickens	HACCP	54	52	85	19	12	4	18	23	65	163	87	11
			Cecal											24.0%	21.0%
					0.0%	55.6%	30.0%	50.0%	47.4%	43.8%	57.1%	50.0%	66.7%	0.0%	13
		Turkeys	Retail Ground Turkey		0	5	3	7	9	7	4	9	2	0	
		Ţ	Cecal											66.7%	40.0%
														12 52.7%	6 62.2%
		Cattle	Cecal (Beef)											69	112
		S	Cecal (Dairy)											29.6%	47.2%
		\vdash												29 7.4%	26 16.7%
		Swine	Cecal (Market Swine)											14	29
		Š	Cecal (Sow)											3.7%	8.1%
Tetracyclines	Tetracycline ³	\vdash		45.5%	40.0%	31.6%	39.6%	44.2%	39.1%	45.4%	50.4%	50.3%	45.5%	6 51.4%	12 50.0%
. 3 40 J 300	(MIC > 2 µg/ml)		Humans	10	10	31.0%	38	46	45	64	58	75	61	73	73
		1	Retail Chickens	53.5%	46.9%	44.4%	46.9%	39.9%	48.1%	38.6%	40.5%	51.0%	48.7%	47.0%	55.7%
		ens		76 53.0%	92 48.9%	67 42.6%	68 54.5%	57 42.1%	87 60.7%	68 45.7%	60 56.0%	107 42.1%	94 49.2%	93 58.5%	83 50.6%
		Chickens	HACCP	131	91	162	67	32	17	37	56	98	341	230	79
		٥	Cecal											52.0%	53.2%
		\vdash		100.0%	0.0%	88.9%	80.0%	64.3%	94.7%	75.0%	100.0%	77.8%	66.7%	26 40.0%	33
		Turkeys	Retail Ground Turkey	1	0.070	8	8	9	18	12	7	14	2	2	
		Ţ	Cecal											77.8%	66.7%
														14 74.0%	78.3%
		Cattle	Cecal (Beef)											97	141
		Ca	Cecal (Dairy)											65.3%	76.4%
		-	, ,,											64 84.2%	42 82.2%
		Swine	Cecal (Market Swine)											160	143
		Sw	Cecal (Sow)											76.7%	79.7%
			thromycin, erythromycin.											125	118

¹ Resistance figures for gentamicin, clindamycin, azithromycin, erythromycin, nalidixic acid, and doxycycline in this report may differ from previously published figures because breakpoints have been revised for these antimicrobials

² Beginning in 2008, ground beef and pork chops were no longer tested for *Campylobacter* due to low isolation in previous years. Data for these retail meats can be found in prior reports.

³ For Retail Chickens and Turkeys, results for 2002 and 2003 are for Doxycycline

Table 59a. Resistance Pattern Year	s ar	nong	g Campylobacter Spec	ies, 2004-2	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested			Humans	N/A 1	788	709	991	1033	1350	1159	1282	1190	1183	1251
		ens	Retail Chickens	510	403	426	332	329	404	355	393	421	428	369
		Chickens	HACCP Cecal	N/A 1	567	228	166	78	117	208	344	1348	788 11	418 8
	ini		Retail Ground Turkey	7	10	12	20	10	9	5	13	3	7	0
	C. jejuni	Turkeys	Cecal	,	10	12	20	10	9	3	13	3	0	1
	ľ	Cattle	Cecal (Beef)										531	574
		Ca	Cecal (Dairy)										542	395
		Swine	Cecal (Market Swine)										4	9
		Ś	Cecal (Sows) Humans	N/A 1	98	96	104	115	141	115	149	134	6 142	12 146
		SU	Retail Chickens	196	151	145	143	181	176	148	210	193	198	149
		Chickens	HACCP	N/A 1	380	123	76	28	81	100	233	693	393	156
		- 67	Cecal										50	62
	C. coli	Turke	Retail Ground Turkey Cecal	5	9	10	14	19	16	7	18	3	5 18	0 15
	ľ	_	Cecal (Beef)										131	180
		Cattle	Cecal (Dairy)										98	55
		Swine	Cecal (Market Swine)										190	174
Paristana Pattan	0		Cecal (Sows)										163	148
Resistance Pattern	Spe	ecies	Isolate Source ¹		46.3%	42.5%	44.3%	45.2%	45.9%	39.5%	33.0%	38.7%	44.5%	44.2%
1. No Resistance Detected		<u> </u>	Humans	39.8%	365 42.7%	301 43.2%	439 40.1%	467 39.2%	620 40.8%	458 51.3%	423 40.5%	460 42.3%	527 46.3%	553 47.7%
		SL	Retail Chickens	203	172	184	133	129	165	182	159	178	198	176
		Chickens	HACCP		45.7% 259	37.7% 86	33.7% 56	32.1% 25	40.2% 47	42.8% 89	47.4% 163	41.3% 557	35.3% 278	29.7% 124
		Ö	Cecal										45.5%	37.5%
	ŗ	y)	Retail Ground Turkey	42.9%	30.0%	16.7%	10.0%	0.0%	0.0%	20.0%	0.0%	0.0%	5 57.1%	3
	C. jejuni	Turkeys		3	3	2	2	0	0	1	0	0	4	0.0%
	Ç	Ľ	Cecal										00 ==:	0
		Cattle	Cecal (Beef)										30.7% 163	22.3% 128
		Ca	Cecal (Dairy)										36.7% 199	35.9% 142
		0	Cecal (Market Swine)										0.0%	0.0%
		Swine											0 16.7%	0 41.7%
	_		Cecal (Sows)		50.0%	43.8%	38.5%	43.5%	44.0%	33.9%	30.9%	42.5%	1 31.7%	5 28.1%
			Humans		49	42	40	50	62	39	46	57	45	41
		so.	Retail Chickens	36.2% 71	34.4% 52	38.6% 56	45.5% 65	38.7% 70	46.6% 82	52.0% 77	40.5% 85	30.1% 58	38.9% 77	27.5% 41
		Chickens	HACCP		46.1% 175	39.0% 48	43.4% 33	28.6% 8	46.9% 38	33.0% 33	42.1% 98	36.8% 269	30.3% 119	44.2% 69
		ర్	Cecal		173	40	33	0	30	33	96	209	30.0%	33.9%
		H		100.0%	11.1%	20.0%	28.6%	5.3%	18.8%	0.0%	22.2%	0.0%	15 60.0%	21
	C. coli	Turkeys	Retail Ground Turkey	5	1	2	4	1	3	0	4	0	3 16.7%	20.0%
	G	F	Cecal										3	3
		qe qe	Cecal (Beef)										12.2% 16	7.2% 13
		Cattle	Cecal (Dairy)										25.5%	16.4%
		_	Cecal (Market Swine)										25 10.5%	9 13.8%
		Swine	` '										20 21.5%	24 20.3%
	<u> </u>	Ľ	Cecal (Sows)		16.2%	13.1%	18.8%	15.8%	15.1%	19.0%	23.6%	20.0%	35 17.2%	30 20.9%
2. Resistance to ≥ 2		L	Humans	0.40/	128	93	186	163	204	220	302	238	204	262
Antimicrobial Classes		SUE	Retail Chickens	8.4% 43	6.5% 26	9.4%	7.2%	7.3%	10.9%	11.6% 41	14.3% 56	10.7% 45	8.9% 38	7.3% 27
		Chickens	HACCP		8.8% 50	6.1% 14	14.5% 24	23.1% 18	12.0% 14	15.9% 33	15.4% 53	15.9% 215	23.0% 181	
		Ĺ	Cecal										36.4% 4	
	C. jejuni	:eys	Retail Ground Turkey	28.6% 2	10.0% 1	41.7% 5	30.0% 6	70.0% 7	44.4% 4	40.0% 2	38.5% 5	33.3% 1	14.3% 1	
	C. je	Turkeys	Cecal											
		<u>a</u>	Cecal (Beef)										14.5% 77	
		Cattle	Cecal (Dairy)										9.6%	
		ine	Cecal (Market Swine)										52 25.0%	
		Swin	Cecal (Sows)										33.3%	
	H		Humans		19.4%	19.8%	22.1%	28.7%	21.3%	38.3%	43.0%	32.8%	2 35.9%	34.2%
		\vdash		16.3%	19 21.9%	19 20.0%	23 20.3%	33 24.3%	30 17.1%	44 24.3%	64 34.8%	44 30.1%	51 25.8%	50 21.5%
		ens	Retail Chickens	32	33 22.6%	29 26.8%	29 21.1%	44 25.0%	30 19.8%	36 26.0%	73 18.9%	58 23.7%	51 25.4%	32 12.2%
		Chickens	HACCP		86	33	16	7	16	26.0%	44	164	100	19
			Cecal			0000	4	50.00	0= =	71.1		00.00	48.0% 24	38.7% 24
	C. coli	Turkeys	Retail Ground Turkey	0.0% 0	55.6% 5	30.0% 3	42.9% 6	52.6% 10	37.5% 6	71.4% 5	55.6% 10	33.3% 1	0.0%	
	Ö	Ţ	Cecal										66.7% 12	40.0% 6
		tle	Cecal (Beef)										58.8% 77	52.8% 95
		Cattle	Cecal (Dairy)										34.7% 34	47.3%
		Φ	Cecal (Market Swine)										43.2%	26 48.9%
		Swine	Cecal (Sows)										82 22.7%	85 27.7%
			in 2004 and for humans										37	41

Data are reported for retail meats beginning in 2004 and for humans and chickens beginning in 2005 when the broth microdilution method was first used

Table 59b. Resistance Pattern Year	is ar	non	g Campylobacter Spec	cies, 2004-2	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested			Humans	N/A ¹	788	709	991	1033	1350	1159	1282	1190	1183	1251
		ens	Retail Chickens	510	403	426	332	329	404	355	393	421	428	369
		Chickens	HACCP Cecal	N/A 1	567	228	166	78	117	208	344	1348	788	418 8
	ini		Retail Ground Turkey	7	10	12	20	10	9	5	13	3	11 7	0
	C. jejuni	Turkey:	Cecal	,	10	12	20	10	3		10	3	0	1
	ľ	Cattle	Cecal (Beef)										531	574
		_	Cecal (Dairy)										542	395
		Swine	Cecal (Market Swine) Cecal (Sows)										4 6	9 12
		S	Humans	N/A 1	98	96	104	115	141	115	149	134	142	146
		ens	Retail Chickens	196	151	145	143	181	176	148	210	193	198	149
		Chickens	HACCP	N/A 1	380	123	76	28	81	100	233	693	393	156
	"		Cecal	_	0	40	44	40	40	-	40	2	50	62
	C. coli	Turkeys	Retail Ground Turkey Cecal	5	9	10	14	19	16	7	18	3	5 18	0 15
		Cattle	Cecal (Beef)										131	180
		_	Cecal (Dairy)										98	55
		wine	Cecal (Market Swine)										190	174
Resistance Pattern	Spe	ຸ scies	Cecal (Sows) Isolate Source ¹										163	148
	Ė		Humans		2.4%	1.3% 9	1.9%	3.5%	2.7%	4.2%	7.5%	4.8%	3.1%	3.0%
3. Resistance to ≥ 3 Antimicrobial Classes		T	Retail Chickens	1.0%	19 0.5%	0.7%	0.6%	1.2%	1.0%	0.6%	96 0.5%	1.0%	1.2%	0.3%
		Chickens	HACCP	5	1.4%	0.9%	0.0%	1.3%	0.0%	0.0%	1.2%	1.2%	2.0%	0.7%
		Chi	Cecal		8	2	0	1	0	0	4	16	16 27.3%	0.0%
	į	s	Retail Ground Turkey	0.0%	0.0%	0.0%	5.0%	10.0%	11.1%	0.0%	0.0%	0.0%	3 0.0%	0
	C. jejuni	Turkeys		0	0	0	1	1	1	0	0	0	0	0.0%
	ď	_	Cecal										13.0%	0 0.7%
		Cattle	Cecal (Beef)										69	1.0%
		O	Cecal (Dairy)										41	4 22.2%
		Swine	Cecal (Market Swine)										25.0% 1	2
		Ś	Cecal (Sows)										33.3% 2	0.0% 0
			Humans		7.1% 7	9.4% 9	8.7% 9	8.7% 10	7.1% 10	13.9% 16	14.8% 22	12.7% 17	21.1% 30	13.7% 20
		2	Retail Chickens	9.2% 18	9.9% 15	6.9% 10	7.0% 10	9.9% 18	5.1% 9	4.1% 6	4.8% 10	11.4% 22	9.6% 19	11.4% 17
		Chickens	HACCP		8.7% 33	8.9% 11	14.5% 11	7.1% 2	6.2% 5	4.0% 4	4.7% 11	9.7% 67	10.2% 40	2.6% 4
		ō	Cecal										26.0% 13	4.8% 3
	coli	sys	Retail Ground Turkey	0.0%	22.2% 2	10.0%	21.4% 3	10.5% 2	0.0%	14.3% 1	5.6% 1	0.0%	0.0%	
	C)	Turkeys	Cecal	Ů	-		J	2	Ů				61.1%	13.3%
		Ф	Cecal (Beef)										11 43.5%	8.9%
		Cattle	Cecal (Dairy)										57 25.5%	16 9.1%
			Cecal (Market Swine)										25 37.4%	5 39.7%
		Swine											71 19.6%	69 19.6%
	-	É	Cecal (Sows)		1.0%	0.7%	1.3%	1.9%	1.6%	1.9%	3.6%	1.8%	32 2.2%	29 2.0%
4. Resistance to ≥ 4 Antimicrobial Classes		L	Humans	0.8%	8	5	13	20	21	22	46 0.3%	21	26	25
		ens	Retail Chickens	4	1 0.7%	3 0.4%	0	0	0	1 0.0%	1 0.3%	0 0.7%	0	0.0%
		Chickens	HACCP		4	1	0.0%	0.078	0.078	0.078	1	9	11 0.0%	0.0%
			Cecal	0.004	0.004	0.004	F 00'	10.007	0.004	0.004	0.004	0.004	0	0.0%
	C. jejuni	Turkeys	Retail Ground Turkey	0.0%	0.0%	0.0%	5.0% 1	10.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.00
	Ö	Ţ	Cecal											0.0%
		Cattle	Cecal (Beef)										0.2% 1	0.3% 2
		Č	Cecal (Dairy)										0.6% 3	0.3% 1
		Swine	Cecal (Market Swine)										0.0%	0.0% 0
		Sw	Cecal (Sows)										0.0%	0.0%
			Humans		4.1% 4	6.3% 6	5.8% 6	7.0% 8	4.3% 6	7.0% 8	4.7% 7	9.0% 12	14.1% 20	6.2%
		<u> </u>	Retail Chickens	3.6%	6.6% 10	2.8%	3.5%	2.8%	2.8%	4.1% 6	3.8%	7.3%	4.6%	6.7%
		Chickens	HACCP	,	5.8%	6.5%	5.3%	0.0%	6.2%	0.0%	2.6%	5.6%	9 4.1%	0.0%
		S	Cecal		22	8	4	0	5	0	6	39	16 16.0%	1.6%
	"	s/	Retail Ground Turkey	0.0%	22.2%	0.0%	0.0%	5.3%	0.0%	14.3%	5.6%	0.0%	0.0%	1
	C. coli	Turkeys	Cecal	0	2	0	0	1	0	1	1	0	0 22.2%	0.0%
	Ī	_											4 8.4%	0 5.6%
		Cattle	Cecal (Beef)										11 3.1%	10 1.8%
			Cecal (Dairy)										3 32.1%	1 10.3%
		Swine	Cecal (Market Swine)										61	18
		S	Cecal (Sows)										28	5

¹ Data are reported for retail meats beginning in 2004 and for humans and chickens beginning in 2005 when the broth microdilution method was first used

Table 59c. Resistance Pattern Year	s an	nong	g Campylobacter Spec	ies, 2004-2	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested			Humans	N/A ¹	788	709	991	1033	1350	1159	1282	1190	1183	1251
		ens	Retail Chickens	510	403	426	332	329	404	355	393	421	428	369
		Chickens	HACCP	N/A 1	567	228	166	78	117	208	344	1348	788	418
	ju.		Cecal Retail Ground Turkey	7	10	12	20	10	9	5	13	3	11 7	8
	C. jejuni	Turkeys	Cecal	,	10	12	20	10	3	3	15	3	0	1
		Cattle	Cecal (Beef)										531	574
		_	Cecal (Dairy)										542	395
		Swine	Cecal (Market Swine) Cecal (Sows)										4 6	9 12
		()	Humans	N/A 1	98	96	104	115	141	115	149	134	142	146
		sue	Retail Chickens	196	151	145	143	181	176	148	210	193	198	149
		Chickens	HACCP	N/A 1	380	123	76	28	81	100	233	693	393	156
	ije	93	Cecal Retail Ground Turkey	5	9	10	14	19	16	7	18	3	50 5	62 0
	C. coli	Turkey	Cecal	3	3	10		13	10	,	10	3	18	15
		Cattle	Cecal (Beef)										131	180
		-	Cecal (Dairy)										98	55
		Swine	Cecal (Market Swine) Cecal (Sows)										190 163	174 148
Resistance Pattern	Spe	cies	Isolate Source ¹										100	
5. At least Quinolone and			Humans		1.4% 11	0.7% 5	1.4% 14	1.5% 15	1.2% 16	1.3% 15	3.0% 38	1.3% 16	1.9% 22	1.4% 18
Macrolide Resistant		s	Retail Chickens	0.4% 2	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.3%	0.0%	0.0% 0	0.0%
		Chickens	HACCP		0.7%	0.9%	0.0%	1.3%	0.0%	0.0%	0.3%	0.5% 7	0.1%	0.5%
		Ş	Cecal		·		J	•		3			0.0%	0.0%
	iur	sys	Retail Ground Turkey	0.0%	0.0%	0.0%	5.0% 1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	C. jejuni	Turkeys	Cecal	0	0	- U		0	U	U		Ü	U	0.0%
		-	Cecal (Beef)										0.0%	0.5%
		Cattle	Cecal (Dairy)										0.4%	0.3%
		Ф	Cecal (Market Swine)										0.0%	0.0%
		Swine	Cecal (Sows)										0.0%	0.0%
			Humans		2.0%	4.2%	1.9%	4.3%	2.8%	3.5%	3.4%	8.2%	9.2%	5.5%
			Retail Chickens	0.5%	1.3%	4 0.7%	1.4%	5 1.1%	1.7%	4 0.7%	5 1.0%	11 6.2%	13 3.0%	2.7%
		Chickens	HACCP	1	1.6%	1.6%	2 5.3%	0.0%	3 4.9%	1 0.0%	1.3%	12 1.7%	6 2.0%	4 0.0%
		Chic			6	2	4	0	4	0	3	12	8 2.0%	0 3.2%
		"	Cecal	0.0%	22.2%	0.0%	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	1 0.0%	2
	C. coli	Turkeys	Retail Ground Turkey	0	2	0	0	0	0	1	0	0	0 16.7%	0.0%
	Ĭ	_	Cecal										3 0.8%	0 1.1%
		Cattle	Cecal (Beef)										1 0.0%	2 1.8%
		0	Cecal (Dairy)										0 1.6%	1 10.3%
		Swine	Cecal (Market Swine)										3	18
		S	Cecal (Sows)		14.0%	11.1%	17.4%	13.9%	13.6%	12.7%	15.7%	16.6%	1 16.6%	5 19.9%
6. At least Quinolone and			Humans	6.50/	110	79	172	144	183	147	201	198	196	249
Tetracycline Resistant		sus	Retail Chickens	6.5% 33	5.5%	8.5% 36	6.6%	6.1%	9.9%	10.7% 38	13.7% 54	9.3%	7.2% 31	7.1% 26
		Chickens	HACCP		7.8% 44	5.7% 13	13.9% 23	20.5% 16	11.1% 13	15.4% 32	14.2% 49	15.0% 202	20.3% 160	26.3% 110
			Cecal										27.3% 3	12.5% 1
	C. jejuni	Turkeys	Retail Ground Turkey	14.3% 1	10.0% 1	41.7% 5	30.0% 6	60.0% 6	44.4% 4	40.0% 2	38.5% 5	33.3% 1	14.3% 1	
	Ċ.	Ţ	Cecal											0.0% 0
		Cattle	Cecal (Beef)										13.0% 69	15.0% 86
		Ca	Cecal (Dairy)										7.2% 39	6.1% 24
		ne	Cecal (Market Swine)										25.0% 1	11.1% 1
		Swine	Cecal (Sows)										0.0%	0.0% 0
			Humans		10.2% 10	10.4% 10	14.4% 15	17.4% 20	14.9% 21	19.1% 22	23.5% 35	24.6% 33	23.9% 34	23.3% 34
		s,	Retail Chickens	7.1% 14	12.6% 19	10.3% 15	14.7% 21	13.3% 24	8.0% 14	8.8% 13	10.5% 22	16.1% 31	12.1% 24	9.4%
		Chickens	HACCP		14.5% 55	10.6%	10.5%	14.3%	16.0%	16.0% 16	12.0% 28	13.4%	15.3% 60	3.8%
		ç	Cecal		- 55	.,							14.0%	16.1% 10
	ilc	3ys	Retail Ground Turkey	0.0%	55.6% 5	30.0%	42.9% 6	47.4% 9	37.5% 6	57.1% 4	50.0% 9	33.3% 1	0.0%	10
	C. coli	Turkeys	Cecal		, J					7			61.1% 11	33.3% 5
		e	Cecal (Beef)										39.7%	48.9%
		Cattle	Cecal (Dairy)										52 24.5%	40.0%
		Φ	Cecal (Market Swine)										6.8%	16.1%
		Swine	Cecal (Sows)										3.7%	28 8.1%
		1											6	12

¹ Data are reported for retail meats beginning in 2004 and for humans and chickens beginning in 2005 when the broth microdilution method was first used

Escherichia coli Data

E. coli Isolates Tested

Table 60. Number of *E. coli* Isolates Tested, 2000-2014

	C								Ye	ear						
	Source	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chickens	Retail Chickens			282	396	400	393	418	299	306	315	357	341	386	360	317
Chic	Cecal														48	84
Turkeys	Retail Ground Turkey			304	333	376	396	388	315	300	306	369	368	391	374	397
Tur	Cecal														29	50
<u>o</u>	Retail Ground Beef			295	311	338	316	295	256	250	247	269	215	271	227	205
Cattle	Cecal (Beef)														293	326
L	Cecal (Dairy)														256	177
a	Retail Pork Chops			184	218	232	205	182	152	146	147	183	146	161	208	205
Swine	Cecal (Market Swine)														118	146
S	Cecal (Sows)														120	118

Isolation of *E. coli* from Retail Meats

Table 61. Number and Percent of Retail Meat Samples Culture Positive for E. coli, 2014

	Retail Chickens	Retail Ground Turkey	Retail Ground Beef	Retail Pork Chops
Number of Meat Samples Tested	480	479	480	480
Number Positive for <i>E. coli</i>	317	397	205	205
Percent Positive for E. coli	66.0%	82.9%	42.7%	42.7%

Figure 9. Percent of Retail Meat Samples Culture Positive for E. coli, 2014

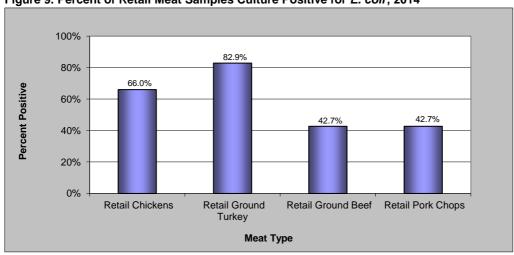
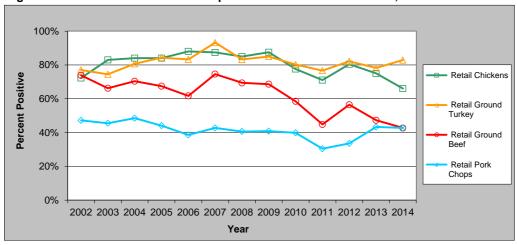


Figure 10. Percent of Retail Meat Samples Culture Positive for E. coli, 2002-2014



MIC Distributions

Table 62a. Distribution of MICs and Occurrence of Resistance among E. coli Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates)	T: % 1	%R ²	[95% CI] ³	0.015 0.03	0.06	0.125	0.25	0.50	Distri 1	bution (2	%) of M 4	IICs (µg/ 8	/ml)⁴ 16	32	64	128	256	512	102
Aminoglycosides	Gentamicin	Retail Chickens (317)	4.1	38.5	[33.1 - 44.1]				0.3	27.4	27.1	2.5		4.1	10.1	28.4					
		ਨੂੰ Cecal (84)	6.0	46.4	[35.5 - 57.6]					19.0	25.0	2.4	1.2	6.0	14.3	32.1					
		o Retail Ground Turkey (397)	4.3	30.2	[25.7 - 35.0]				0.3	32.2	30.2	2.0	0.8	4.3	9.1	21.2					
		¥ ⊢ Cecal (50)	4.0	32.0	[19.5 - 46.7]					20.0	40.0	4.0		4.0	10.0	22.0					
		Retail Ground Beef (205)	0.0	0.5	[0.0 - 2.7]				0.5	42.0	54.6	2.4				0.5					
		Cecal (Beef) (326)	0.0	0.6	[0.0 - 2.7]				0.5	32.8	62.3	4.0	0.3		0.3	0.3					
		Cecal (Dairy) (177)	0.6	0.0	[0.0 - 2.1]					34.5	56.5	7.3	1.1	0.6							
		Retail Pork Chops (205)	0.0	2.0	[0.5 - 4.9]				1.0	31.7	57.1	8.3				2.0					
		Cecal (Market Swine) (146)	0.7	1.4	[0.2 - 4.9]				0.7	37.7	48.6	10.3	0.7	0.7		1.4					
		ഗ് Cecal (Sows) (118)	0.0	2.5	[0.5 - 7.3]				0.8	28.8	57.6	7.6	2.5		1.7	0.8					
	Streptomycin	Retail Chickens (317)	N/A	50.8	[45.1 - 56.4]								18.3	24.9	6.0	6.9	24.0	19.9			
		ਨੂੰ Cecal (84)	N/A	58.3	[47.1 - 69.0]								25.0	14.3	2.4	15.5	15.5	27.4			
		o Retail Ground Turkey (397)	N/A	59.4	[54.4 - 64.3]								13.1	23.9	3.5	6.8	19.4	33.2			
		는 Cecal (50)	N/A	68.0	[53.3 - 80.5]								14.0	12.0	6.0	10.0	10.0	48.0			
		Retail Ground Beef (205)	N/A	9.3	[5.7 - 14.1]								23.9	55.1	11.7	1.0	4.9	3.4			
		Ф Сесаl (Beef) (326)	N/A	12.6	[9.2 - 16.7]							0.3	44.2	38.7	4.3	3.4	4.3	4.9			
		Cecal (Dairy) (177)	N/A	12.4	[8.0 - 18.2]							0.6	50.3	31.6	5.1	1.7	6.2	4.5			
		Retail Pork Chops (205)	N/A	10.7	[6.8 - 15.8]								18.1	49.3	22.0	2.0	3.4	5.4			
		© Cecal (Market Swine) (146)	N/A	25.3	[18.5 - 33.2]							1.4	39.7	21.9	11.6	4.1	9.6	11.6			
		Cecal (Sows) (118)	N/A	21.2	[14.2 - 29.7]							0.8	34.7	33.9	9.3	4.2	9.3	7.6			
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin-Clavulanic Acid	Retail Chickens (317)	1.9	7.6	[4.9 - 11.1]						1.9	27.1	46.4	15.1	1.9	2.8	4.7				
		S Cecal (84)	1.2	2.4	[0.3 - 8.3]						2.4	21.4	47.6	25.0	1.2	1.2	1.2				
		Retail Ground Turkey (397)	18.4	6.0	[3.9 - 8.9]						1.3	9.3	28.5	36.5	18.4	2.8	3.3				
		Cecal (50)	26.0	14.0	[5.8 - 26.7]							4.0	32.0	24.0	26.0	6.0	8.0				
		Retail Ground Beef (205)	0.5	0.5	[0.0 - 2.7]						3.9	19.5	59.0	16.6	0.5		0.5				
		E Cecal (Beef) (326)	0.6	0.6	[0.1 - 2.2]						4.6	17.2	62.3	14.7	0.6	0.3	0.3				
		Cecal (Dairy) (177)	0.0	1.7	[0.4 - 4.9]						2.3	14.7	63.3	18.1		1.7					
		Retail Pork Chops (205)	0.0	2.9	[1.1 - 6.3]						0.5	22.9	55.1	18.5		1.0	2.0				
		Cecal (Market Swine) (146)	0.7	2.7	[0.8 - 6.9]						1.4	19.9	54.1	21.2	0.7	2.1	0.7				
		Cecal (Sows) (118)	0.8	1.7	[0.2 - 6.0]						4.2	20.3	51.7	21.2	0.8		1.7				
Cephems	Cefoxitin	Retail Chickens (317)	2.5	6.9	[4.4 - 10.3]						1.3	12.3	59.6	17.4	2.5	0.9	6.0				
		Cecal (84)	2.4	2.4	[0.3 - 8.3]							11.9	59.5	23.8	2.4		2.4				
		Retail Ground Turkey (397)	1.0	5.0	[3.1 - 7.7]						0.3	11.6	63.7	18.4	1.0	1.3	3.8				
		Cecal (50)	2.0	10.0	[3.3 - 21.8]							10.0	62.0	16.0	2.0		10.0				
		Retail Ground Beef (205)	0.5	1.0	[0.1 - 3.5]						2.4	21.0	57.1	18.1	0.5	0.5	0.5				
		Cecal (Beef) (326)	0.9	0.6	[0.1 - 2.2]						2.8	16.0	60.4	19.3	0.9	0.3	0.3				
		Cecal (Dairy) (177)	2.3	1.1	[0.1 - 4.0]						0.6	12.4	62.7	20.9	2.3	0.6	0.6				
		Retail Pork Chops (205)	0.5	2.9	[1.1 - 6.3]							16.6	66.8	13.2	0.5		2.9				
		Cecal (Market Swine) (146)	2.1	2.7	[0.8 - 6.9]							16.4	58.2	20.5	2.1	0.7	2.1				
		Cecal (Sows) (118)	4.2	1.7	[0.2 - 6.0]						0.8	16.1	59.3	17.8	4.2	0.8	0.8				

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

³95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations.

Table 62b. Distribution of MICs and Occurrence of Resistance among E. coli Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates)	T: % 1	%R²	[95% CI] ³	0.015 0.03	0.06	0.125	0.25	0.50	Distri 1	bution 2	(%) of M 4	ICs (µg/r 8	ml)⁴ 16	32	64	128	256	512	1024
Cephems	Ceftiofur	Retail Chickens (317)	0.3	6.3	[3.9 - 9.6]			1.3	34.4	55.2	2.5		0.3	3.5	2.8						
		Cecal (84)	0.0	2.4	[0.3 - 8.3]			2.4	29.8	63.1	2.4				2.4						
		ο Retail Ground Turkey (397)	0.0	4.3	[2.5 - 6.8]			1.3	29.7	61.5	2.8	0.5		2.5	1.8						
		E Cecal (50)	0.0	10.0	[3.3 - 21.8]				26.0	62.0	2.0			2.0	8.0						
		Retail Ground Beef (205)	0.0	0.5	[0.0 - 2.7]			4.4	41.0	54.2				0.5							
		Cecal (Beef) (326)	0.0	0.9	[0.2 - 2.7]			7.4	36.5	54.9	0.3			0.3	0.6						
		Cecal (Dairy) (177)	0.0	1.1	[0.1 - 4.0]			1.7	37.3	56.5	3.4				1.1						
		Retail Pork Chops (205)	0.0	2.9	[1.1 - 6.3]			1.5	42.0	53.2	0.5			0.5	2.4						
		Cecal (Market Swine) (146)	0.0	3.4	[1.1 - 7.8]			2.1	42.5	52.1				0.7	2.7						
		Cecal (Sows) (118)	0.0	1.7	[0.2 - 6.0]			2.5	39.8	51.7	4.2				1.7						
	Ceftriaxone	Retail Chickens (317)	0.0	6.6	[4.1 - 9.9]				92.4	0.3	0.6			2.2	4.1	0.3					
		Cecal (84)	0.0	2.4	[0.3 - 8.3]				97.6						1.2	1.2					
		Retail Ground Turkey (397)	0.0	4.3	[2.5 - 6.8]				94.2	0.3	1.3			1.0	2.3	0.8		0.3			
		E Cecal (50)	0.0	10.0	[3.3 - 21.8]				88.0		2.0				4.0	4.0	2.0				
		Retail Ground Beef (205)	0.0	0.5	[0.0 - 2.7]				99.5						0.5						
		Cecal (Beef) (326)	0.0	0.9	[0.2 - 2.7]				99.1						0.6	0.3					
		Cecal (Dairy) (177)	0.0	1.1	[0.1 - 4.0]				98.3	0.6					0.6	0.6					
		Retail Pork Chops (205)	0.0	2.9	[1.1 - 6.3]				97.1						2.9						
		Cecal (Market Swine) (146)	0.0	3.4	[1.1 - 7.8]				96.6					0.7	2.1	0.7					
		Cecal (Sows) (118)	0.8	1.7	[0.2 - 6.0]				96.6		8.0	8.0			8.0		8.0		1		
Folate Pathway Inhibitors	Sulfisoxazole	Retail Chickens (317)	N/A	44.5	[38.9 - 50.1]										48.9	6.3		0.3		44.5	
		Ö Cecal (84)	N/A	42.9	[32.1 - 54.1]										51.2	6.0				42.9	
		Retail Ground Turkey (397)	N/A	44.8	[39.9 - 49.9]										48.9	6.1		0.3		44.8	
		Cecal (50)	N/A	60.0	[45.2 - 73.6]										36.0	2.0	2.0			60.0	
		Retail Ground Beef (205)	N/A	7.8	[4.5 - 12.4]										86.8	5.4				7.8	
		Cecal (Beef) (326)	N/A	12.0	[8.6 - 16.0]										78.8	9.2				12.0	
		Cecal (Dairy) (177)	N/A	10.7	[6.6 - 16.3]										80.2	8.5	0.6			10.7	
		Retail Pork Chops (205)	N/A	7.8	[4.5 - 12.4]										86.3	5.9				7.8	
		Cecal (Market Swine) (146)	N/A	21.2	[14.9 - 28.8]										69.9	8.9				21.2	
		Cecal (Sows) (118)	N/A	13.6	[8.0 - 21.1]								"		75.4	11.0				13.6	
	Trimethoprim-Sulfamethoxazole	Retail Chickens (317)	N/A	5.0	[2.9 - 8.1]			80.4	9.8	3.2	0.6	1.0		5.0							
		Ö Cecal (84)	N/A	10.7	[5.0 - 19.4]			78.6	6.0	2.4	1.2	1.2		10.7							
		Retail Ground Turkey (397)	N/A	2.5	[1.2 - 4.6]			78.3	15.9	2.5	8.0			2.5							
		Cecal (50)	N/A	10.0	[3.3 - 21.8]			48.0	30.0	10.0	2.0			10.0							
		Retail Ground Beef (205)	N/A	1.0	[0.1 - 3.5]			97.1	1.5	0.5				1.0							
		Cecal (Beef) (326)	N/A	0.9	[0.2 - 2.7]			92.3	5.5	0.6	0.3	0.3		0.9							
		Cecal (Dairy) (177)	N/A	0.6	[0.0 - 3.1]			93.2	3.4	2.3	0.6			0.6							
		Retail Pork Chops (205)	N/A	2.4	[0.8 - 5.6]			93.2	2.0	1.5	1.0			2.4							
		Cecal (Market Swine) (146)	N/A	5.5	[2.4 - 10.5]			81.5	11.6	1.4				5.5							
		Cecal (Sows) (118)	N/A	5.9	[2.4 - 11.8]			87.3	4.2	1.7	0.8			5.9							

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding.

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

The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentration.

Table 62c. Distribution of MICs and Occurrence of Resistance among E. coli Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates)	T: % 1	%R ²	[95% CI] ³	0.015	0.03	0.06	0.125	0.25	0.50	Distri 1	bution 2	(%) of N 4	IICs (µg/ 8	ml) ⁴ 16	32	64	128	256	512	1024
Macrolides	Azithromycin	Retail Chickens (317)	N/A	0.3	[0.0 - 1.7]						0.6	3.8	23.3	51.7	18.6	1.6	0.3					
		S Cecal (84)	N/A	2.4	[0.3 - 8.3]							4.8	41.7	46.4	4.8		2.4					
		Retail Ground Turkey (397)	N/A	0.0	[0.0 - 0.9]						0.8	3.8	32.2	53.4	9.8							
		E Cecal (50)	N/A	0.0	[0.0 - 7.1]							6.0	36.0	50.0	6.0	2.0						
		Retail Ground Beef (205)	N/A	0.0	[0.0 - 1.8]						1.5	5.4	17.6	58.1	17.1	0.5						
		Cecal (Beef) (326)	N/A	0.0	[0.0 - 1.1]						0.6	5.2	31.0	58.3	4.6	0.3						
		Cecal (Dairy) (177)	N/A	0.6	[0.0 - 3.1]							4.0	29.9	63.3	1.7	0.6	0.6					
		Retail Pork Chops (205)	N/A	0.0	[0.0 - 1.8]					0.5	0.5	1.5	20.5	53.2	22.4	1.5						
		Cecal (Market Swine) (146)	N/A	0.0	[0.0 - 2.5]						1.4	4.8	43.2	47.3	3.4							
		Cecal (Sows) (118)	N/A	0.0	[0.0 - 3.1]							2.5	31.4	61.9	4.2							
Penicillins	Ampicillin	Retail Chickens (317)	0.0	17.4	[13.3 - 22.0]							8.2	40.4	33.1	1.0			17.4				
		S Cecal (84)	0.0	17.9	[10.4 - 27.7]							3.6	31.0	45.2	2.4			17.9				
		Retail Ground Turkey (397)	0.0	57.2	[52.1 - 62.1]							2.5	25.7	14.1	0.5		0.3	56.9				
		E Cecal (50)	0.0	64.0	[49.2 - 77.1]							2.0	14.0	16.0	4.0			64.0				
		Retail Ground Beef (205)	0.0	4.4	[2.0 - 8.2]							8.8	49.3	36.6	1.0			4.4				
		Cecal (Beef) (326)	0.0	5.2	[3.1 - 8.2]							9.5	33.7	47.9	3.7			5.2				
		Cecal (Dairy) (177)	0.0	4.5	[2.0 - 8.7]							5.1	38.4	47.5	4.5			4.5				
		Retail Pork Chops (205)	0.0	11.7	[7.6 - 16.9]							4.9	44.4	37.1	2.0			11.7				
		Cecal (Market Swine) (146)	0.7	17.1	[11.4 - 24.2]							6.2	37.7	33.6	4.8	0.7	0.7	16.4				
		Cecal (Sows) (118)	0.8	13.6	[8.0 - 21.1]							5.1	43.2	36.4	0.8	0.8		13.6				
Phenicols	Chloramphenicol	Retail Chickens (317)	1.0	0.0	[0.0 - 1.2]								6.0	44.5	48.6	1.0						
		S Cecal (84)	3.6	1.2	[0.0 - 6.5]								6.0	39.3	50.0	3.6		1.2				
		Retail Ground Turkey (397)	0.5	3.5	[1.9 - 5.8]								7.8	44.3	43.8	0.5		3.5				
		E Cecal (50)	2.0	4.0	[0.5 - 13.7]								4.0	34.0	56.0	2.0		4.0				
		Retail Ground Beef (205)	0.5	0.5	[0.0 - 2.7]								6.3	36.6	56.1	0.5		0.5				
		S Cecal (Beef) (326)	1.8	3.7	[1.9 - 6.3]								2.8	42.0	49.7	1.8		3.7				
		Cecal (Dairy) (177)	1.1	4.0	[1.6 - 8.0]								5.6	40.7	48.6	1.1		4.0				
		Retail Pork Chops (205)	1.5	1.5	[0.3 - 4.2]								3.9	32.2	61.0	1.5	0.5	1.0				
		Cecal (Market Swine) (146)	4.8	4.8	[1.9 - 9.6]								2.7	37.7	50.0	4.8	2.7	2.1				
		Cecal (Sows) (118)	1.7	2.5	[0.5 - 7.3]								2.5	44.9	48.3	1.7	1.7	0.8				
Quinolones	Ciprofloxacin	Retail Chickens (317)	1.9	0.3	[0.0 - 1.7]	94.3	3.5		0.3	1.0	0.6		0.3									
		S Cecal (84)	2.4	0.0	[0.0 - 4.3]	96.4	1.2		2.4													
		Retail Ground Turkey (397)	1.5	0.0	[0.0 - 0.9]	95.2	3.3		0.5	0.8	0.3											
		Cecal (50)	0.0	0.0	[0.0 - 7.1]	100.0																
		Retail Ground Beef (205)	0.0	0.0	[0.0 - 1.8]	98.5	1.5															
		Cecal (Beef) (326)	0.9	0.0	[0.0 - 1.1]	97.5	1.5			0.6	0.3											
		Cecal (Dairy) (177)	0.0	0.6	[0.0 - 3.1]	99.4									0.6							
		Retail Pork Chops (205)	0.5	0.5	[0.0 - 2.7]	97.6	1.5				0.5				0.5							
		Cecal (Market Swine) (146)	0.7	0.7	[0.0 - 3.8]	95.2	2.7	0.7	0.7						0.7							
		Cecal (Sows) (118)	0.8	0.0	[0.0 - 3.1]	97.5	1.7			0.8												

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding

³95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Table 62d. Distribution of MICs and Occurrence of Resistance among E. coli Isolates, 2014

Table ozal Biotribation	n of MICs and Occurren	Г	Isolate Source	.g c.	011 130	nates, zo i	İ						Dietri	hution (%) of M	IICs (µg/	ml) ⁴						\neg
Antimicrobial Class	Antimicrobial Agent			T: % 1	%R ²	[95% CI] 3	0.015	0.03	0.06	0.125	0.25	0.50	1	2	4	103 (μg/ 8	16	32	64	128	256	512	1024
Quinolones	Nalidixic Acid	Chickens	Retail Chickens (317) Cecal (84)	N/A N/A	1.9 2.4	[0.7 - 4.1] [0.3 - 8.3]						1.3	23.3 8.3	66.9 72.6	6.6 16.7			0.6 1.2	1.3 1.2				
		Turkeys	Retail Ground Turkey (397) Cecal (50)	N/A N/A	1.5 0.0	[0.6 - 3.3] [0.0 - 7.1]						0.8	19.4	70.5 74.0	7.6 20.0	0.3			1.5				
		Cattle	Retail Ground Beef (205) Cecal (Beef) (326)	N/A N/A	0.0 0.3	[0.0 - 1.8] [0.0 - 1.7]						2.9 0.3	15.1 6.4	68.8 69.3	13.2 23.3		0.3		0.3				
		9	Cecal (Dairy) (177) Retail Pork Chops (205)	N/A N/A	0.6	[0.0 - 3.1]						1.0	4.5 18.5	73.4	21.5 8.8		0.5		0.6				
		Swin	Cecal (Market Swine) (146) Cecal (Sows) (118)	N/A N/A	1.4 0.0	[0.2 - 4.9] [0.0 - 3.1]							6.8 7.6	76.0 73.7	15.1 17.8		0.7		1.4				
Tetracyclines	Tetracycline	Chickens	Retail Chickens (317) Cecal (84)	0.6 1.2	44.2 48.8	[38.6 - 49.8] [37.7 - 60.0]									55.2 50.0	0.6 1.2	0.6	2.8 1.2	40.7 47.6				
		Turkeys	Retail Ground Turkey (397) Cecal (50)	0.3	74.1 84.0	[69.4 - 78.3] [70.9 - 92.8]									25.7 16.0	0.3	0.5	3.5 6.0	70.0 78.0				
		Cattle	Retail Ground Beef (205) Cecal (Beef) (326)	0.5 4.3	21.5 37.4	[16.0 - 27.7] [32.2 - 42.9]									78.1 58.3	0.5 4.3	1.5 3.4	0.5 2.5	19.5 31.6				
		_	Cecal (Dairy) (177) Retail Pork Chops (205)	4.0 0.5	21.5 45.9	[15.7 - 28.3] [38.9 - 52.9]									74.6 53.7	4.0	1.7	2.4	19.8 42.0				
		Swine	Cecal (Market Swine) (146) Cecal (Sows) (118)	1.4	71.9	[63.9 - 79.0] [62.1 - 79.2]									26.7	1.4	0.8	2.1	69.9				

¹ Percent of isolates with intermediate susceptibility

² Percent of isolates with resistance. Discrepancies between %R and sums of distribution %'s, to the right of the double vertical bars, are due to rounding.

³95% confidence intervals for percent resistant (%R) were calculated using the Clopper-Pearson exact method

⁴ The unshaded areas indicate the range of dilutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for susceptibility, while double vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentration.

Resistance by Year

Table 63a, Antimicrobial Resistance among E. coli Isolates, 2003-2014

Table 63a. Antimicrol				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		tens	Retail Chickens	396	400	393	418	299	306	315	357	341	386	360	317
		Chickens	Cecal											48	84
		_	Retail Ground Turkey	333	376	396	388	315	300	306	369	368	391	374	397
		Turkeys	Cecal	000	0.0	000	000	0.0	000	000	333		001	29	50
		ө	Retail Ground Beef	311	338	316	295	256	250	247	269	215	271	227	205
		Cattle	Cecal (Beef)											293	326
			Cecal (Dairy)											256	177
		Swine	Retail Pork Chops Cecal (Market Swine)	218	232	205	182	152	146	147	183	146	161	208 118	205 146
		Ó	Cecal (Sows)											120	118
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class	Breakpoint) Gentamicin	10	Source	29.3%	30.0%	37.7%	37.3%	34.4%	34.0%	34.3%	31.9%	38.4%	30.6%	30.3%	38.5%
	(MIC ≥ 16 μg/ml)	Chickens	Retail Chickens	116	120	148	156	103	104	108	114	131	118	111	122
		S.	Cecal											81.3% 39	46.4% 39
		Turkeys	Retail Ground Turkey	29.7% 99	29.3% 110	27.5% 109	29.6% 115	27.0% 85	37.0% 111	37.9% 116	24.9% 92	32.6% 120	40.9% 160	27.0% 101	30.2% 120
		Ţ	Cecal											55.2% 16	32.0% 16
			Retail Ground Beef	1.0%	0.6% 2	0.0%	4.1% 12	0.0%	2.0%	0.8%	0.4%	0.5%	0.7% 2	0.0%	0.5%
		Cattle	Cecal (Beef)	3		0	12	0	5	2	l			0.7%	0.6%
		Ö	Cecal (Dairy)											0.0%	0.0%
		-		1.4%	1.3%	0.0%	1.1%	1.3%	1.4%	4.1%	2.7%	0.7%	0.6%	0 1.0%	2.0%
		e.	Retail Pork Chops	3	3	0	2	2	2	6	5	1	1	2 1.7%	1.4%
		Swine	Cecal (Market Swine)											2	2
			Cecal (Sows)											2.5% 3	2.5% 3
	Streptomycin ¹ (MIC ≥ 64 µg/mI)	cens	Retail Chickens	56.1% 222	56.8% 227	50.6% 199	48.1% 201	46.8% 140	43.8% 134	38.1% 120	39.2% 140	43.4% 148	39.6% 153	38.9% 140	50.8% 161
	, , ,	Chickens	Cecal											4.2% 2	58.3% 49
		ys	Retail Ground Turkey	54.7%	49.2%	43.4%	43.8%	44.8%	57.3%	57.5%	47.7%	60.3%	67.0%	54.0%	59.5%
		Turkeys	Cecal	182	185	172	170	141	172	176	176	222	262	202 24.1%	236 68.0%
		_	Retail Ground Beef	9.0%	11.8%	5.4%	14.2%	6.3%	10.4%	8.1%	9.3%	6.5%	10.0%	7 8.4%	34 9.3%
		e		28	40	17	42	16	26	20	25	14	27	19 0.7%	19 12.6%
		Cattle	Cecal (Beef)											1.2%	41
			Cecal (Dairy)											3	22
		_	Retail Pork Chops	19.7% 43	21.1% 49	13.2% 27	13.7% 25	13.8% 21	19.9% 29	19.7% 29	19.7% 36	15.1% 22	14.9% 24	17.8% 37	10.7% 22
		Swine	Cecal (Market Swine)											3.4% 4	25.3% 37
		,	Cecal (Sows)											1.7% 2	21.2% 25
β-Lactam/β-Lactamase	Amoxicillin-	sue	Retail Chickens	13.6%	10.0%	12.2%	11.5%	7.4%	11.8%	13.3%	6.7%	14.1%	7.8%	5.6%	7.6%
Inhibitor Combinations	Clavulanic Acid (MIC ≥ 32 / 16 µg/ml)	Chickens	Cecal	54	40	48	48	22	36	42	24	48	30	2.1%	24
			Retail Ground Turkey	3.0%	5.3%	3.8%	6.7%	6.3%	8.3%	9.8%	10.0%	13.0%	11.8%	8.8%	6.0%
		Turkeys	-	10	20	15	26	20	25	30	37	48	46	33 6.9%	24 14.0%
		_	Cecal	2.3%	3.9%	1.3%	2.4%	0.8%	2.4%	1.6%	1.1%	0.5%	1.5%	1.8%	7 0.5%
		Ф	Retail Ground Beef	7	13	4	7	2	6	4	3	1	4	4	1
		Cattle	Cecal (Beef)											0.0% 0	0.6% 2
			Cecal (Dairy)											1.6% 4	1.7% 3
			Retail Pork Chops	5.1% 11	5.6% 13	2.9% 6	2.2% 4	0.7% 1	3.4% 5	6.8% 10	2.2% 4	0.0% 0	3.1% 5	1.0% 2	2.9% 6
		Swine	Cecal (Market Swine)		.,	-						-		0.8%	2.7%
		Ó	Cecal (Sows)											0.8%	1.7%
Cephems	Cefoxitin	SL	Retail Chickens	9.3%	8.3%	11.2%	11.2%	7.4%	11.8%	13.3%	6.7%	13.2%	7.8%	5.0%	6.9%
	(MIC ≥ 32 μg/ml)	Chickens		37	33	44	47	22	36	42	24	45	30	18 2.1%	22 2.4%
		ō	Cecal	4.00/	4.50/	0.007	0.00/	0.00/	0.00/	7.00/	0.00/	10.50/	44.00/	1	2
		Turkeys	Retail Ground Turkey	1.2% 4	4.5% 17	3.3% 13	6.2% 24	6.3% 20	6.3% 19	7.8% 24	9.2% 34	12.5% 46	11.3% 44	7.8% 29	5.0% 20
		Ţ	Cecal											3.4% 1	10.0% 5
			Retail Ground Beef	0.3%	1.2%	1.0%	2.0%	0.8%	2.4%	1.6%	1.1%	0.5%	1.9%	1.3%	1.0%
		Cattle	Cecal (Beef)	1	4	3	6	2	6	4	3	1	5	0.0%	0.6%
		Ca												0 1.2%	2 1.1%
			Cecal (Dairy)	2.204	2.204	4 50/	4.007	0.70/	2.407	6.007	0.504	0.004	4.007	3	2
		_	Retail Pork Chops	2.3% 5	2.2% 5	1.5% 3	1.6% 3	0.7% 1	3.4% 5	6.8% 10	0.5% 1	0.0% 0	1.9% 3	1.0% 2	2.9% 2
		Swine	Cecal (Market Swine)											0.8% 1	2.7% 4
		0,	Cecal (Sows)											0.8%	1.7%
			key isolate											1	2

¹ Streptomycin results are unavailable for one 2013 retail meat turkey isolate

Table 63b. Antimicrobial Resistance among E. coli Isolates, 2003-2014

Year	nai ivesisiance ai	non	g E. coli Isolates, 2	2003-201	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Chickens	Retail Chickens	396	400	393	418	299	306	315	357	341	386	360	317
			Cecal											48	84
		Turkeys	Retail Ground Turkey Cecal	333	376	396	388	315	300	306	369	368	391	374 29	397 50
			Retail Ground Beef	311	338	316	295	256	250	247	269	215	271	227	205
		Cattle	Cecal (Beef) Cecal (Dairy)											293 256	326 177
		e	Retail Pork Chops	218	232	205	182	152	146	147	183	146	161	208	205
		Swine	Cecal (Market Swine) Cecal (Sows)											118 120	146 118
	Antimicrobial (Resistance		Isolate											120	110
Antimicrobial Class Cephems	Breakpoint) Ceftiofur	s	Source	7.6%	5.8%	8.7%	8.6%	6.0%	10.8%	11.8%	5.6%	12.3%	7.5%	4.4%	6.3%
	(MIC ≥ 8 μg/ml)	Chickens	Retail Chickens	30	23	34	36	18	33	37	20	42	29	16	20
			Cecal	0.3%	1.1%	1.8%	3.1%	6.0%	3.7%	6.2%	7.9%	9.8%	9.2%	2 6.4%	2 4.3%
		Turkeys	Retail Ground Turkey	1	4	7	12	19	11	19	29	36	36	24 17.2%	17
		ĭ	Cecal	0.3%	0.9%	0.6%	1.0%	0.8%	1.6%	0.8%	1.1%	0.9%	0.0%	5	5 0.5%
		е	Retail Ground Beef	1	3	2	3	2	4	2	3	2	0.078	1.0%	1 0.9%
		Cattle	Cecal (Beef)											3	3
			Cecal (Dairy)	0.09/	0.4%	0.0%	0.09/	0.79/	3.4%	6.8%	0.0%	0.0%	1 20/	2	2
		je	Retail Pork Chops	0.9%	1	0.0%	0.0%	0.7% 1	5	10	0.0%	0.0%	1.2% 2	1.4% 3 4.2%	2.9% 6 3.4%
		Swine	Cecal (Market Swine)											4.2% 5 1.7%	5 1.7%
	Coftwiewene	"	Cecal (Sows)	0.40/	C F0/	10.20/	0.40/	C 40/	44.40/	40.40/	C 40/	12.00/	7.00/	1.7% 2 4.4%	2
	Ceftriaxone (MIC ≥ 4 µg/ml)	Chickens	Retail Chickens	9.1% 36	6.5% 26	10.2% 40	9.1% 38	6.4% 19	11.1% 34	12.4% 39	6.4% 23	12.6% 43	7.8% 30	4.4% 16 4.2%	6.6% 21 2.4%
		_	Cecal	0.3%	1.3%	2.3%	3.1%	6.0%	3.7%	6.9%	8.9%	10.1%	9.7%	2 6.7%	2 4.3%
		Turkeys	Retail Ground Turkey	1	5	9	12	19	11	21	33	37	38	25 6.9%	17 10.0%
		1	Cecal	0.3%	1.5%	1.9%	1.7%	0.8%	1.6%	0.8%	1.1%	0.5%	0.0%	2.2%	5 0.5%
		<u>e</u>	Retail Ground Beef	1	5	6	5	2	4	2	3	1	0.0%	5	1 0.9%
		Cattle	Cecal (Beef)											3	3
			Cecal (Dairy)	0.00/	0.40/	0.50/	0.00/	0.70/	0.40/	0.00/	0.004	0.00/	4.00/	2	2
		ө	Retail Pork Chops	0.9%	0.4% 1	0.5% 1	0.6% 1	0.7% 1	3.4% 5	6.8% 10	0.0%	0.0%	1.2% 2	1.4%	2.9%
		Swine	Cecal (Market Swine)											4.2%	3.4% 5
	0 11 11		Cecal (Sows)	00.40/	44.004	10.10/	40.00/	10.10/	00.00/	40.00/	22.22/	44.00/	07.00/	1.7%	1.7%
Folate Pathway Inhibitors	Sulfamethoxazole/ Sulfisoxazole 1	ickens	Retail Chickens	38.4% 152	41.3% 165	48.1% 189	46.9% 196	42.1% 126	39.2% 120	40.6% 128	38.9% 139	44.3% 151	37.8% 146	39.2% 141	44.5% 141
	(MIC ≥ 512 μg/ml)	Ş	Cecal	E 4 70/	40.40/	10.00/	10.50/	40.00/	54.00/	50.00/	44.704	54.00/	50.00/	37.5% 18	42.9% 36
		Turkeys	Retail Ground Turkey	51.7% 172	48.4% 182	48.0% 190	48.5% 188	48.9% 154	51.0% 153	53.9% 165	44.7% 165	51.9% 191	56.8% 222	50.0% 187	44.8% 178
		1	Cecal	40.00/	40.00/	7.00/	40.50/	0.40/	44.00/	7.70/	40.00/	7.00/	7.40/	55.2% 16	60.0% 30
		Ф	Retail Ground Beef	10.3% 32	13.0% 44	7.0% 22	12.5% 37	9.4% 24	11.6% 29	7.7% 19	12.6% 34	7.9% 17	7.4% 20	7.9%	7.8% 16
		Cattle	Cecal (Beef)											9.2%	12.0% 39
			Cecal (Dairy)	45.407	10.10/	4440/	00.004	44.00/	10.404	44.00/	10.10/	10.00/	0.00/	5.5%	10.7%
		Φ	Retail Pork Chops	15.1% 33	19.4% 45	14.1% 29	20.3% 37	11.8% 18	16.4% 24	14.3% 21	16.4% 30	10.3% 15	6.8% 11	10.1%	7.8% 16
		Swine	Cecal (Market Swine)											19.5% 23	21.2%
			Cecal (Sows)											13.3% 16	13.6% 16
	Trimethoprim- Sulfamethoxazole	Chickens	Retail Chickens	7.1% 28	4.3% 17	7.4% 29	8.9% 37	5.0% 15	3.6% 11	2.2% 7	4.2% 15	2.3% 8	2.6% 10	3.1%	5.1% 16
	(MIC ≥ 4 / 76 μg/ml)		Cecal											4.2%	10.7%
		Turkeys	Retail Ground Turkey	6.9% 23	3.7% 14	5.1% 20	8.0% 31	7.9% 25	5.3% 16	5.9% 18	5.1% 19	4.3% 16	6.1% 24	3.7% 14	2.5%
		Ι'n	Cecal											10.3%	10.0%
			Retail Ground Beef	0.3% 1	0.6% 2	0.6% 2	1.4% 4	1.2% 3	2.0% 5	2.0% 5	0.7% 2	2.3% 5	0.4% 1	1.8%	1.0%
		Cattle	Cecal (Beef)											0.0%	0.9% 3
			Cecal (Dairy)											0.0%	0.6% 1
			Retail Pork Chops	2.8% 6	3.9% 9	1.5% 3	2.2% 4	1.3% 2	6.2% 9	2.7% 4	3.8% 7	3.4% 5	1.9% 3	1.4% 3	2.4% 5
		Swine	Cecal (Market Swine)											3.4% 4	5.5% 8
			Cecal (Sows)											1.7% 2	5.9% 7

Table 63c. Antimicr Year			,	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed	Chickens	Retail Chickens	396	400	393	418	299	306	315	357	341	386	360	317
			Cecal											48	84
		Turkeys	Retail Ground Turkey	333	376	396	388	315	300	306	369	368	391	374	397
		라	Cecal											29	50
		Cattle	Retail Ground Beef Cecal (Beef)	311	338	316	295	256	250	247	269	215	271	227 293	205 326
			Cecal (Dairy)											256	177
		Swine	Retail Pork Chops Cecal (Market Swine)	218	232	205	182	152	146	147	183	146	161	208 118	205 146
		Ś	Cecal (Sows)											120	118
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Macrolides	Breakpoint) Azithromycin	SC	Source Retail Chickens									0.0%	0.0%	0.0%	0.3%
	(MIC ≥32 μg/ml)	Chickens	Cecal									0	0	0 4.2%	1 2.4%
												0.3%	0.8%	2 0.0%	2 0.0%
		Turkeys	Retail Ground Turkey									1	3	0.0%	0.0%
		F	Cecal									0.0%	0.0%	0.9%	0.0%
		Ф	Retail Ground Beef									0.0%	0.0%	2	0
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.4% 1	0.6% 1
			Retail Pork Chops									0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%
Penicillins	Ampicillin (MIC ≥ 32 µg/ml)	suex	Retail Chickens	25.3% 100	17.0% 68	24.7% 97	20.1% 84	18.1% 54	23.5% 72	22.2% 70	16.5% 59	26.4% 90	18.5% 61	20.8% 75	17.4% 55
	(o = 02 µg/)	Chickens	Cecal	100	00	0.	<u> </u>	<u> </u>	, , ,		33	- 55	<u> </u>	31.3% 15	17.9% 15
		ys	Retail Ground Turkey	35.7%	33.2%	38.1%	42.0%	48.3%	58.0%	56.2%	52.6%	51.6%	55.5%	54.0%	57.2%
		Turkeys	Cecal	119	125	151	163	152	174	172	194	190	217	69.0%	227 64.0%
		-	Retail Ground Beef	5.1%	5.3%	3.5%	9.2%	6.6%	6.4%	4.9%	4.8%	3.7%	2.6%	4.8%	32 4.4%
		Cattle		16	18	11	27	17	16	12	13	8	7	11 5.8%	9 5.2%
		Ca												17 3.1%	17 4.5%
			Cecal (Dairy)	13.3%	15.1%	16.1%	15.9%	15.8%	15.1%	11.6%	19.1%	13.0%	13.0%	8 11.5%	8 11.7%
		e e	Retail Pork Chops	29	35	33	29	24	22	17	35	19	21	24	24 17.1%
		Swine	Cecal (Market Swine)											25	25
St. 1.			Cecal (Sows)											13.3%	13.6% 16
Phenicols	Chloramphenicol (MIC ≥ 32 µg/mI)	Chickens	Retail Chickens	0.0% 0	1.8% 7	0.5% 2	2.6% 11	2.0% 6	1.0% 3	0.6% 2	1.4% 5	1.2% 4	0.3% 1	1.7% 6	0.0% 0
		Ş	Cecal											0.0% 0	1.2% 1
		Turkeys	Retail Ground Turkey	3.6% 12	0.8%	4.0% 16	2.3% 9	2.9% 9	3.7% 11	3.3% 10	3.5% 13	4.9% 18	5.9% 23	5.3% 20	3.5% 14
		Ţ	Cecal											0.0%	4.0% 2
			Retail Ground Beef	2.3% 7	3.6% 12	1.6% 5	1.4% 4	3.9% 10	0.8% 2	2.4% 6	2.6% 7	1.4% 3	1.1% 3	4.0%	0.5%
		Cattle	Cecal (Beef)		12	3	4	10	2	0		3	3	3.8%	3.7%
		0	Cecal (Dairy)											2.3%	4.0%
			Retail Pork Chops	4.1%	4.3%	3.4%	6.6%	3.9%	3.4%	4.8%	1.6%	2.7%	3.7%	6 2.4%	7 1.5%
		Swine	Cecal (Market Swine)	9	10	7	12	6	5	7	3	4	6	5.1%	4.8%
		Š												6 5.8%	7 2.5%
Quinolones	Ciprofloxacin	Š	Cecal (Sows)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.6%	0.0%	0.0%	7 0.6%	3 0.3%
	(MIC ≥ 1 μg/ml)	Chickens	Retail Chickens	0	0	0	0	0	0.070	1	2	0	0.070	2 0.0%	1 0.0%
		-	Cecal	0.3%	0.8%	0.0%	0.5%	0.3%	0.0%	0.7%	0.5%	0.0%	0.3%	0.3%	0.0%
		Turkeys	Retail Ground Turkey	1	3	0.0%	2	1	0.0%	2	2	0.0%	1	1	0
		₽	Cecal	0.000	0.000	0.00	0.000	0.00:	0.00:	0.00	0.00	0.000	0.00:	0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.3% 1	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0% 0
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0%	0.6% 1
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.5% 1
		Swine	Cecal (Market Swine)	Ĭ		Ť		Ť		Ť	Ť			1.7%	0.7%
		0)	Cecal (Sows)											0.0%	0.0%
		- 1	i											·	

Table 63d. Antimicrobial Resistance among E. coli Isolates, 2003-2014

Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	d	Chickens	Retail Chickens Cecal	396	400	393	418	299	306	315	357	341	386	360 48	317 84
		Turkeys	Retail Ground Turkey Cecal	333	376	396	388	315	300	306	369	368	391	374 29	397 50
		Cattle	Retail Ground Beef Cecal (Beef) Cecal (Dairy)	311	338	316	295	256	250	247	269	215	271	227 293 256	205 326 177
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	218	232	205	182	152	146	147	183	146	161	208 118 120	205 146 118
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Quinolones	Nalidixic Acid (MIC ≥ 32 μg/mI)	Chickens	Retail Chickens	4.0% 16	7.0% 28	6.6% 26	5.0% 21	3.0% 9	2.9% 9	2.9% 9	3.6% 13	2.3% 8	1.8% 7	2.5% 9	1.9% 6
		Chi	Cecal	44.70/	40.00/	40.40/	5.00/	0.00/	0.70/	0.00/	0.70/	4.00/	4.00/	4.2%	2.4%
		Turkeys	Retail Ground Turkey	11.7% 39	10.6% 40	10.4% 41	5.2% 20	2.2% 7	3.7% 11	2.6% 8	2.7% 10	1.6% 6	1.8% 7	1.9% 7 0.0%	1.5% 6 0.0%
		1	Cecal	1.0%	1.5%	1.3%	0.7%	0.4%	0.4%	0.4%	0.0%	0.0%	1.5%	0.0%	0.0%
		e e	Retail Ground Beef	3	5	4	2	1	1	1	0.0%	0.0%	4	1 0.3%	0.0%
		Cattle	Cecal (Beef)											1 0.4%	1 0.6%
		-	Cecal (Dairy) Retail Pork Chops	0.5%	0.0%	1.5%	0.5%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	1 0.0%	1 0.5%
		Swine	Cecal (Market Swine)	1	0	3	1	0	0	0	1	0	0	0 1.7%	1.4%
		Š	Cecal (Sows)											0.0%	0.0%
Tetracyclines	Tetracycline (MIC ≥ 16 μg/ml)	sues	Retail Chickens	42.9% 170	48.0% 192	46.6% 183	50.5% 211	40.5% 121	43.8% 134	41.6% 131	38.9% 139	40.8% 139	39.4% 152	0 43.3% 156	0 44.2% 140
	(e = 10 pg/)	Chickens	Cecal	11.0	102	100	211	121	10.	101	100	100	102	85.4% 41	48.8% 41
		Turkeys	Retail Ground Turkey	77.8% 259	74.2% 279	78.0% 309	76.5% 297	80.0% 252	85.7% 257	82.0% 251	69.4% 256	79.9% 294	77.2% 302	74.3% 278	74.1% 294
		Turk	Cecal											144.8% 42	84.0% 42
		0	Retail Ground Beef	25.1% 78	22.8% 77	16.5% 52	25.4% 75	21.9% 56	24.0% 60	18.6% 46	22.7% 61	17.7% 38	22.1% 60	22.5% 51	21.5% 44
		Cattle	Cecal (Beef)											41.6% 122	37.4% 122
			Cecal (Dairy)	46 20/	EC 00/	4E 00/	E2 70/	E0.00/	E4 00/	46 00/	44.20/	46.60/	20.40/	14.8% 38	21.5% 38
		Je Je	Retail Pork Chops	46.3% 101	56.0% 130	45.9% 94	52.7% 96	50.0% 76	54.8% 80	46.9% 69	44.3% 81	46.6% 68	39.1% 63	51.4% 107 89.0%	45.9% 94 71.9%
		Swine	Cecal (Market Swine)											89.0% 105 70.0%	71.9% 105 71.2%
			Cecal (Sows)											84	84

Table 64a. Resistance Patt	erns	among E. coli Iso	lates, 200	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	St	Retail Chickens	396	400	393	418	299	306	315	357	341	386	360	317
Number of Isolates Tested	Chickens		330	400	353	410	233	300	313	337	341	300		
	_	Cecal											48	84
	Turkeys	Retail Ground Turkey	333	376	396	388	315	300	306	369	368	391	374	397
	Ē	Cecal											29	50
	tle	Retail Ground Beef	311	338	316	295	256	250	247	269	215	271	227	205
	Cattle	Cecal (Beef) Cecal (Dairy)											293 256	326 177
		Retail Pork Chops	218	232	205	182	152	146	147	183	146	161	208	205
	Swine	Cecal (Market Swine)	2.0	202	200	102	102			100	110		118	146
	S	Cecal (Sows)											120	118
Resistance Pattern		Source	20.5%	20.8%	20.6%	23.7%	29.1%	33.3%	34.3%	33.6%	25.2%	35.8%	30.8%	35.0%
1. No Resistance Detected	Chickens	Retail Chickens	81	83	81	99	87	102	108	120	86	138	111	111
	Ş	Cecal											39.6% 19	23.8% 20
	ys	Retail Ground Turkey	15.9%	19.1%	16.2%	16.0%	13.0%	8.3%	11.8%	17.3%	13.3%	13.3%	14.4%	16.9%
	Turkeys	Cecal	53	72	64	62	41	25	36	64	49	52	54 17.2%	67 10.0%
	Ë	Cecai	70.7%	73.1%	80.1%	71.5%	77.0%	73.2%	78.1%	76.6%	79.5%	75.6%	5 76.7%	5 77.1%
	_	Retail Ground Beef	70.7% 220	247	253	211	197	183	193	206	79.5% 171	205	174	158
	Cattle	Cecal (Beef)											73.0% 214	60.4% 197
	Ī	Cecal (Dairy)											82.8%	76.3%
	\vdash		50.0%	37.9%	50.2%	42.9%	48.0%	43.8%	51.0%	50.8%	52.1%	56.5%	212 46.2%	135 50.7%
	φ	Retail Pork Chops	109	88	103	78	73	64	75	93	76	91	96	104
	Swine	Cecal (Market Swine)											33.9% 40	23.3% 34
		Cecal (Sows)											27.5% 33	27.1% 32
2. Resistance to ≥ 3	SL	Retail Chickens	38.4%	35.3%	44.8%	42.8%	33.8%	36.6%	37.5%	28.0%	37.2%	29.8%	30.8%	36.0%
Antimicrobial Classes	Chickens		152	141	176	179	101	112	118	100	127	115	111 16.7%	114 35.7%
	ō	Cecal											8	30
	Turkeys	Retail Ground Turkey	52.6% 175	51.6% 194	52.0% 206	53.9% 209	56.5% 178	63.3% 190	65.0% 199	55.0% 203	63.9% 235	67.8% 265	58.8% 220	53.7% 213
	Ę	Cecal											62.1% 18	66.0% 33
		Retail Ground Beef	6.4%	10.4%	5.4%	10.8%	9.0%	11.2%	6.9%	11.2%	5.6%	9.2%	7.9%	8.3%
	a te		20	35	17	32	23	28	17	30	12	25	18 8.2%	17 10.1%
	Cattle	Cecal (Beef)											24	33
		Cecal (Dairy)											6.3% 16	11.9% 21
		Retail Pork Chops	15.1% 33	21.1% 49	15.6% 32	15.9% 29	14.5% 22	17.8% 26	14.3% 21	16.4% 30	8.9% 13	11.2%	13.0% 27	9.8% 20
	Swine	Cecal (Market Swine)	33	49	32	29	22	20	21	30	13	18	21.2%	21.9%
	Š												25 21.7%	32 16.9%
		Cecal (Sows)											26	20
3. Resistant to ≥ 4 Antimicrobial Classes	suex	Retail Chickens	11.1% 44	12.5% 50	12.0% 47	14.6% 61	10.4% 31	13.7% 42	13.7% 43	10.6% 38	13.5% 46	7.5% 29	9.2% 33	10.7% 34
	Chickens	Cecal											4.2%	7.1%
	s	Retail Ground Turkey	26.1%	24.5%	24.0%	25.3%	26.7%	32.3%	38.6%	27.4%	33.7%	37.9%	2 31.0%	6 34.0%
	Turkeys		87	92	95	98	84	97	118	101	124	148	116 37.9%	135 44.0%
	ľ	Cecal	0.00:	4 70:	4.001	E 051	4 70:	1.001	0.051	0.00:	4.00:	4.461	11	22
		Retail Ground Beef	3.9% 12	4.7% 16	1.9% 6	5.8% 17	4.7% 12	4.0% 10	3.6% 9	3.0% 8	1.9% 4	1.1% 3	4.8% 11	2.4% 5
	Cattle	Cecal (Beef)											3.4% 10	4.6% 15
	آ	Cecal (Dairy)											3.1%	4.5%
		Retail Pork Chops	6.0%	6.5%	3.4%	7.1%	2.6%	6.8%	9.5%	5.5%	2.1%	3.7%	2.9%	3.4%
	<u>e</u>	Retail Fork Chops	13	15	7	13	4	10	14	10	3	6	6.8%	7
	Swine	Cecal (Market Swine)											8	8.2% 12
		Cecal (Sows)											9.2% 11	6.8% 8
4. Resistant to ≥ 5	su	Retail Chickens	5.6%	6.0%	5.6%	7.2%	5.7%	8.2%	6.3%	4.5%	6.5%	3.1%	2.8%	4.7%
Antimicrobial Classes	Chickens	01	22	24	22	30	17	25	20	16	22	12	10 2.1%	15 4.8%
	0	Cecal	7.00/	0.00/	0.00/	5.40/	4.40/	0.00/	7.00/	0.504	40.00/	44.00/	1	4
	Turkeys	Retail Ground Turkey	7.8% 26	6.9% 26	6.3% 25	5.4% 21	4.1% 13	6.3% 19	7.8% 24	6.5% 24	10.9% 40	11.8% 46	9.4% 35	5.8% 23
	Ę	Cecal											3.4% 1	12.0% 6
		Retail Ground Beef	1.9%	2.7%	0.9%	2.4%	0.4%	2.0%	1.2%	0.7%	0.9%	0.4%	2.2%	0.5%
	æ #		6	9	3	7	1	5	3	2	2	1	5 0.7%	1 2.5%
	Cattle	Cecal (Beef)											2	8
	L	Cecal (Dairy)											2.0% 5	2.3% 4
		Retail Pork Chops	2.8%	1.7%	1.5%	2.7%	0.7%	4.1%	5.4%	1.1%	0.0%	1.2%	1.0%	1.5%
	Swine	Cecal (Market Swine)	6	4	3	5	1	6	8	2	0	2	3.4%	3.4%
	ŵ												4 2.5%	5 0.0%
		Cecal (Sows) antimicrobial classes w											3	0

Starting in 2011, testing included nine antimicrobial classes with the addition of the macrolide azithromycin. Because resistance to azithromycin is low (in this case, <1%), antimicrobial class resistance data from 2011 and beyond are comparable to the data from previous years.

Table 64b. Resistance Patterns among E. coli Isolates, 2003-2014

Table 64b. Resistance Patt	erns	among <i>E. coli</i> Iso												
Year	S	Retail Chieling	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	Chickens	Retail Chickens	396	400	393	418	299	306	315	357	341	386	360	317
		Cecal											48	84
	Turkeys	Retail Ground Turkey	333	376	396	388	315	300	306	369	368	391	374	397
	1	Cecal											29	50
	Cattle	Retail Ground Beef	311	338	316	295	256	250	247	269	215	271	227 293	205
	S	Cecal (Beef) Cecal (Dairy)											293	326 177
		Retail Pork Chops	218	232	205	182	152	146	147	183	146	161	208	205
	Swine	Cecal (Market Swine)	210	202	203	102	132	140	147	103	140	101	118	146
	S	Cecal (Sows)											120	118
Resistance Pattern 5. At Least ACSSuT ¹ Resistant	"0	Source	0.0%	1.3%	0.3%	1.4%	2.0%	1.0%	0.6%	1.1%	1.2%	0.3%	0.8%	0.0%
	Chickens	Retail Chickens	0	5	1	6	6	3	2	4	4	1	3 0.0%	0 1.2%
	ర్	Cecal											0	1
	Turkeys	Retail Ground Turkey	2.7% 9	0.5% 2	1.8% 7	0.8%	1.9% 6	2.0% 6	2.3% 7	2.2% 8	3.0% 11	5.1% 20	3.2% 12	2.0% 8
	Ę	Cecal											0.0%	2.0%
		Retail Ground Beef	1.0%	1.5% 5	0.6% 2	0.3% 1	0.4% 1	0.0%	0.0%	0.4% 1	0.9% 2	0.0% 0	2.2% 5	0.5%
	Cattle	Cecal (Beef)	3	3	2	1	1	0	U	1		0	0.7%	1.8%
	0	Cecal (Dairy)											1.2%	6 2.3%
	<u> </u>		1.4%	1.3%	1.0%	1.1%	0.7%	1.4%	2.0%	0.5%	0.0%	0.6%	3 0.5%	4 0.5%
	e e	Retail Pork Chops	3	3	2	2	1	2	3	1	0	1	0.8%	0.0%
	Swine	Cecal (Market Swine)											1.7%	0.0%
		Cecal (Sows)											2	0
6. At Least ACT/S ² Resistant	Chickens	Retail Chickens	0.0%	0.3% 1	0.0% 0	0.0% 0	0.3% 1	0.0% 0	0.0% 0	0.3% 1	0.0% 0	0.0% 0	0.8% 3	0.0% 0
	Sign	Cecal											0.0%	0.0%
	sys	Retail Ground Turkey	0.9% 3	0.0% 0	0.8%	0.3%	0.3% 1	0.0% 0	0.3% 1	1.1% 4	0.0% 0	1.0% 4	0.3%	0.3%
	Turkeys	Cecal	J	Ü	J	·		Ü	·		Ů		0.0%	2.0%
	┢	Retail Ground Beef	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%
	Cattle	Cecal (Beef)	0	0	1	1	0	0	0	0	0	0	0.0%	0.0%
	ပိ												0.0%	0.0%
	<u> </u>	Cecal (Dairy)	0.0%	0.4%	0.5%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.6%	0.5%	0.5%
	9	Retail Pork Chops	0	1	1	0	0	0	1	0	0	1	1 0.8%	1 0.0%
	Swine	Cecal (Market Swine)											1	0
		Cecal (Sows)											0.8% 1	0.8% 1
7. At Least ACSSuTAuCx ³ Resistant	ens	Retail Chickens	0.0%	1.0%	0.3%	1.0%	0.7% 2	0.7% 2	0.6%	0.8%	1.2% 4	0.3%	0.0%	0.0%
	Chickens	Cecal											0.0%	1.2% 1
	ys	Retail Ground Turkey	0.3%	0.0%	0.3%	0.0%	1.3%	1.3%	1.0%	1.1%	2.2%	1.0%	0.3%	0.5%
	Turke	Cecal	1	0	1	0	4	4	3	4	8	4	0.0%	0.0%
	⊩	Retail Ground Beef	0.0%	0.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	1.3%	0.0%
	Cattle		0	3	1	0	0	0	0	1	0	0	0.0%	0.3%
	Ca	Cecal (Beef)											0.4%	1 0.0%
	<u> </u>	Cecal (Dairy)											1	0
		Retail Pork Chops	0.5% 1	0.4% 1	0.0% 0	0.0%	0.7% 1	0.7% 1	2.0%	0.0%	0.0%	0.6% 1	0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)											0.0%	0.0% 0
		Cecal (Sows)											0.0%	0.0%
8. At Least Ceftriaxone and Nalidixic Acid Resistant	ens	Retail Chickens	0.5% 2	1.5% 6	0.3% 1	0.2%	0.0%	1.0%	1.0%	0.3% 1	0.0%	0.5% 2	0.3%	0.3%
Hallakie Acia Resistant	Chickens	Cecal			•	1		3	3	1	Ü		0.0%	0.0%
	-	Retail Ground Turkey	0.3%	0.3%	0.3%	0.0%	0.6%	0.0%	0.0%	0.0%	0.3%	0.8%	0.0%	0.3%
	Turkeys	Cecal	1	1	1	0	2	0	0	0	1	3	0.0%	0.0%
	Ë	Retail Ground Beef	0.0%	0.3%	0.3%	0.3%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
	te te		0	1	1	1	0	0	1	0	0	0	0.0%	0.0%
	Cattle	Cecal (Beef)											0	0
	<u> </u>	Cecal (Dairy)											0.0%	0.6%
		Retail Pork Chops	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.7% 1
	0,	Cecal (Sows)											0.0%	0.0%
¹ ACSSuT – ampicillin, chloramph	1												0	0

ACSSUT = ampicillin, chloramphenicol, streptomycin, sulfamethoxazole/sulfisoxazole, and tetracycline

ACT/S = ampicillin, chloramphenicol, and trimethoprim-sulfamethoxazole

ACSSUTAUCx = ACSSUT, amoxicillin-clavulanic acid, and ceftriaxone

		Resistance to Selected βε										oution (%				22	64	120	250	E42 400
Antimicrobial Class	Antimicrobial Agent	(# of Isolates)	%l ¹ (or S-DD ²)	%R ³	[95% CI] ⁴	0.015 0.03	0.06	0.125	0.25	0.50	1	2	4	8	16	32	64	128	256	512 1024
β-Lactam/β-Lactamase Inhibitor Combinations	Piperacillin-tazobactam	Retail Chickens (21)	0.0	0.0	[0.0 - 16.1]							23.8	61.9	14.3						
		Retail Ground Turkey (17)	0.0	0.0	[0.0 - 19.5]					5.9	11.8	23.5	47.1	11.8						
		Retail Ground Beef (1)	0.0	0.0	[0.0 - 97.5]								100.0							
		Retail Pork Chops (6)	0.0	0.0	[0.0 - 45.9]								66.7	33.3						
Cephems	Cefepime	Retail Chickens (21)	0.0	0.0	[0.0 - 16.1]			4.8	66.7	23.8	4.8									
		Retail Ground Turkey (17)	5.9	0.0	[0.0 - 19.5]		5.9	11.8	47.1	17.6	11.8		5.9							
		Retail Ground Beef (1)	0.0	0.0	[0.0 - 97.5]				100.0											
		Retail Pork Chops (6)	0.0	0.0	[0.0 - 45.9]				66.7	33.3										
	Cefotaxime	Retail Chickens (21)	0.0	100.0	[83.9 - 100.0]								9.5	61.9	14.3	14.3				
		Retail Ground Turkey (17)	0.0	100.0	[80.5 - 100.0]		5.9						5.9	47.1	29.4	11.8				
		Retail Ground Beef (1)	0.0	100.0	[2.5 - 100.0]									100.0						
		Retail Pork Chops (6)	0.0	100.0	[54.1 - 100.0]									50.0	33.3	16.7				
	Ceftazidime	Retail Chickens (21)	38.1	61.9	[38.4 - 81.9]									38.1	52.4	9.5				
		Retail Ground Turkey (17)	47.1	41.2	[18.4 - 67.1]			5.9		5.9				47.1	29.4	11.8				
		Retail Ground Beef (1)	100.0	0.0	[0.0 - 97.5]									100.0						
		Retail Pork Chops (6)	0.0	100.0	[54.1 - 100.0]										83.3	16.7				
Monobactam	Aztreonam	Retail Chickens (21)	38.1	4.8	[0.1 - 23.8]							4.8	52.4	38.1		4.8				
		Retail Ground Turkey (17)	35.3	5.9	[0.1 - 28.7]		5.9					5.9	47.1	35.3	5.9					
		Retail Ground Beef (1)	0.0	0.0	[0.0 - 97.5]								100.0							
		Retail Pork Chops (6)	50.0	0.0	[0.0 - 45.9]								50.0	50.0						
Penems	Imipenem	Retail Chickens (21)	0.0	0.0	[0.0 - 16.1]			14.3	85.7											
		Retail Ground Turkey (17)	0.0	0.0	[0.0 - 19.5]				11.8	88.2										
		Retail Ground Beef (1)	0.0	0.0	[0.0 - 97.5]				100.0											
		Retail Pork Chops (6)	0.0	0.0	[0.0 - 45.9]			16.7	83.3											

Percent of isolates with intermediate susceptibility

Percent of isolates that are susceptible-dose dependent (S-DD). Cefepime MIC's above the susceptible range but below the resistant range are designed by CLSi to be S-DD.

Percent of isolates that are susceptible-dose dependent (S-DD). Cefepime MIC's above the susceptible range but below the resistant range are designed by CLSi to be S-DD.

Percent of isolates with resistance. Discrepancies between %R and sums of distribution %s, to the right of the double vertical bars, are due to rounding

PS% confidence intervals for percent resistant (%R) were calculated using the Clooper-Pearson exact method

The unshaded areas indicate the range of dillutions tested for each antimicrobial. Single vertical bars indicate the breakpoints for resistance. Numbers in the shaded areas indicate the percentages of isolates with MICs greater than the highest tested concentrations. Numbers listed for the lowest tested concentrations represent the percentages of isolates with MICs equal to or less than the lowest tested concentration.

Enterococcus Data

Enterococcus Isolates Tested

Table 66. Number of Enterococcus Isolates Tested, 2002-2014

								Ye	ar					
	Source	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
kens	Retail Chickens	381	466	466	457	469	339	348	349	439	433	456	439	411
Chickens	Cecal												46	100
Turkeys	Retail Ground Turkey	387	418	437	452	435	329	343	328	417	435	460	457	466
Tur	Cecal												30	60
0	Retail Ground Beef	383	432	448	447	438	334	337	327	415	423	453	454	438
Cattle	Cecal (Beef)												261	406
	Cecal (Dairy)												256	227
_O	Retail Pork Chops	369	426	404	409	389	310	309	303	406	383	416	391	416
Swine	Cecal (Market Swine)												107	166
S	Cecal (Sows)												102	130

Isolation of Enterococcus from Retail Meats

Table 67. Number and Percent of Retail Meat Samples Culture Positive for *Enterococcus*, 2014

	Retail Chickens	Retail Ground Turkey	Retail Ground Beef	Retail Pork Chops
Number of Meat Samples Tested	480	479	480	480
Number Positive for Enterococcus	411	466	438	416
Percent Positive for Enterococcus	85.6%	97.3%	91.3%	86.7%

Figure 11. Percent of Retail Meat Samples Culture Positive for Enterococcus, 2014

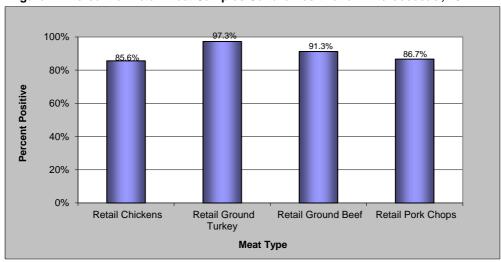
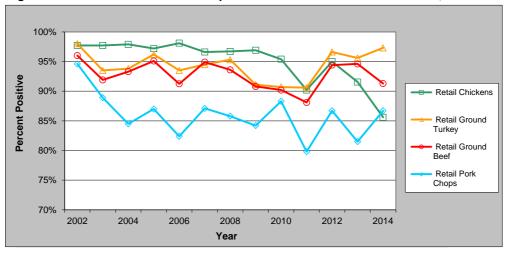


Figure 12. Percent of Retail Meat Samples Culture Positive for Enterococcus, 2002-2014



Enterococcus Species

Table 68. Enterococcus Species Isolated, 2014

	Chic	kens	Turke	eys		Cattle			Swine	
	Retail Chickens (n=411)	Cecal (n=100)	Retail Ground Turkey (n=466)	Cecal (n=60)	Retail Ground Beef (n=438)	Cecal (Beef) (n=406)	Cecal (Dairy) (n=227)	Retail Pork Chops (n=416)	Cecal (Market Swine) (n=166)	Cecal (Sows) (n=130)
Enterococcus Species										
E. faecalis	50.9% 209	72.0% 72	85.8% 400	80.0% 48	71.5% 313	9.6% 39	23.8% 54	85.3% 355	48.2% 80	51.5% 67
E. faecium	37.2% 153	14.0% 14	12.2% 57	6.7% 4	13.7% 60	11.6% 47	12.3% 28	9.6% 40	12.7% 21	11.5% 15
E. hirae	8.0% 33	3.0% 3	0.4% 2	1.7% 1	9.4% 41	48.3% 196	33.0% 75	1.9% 8	30.7% 51	24.6% 32
E. durans	0.7% 3	8.0% 8	0.0% 0	3.3% 2	3.2% 14	9.1% 37	9.3% 21	1.4% 6	4.2% 7	4.6% 6
E. gallinarum	1.7% 7	1.0% 1	0.9% 4	3.3%	0.5% 2	3.2% 13	6.6% 15	0.0% 0	1.8% 3	3.1% 4
E. avium	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%
E. casseliflavus	0.2%	0.0%	0.0%	0.0%	0.0%	4.4%	4.4% 10	0.0%	0.6%	0.8%
E. mundtii	0.0% 0	0.0%	0.0%	3.3%	0.0%	6.4%	5.7%	0.0%	0.6%	0.8%
Enterococcus spp.	1.2%	2.0%	0.6%	0.0%	1.8% 8	7.1% 29	4.8% 11	1.7% 7	0.6%	3.1%

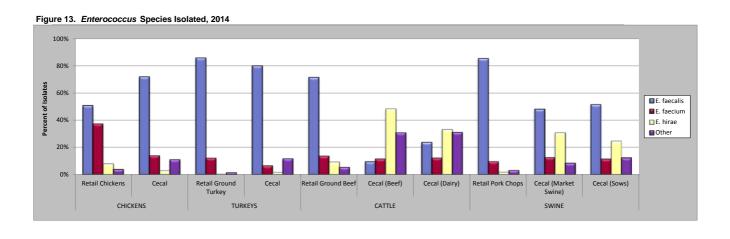


Table 69a. Distribution of MICs and Occurrence among Enterococcus faecalis Isolates, 2014

Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.015	0.03	0.06	0.125	0.25	0.50	1	Dist 2	tribution 4	(%) Of N	16	32	64	128	256	512	1024	2048	>2048
Aminoglycosides	Gentamicin	Retail Chickens (209)	N/A	26.8	[20.9 - 33.3]														73.2			3.8	23.0	
		5 Cecal (72)	N/A	31.9	[21.4 - 44.0]														65.3	2.8	4.2	12.5	15.3	
		Retail Ground Turkey (400)	N/A	34.0	[29.4 - 38.9]														65.5	0.5		0.8	33.3	
		E Cecal (48)	N/A	41.7	[27.6 - 56.8]														58.3	0.0		2.1	39.6	
		Potnil Ground Poof (212)	N/A	0.0	[0.0 - 1.2]														100.0					
		Cecal (Beef) (39)	N/A	0.0	[0.0 - 9.0]														100.0					
		Cecal (Dairy) (54)	N/A	0.0	[0.0 - 6.6]														98.2	1.9				
		Retail (355)	N/A	2.8	[1.4 - 5.1]														96.9	0.3		0.9	2.0	
		Cecal (Market Swine) (80) Cecal (Sows) (67)	N/A N/A	7.5 7.5	[2.8 - 15.6] [2.5 - 16.6]														85.0 86.6	7.5 6.0	1.2 1.5	6.2 3.0	3.0	
	Kanamycin	Retail Chickens (209)	N/A	29.7	[23.6 - 36.4]														70.3	0.0	1.0	1	29.7	
	Remainyour	S Cecal (72)	N/A	40.3	[28.9 - 52.5]														56.9	1.4	1.4	4.2	36.1	
		-	-																					
		Retail Ground Turkey (400)	N/A	42.0	[37.1 - 47.0]														57.8	0.3		0.3	41.8	
		Cecal (48)	N/A	62.5	[47.4 - 76.0]														35.4	2.1			62.5	
		Retail Ground Beef (313) Cecal (Beef) (39)	N/A N/A	0.0	[0.0 - 1.2] [0.0 - 9.0]														100.0 94.9	5.1				
		Cecal (Dairy) (54)	N/A	1.9	[0.0 - 9.9]														98.2	5.1			1.9	
		_Φ Retail (355)	N/A	4.2	[2.4 - 6.9]														95.5	0.3			4.2	
		⊂ Cecal (Market Swine) (80)	N/A	27.5	[18.1 - 38.6]														70.0	2.5			27.5	
		Cecal (Sows) (67)	N/A	28.4	[18.0 - 40.7]														68.7	1.5	1.5		28.4	
	Streptomycin	Retail Chickens (209)	N/A	21.1	[15.7 - 27.2]																79.0	2.9	2.4	15.8
		Cecal (72)	N/A	18.1	[10.0 - 28.9]																81.9	1.4	9.7	6.9
		Retail Ground Turkey (400)	N/A	23.3	[19.2 - 27.7]																76.8	1.0	1.5	20.8
		Cecal (48)	N/A	47.9	[33.3 - 62.8]																52.1	4.2	6.3	37.5
		Retail Ground Beef (313)	N/A	1.6	[0.5 - 3.7]																98.4		1.6	
		Cecal (Beef) (39)	N/A	0.0	[0.0 - 9.0]																100.0			
		Cecal (Dairy) (54)	N/A	5.6	[1.2 - 15.4]																94.4	1.9	3.7	
		Retail (355) Cecal (Market Swine) (80)	N/A N/A	4.5 26.3	[2.6 - 7.2] [17.0 - 37.3]																95.5 73.8	0.3 1.3	1.1 8.8	3.1 16.3
		Cecal (Market Swine) (80) Cecal (Sows) (67)	N/A	31.3	[20.6 - 43.8]																68.7	3.0	16.42	
Glycopeptides	Vancomycin	Retail Chickens (209)	0.0	0.0	[0.0 - 1.7]							72.3	25.8	1.9										
		호 C Cecal (72)	0.0	0.0	[0.0 - 5.0]					2.8	5.6	65.3	26.4											
		Retail Ground Turkey (400)	0.0	0.0	[0.0 - 0.9]						0.5	66.3	31.0	2.3										
		Cecal (48)	0.0	0.0	[0.0 - 7.4]						0.0	87.5	10.4	2.1										
		Retail Ground Beef (313)	0.0	0.0	[0.0 - 1.2]						0.6	69.3	28.8	1.3										
		Cecal (Beef) (39)	0.0	0.0	[0.0 - 1.2]					2.6	15.4	53.9	23.1	5.1										
		Cecal (Dairy) (54)	0.0	0.0	[0.0 - 6.6]						3.7	70.4	25.9											
		Retail (355)	0.0	0.0	[0.0 - 1.0]					0.3	1.1	63.7	34.7	0.3										
		Cecal (Market Swine) (80) Cecal (Sows) (67)	0.0	0.0	[0.0 - 4.5]						3.8 1.5	63.8 80.6	32.5 17.9											
	Time avaling	Retail Chickens (209)			[0.0 - 5.4]	0.5		2.4	20.4	67.0	1.5	80.0	17.5											
	Tigecycline	š	N/A	0.0	[0.0 - 1.7]	0.5		2.4	30.1	67.0														
		G Cecal (72)	N/A	0.0	[0.0 - 5.0]		12.5	40.3	41.7	5.6														
		Retail Ground Turkey (400)	N/A	0.3	[0.0 - 1.4]			0.3	31.8	67.8	0.3													
		E Cecal (48)	N/A	0.0	[0.0 - 7.4]		16.7	39.6	27.1	16.7														
		Retail Ground Beef (313)	N/A	0.0	[0.0 - 1.2]			8.0	35.8	56.2														
		Cecal (Beef) (39) Cecal (Dairy) (54)	N/A N/A	0.0	[0.0 - 9.0] [0.0 - 6.6]	2.6 1.9	20.5 25.9	23.1	35.9 35.2	17.9 16.7														
		Retail (355)	N/A	1.4	[0.5 - 3.3]			0.6	31.8	66.2	1.4													
		Cecal (Market Swine) (80)	N/A	0.0	[0.0 - 4.5]		15.0	27.5	43.8	13.8														
		Cecal (Sows) (67)	N/A	0.0	[0.0 - 5.4]		11.9	35.8	41.8	10.5														
Lincosamides	Lincomycin	Retail Chickens (209)	0.0	100.0	[98.3 - 100.0]										0.5	99.5								
		Cecal (72)	0.0	100.0	[95.0 - 100.0]										2.8	97.2								
		Retail Ground Turkey (400)	0.0	99.0	[97.5 - 99.7]							1.0			0.3	98.8								
		본 Cecal (48)	0.0	100.0	[92.6 - 100.0]										4.2	95.8								
		Retail Ground Beef (313)	0.0	98.1	[95.9 - 99.3]							1.9			0.3	97.8								
		Cecal (Beef) (39)	2.6	94.9	[82.7 - 99.4]							2.6		2.6	12.8	82.1								
		O																						
		Cecal (Dairy) (54)	0.0	98.1	[90.1 - 100.0]							1.9			1.9	96.3								
		Cecal (Dairy) (54) Retail (355) Cecal (Market Swine) (80)	0.0	98.1 98.0 98.8	[90.1 - 100.0] [96.0 - 99.2] [93.2 - 100.0]							1.9 2.0 1.3			1.9 0.6 1.3	96.3 97.5 97.5								

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

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

35% confidence intervals for percent resistance. Percent resistance in (%R) were calculated using the Clopper-Pearson exact method.

4The unshaded areas indicate the dilution range of the Sensitire plates used to test isolates. Single vertical lines indicate the breakpoints for susceptibility, while double vertical lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's equal to or less than the lowest tested concentrations on the plate. Numbers is itself of the lowest tested concentrations or susceptibility, while double vertical lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's equal to or less than the lowest tested concentration.

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

Table 69b. Distribution of MICs and Occurrence among Enterococcus faecalis Isolates, 2014

Table 69b. Distribu	ition of Mics and C	occurrence among <i>En</i>	teroco	occus	raecalis is	olates, 2	2014									4						
Antimicrobial Class	Antimicrobial Agent	Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.015 0.0	03 0.	.06 0.125	0.25	0.50	1	Dis	tribution 4	(%) of I 8	AICs (µg 16	/ml)* 32	64	128	256	512	1024	2048 >2048
Lipopeptides	Daptomycin	Retail Chickens (209)	N/A	0.0	[0.0 - 1.7]					1.4	52.6	40.2	5.7									
		S Cecal (72)	N/A	0.0	[0.0 - 5.0]				2.8	8.3	66.7	20.8	1.4									
			N/A																			
		Retail Ground Turkey (400)	N/A	0.0	[0.0 - 0.9]					1.0	52.8 81.3	42.8 2.1	3.5									
		Cecal (48)	N/A		[0.0 - 7.4]								2.2									
		Retail Ground Beef (313)	N/A	0.0 2.6	[0.0 - 1.2] [0.1 - 13.5]				0.3	2.6	46.3 48.7	47.6 35.9	3.2 12.8	2.6								
		Cecal (Dairy) (54)	N/A	1.9	[0.0 - 9.9]						50.0	42.6	5.6	1.9								
		Retail (355)	N/A	0.3	[0.0 - 1.6]					2.5	51.3	40.6	5.4	0.3								
		Cecal (Market Swine) (80) Cecal (Sows) (67)	N/A N/A	1.3 0.0	[0.0 - 6.8]				1.5	1.3	63.8 56.7	30.0 37.3	3.8			1.3						
Magratidas	For the complete				[0.0 - 5.4]				1.5				3.0	37.3								
Macrolides	Erythromicin	Š	35.9	37.3	[30.7 - 44.3]				21.5	5.3	24.9	11.0			47.0							
		ਦ Cecal (72)	20.9	51.4	[39.3 - 63.3]				19.4	8.3	16.7	4.2		4.2	47.2							
		Retail Ground Turkey (400)	40.3	36.0	[31.3 - 40.9]				15.0	8.8	27.8	12.5		36.0								
		트 Cecal (48)	20.9	54.2	[39.2 - 68.6]				18.8	6.3	14.6	2.1	4.2	10.4	43.8							
		Retail Ground Beef (313)	62.0 35.9	0.3 7.7	[0.0 - 1.8]				24.0	13.7	39.6 28.2	18.9 7.7	3.5	0.3 2.6	5.1							
		Cecal (Dairy) (54)	48.1	1.9	[1.6 - 20.9] [0.0 - 9.9]				46.2 25.9	10.3 24.1	40.7	7.4		2.0	1.9							
		Retail (355)	69.4	7.0	[4.6 - 10.2]				11.3	12.4	38.6	25.4	5.4	7.0								
		Cecal (Market Swine) (80)	15.0	57.5	[45.9 - 68.5]				12.5	15.0	15.0			1.3	56.3							
		Cecal (Sows) (67)	16.4	64.2	[51.5 - 75.5]				11.9	7.5	14.9	1.5		1.5	62.7	1						
	Tylosin	Retail Chickens (209)	0.0	37.3	[30.7 - 44.3]					1.0	12.0	49.3	0.5			37.3						
		ੁੱ Cecal (72)	0.0	52.8	[40.7 - 64.7]					1.4	30.6	13.9	1.4				52.8					
		Retail Ground Turkey (400)	0.0	36.0	[31.3 - 40.9]						20.0	43.5	0.5			36.0						
		Cecal (48)	0.0	58.3	[43.2 - 72.4]						25.0	14.6	2.1				58.3					
		Retail Ground Beef (313)	0.3	0.6	[0.1 - 2.3]						32.2	65.8	1.0		0.3	0.6						
		E Cecal (Beef) (39) Cecal (Dairy) (54)	0.0	7.7	[1.6 - 20.9]						56.4	35.9 46.3					7.7 1.9					
		Retail (355)	0.0	1.9 7.3	[0.0 - 9.9] [4.8 - 10.5]					0.9	51.9 23.4	67.6		0.9		7.3	1.5					
		Cecal (Market Swine) (80)	0.0	57.5	[45.9 - 68.5]					0.5	25.0	16.3	1.3	0.5		7.5	57.5					
		Cecal (Sows) (67)	0.0	64.2	[51.5 - 75.5]						28.4	7.5					64.2					
Nitrofurans	Nitrofurantoin	Retail Chickens (209)	3.4	0.0	[0.0 - 1.7]									18.7	77.0	1.0	3.4					
		Cecal (72)	6.9	1.4	[0.0 - 7.5]							1.4		38.9	47.2	4.2	6.9	1.4				
		Retail Ground Turkey (400)	1.5	0.3	[0.0 - 1.4]									27.0	70.3	1.0	1.5	0.3				
		는 Cecal (48)	0.0	2.1	[0.1 - 11.1]									60.4	37.5			2.1				
		Retail Ground Beef (313)	0.6	0.0	[0.0 - 1.2]								0.3	19.8	78.3	1.0	0.6					
		Cecal (Beef) (39)	5.1	0.0	[0.0 - 9.0]									25.6	56.4	12.8	5.1					
		Cecal (Dairy) (54) Retail (355)	- 5.6	0.0	[0.0 - 6.6]									22.2	68.5 77.8	3.7	5.6					
		Cecal (Market Swine) (80)	1.7 2.5	0.0	[0.0 - 1.0] [0.0 - 4.5]									20.3 31.3	65.0	0.3 1.3	1.7 2.5					
		O Cecal (Sows) (67)	1.5	0.0	[0.0 - 5.4]									49.3	46.3	3.0	1.5					
Oxazolidinones	Linezolid	Retail Chickens (209)	0.0	0.0	[0.0 - 1.7]						34.9	65.1										
		G Cecal (72)	0.0	0.0	[0.0 - 5.0]					22.2	72.2	5.6										
		Retail Ground Turkey (400)	0.0	0.0	[0.0 - 0.9]					0.3	43.0	56.8										
		Cecal (48)	0.0	0.0	[0.0 - 7.4]					14.6	81.3	4.2										
		_Φ Retail Ground Beef (313)	0.0	0.0	[0.0 - 1.2]						13.7	86.3										
		Cecal (Beef) (39)	0.0	2.6	[0.1 - 13.5]						76.9	7.7		2.6								
		Cecal (Dairy) (54)	0.0	0.0	[0.0 - 6.6]					3.7	77.8	18.5										
		Retail (355) Cecal (Market Swine) (80)	0.0	0.0	[0.0 - 1.0] [0.0 - 4.5]					6.3	13.2 86.3	86.8 7.5										
		Cecal (Sows) (67)	0.0	0.0	[0.0 - 5.4]					1.5	85.1	13.4										
Penicillins	Penicillin	Retail Chickens (209)	N/A	0.0	[0.0 - 1.7]						0.5	18.7	80.4	0.5								
		ତି Cecal (72)	N/A	0.0	[0.0 - 5.0]				2.8	1.4		25.0	70.8									
		Retail Ground Turkey (400)	N/A	0.5	[0.1 - 1.8]						2.3	21.5	75.5	0.3	0.5							
		폴 드 Cecal (48)	N/A	0.0	[0.0 - 7.4]							39.6	60.4									
		Retail Ground Beef (313)	N/A	0.0	[0.0 - 1.2]				0.3			25.9	73.8									
		Cecal (Beef) (39)	N/A	0.0	[0.0 - 9.0]				2.6	7.7	7.7	15.4	66.7									
		Cecal (Dairy) (54)	N/A	0.0	[0.0 - 6.6]				1.9			20.4	77.8									
		Retail (355) Cecal (Market Swine) (80)	N/A N/A	0.0	[0.0 - 1.0] [0.0 - 4.5]				0.3 1.3		1.3	27.0 18.8	72.4 78.8	0.3								
		Cecal (Sows) (67)	N/A	0.0	[0.0 - 5.4]						0	11.9	88.1									

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

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

3 95% confidence intervals for percent resistance. Discrepancies between %R and sums of distribution %s are due to rounding. Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

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

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

Table 69c. Distribution of MICs and Occurrence among Enterococcus faecalis Isolates, 2014

		Isolate Source				,						Dis	tribution	(%) of N	IICs (µg/	/ml) ⁴						
Antimicrobial Class	Antimicrobial Agent	(# of Isolates)	%l 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 >204
Phenicols	Chloramphenicol	Retail Chickens (209)	1.9	1.4	[0.3 - 4.1]								3.8	92.8	1.9	1.4						
		ਦੇ Cecal (72)	0.0	1.4	[0.0 - 7.5]							5.6	83.3	9.7			1.4					
		Retail Ground Turkey (400)	0.0	0.5	[0.1 - 1.8]								5.3	94.3		0.5						
		E Cecal (48)	2.1	2.1	[0.1 - 11.1]							6.3	77.1	12.5	2.1		2.1					
		Retail Ground Beef (313)	0.0	0.3	[0.0 - 1.8]								7.4	92.3		0.3						
		Cecal (Beef) (39)	0.0	2.6	[0.1 - 13.5]							7.7	82.1	7.7			2.6					
		Cecal (Dairy) (54)	0.0	0.0	[0.0 - 6.6]							1.9	88.9	9.3								
		Retail (355) Cecal (Market Swine) (80)	0.6	1.4	[0.5 - 3.3]								8.7	89.3	0.6	0.3	1.1 7.5					
		Cecal (Market Swine) (80) Cecal (Sows) (67)	0.0 3.0	8.8 20.9	[3.6 - 17.2] [11.9 - 32.6]							1.5	73.8 65.7	17.5 9.0	3.0	1.3 6.0	14.9					
Outratemen	O'r and the same in	ø.								0.4	45.0		ı									
Quinolones	Ciprofloxacin	5	51.7	1.0	[0.1 - 3.4]					2.4	45.0	51.7	1.0									
		Cecal (72)	4.2	1.4	[0.0 - 7.5]				4.2	19.4	70.8	4.2	1.4									
		Retail Ground Turkey (400)	40.8	0.8	[0.2 - 2.2]					3.3	55.3	40.8	0.8									
		Cecal (48)	2.1	0.0	[0.0 - 7.4]					16.7	81.3	2.1										
		Retail Ground Beef (313)	48.9	0.0	[0.0 - 1.2]					2.9	48.2	48.9										
		Retail Ground Beer (313) Cecal (Beef) (39)	30.8	0.0	[0.0 - 9.0]				5.1	18.0	46.2	30.8										
		Cecal (Dairy) (54)	38.9	3.7	[0.5 - 12.7]					5.6	51.9	38.9	1.9	1.9								
		p Retail (355)	36.6	0.0	[0.0 - 1.0]					4.2	59.2	36.6										
		Cecal (Market Swine) (80)	12.5	0.0	[0.0 - 4.5]				1.3	12.5	73.8	12.5										
		Cecal (Sows) (67)	19.4	0.0	[0.0 - 5.4]					6.0	74.6	19.4										
Streptogramins	Quinupristin-Dalfopristin ⁵	Retail Chickens (209)	N/A	N/A	N/A																	
		ਓ Cecal (72)	N/A	N/A	N/A																	
		Retail Ground Turkey (400)	N/A	N/A	N/A																	
		E Cecal (48)	N/A	N/A	N/A																	
		Retail Ground Beef (313)	N/A	N/A	N/A																	
		Cecal (Beef) (39)	N/A	N/A	N/A																	
		Cecal (Dairy) (54)	N/A	N/A	N/A																	
		Retail (355)	N/A	N/A	N/A																	
		Cecal (Market Swine) (80) Cecal (Sows) (67)	N/A N/A	N/A N/A	N/A N/A																	
Tetracyclines	Tetracycline	Retail Chickens (209)	0.0	68.9	[62.1 - 75.1]						30.6	0.5			l	1.4	67.5					
		중 Cecal (72)	2.8	68.1	[56.0 - 78.6]						27.8	1.4		2.8	2.8	13.9	51.4					
		Retail Ground Turkey (400)	0.5	90.0	[86.6 - 92.8]						9.0		0.5	0.5	0.3	1.8	88.0					
		≚ Cecal (48)	2.1	97.9	[88.9 - 99.9]									2.1	4.2	10.4	83.3					
		Retail Ground Beef (313)	0.0	21.1	[16.7 - 26.0]						78.9				1.3		19.8					
		Cecal (Beef) (39)	2.6	20.5	[9.3 - 36.5]						76.9			2.6	2.6	10.3	7.7					
		Cecal (Dairy) (54)	1.9	22.2	[12.0 - 35.6]						75.9			1.9		3.7	18.5					
		Retail (355)	0.0	76.1	[71.3 - 80.4]						23.9				l	3.4	72.7					
		Cecal (Market Swine) (80)	0.0	80.0	[69.6 - 88.1]						20.0				2.5	12.5	65.0					
		Cecal (Sows) (67)	0.0	82.1	[70.8 - 90.4]						17.9					13.4	68.7					

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

Percent of solates with intermediate susceptibility, N/A used when there is no intermediate breakpoint established.

2 Percent of solates with intermediate susceptibility, N/A used when there is no intermediate breakpoint established.

3 Percent (%) non-susceptible is reported rather than %R for daptomycin and tigecycline because there is no CLSI breakpoint established.

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

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

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

Year		L		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tester	d	Chickens	Retail Chickens	188	88	116	126	123	165	138	214	186	204	202	209
			Cecal											35	72
		Furkeys	Retail Ground Turkey Cecal	289	260	339	291	261	271	260	369	392	384	407 26	400 48
		<u> </u>	Retail Ground Beef	224	194	226	227	205	202	227	285	269	277	304	313
		Cattle	Cecal (Beef)											36	39
		_	Cecal (Dairy)	040	040	200	204	000	000	050	050	004	250	54	54
		Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	313	313	320	301	263	263	259	353	334	350	328 55 66	355 80 67
Antimiarabial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Antimicrobial Class Aminoglycosides	Gentamicin	sus	Retail Chickens	20.2%	19.3%	18.1%	23.0%	19.5%	19.4%	25.4%	31.8%	26.9%	29.4%	24.3%	26.8%
	(MIC >500 μg/ml)	Chickens	Cecal	38	17	21	29	24	32	35	68	50	60	49 45.7%	56 31.9%
		-	Retail Ground Turkey	27.7%	24.6%	20.1%	22.0%	42.1%	41.3%	30.0%	37.4%	33.7%	32.6%	16 33.7%	23 34.0%
		Turkeys	Cecal	80	64	68	64	110	112	78	138	132	125	137 38.5%	136 41.7%
		<u> </u>	Retail Ground Beef	1.8%	1.0%	1.8%	0.9%	0.5%	2.0%	0.9%	0.4%	0.0%	0.0%	10 0.7%	0.0%
		Cattle	Cecal (Beef)	4	2	4	2	1	4	2	1	0	0	2.8%	0.0%
		ő	Cecal (Dairy)											0.0%	0.0%
		\vdash	Retail Pork Chops	0.3%	1.9%	1.6%	0.7%	0.8%	0.4%	1.9%	1.4%	0.9%	1.7%	0.9%	2.8%
		Swine	Cecal (Market Swine)	1	6	5	2	2	1	5	5	3	6	9.1%	7.5%
		Š	Cecal (Sows)											5 16.7%	7.5%
	Kanamycin	SL	Retail Chickens	27.1%	22.7%	26.7%	30.2%	28.5%	29.7%	30.4%	36.0%	33.3%	34.8%	11 26.7%	5 29.7%
	(MIC ≥ 1024 μg/ml)	Chickens	Cecal	51	20	31	38	35	49	42	77	62	71	54 48.6%	62 40.3%
		_	Retail Ground Turkey	36.0%	29.6%	27.4%	32.0%	50.2%	55.4%	35.9%	44.7%	42.9%	38.5%	17 42.8%	29 42.0%
		Turkeys	-	104	77	93	93	131	150	101	165	168	148	174 42.3%	168 62.5%
		_	Cecal	3.1%	3.1%	4.0%	2.6%	2.0%	4.0%	1.8%	0.7%	1.5%	0.0%	11 2.3%	30 0.0%
		tle	Retail Ground Beef	7	6	9	6	4	8	4	2	4	0	7 5.6%	0.0%
		Cattle	Cecal (Beef)											2 1.9%	0 1.9%
			Cecal (Dairy)	4.8%	2.6%	3.1%	2.3%	2.3%	3.0%	2.7%	1.7%	2.4%	2.0%	1 2.7%	1 4.2%
		ne	Retail Pork Chops	15	8	10	7	6	8	7	6	8	7	9 21.8%	15 27.5%
		Swine	Cecal (Market Swine)											12 39.4%	22 28.4%
	Streptomycin	10	Cecal (Sows)	22.9%	18.2%	18.1%	10.3%	17.9%	10.9%	13.0%	15.4%	19.4%	17.7%	26 17.3%	19 21.1%
	(MIC ≥ 1000 μg/ml)	ickens	Retail Chickens	43	16	21	13	22	18	18	33	36	36	35 11.4%	44 18.1%
		ن	Cecal	30.4%	26.9%	21.5%	20.3%	36.4%	39.1%	27.7%	27.9%	19.4%	17.7%	4 26.0%	13
		Turkeys	Retail Ground Turkey	88	70	73	59	95	106	72	103	108	79	106 30.8%	93 47.9%
		ř	Cecal	5.4%	7.7%	8.4%	5.7%	4.9%	1.5%	5.3%	1.4%	1.9%	1.8%	8 3.6%	23
		<u>•</u>	Retail Ground Beef	12	15	19	13	10	3	12	4	5	5	11 5.6%	5
		Cattle	Cecal (Beef)											2	0
			Cecal (Dairy)	7.00/	0.00/	7.00/	7.00/	0.70/	40.00/	0.00/	0.00/	F 70/	4.00/	1.9%	5.6%
		Φ.	Retail Pork Chops	7.3% 23	9.3% 29	7.8% 25	7.6% 23	8.7% 23	10.3% 27	8.9% 23	6.8% 24	5.7% 19	4.0% 14	4.9% 16	4.5% 16
		Swine	Cecal (Market Swine)											27.3% 15	26.3% 21
			Cecal (Sows)											27.3% 18	31.3% 21
Glycopeptides	Vancomycin (MIC ≥ 32 μg/ml)	Chickens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic	Cecal							·				0.0%	0.0%
		Turkeys	Retail Ground Turkey	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%
		Tur	Cecal											0.0%	0.0%
			Retail Ground Beef	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0%	0.0%

Year	obial Resistance amo			2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed	Chickens	Retail Chickens	188	88	116	126	123	165	138	214	186	204	202	209
		Chic	Cecal											35	72
		keys	Retail Ground Turkey	289	260	339	291	261	271	260	369	392	384	407	400
		Tur	Cecal											26	48
		attle	Retail Ground Beef Cecal (Beef)	224	194	226	227	205	202	227	285	269	277	304 36	313 39
		ပိ	Cecal (Beel)											54	54
		ne	Retail Pork Chops	313	313	320	301	263	263	259	353	334	350	328	355
		Swine	Cecal (Market Swine) Cecal (Sows)											55 66	80 67
	Antimicrobial (Resistance		Isolate											00	0,
Antimicrobial Class	Breakpoint)	<u> </u>	Source			0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.004
Glycylcycline	Tigecycline (MIC ≥ 0.25 µg/ml) ¹	Chickens	Retail Chickens			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		S.	Cecal											0.0% 0	0.0% 0
		Turkeys	Retail Ground Turkey			0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.3% 1	0.0% 0	0.0% 0	0.3% 1
		Tur	Cecal											0.0% 0	0.0%
			Retail Ground Beef			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0% 0	0.0% 0
			Retail Pork Chops			0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.3% 1	0.0% 0	0.0%	1.4% 5
		Swine	Cecal (Market Swine)						J	J	J	•		0.0%	0.0%
		o	Cecal (Sows)											0.0%	0.0%
Lincosamides	Lincomycin	sus	Retail Chickens	99.5%	98.9%	99.1%	100.0%	99.2%	100.0%	98.6%	99.1%	98.9%	99.0%	100.0%	100.0%
	(MIC ≥ 8 μg/ml)	Chickens	Cecal	187	87	115	126	122	165	136	212	184	202	202 100.0%	209 100.0%
				99.0%	98.8%	97.3%	98.6%	98.9%	99.3%	97.7%	97.3%	98.5%	98.7%	35 99.8%	72 99.0%
		Turkeys	Retail Ground Turkey	286	257	330	287	258	269	254	359	386	379	406 100.0%	396 100.0%
		F	Cecal	06.40/	97.4%	97.8%	97.8%	97.6%	99.0%	97.8%	99.0%	97.4%	98.9%	26 96.7%	48 98.1%
		0	Retail Ground Beef	96.4% 216	189	221	222	201	200	222	282	262	274	294	307
		Cattle	Cecal (Beef)											100.0% 36	94.9% 37
			Cecal (Dairy)											98.2% 53	98.1% 53
			Retail Pork Chops	98.1% 307	94.9% 297	95.3% 305	97.3% 293	97.7% 257	97.3% 256	97.3% 252	97.2% 343	97.0% 324	98.0% 343	99.4% 326	98.0% 348
		Swine	Cecal (Market Swine)	307	237	000	230	207	200	EGE	040	UZ-4	040	100.0%	98.8%
		S	Cecal (Sows)											100.0%	79 100.0%
Lipopeptides	Daptomycin	SU			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66 0.0%	67 0.0%
	(MIC ≥ 4 μg/ml) ¹	Chickens	Cecal		0	0	0	0	0	0	0	0	0	0.0%	0.0%
					0.0%	0.3%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	Retail Ground Turkey		0	1	0	0	1	0	0	0	0	0.0%	0.0%
		1	Cecal		0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.004	0.00/	0	0
			Retail Ground Beef		0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0% 0	2.6% 1
			Cecal (Dairy)											1.9% 1	1.9% 1
			Retail Pork Chops		0.0% 0	0.0%	0.3% 1	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.3% 1
		Swine	Cecal (Market Swine)				•		J	J	J	J		0.0%	1.3%
		S	Cecal (Sows)											0.0%	0.0%
Macrolides	Erythromycin	St	Retail Chickens	43.1%	35.2%	37.1%	34.9%	44.7%	32.7%	39.9%	32.2%	35.5%	34.3%	0 35.1%	0 37.3%
	(MIC ≥ 8 μg/ml)	Chickens	Cecal	81	31	43	44	55	54	55	69	66	70	71 37.1%	78 51.4%
				43.6%	33.8%	38.3%	47.1%	48.7%	51.7%	37.7%	40.4%	47.2%	37.0%	13 39.3%	37 36.0%
		Turkeys	Retail Ground Turkey	126	88	130	137	127	140	98	149	185	142	160	144 54.2%
		Τ	Cecal	4 = 0					e =:					42.3% 11	26
		_	Retail Ground Beef	4.9% 11	3.6% 7	4.4% 10	4.0% 9	2.4% 5	2.5% 5	2.6% 6	0.7% 2	3.0% 8	0.0% 0	3.0% 9	0.3% 1
		Cattle	Cecal (Beef)											11.1% 4	7.7% 3
			Cecal (Dairy)											3.7%	1.9%
			Retail Pork Chops	7.0%	9.9%	5.9%	6.6%	9.1%	8.0%	6.9%	4.5%	4.5%	5.1%	7.0%	7.0%
		Swine	Cecal (Market Swine)	22	31	19	20	24	21	18	16	15	18	23 52.7%	25 57.5%
		S	Cecal (Sows)											29 53.0%	46 64.2%
			ance as no CLSI breakpo											35	43

	_		
Γable 70c. Antimicrobial Resista	ance among <i>Enterococ</i>	cus faecalis Isolates.	. 2002-2013

	biai Resistance amo	ng E	nterococcus faeca												
Year		SC	Batail Chiekens	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	l	Chickens	Retail Chickens	188	88	116	126	123	165	138	214	186	204	202	209
		Ø	Cecal											35	72
		Turkey	Retail Ground Turkey Cecal	289	260	339	291	261	271	260	369	392	384	407 26	400 48
		<u> </u>	Retail Ground Beef	224	194	226	227	205	202	227	285	269	277	304	313
		Cattle	Cecal (Beef)			220		200	202		200	200		36	39
			Cecal (Dairy)											54	54
		vine	Retail Pork Chops Cecal (Market Swine)	313	313	320	301	263	263	259	353	334	350	328 55	355 80
		Swir	Cecal (Sows)											66	67
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Macrolides	Breakpoint) Tylosin	- 0	Source	42.6%	34.1%	37.1%	36.5%	44.7%	32.7%	39.9%	32.4%	35.5%	34.3%	35.1%	37.3%
Macronides	(MIC ≥ 32 μg/ml)	Chickens	Retail Chickens	80	34.176	43	46	55	54	55	69	66	70	71	78
		Chi	Cecal											48.6% 17	52.8% 38
		eys	Retail Ground Turkey	43.9% 127	34.6% 90	38.3% 130	47.1% 137	49.4% 129	51.3% 139	37.7% 98	40.4% 149	47.2% 185	37.0% 142	39.1% 159	36.0% 144
		Turkeys	Cecal	127	30	100	107	123	100	30	140	100	172	42.3%	58.3%
			Retail Ground Beef	4.9%	3.6%	5.8%	4.0%	2.4%	3.0%	2.2%	0.7%	3.0%	0.0%	3.0%	28 0.6%
		te te		11	7	13	9	5	6	5	2	8	0	9 11.1%	2 7.7%
		Cattle												3.7%	3
			Cecal (Dairy)											2	1
			Retail Pork Chops	7.0% 22	9.9% 31	6.3% 20	7.3% 22	9.1% 24	7.6% 20	6.6% 17	4.5% 16	4.8% 16	5.1% 18	7.0% 23	7.3% 26
		Swine	Cecal (Market Swine)											52.7% 29	57.5% 46
		S	Cecal (Sows)											53.0%	64.2%
Nitrofurans	Nitrofurantoin	SI	Retail Chickens	1.1%	1.1%	4.3%	0.0%	0.0%	1.2%	0.0%	0.0%	0.5%	0.0%	35 0.0%	43 0.0%
	(MIC ≥ 128 μg/ml)	Chickens		2	1	5	0	0	2	0	0	1	0	0.0%	0 1.4%
		5	Cecal											0	1
		Turkeys	Retail Ground Turkey	1.4% 4	1.2% 3	2.4% 8	0.0% 0	0.0% 0	0.0% 0	0.4% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.3% 1
		Tur	Cecal											0.0%	2.1%
			Retail Ground Beef	0.0%	0.0%	0.9%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	2	0	0	1	0	0	0	0	0.0%	0.0%
		ပိ												0.0%	0.0%
			Cecal (Dairy)	0.00/	0.20/	0.20/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.20/	0	0
		0	Retail Pork Chops	0.0%	0.3% 1	0.3% 1	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.3% 1	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0% 0	0.0%
Oxazolidinones	Linezolid	sus	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 8 μg/ml)	Chicker	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		-		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	Retail Ground Turkey	0	0	0	0	0	0	0	0	0	0	0	0
		ı,	Cecal											0.0%	0.0%
			Retail Ground Beef	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
		Cattle	Cecal (Beef)											0.0%	2.6%
			Cecal (Dairy)											0.0%	0.0%
		-	Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne		0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		Swine	Cecal (Market Swine)											0	0
			Cecal (Sows)											1.5% 1	0.0%
Penicillins	Penicillin (MIC ≥ 16 μg/ml)	kens	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.5% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Chickens	Cecal											0.0% 0	0.0% 0
		sk	Retail Ground Turkey	0.0%	0.0%	1.5%	0.3%	0.0%	0.0%	0.0%	0.3%	0.0%	0.3%	0.0%	0.5%
		Turkeys	Cecal	0	0	5	1	0	0	0	1	0	1	0.0%	0.0%
		F		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
		9	Retail Ground Beef	0	0	0	0	0	0	1	0	0	0	0	0
		Cattle	Cecal (Beef)											0.0% 0	0.0% 0
			Cecal (Dairy)											0.0% 0	0.0%
			Retail Pork Chops	0.0%	0.0%	1.3% 4	0.0%	0.0%	0.4% 1	0.4% 1	0.3%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)	U			U	U				U	U	0.0%	0.0%
		Š	Cecal (Sows)											0.0%	0.0%
			Jecai (Juws)											0	0

¹ Not presented as <i>E. faecalis</i>	is considered intrinsically res	sistan	nt to Quinupristin-Dalfopris	st

Table 70d. Antimicr	obial Resistance amo	ng E	nterococcus taeca	2003	es, 2003 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Teste	ed	Chickens	Retail Chickens Cecal	188	88	116	126	123	165	138	214	186	204	202	209
		Turkeys	Retail Ground Turkey	289	260	339	291	261	271	260	369	392	384	407 26	400
		Cattle	Retail Ground Beef Cecal (Beef)	224	194	226	227	205	202	227	285	269	277	304 36	48 313 39
		Swine	Cecal (Dairy) Retail Pork Chops Cecal (Market Swine)	313	313	320	301	263	263	259	353	334	350	54 328 55	54 355 80
	Antimicrobial (Resistance		Cecal (Sows)											66	67
Antimicrobial Class Phenicols	Breakpoint) Chloramphenicol	2	Source Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.9%	0.0%	0.0%	0.5%	1.4%
	(MIC ≥ 32 μg/ml)	Chickens	Cecal	0	0	0	0	0	0	2	2	0	0	1 0.0%	3 1.4%
		-	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.8%	0.4%	0.0%	0.3%	0.3%	0.3%	0 0.7%	1 0.5%
		Turkeys	Cecal	0	0	0	0	2	1	0	1	1	1	3 0.0%	2.1%
		_	Retail Ground Beef	0.0%	0.0%	0.4%	1.3%	1.0%	0.0%	0.0%	0.7%	0.7%	0.0%	0.3%	0.3%
		Cattle	Cecal (Beef)	0	0	1	3	2	0	0	2	2	0	1 2.8%	1 2.6%
		Ca	Cecal (Dairy)											1 0.0%	1 0.0%
		-	Retail Pork Chops	1.0%	0.6%	1.3%	1.0%	0.4%	0.4%	1.2%	0.0%	0.9%	2.3%	0 2.1%	0 1.4%
		Swine	Cecal (Market Swine)	3	2	4	3	1	1	3	0	3	8	7 14.6%	5 8.8%
		Sw	Cecal (Sows)											8 21.2%	7 20.9%
Quinolones	Ciprofloxacin	S	Retail Chickens	0.0%	8.0%	0.9%	0.8%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	14 0.5%	14 1.0%
	(MIC ≥ 4 μg/ml)	Chickens	Cecal	0	7	1	1	0	5	0	0	0	0	1 0.0%	2 1.4%
			Retail Ground Turkey	0.0%	5.8%	2.4%	0.7%	0.0%	3.3%	0.8%	0.0%	0.3%	0.0%	0.0%	1 0.8%
		Turkeys	Cecal	0	15	8	2	0	9	2	0	1	0	0.0%	3 0.0%
		_	Retail Ground Beef	0.4%	12.9%	0.9%	0.0%	0.0%	4.0%	1.3%	0.4%	0.0%	1.1%	0.0%	0.0%
		Cattle	Cecal (Beef)	1	25	2	0	0	8	3	1	0	3	0.0%	0.0%
		Ca	Cecal (Dairy)											0 3.7%	0 3.7%
		-	Retail Pork Chops	0.0%	6.1%	2.5%	0.3%	0.0%	4.6%	1.5%	0.0%	0.3%	0.3%	2 0.0%	2 0.0%
		Swine	Cecal (Market Swine)	0	19	8	1	0	12	4	0	1	1	0.0%	0.0%
		S	Cecal (Sows)											0.0%	0.0%
Streptogramins	Quinupristin-Dalfopristin	S	Retail Chickens	_	_	_	_	_	_	_	_	_	_	0	0
	(MIC ≥ 4 μg/ml) ¹	Chickens	Cecal											_	_
			Retail Ground Turkey		_	-	-	-	_		-	_			_
		Turkeys	Cecal											_	_
		_	Retail Ground Beef	_	_	-	_	_		_	-	_			
		Cattle	Cecal (Beef)		-	-	-		-	-	-	-	-	-	
		Ča	Cecal (Dairy)											_	_
			Retail Pork Chops		-	-	_	-			-	_	_		
		ine	Cecal (Market Swine)		-	-	•			-	-	-		-	
		Swine												-	
Tetracyclines	Tetracycline	δ	Cecal (Sows) Retail Chickens	68.6%	63.6%	75.0%	70.6%	65.9%	69.1%	72.5%	72.4%	63.4%	56.9%	62.4%	68.9%
	(MIC ≥ 16 μg/ml)	Chickens	Cecal	129	56	87	89	81	114	100	155	118	116	126 68.6%	144 68.1%
		_	Retail Ground Turkey	87.9%	88.1%	84.4%	85.9%	94.3%	90.0%	85.8%	87.8%	92.4%	88.8%	24 87.5%	49 90.0%
		Turkeys	Cecal	254	229	286	250	246	244	223	324	362	341	356 92.3%	360 97.9%
		-	Retail Ground Beef	20.5%	25.3%	34.1%	22.5%	32.5%	31.7%	21.1%	16.5%	18.2%	22.0%	24 21.4%	47 21.1%
		Cattle	Cecal (Beef)	46	49	77	51	67	64	48	47	49	61	65 25.0%	66 20.5%
		Ca												9 13.0%	8 22.2%
		-	Cecal (Dairy) Retail Pork Chops	78.0%	75.7%	86.3%	81.4%	90.1%	77.2%	83.8%	79.0%	79.3%	81.7%	7 82.3%	12 76.1%
		ine		244	237	276	245	237	203	217	279	265	286	270 72.7%	270 80.0%
		Swine	Cecal (Sawa)											40 77.3%	64 82.1%
			Cecal (Sows) nt to Quinupristin-Dalfopi											51	55

Table 71a. Resistance Patte	erns a	among Enterococo	cus faeca	lis Isolat	es, 2003-	2014	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	Chickens	Retail Chickens	188	88	116	126	123	165	138	214	186	204	202	209
	Turkeys	Retail Ground Turkey	289	260	339	291	261	271	260	369	392	384	35 407	72 400
	Cattle	Retail Ground Beef Cecal (Beef) Cecal (Dairy)	224	194	226	227	206	202	227	285	269	277	26 304 36 54	48 313 39 54
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	313	313	320	301	263	263	259	353	334	350	328 55 66	355 80 67
Resistance Pattern ¹		Source												
1. No Resistance Detected	Chickens	Retail Chickens Cecal	0.5%	0.0%	0.9%	0.0%	0.0%	0.0%	0.7%	0.5% 1	0.5%	1.0%	0.0% 0 0.0% 0	0.0% 0 0.0% 0
	sys	Retail Ground Turkey	1.0%	0.4%	0.6%	0.3%	0.0%	0.0%	1.5%	2.2%	0.8%	0.5%	0.3%	0.5%
	Turkeys	Cecal	3	1	2	1	0	0	4	8	3	2	0.0%	0.0%
		Retail Ground Beef	2.7%	1.5%	1.3%	1.8%	2.0%	0.5%	1.8%	0.7%	2.2%	1.1%	3.3%	1.9%
	Cattle	Cecal (Beef)	6	3	3	4	4	1	4	2	6	3	0.0%	6 2.6%
	O	Cecal (Dairy)											1.9%	0.0%
		Retail Pork Chops	0.0%	0.6%	1.3%	0.0%	0.4%	0.4%	0.4%	0.3%	0.6%	0.9%	0.0%	0.3%
	e e	-	0	2	4	0	1	1	1	1	2	3	0.0%	1.3%
	Swine	Cecal (Market Swine)											0.0%	1 0.0%
2. Resistance to ≥ 3		Cecal (Sows)	47.9%	42.1%	50.0%	43.7%	45.5%	40.6%	43.5%	39.7%	41.4%	37.3%	0 38.1%	0 45.9%
Antimicrobial Classes	Chickens	Retail Chickens	90	37	58	55	56	67	60	85	77	76	77	96
	ర్	Cecal											45.7% 16	52.8% 38
	Turkeys	Retail Ground Turkey	54.3% 157	52.7% 137	43.4% 147	56.7% 165	67.0% 175	69.7% 189	50.0% 130	58.5% 216	60.2% 236	53.7% 206	58.0% 236	56.0% 224
	Ţ	Cecal											57.7% 15	77.1% 37
		Retail Ground Beef	6.7% 15	10.8% 21	10.2% 23	7.5% 17	6.8% 14	5.5% 11	6.6% 15	2.5% 7	3.7% 10	1.8% 5	3.6% 11	2.6% 8
	Cattle	Cecal (Beef)											13.9% 5	10.3% 7
		Cecal (Dairy)											5.6% 3	7.4% 4
		Retail Pork Chops	9.9% 31	18.8% 59	14.4% 46	12.3% 37	16.3% 43	17.5% 46	14.7% 38	9.3% 33	8.4% 28	8.6% 30	8.2% 27	10.1%
	Swine	Cecal (Market Swine)	31	39	40	37	40	40	30	33	20	30	56.4%	57.5%
	S	Cecal (Sows)											59.1%	46 65.7%
3. Resistant to ≥ 4	દ	Retail Chickens	19.1%	18.2%	20.7%	19.8%	22.8%	21.2%	21.7%	23.8%	23.1%	21.1%	39 19.3%	44 22.5%
Antimicrobial Classes	hickens	Cecal	36	16	24	25	28	35	30	51	43	43	39 28.6%	47 27.8%
	5		31.1%	22.3%	25.7%	22.7%	36.4%	42.8%	28.1%	29.5%	30.9%	23.7%	10 26.5%	20 26.5%
	Turkeys	Retail Ground Turkey	90	58	87	66	95	116	73	109	121	91	108 26.9%	106 52.1%
	_	Cecal	3.1%	3.1%	4.4%	2.2%	1.5%	2.0%	1.3%	0.7%	1.5%	0.0%	7 2.6%	25 0.0%
	Cattle	Retail Ground Beef	7	6	10	5	3	4	3	2	4	0	8 5.6%	0 2.6%
	S	Cecal (Beef)											1.9%	1.9%
		Cecal (Dairy)	5.1%	5.8%	4.4%	3.3%	2.3%	4.9%	3.9%	2.5%	3.3%	3.1%	1 4.3%	1 4.8%
	e e	Retail Pork Chops	16	18	14	10	6	13	10	9	11	11	14 30.9%	17
	Swine	Cecal (Market Swine)											17	25
		Cecal (Sows)											43.9% 29	44.8% 30
4. Resistant to ≥ 5 Antimicrobial Classes	Chickens	Retail Chickens	0.5% 1	1.1% 1	0.9% 1	0.0%	0.0%	1.2% 2	1.4% 2	0.9% 2	0.0% 0	0.0%	0.5% 1	1.0% 2
	Chic	Cecal											0.0% 0	1.4% 1
	eys	Retail Ground Turkey	0.7% 2	0.0%	1.5% 5	0.3% 1	0.0%	0.7% 2	0.0%	0.0%	0.8%	0.0%	0.3% 1	0.3% 1
	Turkeys	Cecal											0.0% 0	0.0%
		Retail Ground Beef	0.0%	0.0%	0.4%	0.4% 1	0.5% 1	0.0%	0.0%	0.0%	0.7% 2	0.0%	0.3%	0.0%
	Cattle	Cecal (Beef)											2.8%	2.6%
	آ	Cecal (Dairy)											0.0%	1.9%
		Retail Pork Chops	0.6%	1.0%	1.3%	0.7%	0.4%	0.8%	0.8%	0.0%	0.6%	0.9%	1.2%	1.1%
	Swine	Cecal (Market Swine)	2	3	4	2	1	2	2	0	2	3	4 12.7%	4 8.8%
	Š												7 18.2%	7 11.9%
		Cecal (Sows)											12	8

¹ Resistance patterns do not include Quinupristin-Dalfoprisitn as *E. faecalis* is considered intrinsically resistant

Table 71b. Resistance Patte	erns a	among Enterococ	cus faeca	lis Isolat	tes, 2003-	2014	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	Chickens	Retail Chickens Cecal	188	88	116	126	123	165	138	214	186	204	202	209
	Turkeys	Retail Ground Turkey Cecal	289	260	339	291	261	271	260	369	392	384	407 26	400 48
	Cattle	Retail Ground Beef Cecal (Beef) Cecal (Dairy)	224	194	226	227	206	202	227	285	269	277	304 36 54	313 39 54
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	313	313	320	301	263	263	259	353	334	350	328 55 66	355 80 67
Resistance Pattern		Source												
5. Resistant to ≥ 6 ¹ Antimicrobial Classes	Chickens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%
	Chic	Cecal											0.0%	0.0%
	ske	Retail Ground Turkey	0.0%	0.0%	1.2% 4	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.3%
	Turkeys	Cecal					J		Ü	J			0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	0	0	-	0	U	U	0	0	0	0	0.0%	0.0%
	0	Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Ś	Cecal (Sows)											0.0%	0.0%
6. At Least Pencillin G and	S.	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Level Gentamicin	Chickens	Cecal	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	<u> </u>	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys		0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Ë	Cecal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	tle	Retail Ground Beef	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Cattle	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%
	e.	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
7. At Least Pencillin G		Cecal (Sows)	0.00/	0.0%	0.0%	0.0%	0.0%	0.00/	0.0%	0.0%	0.00/	0.0%	0.0%	0.0%
High Level Gentamicin,	Chickens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
and Linezolid Resistant	<u>9</u>	Cecal		2.00/	2.00					2.00/	2.00		0	0.0%
	Turkeys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	2	Cecal			2.20						2.20		0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
		Cecal (Sows)											0.0% 0	0.0% 0
8. At Least Pencillin G, High Level Gentamicin,	Chickens	Retail Chickens	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0
and Tigecycline Resistant	S, ic	Cecal											0.0% 0	0.0% 0
	Turkeys	Retail Ground Turkey	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Ţ	Cecal											0.0% 0	0.0% 0
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)											0.0%	0.0% 0
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
	,	Cecal (Sows)											0.0%	0.0%
¹ Resistance patterns do not includ	- 0	uprietin Dalfoprieita ac	E fococlio	ic consider	od intrincios	llu registent								

Resistance patterns do not include Quinupristin-Dalfoprisitn as *E. faecalis* is considered intrinsically resistant

Antimicrobial Class	Antimicrobial Agent	L	Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.02	0.03	0.06	0.125	0.25	0.50	1	Distri 2	bution 4	(%) of 8	MICs ((ua/mI) 32	64	128	256	512	1024	2048	>2048
Aminoglycosides	Gentamicin	kens	Retail Chickens (153)	N/A	7.2	[3.6 - 12.5]														92.2	0.7			7.2	
		Chickens	Cecal (14)	N/A	0.0	[0.0 - 23.2]														100.0					
		rkeys	Retail Ground Turkey (57)	N/A	17.5	[8.7 - 29.9]														82.5				17.5	
			Cecal (4)	N/A	50.0	[6.8 - 93.2]														50.0			25.0	25.0	
		Ф	Retail Ground Beef (60)	N/A	0.0	[0.0 - 6.0]														100.0					
		Cattle	Cecal (Beef) (47)	N/A	0.0	[0.0 - 7.5]														100.0					
			Cecal (Dairy) (28)	N/A	0.0	[0.0 - 12.3]														100.0					
		Je	Retail Pork Chops (40)	N/A	2.5	[0.1 - 13.2]														97.5				2.5	
		Swin	Cecal (Market Swine) (21)	N/A	0.0	[0.0 - 16.1]														100.0					
		SL	Cecal (Sows) (15)	N/A	0.0	[0.0 - 21.8]														100.0			11		
	Kanamycin	ickens	Retail Chickens (153)	N/A		[7.6 - 18.7]														58.2	19.6	9.8	3.3	9.2	
		_	Cecal (14)	N/A	0.0	[0.0 - 23.2]														85.7	7.1	7.1			
		ırkeys	Retail Ground Turkey (57)	N/A	22.8	[12.7 - 35.8]														43.9	24.6	8.8	1.8	21.1	
		Tur	Cecal (4)	N/A	75.0	[19.4 - 99.4]														25.0	00.0	. .		75.0 1.7	
		Cattle	Retail Ground Beef (60) Cecal (Beef) (47)	N/A N/A	1.7 0.0	[0.0 - 8.9] [0.0 - 7.5]														70.0 87.2	23.3 12.8	5.0		1.7	
		S	Cecal (Dairy) (28)	N/A	0.0	[0.0 - 7.3]														82.1	14.3	3.6			
			Retail Pork Chops (40)	N/A	2.5	[0.1 - 13.2]														77.5	17.5			2.5	
		Swine	Cecal (Market Swine) (21)	N/A	4.8	[0.1 - 23.8]														81.0	14.3			4.8	
Streptomycin			Cecal (Sows) (15)	N/A	13.3	[1.7 - 40.5]														73.3	13.3			13.3	
	Streptomycin	Chickens	Retail Chickens (153)	N/A	15.0	[9.8 - 21.7]																85.0	8.5	5.9	0.7
		Chic	Cecal (14)	N/A	28.6	[8.4 - 58.1]																71.4	14.3	7.1	7.1
		Turkeys	Retail Ground Turkey (57)	N/A	33.3	[21.4 - 47.1]																66.7	14.0	12.3	7.0
		Tur	Cecal (4)	N/A	75.0	[19.4 - 99.4]																25.0	50.0		25.0
		9	Retail Ground Beef (60)	N/A	3.3	[0.4 - 11.5]																96.7	1.7	1.7	
		Cattle	Cecal (Beef) (47)	N/A	2.1	[0.1 - 11.3]																97.9	2.1		
			Cecal (Dairy) (28)	N/A	0.0	[0.0 - 12.3]																100.0			
		Swine	Retail Pork Chops (40) Cecal (Market Swine) (21)	N/A N/A	0.0 23.8	[0.0 - 8.8]																100.0 76.2	19 1	4.8	
		Sw	Cecal (Sows) (15)	N/A	26.7	[8.2 - 47.2] [7.8 - 55.1]																73.3		13.3	
Glycopeptides	Vancomycin	sue	Retail Chickens (153)	0.0	0.0	[0.0 - 2.4]					0.7	67.3	20.3	10.5	1.3										
о.,, о о р о р и и и и	vanocinyon:	Chicken	Cecal (14)	0.0	0.0	[0.0 - 23.2]					0.1	71.4	28.6												
			Retail Ground Turkey (57)	0.0	0.0	[0.0 - 6.3]					1.8		28.1	15.8	1.8										
		Turkeys	Cecal (4)	0.0	0.0	[0.0 - 60.2]						50.0		25.0											
			Retail Ground Beef (60)	0.0	0.0	[0.0 - 6.0]					3.3	81.7	8.3	6.7											
		attle	Cecal (Beef) (47)	0.0	0.0	[0.0 - 7.5]					2.1	72.3	8.5	17.0											
		0	Cecal (Dairy) (28)	0.0	0.0	[0.0 - 12.3]						67.9	21.4	10.7											
		е	Retail Pork Chops (40)	0.0	0.0	[8.8 - 0.0]							25.0												
		Swin	Cecal (Market Swine) (21)	0.0	0.0	[0.0 - 16.1]							19.1												
		SI	Cecal (Sows) (15)	0.0	0.0	[0.0 - 21.8]						80.0		20.0											
	Tigecycline	Chickens	Retail Chickens (153)	N/A	0.7	[0.0 - 3.6]		0.7	5.2	46.4		0.7													
			Cecal (14)	N/A	0.0	[0.0 - 23.2]				28.6															
		Furkeys	Retail Ground Turkey (57) Cecal (4)	N/A N/A	1.8 0.0	[0.0 - 9.4] [0.0 - 60.2]			1.8 50.0	45.6	50.9	1.8													
		1	Retail Ground Beef (60)	N/A	0.0	[0.0 - 6.0]			8.3	46.7															
		Cattle	Cecal (Beef) (47)	N/A	0.0	[0.0 - 7.5]		12.8		34.0															
		င်	Cecal (Dairy) (28)	N/A	0.0	[0.0 - 12.3]		7.1	53.6	21.4	17.9														
			Retail Pork Chops (40)	N/A	0.0	[0.0 - 8.8]		2.5	10.0	42.5	45.0														
		Swine	Cecal (Market Swine) (21)	N/A	0.0	[0.0 - 16.1]			28.6	28.6	42.9														
			Cecal (Sows) (15)	N/A	0.0	[0.0 - 21.8]			60.0	20.0	20.0														
Lincosamides	Lincomycin	Chickens	Retail Chickens (153)	0.7	80.4	[73.2 - 86.4]							17.7	1.3	0.7	2.6	77.8								
			Cecal (14)	0.0	78.6	[49.2 - 95.3]							14.3	7.1			78.6								
		Turkeys	Retail Ground Turkey (57)	1.8	82.5	[70.1 - 91.3]							14.0	1.8	1.8	5.3	77.2								
		Tur	Cecal (4)	0.0	75.0	[19.4 - 99.4]							25.0				75.0								
		qe	Retail Ground Beef (60)	3.3	70.0	[56.8 - 81.2]							23.3	3.3	3.3	20.0									
		Cattle	Cecal (Beef) (47)	8.5	57.4 60.7	[42.2 - 71.7]							29.8	4.3	8.5	8.5	48.9 50.0								
			Cecal (Dairy) (28) Retail Pork Chops (40)	3.6 2.5	60.7 80.0	[40.6 - 78.5] [64.4 - 90.9]							32.1 17.5	3.6	3.6 2.5	10.7 37.5	42.5								
				2.0	00.0	[0-1.7 - 00.8]							17.0		2.0	07.0	72.0								
		Swine	Cecal (Market Swine) (21)	0.0	81.0	[58.1 - 94.6]							19.1			9.5	71.4								

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

Percent or isolates with intermediate susceptionity. Not used when there is no intermediate total intermedia

Table 72b. Distribu	tion of MICs and Oc	ccur	Isolate Source	Jecus	lacci	um isolates	1				Dietr	ibution	(9/) of	MICo	(ua/ml	4					
Antimicrobial Class	Antimicrobial Agent	<u> </u>	(# of Isolates)	%l ¹	%R²	[95% CI] ³	0.02 0.03 0.06 0.125	0.25	0.50	1	2	4	8	16	(μg/III) 32	64	128	256	512	1024 2	048 >2048
Lipopeptides	Daptomycin ⁵	Chickens	Retail Chickens (153)	N/A	N/A	N/A				3.9	11.8	77.8	6.5								
		S.	Cecal (14)	N/A	N/A	N/A				7.1		85.7	7.1								
		keys	Retail Ground Turkey (57)	N/A	N/A	N/A				8.8	19.3	52.6	19.3								
		Turk	Cecal (4)	N/A	N/A	N/A				50.0		50.0									
		Φ	Retail Ground Beef (60)	N/A	N/A	N/A				15.0		61.7	6.7								
		Cattle	Cecal (Beef) (47)	N/A	N/A	N/A			4.3	6.4	31.9		4.3								
			Cecal (Dairy) (28)	N/A	N/A	N/A		3.6		7.1 12.5	17.9		3.6								
		ne	Retail Pork Chops (40) Cecal (Market Swine) (21)	N/A N/A	N/A N/A	N/A N/A				4.8	32.5		5.0 4.8								
		Swine	Cecal (Sows) (15)	N/A	N/A	N/A				6.7	20.0		6.7								
Macrolides	Erythromicin	ens	Retail Chickens (153)	47.1	34.6	[27.1 - 42.7]		9.8	8.5	17.7	22.9	6.5	0.7	34.0							
		Chicken	Cecal (14)		14.3	[1.8 - 42.8]		7.1	7.1	7.1	57.1	7.1	***	14.3							
		_		36.8	36.8	[24.4 - 50.7]		21.1	5.3			12.3	5.3	31.6							
		Turkeys	Cecal (4)	25.0	50.0	[6.8 - 93.2]		21.1	25.0	7.0	17.0	25.0	0.0	50.0							
		_	Retail Ground Beef (60)	76.7	8.3	[2.8 - 18.4]		11.7	3.3	15.0	26.7		5.0	3.3							
		Cattle	Cecal (Beef) (47)	70.3	6.4	[1.3 - 17.5]		21.3	2.1		29.8			6.4							
		Ö	Cecal (Dairy) (28)	67.8	3.6	[0.1 - 18.3]		25.0	3.6	7.1	46.4	14.3	3.6								
			Retail Pork Chops (40)	87.5	7.5	[1.6 - 20.4]		5.0		17.5	22.5	47.5	7.5								
		wine	Cecal (Market Swine) (21)	66.7	14.3	[3.0 - 36.3]		19.1		23.8	28.6	14.3	4.8	9.5							
		Ś	Cecal (Sows) (15)	60.0	13.3	[1.7 - 40.5]		26.7		6.7	40.0	13.3		13.3							
	Tylosin	cken	Retail Chickens (153)	0.7	33.3	[25.9 - 41.4]				19.6	12.4	27.5	6.5	0.7	33.3						
		Ch _i	Cecal (14)	0.0	7.1	[0.2 - 33.9]				14.3	21.4	57.1				7.1					
		keys	Retail Ground Turkey (57)	0.0	19.3	[10.0 - 31.9]			1.8	19.3	31.6	22.8	5.3		19.3						
		Tur	Cecal (4)	0.0	75.0	[19.4 - 99.4]				25.0						75.0					
		Ф	Retail Ground Beef (60)	0.0	0.0	[0.0 - 6.0]				16.7	31.7	31.7	20.0								
		Cattl	Cecal (Beef) (47)	2.1	6.4	[1.3 - 17.5]				19.2	25.5	34.0	12.8	2.1	2.1	4.3					
			Cecal (Dairy) (28)	0.0	0.0	[0.0 - 12.3]			3.6	10.7	28.6		10.7								
		ne	Retail Pork Chops (40) Cecal (Market Swine) (21)	0.0 4.8	10.0 9.5	[2.8 - 23.7] [1.2 - 30.4]				10.0	25.0		15.0	4.0	10.0	0.5					
		Swine	Cecal (Sows) (15)	0.0	13.3	[1.7 - 40.5]				38.1 26.7	14.3	28.6	4.8 6.7	4.8		9.5					
	Alle de la companya d	ŝue	Retail Chickens (153)	58.8	35.9	[28.4 - 44.1]				20.7	33.3	20.0	0.7		5.2	58.8	36.0				
Nitrofurans	Nitrofurantoin	Chicken	Cecal (14)		21.4	[4.7 - 50.8]									0.2	78.6					
		-	Retail Ground Turkey (57)	56.1	36.8	[24.4 - 50.7]							1.8	3.5	1.8	56.1	36.8				
		Turkeys	Cecal (4)		50.0	[6.8 - 93.2]							25.0	0.0		25.0	50.0				
		F	Retail Ground Beef (60)	65.0	25.0	[14.7 - 37.9]									10.0	65.0	25.0				
		Cattle	Cecal (Beef) (47)	83.0	10.6	[3.5 - 23.1]								2.1	4.3	83.0	10.6				
		O	Cecal (Dairy) (28)	60.7	28.6	[13.2 - 48.7]							3.6	7.1		60.7	28.6				
		m	Retail Pork Chops (40)	82.5	10.0	[2.8 - 23.7]							2.5		5.0	82.5	10.0				
		Swine	Cecal (Market Swine) (21)	52.4		[18.1 - 61.6]							4.8		4.8	52.4	38.1				
		,	Cecal (Sows) (15)	66.7	33.3	[11.8 - 61.6]										66.7	33.3				
Oxazolidinones	Linezolid	Chicken	Retail Chickens (153)	0.0	0.0	[0.0 - 2.4]					66.7										
			Cecal (14)	0.0	0.0	[0.0 - 23.2]				14.3	85.7										
		Turkeys	Retail Ground Turkey (57)	0.0	0.0	[0.0 - 6.3]					64.9										
		ľ	Cecal (4)	0.0	0.0	[0.0 - 60.2]			25.0	25.0											
		a E	Retail Ground Beef (60) Cecal (Beef) (47)	1.7 0.0	0.0	[0.0 - 6.0] [0.0 - 7.5]					85.0	1.7									
		Cattle	Cecal (Deiry) (28)	64.3	0.0	[0.0 - 7.3]			2.1	25.5 3.6	72.3 32.1	64.3									
			Retail Pork Chops (40)	0.0	0.0	[0.0 - 8.8]					72.5	04.5									
		Swine	Cecal (Market Swine) (21)	0.0	0.0	[0.0 - 16.1]				23.8	76.2										
		Ó	Cecal (Sows) (15)	0.0	0.0	[0.0 - 21.8]					80.0										
Penicillins	Penicillin	kens	Retail Chickens (153)	N/A	10.5	[6.1 - 16.4]		0.7	5.2	5.9	13.7	52.9	11.1	5.9	4.6						
		Chickens	Cecal (14)	N/A	7.1	[0.2 - 33.9]				7.1	7.1	50.0	28.6	7.1							
			Retail Ground Turkey (57)	N/A	45.6	[32.4 - 59.3]		1.8		1.8	10.5	24.6	15.8	12.3	33.3						
		Turkeys	Cecal (4)	N/A	50.0	[6.8 - 93.2]						50.0		25.0	25.0						
		•	Retail Ground Beef (60)	N/A	1.7	[0.0 - 8.9]		23.3	5.0	10.0	13.3	38.3	8.3	1.7							
		Cattle	Cecal (Beef) (47)	N/A	0.0	[0.0 - 7.5]		6.4		6.4	19.2	61.7	6.4								
		Ľ	Cecal (Dairy) (28)	N/A	0.0	[0.0 - 12.3]		10.7			14.3	64.3	10.7								
		ЭС	Retail Pork Chops (40)	N/A	0.0	[0.0 - 8.8]		37.5	5.0			30.0									
		Swine	Cecal (Market Swine) (21)	N/A	9.5	[1.2 - 30.4]		<u> </u>		9.5		57.1		4.8	4.8						
			Cecal (Sows) (15)	N/A	0.0	[0.0 - 21.8]		6.7			13.3	60.0	20.0								

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

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

Percent of isolates with intermediate breakpoints for percent resistant. (%R) were calculated using the Clopper-Pearson exact method

The unshaded areas indicate the dilution range of the Sensitire plates used to test isolates. Single vertical lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

There are no established CLSI breakpoints for daptomycin

Table 72c. Distribution of MICs and Occurrence among Enterococcus faecium Isolates, 2014

Table 72c. Distribu	ition of MICs and Oc	cur	rence among Enteroc	occus	s faeci	um Isolates	, 2014	4															
Antimicrobial Class	Antimicrobial Agent		Isolate Source (# of Isolates)	%l ¹	%R²	[95% CII ³	0.02	0.03	0.06	0.125 0.25	0.50	1	Distri 2	ibution 4	(%) of 8	MICs 16	(µg/ml 32)* 64	128	256	512	1024	2048 >204
Phenicols	Chloramphenicol	ens	Retail Chickens (153)	0.0	0.7	[0.0 - 3.6]								28.1	71.2		0.7						
		Chicken	Cecal (14)	0.0	0.0	[0.0 - 23.2]								57.1	42.9								
		Turkeys	Retail Ground Turkey (57)	1.8	0.0	[0.0 - 6.3]								50.9	47.4	1.8							
		Turk	Cecal (4)	0.0	0.0	[0.0 - 60.2]								50.0	50.0								
			Retail Ground Beef (60)	0.0	1.7	[0.0 - 8.9]								31.7	66.7		1.7						
		Cattle	Cecal (Beef) (47)	0.0	0.0	[0.0 - 7.5]							2.1	74.5	23.4								
		0	Cecal (Dairy) (28)	0.0	0.0	[0.0 - 12.3]							7.1	71.4	21.4								
			Retail Pork Chops (40)	0.0	0.0	[0.0 - 8.8]								40.0	60.0								
		- 5	Cecal (Market Swine) (21)	0.0	0.0	[0.0 - 16.1]								61.9	38.1								
		S	Cecal (Sows) (15)	0.0	0.0	[0.0 - 21.8]																	
Quinolones	Ciprofloxacin	kens	Retail Chickens (153)	36.6	45.8	[37.7 - 54.0]				0.7	2.0	15.0	36.6	37.9	7.8								
		Chic	Cecal (14)	64.3	7.1	[0.2 - 33.9]					7.1	21.4	64.3	7.1									
		eys	Retail Ground Turkey (57)	40.4	40.4	[27.6 - 54.2]					1.8	17.5	40.4	31.6	8.8								
		Turkeys	Cecal (4)	50.0	25.0	[0.6 - 80.6]						25.0	50.0	25.0									
			Retail Ground Beef (60)	25.0	10.0	[3.8 - 20.5]				3.3	13.3	48.3	25.0	6.7	3.3								
		Cattle	Cecal (Beef) (47)	36.2	31.9	[19.1 - 47.1]					8.5	23.4	36.2	25.5	6.4								
		0	Cecal (Dairy) (28)	28.6	28.6	[13.2 - 48.7]				3.6	3.6	35.7	28.6	21.4	7.1								
		o)	Retail Pork Chops (40)	27.5	5.0	[0.6 - 16.9]				7.5	12.5	47.5	27.5	5.0									
		Swine	Cecal (Market Swine) (21)	19.1	42.9	[21.8 - 66.0]					9.5	28.6	19.1	28.6	14.3								
		,	Cecal (Sows) (15)	6.7	53.3	[26.6 - 78.7]					6.7	33.3	6.7	26.7	26.7								
Streptogramins	Quinupristin- Dalfopristin	Chicken	Retail Chickens (153)	39.2	28.8	[21.7 - 36.6]					30.1	2.0	39.2	6.5	9.8	6.5	5.2	0.7					
	Danoprisun	Chi	Cecal (14)	35.7	42.9	[17.7 - 71.1]					14.3	7.1	35.7	14.3	14.3	14.3							
		Turkeys	Retail Ground Turkey (57)	38.6	40.4	[27.6 - 54.2]					10.5	10.5	38.6	10.5	10.5	10.5	8.8						
		Tur	Cecal (4)	0.0	75.0	[19.4 - 99.4]					25.0			25.0	25.0	25.0							
		o)	Retail Ground Beef (60)	65.0	5.0	[1.0 - 13.9]					26.7	3.3	65.0	5.0									
		Cattle	Cecal (Beef) (47)	51.1	4.3	[0.5 - 14.5]					31.9	12.8	51.1	4.3									
			Cecal (Dairy) (28)	53.6	3.6	[0.1 - 18.3]					35.7	7.1	53.6	3.6									
		Ф	Retail Pork Chops (40)	60.0	20.0	[9.1 - 35.6]					10.0	10.0	60.0	20.0									
		Swine	Cecal (Market Swine) (21)	52.4	23.8	[8.2 - 47.2]					19.1	4.8	52.4	19.1		4.8							
		91	Cecal (Sows) (15)	53.3	13.3	[1.7 - 40.5]					13.3	20.0	53.3	6.7	6.7								
Tetracyclines	Tetracycline	Chicken	Retail Chickens (153)	3.3	51.6	[43.4 - 59.8]						45.1			3.3	1.3	2.6	47.7					
			Cecal (14)	0.0	35.7	[12.8 - 64.9]						57.1		7.1		7.1	7.1	21.4					
		Furkeys	Retail Ground Turkey (57)	0.0	70.2	[56.6 - 81.6]						29.8						70.2					
		Tur	Cecal (4)	0.0	75.0	[19.4 - 99.4]						25.0						75.0					
		е	Retail Ground Beef (60)	0.0	18.3	[9.5 - 30.4]						81.7						18.3					
		Cattle	Cecal (Beef) (47)	0.0	31.9	[19.1 - 47.1]						61.7	4.3	2.1		4.3	2.1	25.5					
			Cecal (Dairy) (28)	0.0	7.1	[0.9 - 23.5]						92.9				3.6		3.6					
		e	Retail Pork Chops (40)	0.0	40.0	[24.9 - 56.7]						60.0						40.0					
		Swin	Cecal (Market Swine) (21)	4.8	57.1	[34.0 - 78.2]						33.3	4.8		4.8	4.8		52.4					
1 December 1 in the latest with interest	La constitue de la constitue d		Cecal (Sows) (15) there is no intermediate breakpoint es	0.0	60.0	[32.3 - 83.7]						40.0						60.0					

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

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

^{35%} confidence intensals for percent resistance. User-particle using the Clopper-Pearson exact method

The unshaded areas indicate the dilution range of the Sensitire plates used to test isolates. Single vertical lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

Resistance by Year

Table 73a. Antimicrobial Resistance among Enterococcus faecium Isolates, 2003-2014

Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Chickens	Retail Chickens Cecal	248	348	307	315	189	163	202	197	221	235	213 6	153 14
		urkeys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
		Cattle	Retail Ground Beef Cecal (Beef)	112	162	129	125	69	73	59	61	82	91	80 27	60 47
		_	Cecal (Dairy) Retail Pork Chops	97	75	75	70	33	35	26	32	37	52	34 50	28 40
		Swine	Cecal (Market Swine) Cecal (Sows)	31	13	13	10	33	33	20	32	37	32	12 7	21 15
Antimicrobial Class	Antimicrobial (Resistance Breakpoint)		Isolate Source												
Aminoglycosides	Gentamicin (MIC >500 μg/ml)	Chickens	Retail Chickens	5.6% 14	4.3% 15	6.2% 19	6.0% 19	9.5% 18	11.7% 19	6.9% 14	6.1% 12	9.5% 21	6.8% 16	7.0% 15	7.2% 11
		Chic	Cecal											0.0%	0.0%
		Turkeys	Retail Ground Turkey	12.7% 15	13.4% 23	12.1% 13	15.1% 21	1.5% 1	10.0% 7	18.2% 12	6.7%	10.0% 4	13.7% 10	8.3% 4	17.5% 10
		Ţ	Cecal											0.0% 0	50.0%
		0	Retail Ground Beef	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
		0	Retail Pork Chops	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
		Swine	Cecal (Market Swine)											0.0%	0.0%
			Cecal (Sows)											0.0% 0	0.0%
	Kanamycin (MIC ≥ 1024 μg/ml)	Chickens	Retail Chickens	10.5% 26	9.5% 33	10.7% 33	6.3% 20	12.2% 23	11.7% 19	9.9% 20	5.6% 11	9.5% 21	8.0% 19	9.4% 20	12.4% 19
		Chic	Cecal											33.3% 2	0.0%
		Turkeys	Retail Ground Turkey	28.0% 33	35.5% 61	29.9% 32	33.8% 47	7.7% 5	12.9% 9	33.3% 22	15.6% 7	25.0% 10	26.0% 19	27.1% 13	22.8% 13
		TuT	Cecal											0.0%	75.0% 3
			Retail Ground Beef	8.0% 9	8.6% 14	3.9% 5	1.6% 2	0.0%	5.5% 4	6.8% 4	8.2% 5	6.1% 5	5.5% 5	3.8% 3	1.7% 1
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											2.9% 1	0.0%
			Retail Pork Chops	2.1% 2	2.7% 2	8.0% 6	2.9% 2	3.0% 1	5.7% 2	0.0%	3.1% 1	5.4% 2	0.0% 0	4.0% 2	2.5% 1
		Swine	Cecal (Market Swine)											0.0%	4.8% 1
			Cecal (Sows)											28.6% 2	13.3% 2
	Streptomycin (MIC ≥ 1000 µg/ml)	Chickens	Retail Chickens	16.9% 42	8.3% 29	14.0% 43	3.8% 12	3.7% 7	6.7% 11	30.2% 61	26.4% 52	27.2% 60	17.9% 42	17.4% 37	15.0% 23
		Chic	Cecal											0.0%	28.6% 4
		Turkeys	Retail Ground Turkey	32.2% 38	34.3% 59	34.6% 37	22.3% 31	16.9% 11	17.1% 12	51.5% 34	29.9% 13	55.0% 22	48.0% 35	37.5% 18	33.3% 19
		Turk	Cecal											0.0%	75.0% 3
			Retail Ground Beef	2.7% 3	5.6% 9	1.6% 2	0.8% 1	0.0%	2.7%	8.5% 5	3.3%	6.1% 5	3.3%	2.5% 2	3.3%
		Cattle	Cecal (Beef)											0.0%	2.1%
			Cecal (Dairy)											2.9%	0.0%
			Retail Pork Chops	3.1%	6.7% 5	6.7% 5	2.9% 2	0.0%	0.0%	3.8%	3.1% 1	5.4% 2	0.0%	4.0% 2	0.0%
		Swine	Cecal (Market Swine)											25.0% 3	23.8% 5
			Cecal (Sows)											42.9% 3	26.6%
ilycopeptides	Vancomycin (MIC ≥ 32 µg/ml)	(ens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	, , , , , , , , , , , , , , , , , , ,	Chickens	Cecal											0.0%	0.0%
		eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	Cecal											0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
				<u> </u>					<u> </u>	<u>. </u>	<u> </u>				
		Swine	Cecal (Market Swine)											0.0%	0.0%

Table 73b. Antimicro	bial Resistance amo	ng E	nterococcus faeciu				2000	2007	2000	2000	2040	2044	2042	2042	2044
Year		SUS	Retail Chickens	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Chickens	Cecal	248	348	307	315	189	163	202	197	221	235	213 6	153 14
		urkeys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
		Įn L	Cecal											4	4
		Cattle	Retail Ground Beef Cecal (Beef)	112	162	129	125	69	73	59	61	82	91	80 27	60 47
		0	Cecal (Dairy)											34	28
		Swine	Retail Pork Chops Cecal (Market Swine)	97	75	75	70	33	35	26	32	37	52	50	40
		Š	Cecal (Sows)											12 7	21 15
Australia abial Olasa	Antimicrobial (Resistance Breakpoint)		Isolate Source												i
Antimicrobial Class Glycylcycline	Tigecycline	sus	Retail Chickens			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%
	(MIC ≥ 0.25 μg/mI) ¹	Chickens	Cecal			0	0	0	0	0	0	0	0	0.0%	0.0%
		-	Retail Ground Turkey			0.0%	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%
		Turkeys	Cecal			0	0	0	2	0	0	0	0	0.0%	0.0%
			Retail Ground Beef			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)			0	0	0	0	0	0	0	0	0.0%	0.0%
		ပိ	Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ine	i i			0	0	0	0	0	0	0	0	0.0%	0.0%
		Swine	Cecal (Market Swine) Cecal (Sows)											0.0%	0.0%
Lincosamides	Lincomycin	s		86.7%	83.3%	78.2%	74.9%	84.1%	81.0%	83.2%	82.2%	81.9%	78.7%	0 83.1%	0 80.4%
	(MIC ≥ 8 μg/ml)	Chickens	Retail Chickens	215	290	240	236	159	132	168	162	181	185	177 100.0%	123 78.6%
		-	Cecal	89.0%	88.4%	92.5%	97.8%	92.3%	91.4%	93.9%	86.7%	87.5%	83.6%	6 91.7%	11 82.5%
		Turkeys	Retail Ground Turkey	105	152	99	136	60	64	62	39	35	61	44 75.0%	47 75.0%
		ĭ	Cecal	E0.00/	67.9%	74.4%	44 69/	56.5%	75.3%	79.7%	73.8%	79.3%	72.5%	3 58.8%	3 70.0%
		Ф	Retail Ground Beef	58.9% 66	110	96	41.6% 52	39	55	47	45	65	66	47	42
		Cattle	Cecal (Beef)											81.5% 22	57.4% 27
			Cecal (Dairy)											67.6% 23	60.7% 17
		Ф	Retail Pork Chops	89.7% 87	84.0% 63	88.0% 66	64.3% 45	66.7% 22	57.1% 20	84.6% 22	78.1% 25	73.0% 27	90.4% 47	84.0% 42	80.0% 32
		Swine	Cecal (Market Swine)											83.3% 10	81.0% 17
			Cecal (Sows)											85.7% 6	80.0% 12
Lipopeptides	Daptomycin ²	Chickens	Retail Chickens		-	-	-	-	-	-	-	-	-	-	-
		Chi	Cecal											-	-
		Turkeys	Retail Ground Turkey		-	-	-	-	-	-	-	-	-	-	-
		Tur	Cecal											-	-
			Retail Ground Beef		-	-	-	-	-	-	-	-	-	-	-
		Cattle	Cecal (Beef)											-	-
			Cecal (Dairy)											-	-
			Retail Pork Chops		-	-	-	-	-	-	-	-	-	-	-
		Swine	Cecal (Market Swine)											-	
			Cecal (Sows)											-	-
Macrolides	Erythromycin (MIC ≥ 8 µg/ml)	ens	Retail Chickens	17.3% 43	12.6% 44	13.7% 42	9.5% 30	19.6% 37	22.1% 36	19.8% 40	13.7% 27	21.7% 48	21.3% 50	29.6% 63	34.6% 53
	, ,	Chickens	Cecal											16.7% 1	14.3%
		ske	Retail Ground Turkey	44.1% 52	43.0% 74	41.1% 44	44.6% 62	23.1% 15	37.1% 26	56.1% 37	33.3% 15	32.5% 13	27.4% 20	39.6% 19	36.8% 21
		Turkeys	Cecal	J						,	7.0			0.0%	50.0%
			Retail Ground Beef	8.9% 10	9.3% 15	4.7% 6	7.2% 9	4.3%	13.7% 10	5.1% 3	6.6%	6.1% 5	3.3%	7.5% 6	8.3% 5
		Cattle	Cecal (Beef)	10	13	Ů	Ť	Ĭ	1.0			j	j	3.7%	6.4%
			Cecal (Dairy)											0.0%	3.6%
			Retail Pork Chops	6.2%	5.3%	9.3%	7.1%	3.0%	14.3%	3.8%	9.4%	1.8%	1.9%	4.0%	7.5%
		Swine	Cecal (Market Swine)	6	4	7	5	1	5	1	3	4	1	16.7%	14.3%
		6	Cecal (Sows)											14.3%	13.3%
1 Descent per suggestible is	rangeted rather than parago	t reciet	ance as no CLSI breakpo	int has bee	n octoblick	od NADM	S brookpoi	nt octoblish	and to doto	mino rocio	tongo			1	2

¹ Percent non-susceptible is reported rather than percent resistance as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance.
² Resistance data are not presented because there are no established CLSI breakpoints for daptomycin

Table 73c. Antimicrobial Resistance among Enterococcus faecium Isolates, 2003-2014

	obial Resistance amo	ong <i>Er</i>	nterococcus faeciu			3-2014									
Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		Chickens	Retail Chickens	248	348	307	315	189	163	202	197	221	235	213	153
			Cecal											6	14
		Turkeys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
		르	Cecal											4	4
		Cattle	Retail Ground Beef Cecal (Beef)	112	162	129	125	69	73	59	61	82	91	80 27	60 47
		Ö	Cecal (Dairy)											34	28
		ne	Retail Pork Chops	97	75	75	70	33	35	26	32	37	52	50	40
		Swine	Cecal (Market Swine) Cecal (Sows)											12 7	21 15
	Antimicrobial														
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Macrolides	Tylosin (MIC ≥ 32 μg/ml)	Chickens	Retail Chickens	12.5% 31	10.3% 36	12.4% 38	7.9% 25	19.0% 36	20.2% 33	19.3% 39	12.2% 24	20.4% 45	20.9% 49	27.7% 59	33.3% 51
		Spi	Cecal											16.7% 1	7.1% 1
		eys	Retail Ground Turkey	27.1% 32	35.5% 61	29.9% 32	36.0% 50	13.8% 9	12.9% 9	24.2% 16	15.6% 7	22.5% 9	17.8% 13	20.8% 10	19.3% 11
		Turkeys	Cecal	,=	7.				-			-		0.0%	75.0%
			Retail Ground Beef	0.9%	5.6%	2.3%	4.8%	2.9%	4.1%	3.4%	3.3%	3.7%	2.2%	5.0%	0.0%
		Cattle	Cecal (Beef)	1	9	3	6	2	3	2	2	3	2	0.0%	6.4%
		Ö	Cecal (Dairy)											0.0%	0.0%
				2.1%	0.0%	5.3%	5.7%	3.0%	5.7%	0.0%	3.1%	5.4%	0.0%	0 4.0%	0 10.0%
		e e	Retail Pork Chops	2	0	4	4	1	2	0	1	2	0	2 8.3%	4 9.5%
		Swine	Cecal (Market Swine)											1	2
			Cecal (Sows)											14.3% 1	13.3% 2
Nitrofurans	Nitrofurantoin (MIC ≥ 128 µg/ml)	Chickens	Retail Chickens	64.5% 160	85.3% 297	54.7% 168	38.4% 121	32.8% 62	46.0% 75	51.5% 104	40.1% 79	41.6% 92	36.6% 86	23.0% 49	36.0% 55
		Shic	Cecal											0.0% 0	21.4% 3
		sys	Retail Ground Turkey	52.5% 62	66.9% 115	43.0% 46	22.3% 31	12.3% 8	27.1% 19	40.9% 27	22.2% 10	40.0% 16	39.7% 29	29.2% 14	36.8% 21
		Turkeys	Cecal	02	113	40	31		19	21	10	10	23	0.0%	50.0%
			Retail Ground Beef	36.6%	51.9%	18.6%	12.8%	4.3%	20.5%	16.9%	6.6%	28.1%	22.0%	20.0%	2 25.0%
		Cattle	Cecal (Beef)	41	84	24	16	3	15	10	4	23	20	16 0.0%	15 10.6%
		ပိ												0.0%	5 28.6%
		-	Cecal (Dairy)	16.5%	37.3%	10.7%	4.3%	9.1%	8.6%	11.5%	6.3%	18.9%	5.8%	0 16.0%	8
		o o	Retail Pork Chops	16	28	8	3	3	3	3	2	7	3	8	4 38.1%
		Swine	Cecal (Market Swine)											0.0%	8
			Cecal (Sows)											0.0% 0	33.3% 5
Oxazolidinones	Linezolid (MIC ≥ 8 µg/ml)	kens	Retail Chickens	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chickens	Cecal											0.0%	0.0%
		ske	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Turkeys	Cecal	Ü						Ů				0.0%	0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		ပိ	Cecal (Dairy)											0.0%	0.0%
		\vdash		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	0.0%
		_ e	Retail Pork Chops	0.070	0	0.070	0.070	0.070	0	0	0	0	0	0	0.0%
		Swine	Cecal (Market Swine)											0	0
			Cecal (Sows)											0.0% 0	0.0%
Penicillins	Penicillin (MIC ≥ 16 μg/ml)	Chickens	Retail Chickens	51.2% 127	39.1% 136	31.9% 98	22.2% 70	12.2% 23	27.6% 45	23.3% 47	24.4% 48	18.6% 41	11.9% 28	9.9% 21	10.5% 16
		Chic	Cecal											0.0%	7.1% 1
		sys	Retail Ground Turkey	65.3% 77	61.6% 106	59.8% 64	67.6% 94	60.0% 39	61.4% 43	69.7% 46	48.9% 22	75.0% 30	68.5% 50	54.2% 26	45.6% 26
		Turkeys	Cecal	<u>''</u>	100	<u> </u>	J-	33				30	33	0.0%	50.0%
			Retail Ground Beef	8.0%	3.1%	2.3%	4.8%	1.4%	9.6%	6.8%	3.3%	3.7%	3.3%	5.0%	1.7%
		Cattle	Cecal (Beef)	9	5	3	6	1	7	4	2	3	3	0.0%	0.0%
		ပီ												0.0%	0.0%
		\vdash	Cecal (Dairy)	1.0%	8.0%	1.3%	1.4%	0.0%	0.0%	7.7%	6.3%	2.7%	0.0%	0 4.0%	0.0%
		ē	Retail Pork Chops	1.0%	6	1.376	1.476	0.078	0.0%	2	2	1	0.076	2 0.0%	0.0 % 0 9.5%
		Swine	Cecal (Market Swine)											0	2
			Cecal (Sows)											42.9% 3	0.0% 0

Table 73d. Antimicrobial Resistance among Enterococcus faecium Isolates, 2003-2014

Marie Character Faceure Trianger Tr		bial Resistance amon	ig E	nterococcus taecii		tes, 200	3-2014									
Part	Year				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Part	Number of Isolates Tested		kens	Retail Chickens	248	348	307	315	189	163	202	197	221	235	213	153
March Control March Contro			Shic	Cecal											6	14
Manufaction			keys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
Control (Sumple Control (Sum			Tur	Cecal											4	4
Professional part			ite E		112	162	129	125	69	73	59	61	82	91		
Part			Cat													
Marie Control (Control (Co					07	75	75	70	22	25	26	22	27	F2		
Part			wine		31	/3	/3	70	33	33	20	32	37	32		
			0)	Cecal (Sows)											7	15
Control Cont		(Resistance														
Part			10	İ	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%
Part Part			cken	Retail Chickens											0	1
March Colorido 100			S	Cecal												
Part Part			ske	Retail Ground Turkey												
Part Part			Turk.	Cecal	Ü	0	U	0		0	0	0			0.0%	0.0%
Part				Datail Court d Date	0.0%	1.2%	0.0%	0.0%	0.0%	1.4%	0.0%	1.6%	0.0%	1.1%		
Decision Decision			<u>e</u>	Retail Ground Beer	0	2	0	0	0	1	0	1	0	1		
Marie Care Care Care Care Care Care Care Car			Catt	Cecal (Beef)												
Real Fox Coxpg. 0.0% 0.0				Cecal (Dairy)												
Part Control (Source) Cont				Retail Pork Chops											0.0%	0.0%
Carlo (Sove) Carl			ine		0	0	0	0	0	0	0	0	1	0		
Continue			Sw													
March Appendix Part	Outreland		1	Cecal (Sows)											0	0
Retail Ground Turkey	Quinolones		sues	Retail Chickens										1		
Retail Ground Turkey		, ,	Chic	Cecal											50.0%	7.1%
Part Count			-	Retail Ground Turkey	39.0%	53.5%	43.9%	37.4%	35.4%	54.3%	40.9%	42.2%	57.5%	54.8%		
Retail Ground Beef 33.0% 27.2% 20.9% 21.8% 10.1% 28.0% 18.8% 14.8% 17.1% 12.1% 20.0% 10.0% 10.0% 11.0% 11.0% 11.0% 12.1% 20.0% 10.0% 11.0% 11.0% 11.0% 12.1% 20.0% 10.0% 11.0% 11.0% 12.1% 20.0% 10.0% 11.0% 11.0% 12.1% 20.0% 10.0% 11.0% 12.1% 20.0% 10.0% 11.0% 10.0% 10.0% 11.0% 10.0%			urkey		46	92	47	52	23	38	27	19	23	40		
Note of Carcial (Seeler) 32 44 27 27 7 13 11 9 14 11 20 6			F	Cecal											2	1
Part				Retail Ground Beef										1		
Part			attle	Cecal (Beef)												
Retail Pork Chops			0	Cecal (Dairy)												
Retail Ground Turkey 6 33 7 3 3 5 2 4 4 2 8 2 2 8 2 2 8 2 2			-		6.2%	17.3%	9.3%	4.3%	9.1%	14.3%	7.7%	12.5%	10.8%	3.9%		
Cocal (Sows) Septembroad Streptogramina Cocal (Sows) Septembroad Septembro			o o	Retail Pork Chops					1						8	2
Surpetgogramms			Swin	Cecal (Market Swine)												
Caregoramins Care				Cecal (Sows)												
Retail Ground Turkey	Streptogramins		sus	Retail Chickens											28.2%	28.8%
Retail Ground Turkey		(MIC ≥ 4 μg/ml)	hicke	Cocol	148	110	120	115	108	89	101	57	71	88		
Part Part					70.79/	GA E0/	62.69/	7E E0/	76.00/	60.60/	60.79/	E7 00/	EE 00/	64.49/		
Retail Ground Beef 50.0% 6.2% 7.8% 6.4% 5.8% 16.4% 11.0% 0.9% 11.0% 26.4% 11.8% 5.9% 5.9% 10.0 10.0 8.4 12.0 11.0 0.9% 24.0 15.3% 2.0% 4.3% 3.6% 2.0% 4.3% 3.6% 3			keys	Retail Ground Turkey											20	23
Retail Ground Beef 50.0% 6.2% 7.8% 6.4% 5.8% 16.4% 18.6% 0.0% 11.0% 26.4% 18.8% 5.0% 3.8% 3.6% 4.12 11 0 9 24 15 3 3 4 4.3% 4			Tur	Cecal												
Cecal (Beef) Cecal (Cairy)				Retail Ground Beef					1						18.8%	5.0%
Cecal (Dairy) Cecal (Dairy) Cecal (Dairy) Cecal (Dairy) Cecal (Dairy) Cecal (Market Swine) Cecal (Sows) Cecal (Market Swine) Cecal (Sows) Cecal (Market Swine) Ce			ıttle	Cecal (Beef)	56	10	10	ð	4	12	11	U	9	24	29.6%	4.3%
Retail Pork Chops			ပ္ပ													
Retail Chickens 51.6% 45.1% 54.4% 53.0% 63.0 57.0% 64.4% 56.9% 35.5% 43.4% 55.7% 55				Cecai (Dairy)	04	0	40	40	0		40	0	40	00	3	1
Cecal (Market Swine) Cecal (Market Swine)				·					1							
Tetracyclines Tetracycline (MIC ≥ 16 μg/ml) Tetracycline			wine	Cecal (Market Swine)												
Tetracyclines Tetracycline			S												28.6%	13.3%
(MIC ≥ 16 µg/ml) Mode Herial Chickens 128 157 167 167 125 105 115 70 96 131 125 79	Tetracyclines	Tetracycline	ø		51.6%	45.1%	54.4%	53.0%	66.1%	64.4%	56.9%	35.5%	43.4%	55.7%		
Retail Ground Turkey 91.5% 86.6% 91.6% 92.8% 96.9% 81.4% 92.4% 71.1% 82.5% 78.1% 75.0% 70.2% 70.2% 75.0% 149 98 129 63 57 61 32 33 57 36 40 70.2% 75.0			icken												125	79
Retail Ground Beef 28.6% 24.7% 28.7% 20.0% 18.8% 39.0% 27.9% 22.0% 23.1% 20.0% 18.3% 31.9% Cecal (Beef) 29.6% 37.0% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 25.1% 20.0% 11.8% 71.9% 11.8% 71.9% 15.1% 15.1% 16.1			ç	Cecal											4	5
Retail Ground Beef 28.6% 24.7% 28.7% 20.0% 18.8% 28.8% 39.0% 27.9% 22.0% 23.1% 20.0% 18.3% 25 13 21 23 17 18 21 16 11 16 11 16 13 16 18 16 32 16 16 19 16 17 18 18 16 32 16 16 17 18 18 16 32 16 16 17 18 18 16 18 18 16 18 16 18 18 16 18 18 16 18 18 16 18 18 18 18 18 18 18 18 18 18 18 18 18			eys	Retail Ground Turkey												
Retail Ground Beef 28.6% 24.7% 28.7% 20.0% 18.8% 28.8% 39.0% 27.9% 22.0% 23.1% 20.0% 18.3% 25 13 21 23 17 18 21 16 11 16 11 16 13 16 18 16 32 16 16 19 16 17 18 18 16 32 16 16 17 18 18 16 32 16 16 17 18 18 16 18 18 16 18 16 18 18 16 18 18 16 18 18 16 18 18 18 18 18 18 18 18 18 18 18 18 18			Turk	Cecal						-	-				25.0%	75.0%
Retail Ground Beef 32 40 37 25 13 21 23 17 18 21 16 11 Cecal (Beef) Cecal (Dairy) Retail Pork Chops 69.1% 72.0% 56.0% 54.3% 33.3% 45.7% 50.0% 50.0% 48.7% 30.8% 64.0% 40.0% 67 54 42 38 11 16 13 16 18 16 32 16 Cecal (Market Swine) Cecal (Sows)			-		28.6%	24.7%	28.7%	20.0%	18.8%	28.8%	39.0%	27.9%	22.0%	23.1%		
Cecal (Dairy) Retail Pork Chops 69.1% 72.0% 67 54 42 38 11 16 13 16 18 16 32 11.8% 7.1% 4 2 Cecal (Market Swine) Cecal (Spws) Cecal (Spws) Cecal (Spws) Retail Pork Chops 69.1% 72.0% 56.0% 54.3% 33.3% 45.7% 50.0% 50.0% 48.7% 50.0% 48.7% 50.0% 48.7% 50.0% 48.7% 50.0% 51.0% 57.1% 60.0%			ē			40	37		13			17	18	21		
Retail Pork Chops 69.1% 72.0% 56.0% 54.3% 33.3% 45.7% 50.0% 50.0% 48.7% 30.8% 64.0% 40.0%			Catt	Cecal (Beef)											8	15
Retail Pork Chops 69.1% 72.0% 56.0% 54.3% 33.3% 45.7% 50.0% 50.0% 48.7% 30.8% 64.0% 40.0% 67 54 42 38 11 16 13 16 18 16 32 16 12 57.1% 57.				Cecal (Dairy)												
Cecal (Market Swine) 41.7% 57.1% 5 12 Cecal (Sows) 71.4% 60.0%				Retail Pork Chops											64.0%	40.0%
Cecal (Sows) 71.4% 60.0%			ine	Cecal (Market Swine)	6/	54	42	38	11	16	13	16	18	16		
			Sw													
				Cecal (Sows)												

Table 74a. Resistance Patte	rns a	among Enterococo	cus faecii	um Isolat	es, 2003	2014	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	ens	Retail Chickens	248	348	307	315	189	163	2009	197	221	235	213	153
TOSIGU	Chickens	Cecal	240	0.0	307	013	103	100	202	107	221	200	6	14
	Turkeys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
	Η	Cecal											4	4
	Cattle	Retail Ground Beef Cecal (Beef) Cecal (Dairy)	112	162	129	125	70	73	59	61	82	91	80 27 34	60 47 28
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	97	75	75	70	33	35	26	32	37	52	50 12 7	40 21 15
Resistance Pattern ¹		Source											,	13
1. No Resistance Detected	kens	Retail Chickens	1.2% 3	1.1% 4	9.8% 30	10.8% 34	9.0% 17	4.9% 8	4.5% 9	6.1% 12	5.0% 11	3.4% 8	7.0% 15	6.5% 10
	Chickens	Cecal											0.0%	14.3% 2
	ske	Retail Ground Turkey	0.0% 0	0.6% 1	0.0% 0	0.0%	1.5% 1	2.9%	1.5% 1	6.7% 3	5.0% 2	1.4% 1	2.1% 1	0.0% 0
	Turkeys	Cecal	J		J	J				J	_	•	0.0%	0.0%
		Retail Ground Beef	10.7% 12	9.9% 16	9.3% 12	40.0% 50	38.6% 27	8.2% 6	3.4%	11.5% 7	7.3% 6	11.0% 10	15.0% 12	15.0% 9
	Cattle	Cecal (Beef)	12	10	12	30	21	0	2		0	10	0.0%	21.3%
		Cecal (Dairy)											2.9%	21.4%
		Retail Pork Chops	3.1%	1.3%	6.7%	21.4%	18.2%	17.1%	11.5%	15.6%	10.8%	5.8%	6.0%	12.5%
	Swine	Cecal (Market Swine)	3	1	5	15	6	6	3	5	4	3	3 8.3%	4.8%
	Ó	Cecal (Sows)											1 14.3%	6.7%
2. Resistance to ≥ 3	શ	Retail Chickens	79.4%	75.9%	63.2%	53.3%	66.7%	63.8%	65.8%	48.7%	54.8%	60.0%	62.9%	60.8%
Antimicrobial Classes	Chickens	Cecal	197	264	194	168	126	104	133	96	121	141	134 66.7%	93 50.0%
		Retail Ground Turkey	88.1%	91.9%	86.9%	93.5%	90.8%	85.7%	92.4%	75.6%	85.0%	84.9%	4 79.2%	7 75.4%
	Turkeys	Cecal	104	158	93	130	59	60	61	34	34	62	38 25.0%	43 75.0%
	_		40.2%	27.2%	15.5%	9.6%	7.2%	27.4%	20.3%	9.8%	20.7%	22.0%	1 16.3%	3 13.3%
	te te	Retail Ground Beef	45	44	20	12	5	20	12	6	17	20	13 18.5%	8 19.2%
	Cattle	Cecal (Beef)											5 14.7%	9
		Cecal (Dairy)	54.6%	41.3%	21.3%	12.9%	3.0%	17.1%	23.1%	12.5%	16.2%	7.7%	5 18.0%	5 17.5%
	Ф	Retail Pork Chops	53	31	16	9	1	6	6	4	6	4	9 41.7%	7 52.4%
	Swine	Cecal (Market Swine)											5	11
a Paristantia d		Cecal (Sows)	50.00/	50.00/	40.70/	00.50/	00.00/	54.50/	50.40/	00.40/	40.40/	44.00/	71.4% 5	53.3%
3. Resistant to ≥ 4 Antimicrobial Classes	Chickens	Retail Chickens	52.8% 131	52.6% 183	43.7% 134	36.5% 115	38.6% 73	51.5% 84	56.4% 114	38.1% 75	42.1% 93	44.3% 104	36.2% 77	47.1% 72
	Ċ	Cecal											50.0% 3	21.4% 3
	Turkeys	Retail Ground Turkey	72.9% 86	82.6% 142	73.8% 79	82.0% 114	75.4% 49	80.0% 56	86.4% 57	64.4% 29	75.0% 30	75.3% 55	64.6% 31	49.1% 28
	Ē	Cecal											0.0% 0	75.0% 3
	<u>.</u>	Retail Ground Beef	18.8% 21	9.9% 16	6.2% 8	4.8% 6	4.3% 3	15.1% 11	13.6% 8	3.3%	7.3% 6	7.7% 7	8.8% 7	5.0%
	Cattle	Cecal (Beef)											3.7% 1	6.4% 3
		Cecal (Dairy)											2.9% 1	0.0% 0
		Retail Pork Chops	7.2% 7	12.0% 9	9.3% 7	4.3% 3	3.0% 1	5.7% 2	3.8% 1	9.4% 3	10.8% 4	0.0% 0	10.0% 5	10.0% 4
	Swine	Cecal (Market Swine)											25.0% 3	38.1% 8
		Cecal (Sows)											57.1% 4	26.7% 4
4. Resistant to ≥ 5 Antimicrobial Classes	kens	Retail Chickens	35.5% 88	28.7% 100	28.3% 87	16.8% 53	16.9% 32	34.4% 56	39.1% 79	25.4% 50	23.1% 51	19.6% 46	14.6% 31	25.5% 39
	Chickens	Cecal											33.3% 2	21.4% 3
	eys	Retail Ground Turkey	68.6% 81	62.2% 107	57.0% 61	57.6% 80	38.5% 25	55.7% 39	65.2% 43	42.2% 19	62.5% 25	56.2% 41	43.8% 21	38.6% 22
	Turkeys	Cecal											0.0%	75.0% 3
		Retail Ground Beef	8.0%	5.6%	4.7% 6	4.0% 5	0.0%	8.2%	1.7%	1.6%	3.7%	3.3%	5.0%	1.7%
	Cattle	Cecal (Beef)	3	3		,	0				3	3	0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	5.2%	4.0%	6.7%	4.3%	0.0%	2.9%	3.8%	6.3%	8.1%	0.0%	4.0%	0.0%
	Swine	Cecal (Market Swine)	5	3	5	3	0	1	1	2	3	0	0.0%	33.3%
	Ś	Cecal (Sows)											0 28.6%	7 13.3%
		cecai (Sows)		0.01									2	2

¹Resistance patterns do not include daptomycin as there are no established CLSI breakpoints

Table 74b. Resistance Patt	erns a	among <i>Enterococ</i> e	cus faeci 2003	um Isola 2004	tes, 2003	-2014 2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	Chickens	Retail Chickens Cecal	248	348	307	315	189	163	202	197	221	235	213	153
	Turkeys	Retail Ground Turkey	118	172	107	139	65	70	66	45	40	73	48	57
	Cattle	Cecal Retail Ground Beef Cecal (Beef) Cecal (Dairy)	112	162	129	125	70	73	59	61	82	91	4 80 27 34	4 60 47 28
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	97	75	75	70	33	35	26	32	37	52	50 12 7	40 21 15
Resistance Pattern ¹		Source												
4. Resistant to ≥ 6 Antimicrobial Classes	Chickens	Retail Chickens Cecal	12.9% 32	14.9% 52	15.0% 46	9.8%	10.6%	23.3% 38	14.4% 29	12.2% 24	11.8% 26	8.1% 19	7.5% 16 16.7% 1	7.2% 11 0.0% 0
	Turkeys	Retail Ground Turkey Cecal	43.2% 51	44.8% 77	38.3% 41	30.9% 43	15.4% 10	30.0% 21	47.0% 31	24.4% 11	50.0% 20	32.9% 24	29.2% 14 0.0%	26.3% 15 50.0%
	<u> </u>		4.5%	4.3%	0.0%	2.4%	0.0%	4.1%	1.7%	1.6%	2.4%	1.1%	0 3.8%	2 0.0%
	e e	Retail Ground Beef	5	7	0	3	0	3	1	1	2	1	3	0
	Cattle	Cecal (Beef)											0	0.0%
		Cecal (Dairy)			2 = 2					2 101			0.0%	0
		Retail Pork Chops	1.0% 1	0.0%	2.7% 2	1.4% 1	0.0% 0	2.9% 1	3.9% 1	3.1% 1	2.7% 1	0.0%	4.0% 2	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
		Cecal (Sows)											0.0%	6.7% 1
6. At Least Pencillin G and High Level Gentamicin	ens	Retail Chickens	3.2% 8	3.5% 12	3.3% 10	3.2% 10	3.7% 7	7.4% 12	3.0% 6	2.5% 5	3.6% 8	0.9% 2	1.4% 3	1.3% 2
riigii Lever Gentainieni	Chickens	Cecal	Ü	12	10	10	,	12	Ü	J	Ü		0.0%	0.0%
	-	Retail Ground Turkey	7.6%	10.5%	9.4%	7.2%	1.5%	7.1%	13.6%	2.2%	5.0%	13.7%	2.1%	12.3%
	Turkeys	Cecal	9	18	10	10	1	5	9	1	2	10	0.0%	7 25.0%
	_	Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)	0	0	0	0	0	0	1	0	0	0	0.0%	0.0%
	రొ												0.0%	0.0%
		Cecal (Dairy)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	e.	Retail Pork Chops	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Swine	Cecal (Market Swine)											0	0
T. At Local Bourillin C		Cecal (Sows)	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0.00/	0	0
7. At Least Pencillin G High Level Gentamicin,	Chickens	Retail Chickens	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0
	Ş	Cecal											0.0% 0	0.0% 0
	eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0%	0.0% 0
	Turke	Cecal											0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	U	0	U	0	U	U	U	U	U	U	0.0%	0.0%
	Ó	Cecal (Sows)											0.0%	0.0%
8. At Least Pencillin G,	St	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Level Gentamicin,	Chickens	Cecal	0	0	0	0	0	0	0	0	0	0	0 0.0% 0	0 0.0% 0
	eys	Retail Ground Turkey	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Turkeys	Cecal											0.0%	0.0%
		Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)		U		0		-		0			0.0%	0.0%
		Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
	Š												0.0%	0.0%
1 Desistance authorized and include		Cecal (Sows)											0	0

¹Resistance patterns do not include daptomycin as there are no established CLSI breakpoints

Table 75a. Distribu	ition of MICs and Occi	urre	nce among Enterococ	cus h	irae Is	olates, 2014	I							Diete	:	(0/) = 6 8	UC- (···							—
Antimicrobial Class	Antimicrobial Agent	L	Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.02	0.03	0.06	0.125	0.25	0.50	1	Distr 2	ibution 4	(%) of I 8	IICs (µı 16	g/ml) 32 64	128	256	512	1024	2048	>2048
Aminoglycosides	Gentamicin	kens	Retail Chickens (33)	N/A	9.1	[1.9 - 24.3]													90.3			9.1		
		Chickens	Cecal (3)	N/A	0.0	[0.0 - 70.8]													100.0					
			Retail Ground Turkey (2)	N/A	0.0	[0.0 - 84.2]													100.0					
		Turkeys	Cecal (1)	N/A	0.0	[0.0 - 97.5]													100.0					
		6	Retail Ground Beef (41)	N/A	0.0	[0.0 - 8.6]													100.0					
		Cattle	Cecal (Beef) (196)	N/A	0.5	[0.0 - 2.8]													99.5			0.5		
			Cecal (Dairy) (75)	N/A	0.0	[0.0 - 4.8]													100.0					
		e(Retail Pork Chops (8)	N/A	0.0	[0.0 - 36.9]													100.0					
		Swin	Cecal (Market Swine) (51)	N/A	0.0	[0.0 - 7.0]													100.0					
		ů	Cecal (Sows) (32)	N/A	0.0	[0.0 - 10.9]													100.0		L			
	Kanamycin	Chicken	Retail Chickens (33) Cecal (3)	N/A N/A	9.1 33.3	[1.9 - 24.3] [0.8 - 90.6]													87.9 66.7	3.0		9.1 33.3		
		ays C	Retail Ground Turkey (2)	N/A	0.0	[0.0 - 84.2]													100.0			55.5		
		Furkey	Cecal (1)	N/A	0.0	[0.0 - 84.2]													100.0					
		_	Retail Ground Beef (41)	N/A	0.0	[0.0 - 8.6]														2.4				
		Cattle	Cecal (Beef) (196)	N/A	0.5	[0.0 - 2.8]													97.5	2.0			0.5	
		O	Cecal (Dairy) (75)	N/A	1.3	[0.0 - 7.2]													9.3	2.7			1.3	
		6	Retail Pork Chops (8)	N/A	0.0	[0.0 - 36.9]													100.0					
		Swine	Cecal (Market Swine) (51)	N/A	3.9	[0.5 - 13.5]													96.1				3.9	
			Cecal (Sows) (32)	N/A	3.1	[0.1 - 16.2]													90.6	6.3			3.1	
	Streptomycin	Chickens	Retail Chickens (33)	N/A	3.0	[0.1 - 15.8]															97.0	3.0		
		Chic	Cecal (3)	N/A	0.0	[0.0 - 70.8]															100.0			
		keys	Retail Ground Turkey (2)	N/A	0.0	[0.0 - 84.2]															100.0			
		Tur	Cecal (1)	N/A	0.0	[0.0 - 97.5]															100.0			
			Retail Ground Beef (41)	N/A	2.4	[0.1 - 12.9]															97.6	2.4		
		Cattle	Cecal (Beef) (196)	N/A	2.6	[0.8 - 5.9]															97.5	2.0		0.5
			Cecal (Dairy) (75)	N/A	1.3	[0.0 - 7.2]															98.7			1.3
		ЭС	Retail Pork Chops (8)	N/A	0.0	[0.0 - 36.9]															100.0			
		Swine	Cecal (Market Swine) (51) Cecal (Sows) (32)	N/A N/A	11.8 12.5	[4.4 - 23.9] [3.5 - 29.0]															88.2 87.5	5.9 3.1	1.9 6.3	3.9 3.1
		SL																_			07.5	3.1	0.5	3.1
Glycopeptides	Vancomycin	Chickens	Retail Chickens (33)	0.0	0.0	[0.0 - 10.6] [0.0 - 70.8]						24.2 100.0	75.8											
			Cecal (3)											50.0										
		urkeys	Retail Ground Turkey (2) Cecal (1)	0.0	0.0	[0.0 - 84.2] [0.0 - 97.5]						50.0 100.0		50.0										
		⊥	Retail Ground Beef (41)	0.0	0.0	[0.0 - 8.6]						41.5	58.5											
		Cattle	Cecal (Beef) (196)	0.5	0.0	[0.0 - 1.9]					3.6	79.6	15.8	0.5		0.5								
		Ca	Cecal (Dairy) (75)	0.0	0.0	[0.0 - 4.8]					1.3	70.7	26.7		1.3									
			Retail Pork Chops (8)	0.0	0.0	[0.0 - 36.9]						75.0	25.0											
		wine	Cecal (Market Swine) (51)	0.0	0.0	[0.0 - 7.0]					3.9		13.7	2.0										
		Ś	Cecal (Sows) (32)	0.0	0.0	[0.0 - 10.9]						96.9	3.1											
	Tigecycline	ens	Retail Chickens (33)	N/A	0.0	[0.0 - 10.6]			9.1	51.5	39.4	I												
		Chickens	Cecal (3)	N/A	0.0	[0.0 - 70.8]			33.3	66.7														
		keys	Retail Ground Turkey (2)	N/A	0.0	[0.0 - 84.2]					100.0													
		Turk	Cecal (1)	N/A	0.0	[0.0 - 97.5]			100.0															
		6	Retail Ground Beef (41)	N/A	2.4	[0.1 - 12.9]		2.4	9.8	26.8	58.5	2.4												
		Cattle	Cecal (Beef) (196)	N/A	0.0	[0.0 - 1.9]		25.5	29.1	29.1	16.3													
			Cecal (Dairy) (75)	N/A	0.0	[0.0 - 4.8]		30.7	28.0	22.7	18.7													
		Э	Retail Pork Chops (8)	N/A	12.5	[0.3 - 52.7]					75.0	12.5												
		Swir	Cecal (Market Swine) (51)	N/A N/A	0.0	[0.0 - 7.0]	2.0	2.0	29.4	35.3														
		SI	Cecal (Sows) (32)			[0.0 - 10.9]		6.3	25.0	40.0	28.1	l												
Lincosamides	Lincomycin	Chickens	Retail Chickens (33)	0.0	100.0	[89.4 - 100.0]										100.0	400.0							
			Cecal (3)	0.0	100.0	[29.2 - 100.0]										405.5	100.0							
		Turkeys	Retail Ground Turkey (2)	0.0	100.0 100.0	[15.8 - 100.0]										100.0	100.0							
		Ĭ	Cecal (1)			[2.5 - 100.0]							,,			7.2								
		#le	Retail Ground Beef (41) Cecal (Beef) (196)	0.0 2.0	95.1 91.3	[83.5 - 99.4] [86.5 - 94.9]							4.9 6.1	0.5	2.0	7.3 12.2	87.8 79.1							
		Cattle	Cecal (Dairy) (75)	1.3	89.3	[80.1 - 95.3]							9.3	5.5	1.3		65.3							
			Retail Pork Chops (8)	0.0	100.0	[63.1 - 100.0]										25.0	75.0							
		Swine	Cecal (Market Swine) (51)	3.9	86.3	[73.7 - 94.3]							9.8		3.9		82.4							
		Ś	Cecal (Sows) (32)	0.0	87.5	[71.0 - 96.5]							12.5			6.3	81.3							
1																•								-

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

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

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

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

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

Percent of isolates with microscopic intervals are included the data of the distribution rate of the distribution are included as a contraction of the distribution rate of t

Table 75b Distribution of MICs and Oct ana Entorococcus hirao Isolatos 2014

Manufaction Manufaction	Table 75b. Distribu	tion of MICs and Occ	urrence among Enterococ Isolate Source	cus n	irae is	olates, 2014						Dietri	hutian	(9/) of B	IICo (u	a/m1\4					
Second Control March Mar	Antimicrobial Class	Antimicrobial Agent		%l ¹	%R²	[95% CI] ³	0.02 0.03	0.06 0.125	0.25	0.50	1						64	128 256	512	1024 2	:048 >204
Second Control March Mar	Lipopeptides	Daptomycin ⁵	Retail Chickens (33)	N/A	N/A	N/A					15.2	33.3	39.4	12.1							
Part Part			Opi Opi Opi Opi Opi Opi Opi Opi Opi Opi	N/A	N/A	N/A							100.0								
Part Part			Retail Ground Turkey (2)	N/A	N/A	N/A						50.0	50.0								
Part			Cecal (1)	N/A	N/A	N/A					100.0										
Control Carrier Carr				N/A	N/A	N/A					2.4	19.5	61.0	12.2	4.9						
Profession Pro			Te Cecal (Beef) (196)													0.5					
Professionary Control			Cecal (Dairy) (75)	N/A	N/A	N/A				1.3	10.7	40.0	34.7	12.0	1.3						
Part																					
Principle			S Cecal (Market Swine) (51)								5.9										
Part Part													30.3								
Part Part	Macrolides	Erythromicin	b Retail Chickens (33)									3.0		30.3	22.2						
Manual Control Resert 14				-											33.3						
Manual Control Resert 14			Retail Ground Turkey (2)											50.0							
Material Part Part				-								2.4	2.4	146							
Main Park Districts 25 25 25 25 25 25 25 2										0.5	0.5				14.8						
Process Secret (Alberta Server) 19			Cecal (Dairy) (75)																		
Process Secret (Alberta Server) 19			Retail Pork Chops (8)	25.0	50.0	[15.7 - 84.3]			25.0				25.0	37.5	12.5						
Tyleian Property									74.5	3.9											
Retail Content Color (1) 20 20 20 20 20 20 20 2			ර Cecal (Sows) (32)	3.1	12.5	[3.5 - 29.0]			81.3	3.1		3.1			12.5						
Retail Content Color (1) 20 20 20 20 20 20 20 2		Tylosin	g Retail Chickens (33)	0.0	30.3	[15.6 - 48.7]					6.1	57.6	6.1			30.3					
Part Part		ŕ	Cecal (3)														33.3				
Part Part				0.0	50.0	[1.3 - 98.7]						50.0				50.0					
Part			X	0.0	0.0	[0.0 - 97.5]					100.0										
Resist Post Closes (1)			Retail Ground Beef (41)	0.0	12.2	[4.1 - 26.2]					17.1	61.0	7.3	2.4		12.2					
Resist Post Closes (1)			Example 2 Cecal (Beef) (196)	0.5	24.0	[18.2 - 30.6]				2.0	34.7	37.2	0.5	1.0	0.5	1.5	22.5				
Mindurantian Repair Cacal (Manica Savine) (S1) 0.0 21.6 (11.3 - 35.3) 0.0 0.0 - 70.8 0.0 0.0 0.0 - 70.8 0.0 0.0 - 70.8 0.0 0.0 0.0 - 70.8 0.0 0.0 0.0 - 70.8 0.0			Cecal (Dairy) (75)	0.0	1.3	[0.0 - 7.2]				1.3	53.3	41.3	2.7				1.3				
Miroduranto Miroduranto				0.0	12.5	[0.3 - 52.7]					12.5	12.5	37.5	25.0		12.5					
Miroduranto Miroduranto			Cecal (Market Swine) (51)																		
Fig. Cocal (3)			Cecai (Sows) (32)	0.0	15.6	[5.3 - 32.8]				3.1	18.8	50.0	12.5				15.6				
Second Control Turkey (2) 0.0 50.0 (13.98.7) 2.0 (10.97.5) 50.0 50.0 (10.97.5) 50.0 50.0 50.0 (10.97.5) 50.0	Nitrofurans	Nitrofurantoin		33.3	18.2	[7.0 - 35.5]												18.2			
Retail Ground Beef (41) 43.9 0.0 (0.0 - 97.5) (0.1 - 8.6) (0				33.3	0.0	[0.0 - 70.8]									33.3	33.3	33.3				
Retail Ground Beef (41) 43,9 0,0 (0,0 - 8,6]			ž											50.0		400.0		50.0			
Partial Fork Chops (8) 62.5 1.0 1.				-																	
Cocal (Dairy) (75) 34.7 4.0 (0.8 - 11.2)												0.5		0.5				10			
Retail Pork Chops (8) 62.5 0.0 (0.0 - 36.9) 12 16.2 2.0 7.8 47.1 37.3 3			Cecal (Dairy) (75)			-						0.5									
Cacal (Market Swine) (61) 37.3 5.9 (1.2 - 16.2) Cacal (Sows) (32) 56.3 3.4 (2.0 - 25.0) Cacal (Sows) (32) 56.3 3.4 (2.0 - 25.0) Cacal (Sows) (32) 56.3 Cacal (Sows) (32) Cacal (Sow				-		-															
Cecul (Cowns) (32) 56.3 54. (20 - 25.5)			Cecal (Market Swine) (51)											2.0				5.9			
Retail Ground Turkey (2) 0.0 0			ග් Cecal (Sows) (32)	56.3	9.4	[2.0 - 25.0]									3.1	31.3	56.3	9.4			
Retail Ground Turkey (2) 0.0 0	Oxazolidinones	Linezolid	ε Retail Chickens (33)	0.0	0.0	[0.0 - 10.6]					57.6	42.4	1 1								
Retail Ground Turkey (2) 0.0 0			S Cecal (3)							33.3											
Penicillin Pen			Retail Ground Turkey (2)	0.0	0.0	[0.0 - 84.2]					50.0	50.0									
Penicillins Penicillin Pe			본 Cecal (1)	0.0	0.0	[0.0 - 97.5]					100.0										
Cecal (Dairy) (75)			Retail Ground Beef (41)	0.0	0.0	[0.0 - 8.6]					19.5	80.5									
Cecal (Dairy) (75)			Cecal (Beef) (196)	0.0	0.0	[0.0 - 1.9]				11.7	64.8	23.5									
Penicillins Penicillin Pe			Cecal (Dairy) (75)	0.0	0.0	[0.0 - 4.8]				1.3	60.0	38.7									
Penicillins N/A 0.0 [0.1-15.8] 9.1 9.1 48.5 24.2 6.1 3.0 3.0 3.3 66.7 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0																					
Penicillins Penic			Cecal (Market Swine) (51)							3.9											
Retail Ground Turkey (2) N/A 0.0 [0.0 - 84.2]																					
Retail Ground Turkey (2) N/A 0.0 [0.0 - 84.2]	Penicillins	Penicillin	Retail Chickens (33)							00.7	9.1	48.5	24.2	6.1	3.0						
Retail Ground Beef (41) N/A 2.4 [0.1 - 12.9] 17.1 4.9 26.8 31.7 17.1 2.4 Retail Ground Beef (196) N/A 0.5 [0.0 - 2.8] 18.9 20.9 33.7 23.0 3.1 0.5 Cecal (Beef) (196) N/A 0.0 [0.0 - 4.8] 24.0 17.3 22.7 30.7 5.3 Retail Pork Chops (8) N/A 0.0 [0.0 - 36.9] 62.5 12.5 25.0 Retail Retail Pork Chops (8) N/A 0.0 [0.0 - 7.0] 19.6 19.6 31.4 19.6 5.9 3.9				-					33.3	ьб.7											
Retail Ground Beef (41) N/A 2.4 [0.1 - 12.9] 17.1 4.9 26.8 31.7 17.1 2.4 Cecal (Beef) (196) N/A 0.5 [0.0 - 2.8] 18.9 20.9 33.7 23.0 3.1 0.5 Cecal (Dairy) (75) N/A 0.0 [0.0 - 4.8] 24.0 17.3 22.7 30.7 5.3 Retail Pork Chops (8) N/A 0.0 [0.0 - 36.9] 62.5 12.5 25.0 Cecal (Market Swine) (51) N/A 0.0 [0.0 - 7.0] 19.6 19.6 31.4 19.6 5.9 3.9												50.0									
Cecal (Beef) (196) N/A 0.5 [0.0 - 2.8] 18.9 20.9 33.7 23.0 3.1 0.5 Cecal (Dairy) (75) N/A 0.0 [0.0 - 4.8] 24.0 17.3 22.7 30.7 5.3 Retail Pork Chops (8) N/A 0.0 [0.0 - 36.9] Cecal (Market Swine) (51) N/A 0.0 [0.0 - 7.0] 19.6 19.6 31.4 19.6 5.9 3.9			•	-					47.4	4.0		24.7	47.4								
Cecal (Dairy) (75) N/A 0.0 [0.0 - 4.8] 24.0 17.3 22.7 30.7 5.3 Retail Pork Chops (8) N/A 0.0 [0.0 - 36.9] 62.5 12.5 25.0 Eacal (Market Swine) (51) N/A 0.0 [0.0 - 7.0] 19.6 19.6 31.4 19.6 5.9 3.9			Ketali Ground Beef (41)																		
Retail Pork Chops (8) N/A 0.0 [0.0 - 36.9] 62.5 12.5 25.0 [19.6 19.6 31.4 19.6 5.9 3.9]			Cecal (Dairy) (75)												0.5						
Cecal (Market Swine) (51) N/A 0.0 [0.0 - 7.0] 19.6 19.6 31.4 19.6 5.9 3.9				-																	
ο Cecal (Sows) (32) N/A 0.0 [0.0 - 10.9] 31.3 25.0 6.3 15.6 12.5 9.4												19.6	5.9	3.9							
			Cecal (Sows) (32)	N/A	0.0				31.3	25.0	6.3	15.6	12.5	9.4							

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

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

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

Percent of isolates with intermediate breakpoints for percent resistant (%R) were calculated using the Clopper-Pearson exact method

The unshaded areas indicate the dilution range of the Sensitire plates used to test isolates. Single vertical lines indicate the breakpoints for resistance. Numbers in the shaded areas indicate percentage of isolates with MIC's greater than the highest concentrations on the plate. Numbers listed for the lowest tested concentrations represent the percentage of isolates with MIC's equal to or less than the lowest tested concentration.

There are no established CLSI breakpoints for daptomycin

Table 75c. Distribution of MICs and Occurrence among Enterococcus hirae Isolates, 2014

Antimicrobial Class	Antimicrobial Agent		Isolate Source (# of Isolates)	%l ¹	%R²	[95% CI] ³	0.02	0.03	0.06	0.125	0.25	0.50	1	Distri 2	bution 4	(%) of I 8	/IICs (µ 16	g/ml) ⁴ 32	64	128	256	512	1024	2048 >20
Phenicols	Chloramphenicol	kens	Retail Chickens (33)	0.0	0.0	[0.0 - 10.6]									66.7	33.3								
T Helileois	Onioramphenicor	Chickens	Cecal (3)	0.0	0.0	[0.0 - 70.8]									100.0									
		urkeys	Retail Ground Turkey (2)	0.0	0.0	[0.0 - 84.2]										100.0								
		Turk	Cecal (1)	0.0	0.0	[0.0 - 97.5]								100.0										
		0	Retail Ground Beef (41)	0.0	0.0	[0.0 - 8.6]									70.7	29.3								
		Cattle	Cecal (Beef) (196)	0.5	0.0	[0.0 - 1.9]								16.8	73.0	9.7	0.5							
			Cecal (Dairy) (75)	0.0	1.3	[0.0 - 7.2]								8.0	80.0	10.7			1.3					
		ЭС	Retail Pork Chops (8)	0.0	0.0	[0.0 - 36.9]									75.0	25.0								
		Swine	Cecal (Market Swine) (51) Cecal (Sows) (32)	0.0	2.0 0.0	[0.0 - 10.4]								9.8 9.4	78.4 71.9	9.8 8.8		2.0						
		S	Cecai (30ws) (32)	0.0	0.0	[0.0 - 10.9]								9.4	71.9	0.0								
Quinolones	Ciprofloxacin	Chickens	Retail Chickens (33)	9.1	3.0	[0.1 - 15.8]					18.2	51.5	18.2	9.1	3.0									
			Cecal (3)	0.0	0.0	[0.0 - 70.8]					33.3	66.7												
		rkeys	Retail Ground Turkey (2)	50.0	0.0	[0.0 - 84.2]							50.0	50.0										
		Tur	Cecal (1)	0.0	0.0	[0.0 - 97.5]					100.0													
		<u>e</u>	Retail Ground Beef (41)	2.4	0.0	[0.0 - 8.6]						46.3	51.2	2.4										
		Cattle	Cecal (Beef) (196) Cecal (Dairy) (75)	0.5 1.3	0.0 1.3	[0.0 - 1.9] [0.0 - 7.2]				0.5 1.3	18.4 8.0	69.4 73.3	11.2 14.7	0.5 1.3	1.3									
			Retail Pork Chops (8)	,	0.0					1.5	0.0	12.5	87.5	1.5	1.5									
		ine	Cecal (Market Swine) (51)	0.0	0.0	[0.0 - 36.9] [0.0 - 7.0]					9.8	78.4	11.8											
		Swine	Cecal (Sows) (32)	0.0	0.0	[0.0 - 10.9]				3.1	6.3	78.1	12.5											
Streptogramins	Quinupristin-Dalfopristin	ens	Retail Chickens (33)	51.5	39.4	[22.9 - 57.9]							9.1	51.5	12.1	12.1	12.1	3.0						
		Chicke	Cecal (3)	33.3	33.3	[0.8 - 90.6]							33.3	33.3		33.3								
		ceys C	Retail Ground Turkey (2)	50.0	50.0	[1.3 - 98.7]								50.0			50.0							
		Turke	Cecal (1)	0.0	0.0	[0.0 - 97.5]							100.0											
		Ė	Retail Ground Beef (41)	75.6	9.8	[2.7 - 23.1]						4.9	9.8	75.6	7.3	2.4								
		Cattle	Cecal (Beef) (196)	54.1	4.1	[1.8 - 7.9]						8.7	33.2	54.1	3.6	0.5								
		Ö	Cecal (Dairy) (75)	46.7	1.3	[0.0 - 7.2]						10.7	41.3	46.7			1.3							
			Retail Pork Chops (8)	87.5	12.5	[0.3 - 52.7]								87.5	12.5									
		Swine	Cecal (Market Swine) (51)	52.9	17.6	[8.4 - 30.9]						9.8	19.6	52.9	13.7	3.9								
		0,	Cecal (Sows) (32)	53.1	12.5	[3.5 - 29.0]						15.6	18.8	53.1	9.4	3.1								
Tetracyclines	Tetracycline	skens	Retail Chickens (33)	3.0	69.7	[51.3 - 84.4]							27.3			3.0		3.0	66.7					
		Chic	Cecal (3)	0.0	66.7	[9.4 - 99.2]							33.3					33.3	33.3					
		eys	Retail Ground Turkey (2)	0.0	100.0	[15.8 - 100.0]												100.0						
		Turk	Cecal (1)	0.0	100.0	[2.5 - 100.0]													100.0					
			Retail Ground Beef (41)	0.0	46.3	[30.7 - 62.6]							53.7				4.9	4.9	36.6					
		Cattle	Cecal (Beef) (196)	2.0	60.7	[53.5 - 67.6]							37.2			2.0	12.2	11.2	37.2					
		Ľ	Cecal (Dairy) (75)	4.0	38.7	[27.6 - 50.6]							57.3			4.0	5.3	10.7	22.7					
		ē	Retail Pork Chops (8)	0.0	100.0	[63.1 - 100.0]													100.0					
		Swine	Cecal (Market Swine) (51)	0.0	76.5	[62.5 - 87.2]							23.5		2.4		2.0	7.8	66.7					
			Cecal (Sows) (32)	0.0	78.1	[60.0 - 90.7]							18.8		3.1			3.1	75.0					

Cectal (SOWs) (3.2) U.U 78.1 [60.0 - 90.7] [60.0 - 90.7] [60.0 - 90.7] [60.0 - 90.7] [7.8] [7.9]

Resistance by Year

Table 76a, Antimicrobial Resistance among Enterococcus hirae Isolates, 2003-2014

Year	bial Resistance amo	ong E	nterococcus hira	e Isolate	es, 2003- 2004	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested		sus	Retail Chickens	28	27	30	27	22	16	8	24	18	10	15	33
		Chickens	Cecal											2	3
		-S	Retail Ground Turkey	3	0	1	3	2	0	0	2	0	3	1	2
		Turke	Cecal Cround Turkey	3			3			0		0	3	0	1
		#le	Retail Ground Beef	84	88	82	77	57	49	26	41	44	57	38	41
		Cattle	Cecal (Beef) Cecal (Dairy)											103 70	196 75
		9	Retail Pork Chops	14	14	4	8	6	5	2	7	2	5	2	8
		Swine	Cecal (Market Swine) Cecal (Sows)											34 27	51 32
	Antimicrobial (Resistance													21	32
Antimicrobial Class	Breakpoint)		Isolate Source												
Aminoglycosides	Gentamicin (MIC >500 µg/ml)	Chickens	Retail Chickens	0.0% 0	0.0% 0	10.0% 3	3.7% 1	4.5% 1	6.3% 1	12.5% 1	4.2% 1	11.1% 2	20.0%	26.7% 4	9.1% 3
		Chic	Cecal											0.0% 0	0.0% 0
		Turkeys	Retail Ground Turkey	0.0% 0		0.0% 0	33.3% 1	0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Ţ	Cecal												0.0%
			Retail Ground Beef	0.0%	0.0% 0	1.2% 1	1.3% 1	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)											0.0% 0	0.5% 1
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)	0		0	U				0	U	0	0.0%	0.0%
		S	Cecal (Sows)											0.0%	0.0%
	Kanamycin	sus	Retail Chickens	28.6%	3.7%	26.7%	3.7%	18.2%	12.5%	12.5%	4.2%	16.7%	20.0%	26.7%	9.1%
	(MIC ≥ 1024 μg/ml)	Chickens	Cecal	8	1	8	1	4	2	1	1	3	2	0.00%	33.3%
			Retail Ground Turkey	66.7%		0.0%	33.3%	0.0%			0.0%		0.0%	0.0%	0.0%
		Turkeys	Cecal	2		0	1	0			0		0	0	0.0%
			Retail Ground Beef	3.6%	0.0%	1.2%	1.3%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		tte e	Cecal (Beef)	3	0	1	1	0	1	0	0	0	0	0.00%	0.5%
		Cattle												0.00%	1.3%
			Cecal (Dairy)	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne	Retail Pork Chops	0	1	0	0	0	0	0	0	0	0	0 2.9%	0
		Swine	Cecal (Market Swine)											1 3.7%	2 3.1%
	Streptomycin		Cecal (Sows)	42.9%	22.2%	23.3%	18.5%	9.1%	25.0%	25.0%	8.3%	5.6%	0.0%	1 13.3%	3.0%
	(MIC ≥ 1000 µg/ml)	Chickens	Retail Chickens	12	6	7	5	2	4	2	2	1	0.070	2 0.0%	1 0.0%
			Cecal	0.0%		0.0%	33.3%	0.0%			0.0%		0.0%	0.0%	0.0%
		Turkeys	Retail Ground Turkey	0.0%		0.0%	1	0.0%			0.0%		0.0%	0.0%	0.0%
		1	Cecal	0.00/	0.00/	4.00/	0.00/	4.00/	0.00/	0.00/	0.00/	0.00/	4.00/	5.00/	0
		o o	Retail Ground Beef	3.6%	0.0% 0	4.9% 4	2.6%	1.8% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	1.8% 1	5.3% 2	2.4% 1
		Cattle	Cecal (Beef)											1.0% 1	2.6% 5
			Cecal (Dairy)											0.0% 0	1.3% 1
			Retail Pork Chops	0.0% 0	0.0% 0	25.0% 1	0.0% 0	16.7% 1	0.0% 0	0.0% 0	0.0% 0	50.0% 1	0.0% 0	0.0% 0	0.0% 0
		Swine	Cecal (Market Swine)											5.9% 2	11.8% 6
			Cecal (Sows)											29.6% 8	12.5% 4
Glycopeptides	Vancomycin (MIC ≥ 32 μg/ml)	kens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	, ,	Chickens	Cecal											0.0%	0.0%
		eys	Retail Ground Turkey	0.0%		0.0%	0.0%	0.0%			0.0%		0.0%	0.0%	0.0%
		Turkeys	Cecal	Ť			Ì				Ť				0.0%
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cattle	Cecal (Beef)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		Ö	Cecal (Dairy)											0.0%	0.0%
		-	Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
		Sw	Cecal (Sows)											0.0%	0.0%
		<u> </u>	Jecai (Juws)											0	0

Table 76b. Antimicrobial Resistance among Enterococcus hirae Isolates, 2003-2014

Year	obial Resistance amo	ong <i>I</i>	Enterococcus hira	e Isolate	es, 2003 2004	-2014 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
		sus	Retail Chickens	28	27	30	27	22	16	8	24	18	10	15	33
Number of Isolates Teste	ed	Chickens	Cecal											2	3
		Turkeys	Retail Ground Turkey Cecal	3	0	1	3	2	0	0	2	0	3	1 0	2
		Cattle	Retail Ground Beef Cecal (Beef)	84	88	82	77	57	49	26	41	44	57	38 103	41 196
			Cecal (Dairy) Retail Pork Chops	14	14	4	8	6	5	2	7	2	5	70 2	75 8
	Antimicrobial	Swine	Cecal (Market Swine) Cecal (Sows)											34 27	51 32
Antimicrobial Class	(Resistance Breakpoint)		Isolate Source												
Glycylcycline	Tigecycline (MIC ≥ 0.25 μg/mI) ¹	Chickens	Retail Chickens			0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Chic	Cecal											0.0% 0	0.0%
		Turkeys	Retail Ground Turkey			0.0% 0	0.0%	0.0% 0			0.0% 0		0.0% 0	0.0%	0.0%
		Tul	Cecal												0.0% 0
			Retail Ground Beef			0.0% 0	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4% 1
		Cattle	Cecal (Beef)											0.0%	0.0%
			Cecal (Dairy)											0.0%	0.0%
			Retail Pork Chops			0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.0%	12.5% 1
		Swine	Cecal (Market Swine)											0.0%	0.0%
		0,	Cecal (Sows)											0.0%	0.0%
Lincosamides	Lincomycin (MIC ≥ 8 µg/ml)	ens	Retail Chickens	100.0% 28	92.6% 25	100.0% 30	77.8% 21	95.5% 21	100.0% 16	100.0%	100.0% 24	100.0% 18	100.0% 10	100.0% 15	100.09
	(WIIC 2 0 µg/III)	Chickens	Cecal	20	23	30	21		10	0	24	10	10	100.0%	100.09
			Retail Ground Turkey	100.0%		100.0%	100.0%	100.0%			50.0%		66.7%	100.0%	100.09
		Turkeys	Cecal	3		1	3	2			1		2	1	100.09
			Retail Ground Beef	91.7%	85.2%	98.8%	81.8%	96.5%	91.8%	88.5%	95.1%	84.1%	93.0%	92.1%	95.1%
		e H		77	75	81	63	55	45	23	39	37	53	35 93.2%	39 91.3%
		Cattle	Cecal (Beef)											96 94.3%	179 89.3%
		-	Cecal (Dairy)	100.0%	71.4%	100.0%	87.5%	83.3%	100.0%	100.0%	100.0%	100.0%	80.0%	66	67
		Φ	Retail Pork Chops	14	10	4	7	5	5	2	7	2	4	2 73.5%	86.3%
		Swine	Cecal (Market Swine)											25	44
			Cecal (Sows)											92.6% 25	87.5% 28
Lipopeptides	Daptomycin ²	skens	Retail Chickens		-	-	-	-	-	-	-	-	-	-	-
		Chic	Cecal											-	-
		eys	Retail Ground Turkey			-	-	-			-		-	-	-
		Turkeys	Cecal												-
			Retail Ground Beef		-	-	-	-	-	-	-	-	-	-	-
		Cattle	Cecal (Beef)											-	-
		0	Cecal (Dairy)											-	-
			Retail Pork Chops		-	-	-		-	-		-	-	-	_
		Swine	Cecal (Market Swine)											_	_
		Š												_	
Macrolides	Erythromycin	ø	Cecal (Sows)	67.9%	11.1%	63.3%	14.8%	45.5%	37.5%	25.0%	41.7%	16.7%	20.0%	26.7%	30.3%
	(MIC ≥ 8 μg/ml)	Chickens	Retail Chickens	19	3	19	4	10	6	2	10	3	2	4 0.0%	10
		Ò	Cecal	66 70/		0.09/	66 70/	0.09/			E0.09/		0.09/	0	1
		Turkeys	Retail Ground Turkey	66.7%		0.0%	66.7%	0.0%			50.0% 1		0.0%	0.0%	50.0%
		μ	Cecal												0.0%
			Retail Ground Beef	15.5% 13	8.0% 7	17.1% 14	14.3% 11	17.5% 10	12.2% 6	3.8% 1	14.6% 6	13.6% 6	14.0% 8	21.1% 8	14.6% 6
		Cattle	Cecal (Beef)											22.3% 23	16.3% 32
			Cecal (Dairy)											2.9%	1.3%
			Retail Pork Chops	7.1% 1	0.0%	25.0% 1	25.0% 2	33.3%	60.0%	0.0%	0.0%	50.0% 1	20.0%	0.0%	50.0%
		Swine	Cecal (Market Swine)		U	'			3	U	U	'	'	11.8%	19.6%
		Ś	Cecal (Sows)											29.6%	12.5%
I Daniel and a successible in	reported rather than percent	rocioto		nt has been	octoblisho	d NADMS	areakpoint.	octoblished	to determin	a raniatana				8	4

¹ Percent non-susceptible is reported rather than percent resistance as no CLSI breakpoint has been established. NARMS breakpoint established to determine resistance ² Resistance data are not presented because there are no established CLSI breakpoints for daptomycin

Table 76c. Antimicrobial Resistance among Enterococcus hirae Isolates, 2003-2014 Year 2003 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 Retail Chickens 28 30 27 22 16 24 18 10 15 33 Number of Isolates Tested Chic Cecal 2 3 Retail Ground Turkey 3 0 3 2 0 0 2 0 3 2 0 Retail Ground Beef 82 41 38 84 88 77 57 49 26 44 41 57 Cattle Cecal (Beef) 103 196 Cecal (Dairy) 70 75 Retail Pork Chops 2 2 14 14 8 6 5 2 5 8 Cecal (Market Swine) 34 51 Cecal (Sows) 27 32 Antimicrobial Isolate (Resistance Breakpoint) Source Antimicrobial Class 64.3% 11.1% 60.0% 18.5% 45.5% 37.5% 41.7% 16.7% 20.0% 26.7% 30.3% 25.0% Retail Chickens Chickens (MIC ≥ 32 µg/ml) 18 18 10 10 10 0.0% 33.3% Cecal 0 0.0% 66.7% 0.0% 50.0% 66.7% 0.0% 50.0% 0.0% Retail Ground Turkey 3 0.0% Cecal 12.2% 17.1% 12.2% 14.6% 14.0% 21.1% 15.5% 8.0% 15.6% 19.3% 3.8% 13.6% Retail Ground Beef Cattle 23.3% 24.0% Cecal (Beef) 24 47 2.9% 1.3% Cecal (Dairy) 7.1% 0.0% 25.0% 25.0% 33.3% 40.0% 0.0% 0.0% 50.0% 20.0% 0.0% 12.5% Retail Pork Chops 11.8% 21.6% Cecal (Market Swine) 11 29.6% 15.6% Cecal (Sows) 5 Nitrofurans Nitrofurantoin 10.7% 14.8% 6.7% 7.4% 0.0% 0.0% 0.0% 4.2% 5.6% 10.0% 13.3% 18.2% Chickens Retail Chickens (MIC ≥ 128 µg/ml) 0 6 0.0% 0.0% Cecal 0.0% 0.0% 66.7% 0.0% 0.0% 0.0% 0.0% 50.0% Retail Ground Turkey 0 0 ž Cecal 0.0% 6.8% 4.9% 0.0% 0.0% 0.0% 0.0% 0.0% 2.3% 1.8% 2.6% 0.0% Retail Ground Beef 0 0 0 0.0% 1.0% Cecal (Beef) 1.4% 4.0% Cecal (Dairy) 25.0% 0.0% 7.1% 21.4% 0.0% 0.0% 20.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Pork Chops 0.0% 5.9% Cecal (Market Swine) 0 3.7% 9.4% Cecal (Sows) Oxazolidinones Linezolid 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Chickens (MIC ≥ 8 µg/ml) 0 0 0 Chick 0.0% 0.0% Cecal 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Ground Turkey 0 0 0.0% Cecal 0 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Ground Beef 0.0% 0.0% Cecal (Beef) 0.0% 0.0% Cecal (Dairy) 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Pork Chops 0 0.0% 0.0% Cecal (Market Swine) 0 0 0.0% 0.0% Cecal (Sows) 0 Penicillins 10.0% Penicillin 7.1% 25.9% 0.0% 7.4% 4.5% 0.0% 0.0% 8.3% 5.6% 13.3% 3.0% Retail Chickens (MIC ≥ 16 µg/ml) Chic 0.0% 0.0% Cecal 0.0% 0.0% 66.7% 100.0% 0.0% 0.0% 0.0% 0.0% Retail Ground Turkey 0 0 0 0 0 0 0.0% Cecal 0.0% 1.1% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 2 4% Retail Ground Beef 0 0 0 0 0.0% 0.5% Cecal (Beef) 0.0% 0.0% Cecal (Dairy) 0 0.0% 0.0% 0.0% 7.1% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% Retail Pork Chops 0 0.0% 0.0% Cecal (Market Swine) Š

Cecal (Sows)

0.0%

7.4%

Table 76d. Antimicro	obial Resistance amo	ong <i>E</i>	Enterococcus hira					222			2212			2212	
Year		SI	Potoil Chieles	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	ı	Chickens	Retail Chickens	28	27	30	27	22	16	8	24	18	10	15	33
		-	Cecal											2	3
		Turkeys	Retail Ground Turkey	3	0	1	3	2	0	0	2	0	3	1	2
			Cecal Retail Ground Reef	0,4	00	00	77	57	40	20	44	44	67	0	1
		Cattle	Retail Ground Beef Cecal (Beef)	84	88	82	77	57	49	26	41	44	57	38 103	41 196
		L	Cecal (Dairy)											70	75
		Swine	Retail Pork Chops Cecal (Market Swine)	14	14	4	8	6	5	2	7	2	5	2 34	8 51
		Š	Cecal (Sows)											27	32
	Antimicrobial (Resistance		Isolate												
Antimicrobial Class Phenicols	Breakpoint) Chloramphenicol	s	Source	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	(MIC ≥ 32 μg/ml)	Chickens	Retail Chickens	0	0	1	0	0	0	0	0	0	0	0	0.0%
		5	Cecal	0.004		0.00/	0.00/	0.00/			2.20/		0.004	0	0
		Turkeys	Retail Ground Turkey	0.0%		0.0%	0.0%	0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Τu	Cecal												0.0% 0
			Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0% 0
		Cattle	Cecal (Beef)											0.0%	0.0% 0
			Cecal (Dairy)											0.0%	1.3%
			Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Swine	Cecal (Market Swine)	0	0	0	0	0	0	0	0	0	0	2.9%	2.0%
		Š												0.0%	1 0.0%
Quinolones	Ciprofloxacin		Cecal (Sows)	0.0%	3.7%	0.0%	14.8%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0 3.0%
	(MIC ≥ 4 μg/ml)	Chickens	Retail Chickens	0.078	1	0.076	4	1	0.078	0.076	0.076	0.070	0.078	0	1
		S	Cecal											0.0% 0	0.0% 0
		Turkeys	Retail Ground Turkey	0.0% 0		0.0% 0	33.3% 1	100.0% 2			0.0% 0		0.0% 0	0.0% 0	0.0% 0
		Tu	Cecal												0.0%
			Retail Ground Beef	0.0%	1.1% 1	0.0%	0.0%	1.8% 1	0.0%	0.0%	0.0% 0	0.0% 0	0.0%	0.0% 0	0.0% 0
		Cattle	Cecal (Beef)	0		0	0		0	0	0	0	0	0.0%	0.0%
		O	Cecal (Dairy)											0.0%	1.3%
		-	Retail Pork Chops	0.0%	7.1%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		ne		0	1	0	1	0	0	0	0	0	0	0.0%	0.0%
		Swine	Cecal (Market Swine)											0.0%	0.0%
Streptogramins	Outrom dette Delfe e dette		Cecal (Sows)	00.40/	7.40/	40.00/	40.50/	40.00/	40.00/	05.00/	40.70/	F 00/	00.00/	0	0
Streptogramms	Quinupristin-Dalfopristin (MIC ≥ 4 µg/ml)	ckens	Retail Chickens	82.1% 23	7.4% 2	40.0% 12	18.5% 5	40.9% 9	18.8% 3	25.0% 2	16.7% 4	5.6% 1	20.0%	40.0% 6	39.4% 13
		Chicke	Cecal											50.0% 1	33.3% 1
		Turkeys	Retail Ground Turkey	66.7% 2		0.0% 0	33.3% 1	0.0%			50.0% 1		0.0% 0	0.0%	50.0% 1
		ž	Cecal												0.0% 0
			Retail Ground Beef	60.7%	10.2%	11.0%	5.2%	5.3%	4.1%	7.7%	7.3%	9.1%	12.3%	15.8%	9.8%
		Cattle	Cecal (Beef)	51	9	9	4	3	2	2	3	4	7	6 14.6%	4.1%
		Ö	Cecal (Dairy)											15 2.9%	1.3%
				35.7%	0.0%	25.0%	0.0%	0.0%	20.0%	0.0%	0.0%	50.0%	20.0%	0.0%	1 12.5%
		Je.	Retail Pork Chops	5	0	1	0	0	1	0	0	1	1	0 20.6%	1 17.7%
		Swine	Cecal (Market Swine)											7 25.9%	9
			Cecal (Sows)											7	4
Tetracyclines	Tetracycline (MIC ≥ 16 μg/ml)	Chickens	Retail Chickens	64.3% 18	51.9% 14	46.7% 14	33.3% 9	81.8% 18	43.8% 7	62.5% 5	50.0% 12	72.2% 13	90.0%	80.0% 12	69.7% 23
		Chic	Cecal											50.0% 1	66.7% 2
		eys	Retail Ground Turkey	0.0%		0.0%	66.7% 2	100.0% 2			50.0% 1		33.3% 1	100.0% 1	100.0% 2
		Turkeys	Cecal			Ì									100.0%
			Retail Ground Beef	46.4%	53.4%	65.9%	53.2%	52.6%	53.1%	50.0%	43.9%	38.6%	66.7%	68.4%	46.3%
		Cattle	Cecal (Beef)	39	47	54	41	30	26	13	18	17	38	26 59.2%	19 60.7%
		ပီ	Cecal (Dairy)											61 44.3%	119 38.7%
		-		14.3%	35.7%	50.0%	50.0%	83.3%	60.0%	100.0%	85.7%	50.0%	80.0%	31 100.0%	29 100.0%
		Ð.	Retail Pork Chops	2	5	2	4	5	3	2	6	1	4	2	8
		Swine	Cecal (Market Swine)											61.8% 21	76.5% 39
			Cecal (Sows)											81.5% 22	78.1% 25

Table 77a. Resistance Pa	ttern	s among <i>Enterocod</i>	cus hira	e Isolate:	s, 2003-2 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of Isolates Tested	ens	Retail Chickens	28	27	30	27	22	16	8	24	18	10	15	33
individual of isolates 165teu	Chickens	Cecal											2	3
	Turkeys	Retail Ground Turkey	3	0	1	3	2	0	0	2	0	3	1	2
	Cattle To	Retail Ground Beef Cecal (Beef)	84	88	82	77	57	49	26	41	44	57	0 38 103	1 41 196
	Swine	Retail Pork Chops Cecal (Market Swine)	14	14	4	8	6	5	2	7	2	5	70 2 34	75 8 51
Resistance Pattern ¹		Cecal (Sows) Source											27	32
1. No Resistance Detected	ens	Retail Chickens	0.0%	3.7% 1	0.0% 0	11.1% 3	0.0%	0.0% 0	0.0% 0	0.0%	0.0%	0.0%	0.0% 0	0.0%
	Chickens	Cecal	J			-	-	J	J	-	-	J	0.0%	0.0%
	ske	Retail Ground Turkey	0.0%		0.0%	0.0%	0.0%			50.0% 1		33.3% 1	0.0%	0.0%
	Turkeys	Cecal				U	U							0.0%
		Retail Ground Beef	3.6%	6.8%	0.0%	11.7% 9	0.0%	4.1% 2	7.7% 2	4.9%	11.4% 5	3.5%	2.6%	4.9%
	Cattle	Cecal (Beef)	3	0	0	3	0	2	2		3	2	2.9%	2.6%
		Cecal (Dairy)											2.9%	6.7%
		Retail Pork Chops	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0	5 0.0% 0
	Swine	Cecal (Market Swine)	U	2	U	U	U	U	U	U	U	U	8.8%	7.8%
	Ó	Cecal (Sows)											0.0%	0.0%
2. Resistance to ≥ 3	sué	Retail Chickens	92.9%	37.0%	50.0%	22.2%	68.2%	37.5%	37.5%	20.8%	16.7%	50.0%	53.3%	0 45.5%
Antimicrobial Classes	Chickens	Cecal	26	10	15	6	15	6	3	5	3	5	50.0%	15 66.7%
		Retail Ground Turkey	66.7%		0.0%	66.7%	100.0%			50.0%		0.0%	0.0%	100.0%
	Turkeys	Cecal	2		0	2	2			1		0	0	0.0%
		Retail Ground Beef	36.9%	15.9%	19.5%	13.0%	17.5%	12.2%	3.9%	14.6%	15.9%	14.0%	21.1%	17.1%
	Cattle	Cecal (Beef)	31	14	16	10	10	6	1	6	7	8	21.4%	20.4%
	0	Cecal (Dairy)											22	1.3%
		Retail Pork Chops	14.3%	14.3%	25.0%	12.5%	33.3%	40.0%	0.0%	0.0%	50.0%	20.0%	0.0%	50.0%
	Swine	Cecal (Market Swine)	2	2	1	1	2	2	0	0	1	1	17.7%	29.4%
	Ó	Cecal (Sows)											6 48.2%	15 31.3%
3. Resistant to ≥ 4	Sus	Retail Chickens	67.9%	14.8%	36.7%	14.8%	40.9%	6.3%	12.5%	12.5%	11.1%	30.0%	13 33.3%	10 30.3%
Antimicrobial Classes	Chickens	Cecal	19	4	11	4	9	1	1	3	2	3	5 0.0%	0.0%
	<u> </u>	Retail Ground Turkey	66.7%		0.0%	66.7%	100.0%			50.0%		0.0%	0.0%	50.0%
	Turkeys	Cecal	2		0	2	2			1		0	0	0.0%
	Ė	Retail Ground Beef	14.3%	6.8%	12.2% 10	3.9%	5.3%	4.1% 2	3.9%	7.3%	2.3%	10.5%	13.2%	7.3%
	Cattle	Cecal (Beef)	12	6	10	3	3		1	3	'	6	5 12.6% 13	6.1% 12
		Cecal (Dairy)											2.9%	1.3%
		Retail Pork Chops	7.1% 1	7.1% 1	25.0% 1	0.0%	16.7% 1	20.0%	0.0%	0.0%	50.0% 1	20.0%	0.0%	25.0%
	Swine	Cecal (Market Swine)											8.8%	15.7% 8
	U)	Cecal (Sows)											29.6% 8	9.4%
4. Resistant to ≥ 5 Antimicrobial Classes	ens	Retail Chickens	32.1% 9	0.0%	20.0%	11.1% 3	0.0%	0.0%	0.0%	4.2% 1	11.1% 2	0.0%	26.7% 4	9.1%
	Chickens	Cecal											0.0%	0.0%
		Retail Ground Turkey	0.0%		0.0%	66.7% 2	0.0%			0.0%		0.0%	0.0%	0.0%
	Turkeys	Cecal					U							0.0%
		Retail Ground Beef	1.2%	1.1% 1	2.4%	1.3%	1.8%	0.0%	0.0%	0.0%	0.0%	1.8%	5.3%	2.4%
	Cattle	Cecal (Beef)				1				0	J		1.0%	0.5%
		Cecal (Dairy)											0.0%	1.3%
		Retail Pork Chops	0.0%	7.1%	25.0%	0.0%	0.0%	20.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	0	1	1	0	0	1	0	0	1	0	2.9%	9.8% 5
	Ó	Cecal (Sows)											11.1%	0.0%
1 Resistance patterns do not inc	<u> </u>												3	0

¹ Resistance patterns do not include daptomycin as there are no established CLSI breakpoints

Table 77b. Resistance Patterns among Enterococcus hirae Isolates, 2003-2014

Table 77b. Resistance Pa	attern	is among Enteroco					1 0007	1 0000	1 0000	0040	0044	0040	1 0040	T 0044
Year Number of Isolates Tested	sue	Retail Chickens	2003 28	2004 27	2005 30	2006 27	2007 22	2008 16	2009 8	2010 24	2011 18	2012 10	2013 15	2014 33
Number of Isolates Tested	Chickens	Cecal											2	3
	Turkeys	Retail Ground Turkey Cecal	3	0	1	3	2	0	0	2	0	3	1 0	2
	Cattle	Retail Ground Beef Cecal (Beef) Cecal (Dairy)	84	88	82	77	57	49	26	41	44	57	38 103 70	41 196 75
	Swine	Retail Pork Chops Cecal (Market Swine) Cecal (Sows)	14	14	4	8	6	5	2	7	2	5	2 34 27	8 51 32
Resistance Pattern ¹ 4. Resistant to ≥ 6	s	Source	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	4.2%	0.0%	0.0%	6.7%	6.1%
Antimicrobial Classes	Chickens	Retail Chickens Cecal	0	0	3	0	0	0	0	1	0	0	0.0%	0.0%
		Retail Ground Turkey	0.0%		0.0%	33.3%	0.0%			0.0%		0.0%	0.0%	0.0%
	Turkeys	Cecal	0		0	1	0			0		0	0	0.0%
	<u> </u>	Retail Ground Beef	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%
	Cattle	Cecal (Beef)	0	0	1	0	0	0	0	0	0	0	0.0%	0.0%
	Ö	Cecal (Dairy)											0.0%	1.3%
	-	Retail Pork Chops	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Swine	Cecal (Market Swine)	0	0	1	0	0	0	0	0	0	0	2.9%	2.0%
	Ś	Cecal (Sows)											3.7% 1	0.0% 0
6. At Least Pencillin G and High Level Gentamicin	sue	Retail Chickens	0.0%	0.0%	0.0%	0.0%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	0.0%
High Level Gentamich	Chickens	Cecal	U	U	U	U	I	U	U	U	U	U	0.0%	0.0%
		Retail Ground Turkey	0.0%		0.0%	33.3% 1	0.0%			0.0%		0.0%	0.0%	0.0%
	Turkeys	Cecal				,								0.0%
		Retail Ground Beef	0.0%	0.0%	0.0% 0	0.0%	0.0%	0.0%	0.0%	0.0% 0	0.0%	0.0% 0	0.0%	0.0%
	Cattle	Cecal (Beef)									-		0.0%	0.0%
	Ŭ	Cecal (Dairy)											0.0%	0.0%
		Retail Pork Chops	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Swine	Cecal (Market Swine)											0.0% 0	0.0% 0
	.,	Cecal (Sows)											0.0%	0.0% 0
7. At Least Pencillin G High Level Gentamicin,	Chickens	Retail Chickens	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0%
	Chic	Cecal											0.0% 0	0.0% 0
	keys	Retail Ground Turkey	0.0% 0		0.0% 0	0.0% 0	0.0% 0			0.0% 0		0.0% 0	0.0% 0	0.0% 0
	Turke	Cecal												0.0%
	ø.	Retail Ground Beef	0.0%	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Cattle	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)	0.00/	0.00/	2.22/	0.00/	0.00/	0.00/	0.00/	2.22/	2.22/	2.22/	0.0%	0.0%
	e e	Retail Pork Chops	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0% 0 0.0%	0.0% 0 0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
O. At Land Paraillin C		Cecal (Sows)	0.0%	0.00/	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
8. At Least Pencillin G, High Level Gentamicin,	Chickens	Retail Chickens	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Cecal	0.00/		0.00/	0.00/	0.00/			0.00/		0.00/	0	0.0%
	Turkeys	Retail Ground Turkey	0.0%		0.0%	0.0%	0.0%			0.0%		0.0%	0.0%	0.0% 0 0.0%
	2	Cecal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ie E	Retail Ground Beef	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Cattle	Cecal (Beef)											0.0%	0.0%
		Cecal (Dairy)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	ne Je	Retail Pork Chops	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.0%	0.0%
	Swine	Cecal (Market Swine)											0.0%	0.0%
1 Resistance patterns do not inc	ludo d	Cecal (Sows)	o ootoblish	od CI CI bro	almainta								0	0

¹ Resistance patterns do not include daptomycin as there are no established CLSI breakpoints

Appendix A

Table A1. Concentration Ranges Used for Susceptibility Testing of Salmonella and E. coli, 2014

Antimicrobial Class	Antimicrobial Agent	Concentration Range (μg/ml)
Aminoglycosides	Gentamicin	0.25 - 16
	Streptomycin	2 - 64
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin–Clavulanic Acid	1 / 0.5 - 32 / 16
Cephems	Cefoxitin	0.5 - 32
	Ceftiofur	0.12 - 8
	Ceftriaxone	0.25 - 64
Folate Pathway Inhibitors	Sulfisoxazole	16 - 256
	Trimethoprim-Sulfamethoxazole	0.12 / 2.4 - 4 / 76
Macrolides	Azithromycin	0.12 - 16
Penicillins	Ampicillin	1 - 32
Phenicols	Chloramphenicol	2 - 32
Quinolones	Ciprofloxacin	0.015 - 4
	Nalidixic acid	0.5 - 32
Tetracyclines	Tetracycline	4 - 32

Table A2. Concentration Ranges Used for Susceptibility Testing of Campylobacter, 2014

Antimicrobial Class	Antimicrobial Agent	Concentration Range (μg/ml)
Aminoglycosides	Gentamicin	0.12 - 32
Ketolides	Telithromycin	0.015 - 8
Lincosamides	Clindamycin	0.03 - 16
Macrolides	Azithromycin	0.015 - 64
	Erythromycin	0.03 - 64
Phenicols	Florfenicol	0.03 - 64
Quinolones	Ciprofloxacin	0.015 - 64
	Nalidixic acid	4 - 64
Tetracyclines	Tetracycline	0.06 - 64

Table A3. Concentration Ranges Used for Antimicrobial Susceptibility Testing of Salmonella and E. coli Resistant to Ceftriaxone or Ceftiofur, 2014

Antimicrobial Class	Antimicrobial Agent	Concentration Range (µg/ml)
β-Lactam/β-Lactamase Inhibitor Combinations	Piperacillin-tazobactam	0.5 - 128
Cephems	Cefepime	0.125 - 32
	Cefotaxime	0.125 - 128
	Ceftazidime	0.125 - 128
Monobactams	Aztreonam	0.125 - 32
Penems	Imipenem	0.125 - 16

Table A4. Concentration Ranges Used for Susceptibility Testing of *Enterococcus*, 2014

Antimicrobial Class	Antimicrobial Agent	Concentration Range (µg/ml)
Aminoglycosides	Gentamicin	128 - 1024
	Kanamycin	128 - 1024
	Streptomycin	512 - 2048
Glycopeptides	Vancomycin	0.25 - 32
Glycylcyclines	Tigecycline	0.015 - 0.5
Lincosamides	Lincomycin	1 - 8
Lipopeptides	Daptomycin	0.25 - 16
Macrolides	Erythromycin	0.25 - 8
	Tylosin	0.25 - 32
Nitrofurans	Nitrofurantoin	2 - 64
Oxazolidinones	Linezolid	0.5 - 8
Penicillins	Penicillin	0.25 - 16
Phenicols	Chloramphenicol	2 - 32
Quinolones	Ciprofloxacin	0.12 - 4
Streptogramins	Quinupristin-Dalfopristin	0.5 - 32
Tetracyclines	Tetracycline	1 - 32

Appendix B

Table B1. Antimicrobial Agents and Antimicrobial Susceptibility Testing Methods for Salmonella and E. coli Isolates, 1996-2014^{1,2}

	icrobial Agents and A			<u>, , , , , , , , , , , , , , , , , , , </u>							th Microdilutio									
	Sensititre® Plate Name	CMV1CCDC ³ CMV3CNCD	CMV3	CNCD	CMV4CNCD	CMV5CNCD	CMV6CNCD	CMV7	CNCD				CMV1AGNF					CMV2AGNF		CVM3AGNF
	Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Antimicrobial Class	Antimicrobial Agent																			
Aminocyclitols	Apramycin	√	√	√	√	√	√													
Aminoglycosides	Amikacin	√	V	V	4	V	√	V	V	V	V	4	4	V	V	4				
	Gentamicin	√	√	√	√	√	√	√	√	V	V	√	√	√	V	√	√	√	√	√
	Kanamycin	√	√	√	V	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
	Streptomycin	√	√	√	V	√	√	√	√	√	√	V	√	√	√	√	√	√	√	√
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin–Clavulanic Acid	√	√	V	٧	√	V	V	V	√	V	٧	٧	V	V	V	V	V	V	V
Cephems	Cefoxitin					√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Ceftiofur	V	√	√	√	√	√	√	V	V	V	√	√	√	√	√	√	√	√	√
	Ceftriaxone	V	√	√	√	√	√	√	V	V	V	√	√	√	√	√	√	√	√	√
	Cephalothin	V	√	√	√	√	√	√	V											
Coumarins	Novobiocin																			
Folate Pathway Inhibitors	Sulfamethoxazole	√	√	√	√	√	√	√	√											
	Sulfisoxazole									√	√	√	√	4	√	√	V	√	√	√
	Trimethoprim-Sulfamethoxazole	√	√	√	4	√	√	√	√	√	√	√	√	4	√	√	V	√	√	√
Macrolides	Azithromycin																V	√	√	√
Penems	Imipenem						√													
Penicillins	Ampicillin	√	√	√	√	√	√	√	√	√	√	√	√	4	√	√	√	√	√	√
	Ticarcillin		V	V																
Phenicols	Chloramphenicol	V	√	1	√	√	√	√	√	√	√	√	√	√	√	√	V	√	1	√
	Florfenicol				√															
Quinolones	Ciprofloxacin	√	√	1	√	√	√	√	√	√	√	√	√	√	√	√	V	√	1	√
	Nalidixic acid	√	√	V	4	√	√	√	√	√	√	√	√	4	√	√	√	√	√	√
Tetracyclines	Tetracycline	V	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

¹ Testing of Salmonella isolates from humans, food animals, and retail meats began in 1996, 1997, and 2002, respectively

² Testing of *E. coli* isolates from chickens and retail meats began in 2000 and 2002, respectively. Testing of *E. coli* 0157 isolates from humans began in 1996 and a study of *E. coli* isolates from people in the community began in 2004

³ In 1996, most isolates were tested using Sensititre® plate CMV1CCDC, but a few isolates were tested using Sensititre® plate CMV3CNCD

Table B2. Antimicrobial Agents and Antimicrobial Susceptibility Testing Methods for Campylobacter Isolates from Humans and Chickens, 1997-2014¹

	l	Illians and Chickens, 1997-2014																		
	Method				E-T	est [®]				Broth Microdilution Sensititre® Plate: CAMPY										
	Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Antimicrobial Class	Antimicrobial Agent																			
Aminoglycosides	Gentamicin		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	1	√	
Ketolides	Telithromycin									√	√	√	√	√	√	√	√	1	√	
Lincosamides	Clindamycin	√	√	√	√	√	√	√	√	√	4	√	√	√	√	√	√	V	√	
Macrolides	Azithromycin		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	V	√	
	Erythromycin	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	V	√	
Penems	Meropenem																			
Phenicols	Chloramphenicol	√	√	√	√	√	√	√	√											
	Florfenicol									√	√	√	√	√	√	√	√	V	√	
Quinolones	Ciprofloxacin	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	V	√	
	Nalidixic acid	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	V	√	
Tetracyclines	Doxycycline																			
	Tetracycline	√	√	√	V	√	√	√	√	V	√	√	√	V	√	√	√	√	V	

¹Testing of *Campylobacter* isolates from humans and chickens began in 1997 and 1998, respectively

Table B3. Antimicrobial Agents and Antimicrobial Susceptibility Testing Methods for Campylobacter Isolates from Retail Meats, 2002-2014

	Method				Agar [Dilution	Broth Microdilution Sensititre® Plate: CAMPY										
	Year				2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Antimicrobial Class	Antimicrobial Agent																
Aminoglycosides	Gentamicin				√	√	√	√	√	√	√	√	√	√	V	√	√
Ketolides	Telithromycin						√	√	√	√	√	√	√	√	√	√	√
Lincosamides	Clindamycin						√	√	√	√	√	√	√	√	√	√	√
Macrolides	Azithromycin						√	√	√	√	√	√	√	√	√	√	√
	Erythromycin				√	√	√	√	√	√	√	√	√	√	√	√	√
Penems	Meropenem				√	√											
Phenicols	Chloramphenicol																
	Florfenicol						√	√	√	√	√	√	√	√	√	√	√
Quinolones	Ciprofloxacin				√	√	√	√	√	V	√	√	√	√	√	√	√
	Nalidixic acid						√	√	V	1	√	√	√	√	√	√	√
Tetracyclines	Doxycycline				√	√											_
	Tetracycline						√	1	1	√	√	√	4	√	4	√	√

Table B4. Antimicrobial Agents and Antimicrobial Susceptibility Testing Methods for Enterococcus Isolates, 2001-2014

	Method	idinicrobial Susceptibility Testing Methods id					th Microdilutio	n	
	Sensititre® Plate Name		CMV4ACDC ² CMV5ACDC	CMV5	ACDC	CMV1AGPF	CMV1AGPF ³ CMV2AGPF	CMV2AGPF	CMV3AGPF
	Year		2001	2002	- 2003	2004	2005	2006 - 2008	2009 - 2014
Antimicrobial Class	Antimicrobial Agent							Concentration Range (μg/m	l)
Aminoglycosides	Gentamicin		√	√	√	√	√	√	√
	Kanamycin		√	√	√	√	√	√	√
	Streptomycin		√	√	√	√	√	√	√
Glycopeptides	Vancomycin		√	√	√	√	√	√	√
Glycylcyclines	Tigecycline						7	√	V
Ionophores	Salinomycin		√		V				
Lincosamides	Lincomycin		√		V	V	√	√	V
Lipopeptides	Daptomycin					√	√	√	√
Macrolides	Erythromycin		√	-	V	√	√	√	V
	Tylosin		√		V	√	√	√	V
Nitrofurans	Nitrofurantoin				V	V	√	1	1
Oxazolidinones	Linezolid				V	V	√	√	4
Penicillins	Penicillin		√	-	V	V	√	√	4
Phenicols	Chloramphenicol		√		V	V	√	1	1
Phosphoglycolipids	Flavomycin		√	-	V	√	√	$\sqrt{4}$	
Polypeptides	Bacitracin		√		V	V	- V		
Quinolones	Ciprofloxacin		√		V	V	√	1	٨
Streptogramins	Quinupristin-Dalfopristin		√		V	V	√	1	٧
	Virginiamycin								
Tetracyclines	Tetracycline		√		J	√	√	√	V

¹ Testing of Enterococcus isolates from retail meats and chickens began in 2002 and 2003, respectively. A study of Enterococcus isolates from people in the community began in 2001

² In 2001, most isolates were tested using Sensititre® plate CMV5ACDC, but a few isolates were tested using Sensititre® plate CMV4ACDC

³ In 2005, isolates from chickens and most isolates from humans were tested with Sensititre® plate CMV1AGPF, while isolates from retail meats were tested with Sensititre® plate CMV2AGPF

 $^{^{\}rm 4}$ Flavomycin was not available for all of the plates used to test isolates from 2008

Table B5. Antimicrobial Agents and Antimicrobial Susceptibility Testing Methods for Salmonella and E. coli Resistant to Ceftriaxone or Ceftiofur, 2011-2014

	Method									Broth Microdilution					
	Sensititre® Plate Name									CMV2DW					
	Year								2011	2012	2013	2014			
Antimicrobial Class	Antimicrobial Agent														
β-Lactam/β-Lactamase Inhibitor Combinations	Piperacillin-tazobactam								√	√	√	√			
Cephems	Cefepime								√	√	√	√			
	Cefotaxime								√	√	1	√			
	Ceftazidime								V	√	1	√			
Monabactams	Aztreonam								V	1	√	√			
Penems	Imipenem								V	V	1	√			