

**Table 1a. Top Serotypes among *Salmonella* from Retail Meat, 2014**

Source: Retail Chicken (N=143)			Source: Ground Turkey (N=86)			Source: Ground Beef (N=13)			Source: Pork Chops (N=20)		
Serotype	n	%	Serotype	n	%	Serotype	n	%	Serotype	n	%
Typhimurium	38	26.6	Reading	18	20.9	Dublin	3	23.1	Derby	5	25.0
Kentucky	35	24.5	Hadar	13	15.1	Typhimurium	3	23.1	Infantis	5	25.0
Enteritidis	27	18.9	Saintpaul	12	13.9	Montevideo	2	15.4	I 4,5,12:i:-	2	10.0
Heidelberg	24	16.8	Berta	8	9.3	Newport	2	15.4	Anatum	1	5.0
Infantis	4	2.8	Albany	6	7.0	Anatum	1	7.7	Brandenburg	1	5.0
Shwarzengrund	4	2.8	Heidelberg	6	7.0	Bredeney	1	7.7	Bredeney	1	5.0
Mbandaka	3	2.1	Muenchen	4	4.6	Infantis	1	7.7	Cerro	1	5.0
I 4,5,12:i:-	2	1.4	Schwarzengrund	3	3.5				London	1	5.0
Thompson	2	1.4	Senftenberg	3	3.5				Muenchen	1	5.0
Blockley	1	0.7	Anatum	2	2.3				Ohio	1	5.0
Braenderup	1	0.7	Brandenburg	2	2.3				Typhimurium	1	5.0
IIIa 40:z4,z23:-	1	0.7	I 4,12:d:-	2	2.3						
Senftenberg	1	0.7	Infantis	2	2.3						
			Typhimurium	2	2.3						
			I 4,12:non-motile	1	1.2						
			Montevideo	1	1.2						
			Worthington	1	1.2						

**Table 1b. Top Serotypes among *Salmonella* from Retail Meat, 2015<sup>†</sup>**

Source: Retail Chicken (N=60)			Source: Ground Turkey (N=47)			Source: Ground Beef (N=1)			Source: Pork Chops (N=6)		
Serotype	n	%	Serotype	n	%	Serotype	n	%	Serotype	n	%
Kentucky	23	38.3	Reading	15	31.9	Typhimurium	1	100.0	Infantis	2	33.3
Enteritidis	14	23.3	Muenchen	8	17.0				Johannesburg	2	33.3
Heidelberg	5	8.3	Saintpaul	6	12.8				Derby	1	16.7
Saintpaul	3	5.0	Hadar	3	6.4				Schwarzengrund	1	16.7
Blockley	2	3.3	Kentucky	3	6.4						
Johannesburg	2	3.3	Schwarzengrund	3	6.4						
Livingstone	2	3.3	Heidelberg	2	4.3						
Newport	2	3.3	I 4,12:i:-	2	4.3						
Typhimurium	2	3.3	Albany	1	2.1						
Alachua	1	1.7	Infantis	1	2.1						
Braenderup	1	1.7	Rissen	1	2.1						
Muenchen	1	1.7	Senftenberg	1	2.1						
Ohio	1	1.7	I 4,5,12:i:-	1	2.1						
I 4, 12:i:-	1	1.7									

<sup>†</sup> *Salmonella* serotypes listed in Table 1b. reflect the total number of isolates with confirmatory identifications completed at the time of reporting, therefore, totals may differ from the actual received in January through June of 2015.

**Table 2a. Percentage and Number of Retail Meat Samples with *Salmonella*, by Site, 2014**

Site	Retail Chicken			Ground Turkey			Ground Beef			Pork Chop			Site Total		
	N	n	%	N	n	%	N	n	%	N	n	%	N	n	%
California	120	6	5.0	120	3	2.5	120	0	0.0	120	3	2.5	480	12	2.5
Colorado	120	7	5.8	120	5	4.2	120	1	0.8	120	2	1.7	480	15	3.1
Connecticut	40	5	12.5	40	3	7.5	40	0	0.0	40	0	0.0	160	8	5.0
Georgia	120	5	4.2	120	3	2.5	120	0	0.0	120	3	2.5	480	11	2.3
Louisiana	120	4	3.3	109	1	0.9	107	0	0.0	117	1	0.9	453	6	1.3
Maryland	120	17	14.2	120	18	15.0	120	0	0.0	120	4	3.3	480	39	8.1
Minnesota	120	19	15.8	120	9	7.5	120	2	1.7	120	2	1.7	480	32	6.7
Missouri	120	7	5.8	119	4	3.4	120	2	1.7	120	0	0.0	479	13	2.7
New Mexico	90	27	30.0	90	7	7.8	90	1	1.1	90	1	1.1	360	36	10.0
New York	120	12	10.0	120	7	5.8	120	0	0.0	120	0	0.0	480	19	4.0
Oregon	120	4	3.3	120	2	1.7	120	1	0.8	120	0	0.0	480	7	1.5
Pennsylvania	120	13	10.8	120	11	9.2	120	0	0.0	120	1	0.8	480	25	5.2
Tennessee	120	11	9.2	119	5	4.2	120	5	4.2	120	0	0.0	479	21	4.4
Washington	120	6	5.0	120	8	6.7	120	1	0.8	120	3	2.5	480	18	3.8
<b>Total</b>	<b>1570</b>	<b>143</b>	<b>9.1</b>	<b>1557</b>	<b>86</b>	<b>5.5</b>	<b>1557</b>	<b>13</b>	<b>0.8</b>	<b>1567</b>	<b>20</b>	<b>1.3</b>	<b>6251</b>	<b>262</b>	<b>4.2</b>

**Table 2b. Percentage and Number of Retail Meat Samples with *Salmonella*, by Site, January - June 2015<sup>†</sup>**

Site	Retail Chicken			Ground Turkey			Ground Beef			Pork Chop			Site Total		
	N	n	%	N	n	%	N	n	%	N	n	%	N	n	%
California	150	9	6.0	90	7	7.8	60	0	0.0	60	1	1.7	360	17	4.7
Colorado	60	4	6.7	60	1	1.7	60	0	0.0	60	0	0.0	240	5	2.1
Connecticut	180	11	6.1	100	8	8.0	60	0	0.0	60	1	1.7	400	20	5.0
Georgia	90	7	7.8	70	6	8.6	60	0	0.0	60	0	0.0	280	13	4.6
Louisiana	50	3	6.0	46	1	2.2	47	0	0.0	46	0	0.0	189	4	2.1
Maryland	60	7	11.7	60	13	21.7	60	0	0.0	60	1	1.7	240	21	8.8
Minnesota	120	8	6.7	80	10	12.5	60	0	0.0	60	0	0.0	320	18	5.6
Missouri	60	7	11.7	60	3	5.0	60	0	0.0	60	0	0.0	240	10	4.2
New Mexico	120	20	16.7	80	8	10.0	60	0	0.0	60	0	0.0	320	28	8.8
New York	120	13	10.8	80	9	11.3	60	0	0.0	60	0	0.0	320	22	6.9
Oregon	60	3	5.0	60	1	1.7	60	0	0.0	60	0	0.0	240	4	1.7
Pennsylvania	60	9	15.0	60	3	5.0	60	0	0.0	60	3	5.0	240	15	6.3
Tennessee	60	3	5.0	59	0	0.0	60	1	1.7	56	1	1.8	235	5	2.1
Washington	60	0	0.0	60	2	3.3	60	0	0.0	60	1	1.7	240	3	1.3
<b>Total</b>	<b>1250</b>	<b>104</b>	<b>8.3</b>	<b>965</b>	<b>72</b>	<b>7.5</b>	<b>827</b>	<b>1</b>	<b>0.1</b>	<b>822</b>	<b>8</b>	<b>1.0</b>	<b>3864</b>	<b>185</b>	<b>4.8</b>

<sup>†</sup> The NARMS retail meat surveillance program expanded the number of samples tested for chicken and turkey in 2015. The increased number of samples are due to sites implementing expanded sampling.

**Table 3a. Resistance Patterns of *Salmonella* Isolates from Retail Meats, 2014<sup>o</sup>**

Retail Meat Source Total Isolates	Retail Chicken 143	Ground Turkey 86	Ground Beef 13	Pork Chop 20
<b>Resistance Pattern</b>				
No Resistance Detected	40.6% 58	26.7% 23	46.2% 6	40.0% 8
Quinolone Resistance (ciprofloxacin)	0.0% 0	0.0% 0	0.0% 0	5.0% 1
Cephem Resistance (ceftriaxone)	17.5% 25	7.0% 6	38.5% 5	0.0% 0
Macrolide Resistance (azithromycin)	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Resistance ≥ 3 CLSI classes*	20.3% 29	36.0% 31	38.5% 5	20.0% 4
At least ACSSuT <sup>†</sup>	2.1% 3	2.3% 2	30.8% 4	5.0% 1
At least ASSuT <sup>‡</sup> and not resistant to chloramphenicol	0.0% 0	4.7% 4	0.0% 0	15.0% 3
At least ACT/S <sup>§</sup>	0.0% 0	0.0% 0	0.0% 0	5.0% 1
At least ACSSuTAuCx <sup>¶</sup>	1.4% 2	2.3% 2	30.8% 4	0.0% 0
At least AAuCx <sup>**</sup>	16.8% 24	7.0% 6	38.5% 5	0.0% 0
At least ceftriaxone and nalidixic acid resistant	0.7% 1	0.0% 0	7.7% 1	0.0% 0
At least ceftriaxone and azithromycin resistant	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least nalidixic acid and azithromycin resistant	0.0% 0	0.0% 0	0.0% 0	0.0% 0

**Table 3b. Resistance Patterns of *Salmonella* Isolates from Retail Meats, 2015<sup>o,Σ</sup>**

Retail Meat Source Total Isolates	Retail Chicken 60	Ground Turkey 47	Ground Beef 1	Pork Chop 6
<b>Resistance Pattern</b>				
No Resistance Detected	51.7% 31	53.2% 25	100.0% 1	66.7% 4
Quinolone Resistance (ciprofloxacin)	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Cephem Resistance (ceftriaxone)	5.0% 3	4.3% 2	0.0% 0	0.0% 0
Macrolide Resistance (azithromycin)	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Resistance ≥ 3 CLSI classes*	10.0% 6	17.0% 8	0.0% 0	0.0% 0
At least ACSSuT <sup>†</sup>	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least ASSuT <sup>‡</sup> and not resistant to chloramphenicol	0.0% 0	4.3% 2	0.0% 0	0.0% 0
At least ACT/S <sup>§</sup>	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least ACSSuTAuCx <sup>¶</sup>	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least AAuCx <sup>**</sup>	5.0% 3	4.3% 2	0.0% 0	0.0% 0
At least ceftriaxone and nalidixic acid resistant	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least ceftriaxone and azithromycin resistant	0.0% 0	0.0% 0	0.0% 0	0.0% 0
At least nalidixic acid and azithromycin resistant	0.0% 0	0.0% 0	0.0% 0	0.0% 0

\* CLSI: Clinical and Laboratory Standards Institute

† ACSSuT: resistance to ampicillin, chloramphenicol, streptomycin, sulfoxazole, tetracycline

‡ ASSuT: resistance to ampicillin, streptomycin, sulfoxazole, tetracycline

§ ACT/S: resistance to ampicillin, chloramphenicol, trimethoprim-sulfamethoxazole

¶ ACSSuTAuCx: resistance to ACSSuT, amoxicillin-clavulanic acid, ceftriaxone

\*\* AAuCx: resistance to ampicillin, amoxicillin-clavulanic acid, ceftriaxone

<sup>o</sup> This data was analyzed using an expanded concentration range of 2-64 µg/ml and a resistance cutoff value of ≥ 32 for streptomycin.

<sup>Σ</sup> Results are from isolates where identifications were confirmed at the time of reporting, therefore totals may differ from the actual received in January through June 2015.

**Table 4a. Resistance genes found among resistant *Salmonella* Isolates from Retail Meats, 2014<sup>o</sup>**

Total Isolates	Retail Chicken (143) Ground Turkey (86) Ground Beef (13) Pork Chop (20)			
	Resistance Genes Detected (total number) <sup>‡</sup>			
Antimicrobial (total resistant)	Retail Chicken	Ground Turkey	Ground Beef	Pork Chop
Gentamicin (29)	<i>aadB</i> (4), <i>aac</i> (3) (5)	<i>aac</i> (3) (15)	<i>aadB</i> (1)	<i>aac</i> (3) (1)
Streptomycin (102)	<i>strA/strB</i> (41), <i>aadA</i> (4), <i>aadB</i> (4)	<i>strA/strB</i> (31), <i>aadA</i> (18), <i>aadB</i> (1)	<i>strA/strB</i> (4), <i>aadB</i> (1)	<i>strA/strB</i> (5), <i>aadA</i> (3)
Amoxicillin-Clavulanic Acid (35)	<i>blaCMY</i> (24)	<i>blaCMY</i> (6)	<i>blaCMY</i> (5)	None
Cefoxitin (32)	<i>blaCMY</i> (21)	<i>blaCMY</i> (6)	<i>blaCMY</i> (5)	None
Ceftiofur (36)	<i>blaCMY</i> (24), <i>blaCTX-M</i> (1)	<i>blaCMY</i> (6)	<i>blaCMY</i> (5)	None
Ceftriaxone (36)	<i>blaCMY</i> (24), <i>blaCTX-M</i> (1)	<i>blaCMY</i> (6)	<i>blaCMY</i> (5)	None
Sulfamethoxazole/Sulfisoxazole (78)	<i>sul1</i> (4), <i>sul2</i> (42)	<i>sul1</i> (9), <i>sul2</i> (18)	<i>sul2</i> (5)	<i>sul1</i> (2), <i>sul2</i> (4), <i>sul3</i> (1)
Azithromycin (0)	None	None	None	None
Ampicillin (60)	<i>blaTEM</i> (8), <i>blaCMY</i> (24), <i>blaCTX-M</i> (1)	<i>blaTEM</i> (20), <i>blaCMY</i> (6), <i>blaHERA</i> (2)	<i>blaTEM</i> (2), <i>blaCMY</i> (5)	<i>blaTEM</i> (3), <i>blaCARB</i> (1)
Chloramphenicol (14)	<i>floR</i> (5), <i>cmIA</i> (4)	<i>floR</i> (2)	<i>floR</i> (4), <i>cmIA</i> (1)	<i>floR</i> (1)
Ciprofloxacin (1)	None	None	None	<i>qnrS</i> (1)
Nalidixic acid (3)	<i>gyrA</i> mutation (1)	None	<i>gyrA</i> mutation (1)	<i>qnrS</i> (1)
Tetracycline (137)	<i>tetA</i> (42), <i>tetB</i> (26)	<i>tetA</i> (35), <i>tetB</i> (17), <i>tetC</i> (1)	<i>tetA</i> (4), <i>tetB</i> (1), <i>tetC</i> (1)	<i>tetA</i> (2), <i>tetB</i> (8), <i>tetG</i> (1)
Trimethoprim-sulfamethoxazole (1)	None	None	None	<i>dfpA</i> (1)

**Table 4b. Resistance genes found among resistant *Salmonella* Isolates from Retail Meats, 2015<sup>o</sup>**

Total Isolates	Retail Chicken (60) Ground Turkey (47) Ground Beef (1) Pork Chop (6)			
	Resistance Genes Detected (total number) <sup>‡</sup>			
Antimicrobial (total resistant)	Retail Chicken	Ground Turkey	Ground Beef	Pork Chop
Gentamicin (13)	<i>aac</i> (3) (4)	<i>aadB</i> (1), <i>aac</i> (3) (7)	None	None
Streptomycin (44)	<i>strA/strB</i> (21), <i>aadA</i> (6)	<i>strA/strB</i> (12), <i>aadA</i> (9), <i>aadB</i> (1)	None	None
Amoxicillin-Clavulanic Acid (5)	<i>blaCMY</i> (3)	<i>blaCMY</i> (2)	None	None
Cefoxitin (5)	<i>blaCMY</i> (3)	<i>blaCMY</i> (2)	None	None
Ceftiofur (5)	<i>blaCMY</i> (3)	<i>blaCMY</i> (2)	None	None
Ceftriaxone (5)	<i>blaCMY</i> (3)	<i>blaCMY</i> (2)	None	None
Sulfamethoxazole/Sulfisoxazole (16)	<i>sul1</i> (3), <i>sul2</i> (4)	<i>sul1</i> (4), <i>sul2</i> (7)	None	None
Azithromycin (0)	None	None	None	None
Ampicillin (12)	<i>blaTEM</i> (2), <i>blaCMY</i> (3)	<i>blaTEM</i> (6), <i>blaCMY</i> (2)	None	None
Chloramphenicol (0)	None	None	None	None
Ciprofloxacin (0)	None	None	None	None
Nalidixic acid (0)	None	None	None	None
Tetracycline (46)	<i>tetA</i> (8), <i>tetB</i> (17)	<i>tetA</i> (15), <i>tetB</i> (5), <i>tetC</i> (1)	None	<i>tetB</i> (2)
Trimethoprim-sulfamethoxazole (2)	<i>dfpA</i> (1)	<i>dfpA</i> (1)	None	None

<sup>o</sup> Only resistant isolates are listed; isolates with resistance genes not conferring resistance are not depicted in this table

<sup>‡</sup> The parentheses after each resistance gene is the total number of isolates exhibiting the identified mechanism. Please be advised the sum of the genes detected may add to more than the total resistant due to multiple mechanisms.