Table 14a. Antimicrobial Resistance among *Salmonella* Heidelberg Isolates from Food Animals, by Year, 1997-2005

Year			1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of Isolates Tested		Chickens	51	143	297	259	329	403	226	167	283
		Turkeys	14	39	139	125	142	60	57	46	25
		Cattle	1	11	28	6	10	8	9	1	6
		Swine	7	37	33	22	16	11	11	4	8
Antimicrobial Class	Antimicrobial	Isolate Source									
Aminoglycosides	Amikacin	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
		Turkeys	0.0% 0	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% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Gentamicin	Chickens	41.2% 21	26.6% 38	18.5% 55	32.0% 83	12.5% 41	8.9% 36	7.5% 17	10.2% 17	9.2% 26
		Turkeys	0.0% 0	17.9% 7	16.5% 23	12.0% 15	13.4% 19	18.3% 11	12.3% 7	17.4% 8	36.0% 9
		Cattle	0.0% 0	27.3% 3	39.3% 11	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	0.0% 0	0.0% 0	0.0% 0	9.1% 2	0.0% 0	9.1% 1	0.0% 0	0.0% 0	0.0% 0
	Kanamycin	Chickens	0.0% 0	0.7% 1	1.3% 4	12.0% 31	4.3% 14	3.7% 15	5.3% 12	6.0% 10	6.7% 19
		Turkeys	7.1% 1	5.1% 2	17.3% 24	43.2% 54	31.0% 44	30.0% 18	21.1% 12	19.6% 9	44.0% 11
		Cattle	0.0% 0	63.6% 7	42.9% 12	16.7% 1	10.0% 1	37.5% 3	55.6% 5	100.0% 1	50.0% 3
		Swine	85.7% 6	64.9% 24	60.6% 20	77.3% 17	75.0% 12	54.5% 6	100.0% 11	75.0% 3	75.0% 6
	Streptomycin	Chickens	35.3% 18	32.9% 47	23.9% 71	36.7% 95	20.4% 67	18.6% 75	17.7% 40	18.0% 30	15.5% 44
		Turkeys	14.3% 2	30.8% 12	30.2% 42	52.8% 66	40.1% 57	35.0% 21	28.1% 16	21.7% 10	44.0% 11
		Cattle	0.0% 0	72.7% 8	57.1% 16	16.7% 1	20.0% 2	37.5% 3	55.6% 5	100.0% 1	50.0% 3
		Swine	57.1% 4	81.1% 30	63.6% 21	86.4% 19	75.0% 12	45.5% 5	100.0% 11	75.0% 3	87.5% 7
Aminopenicillins	Ampicillin	Chickens	21.6% 11	25.2% 36	16.2% 48	24.7% 64	16.7% 55	14.9% 60	19.0% 43	16.2% 27	25.1% 71
		Turkeys	7.1% 1	12.8% 5	8.6% 12	4.0% 5	9.2% 13	13.3% 8	3.5% 2	17.4% 8	24.0% 6
		Cattle	0.0% 0	27.3% 3	50.0% 14	0.0% 0	0.0% 0	50.0% 4	55.6% 5	100.0% 1	83.3% 5
		Swine	0.0% 0	5.4% 2	0.0% 0	9.1% 2	0.0% 0	18.2% 2	9.1% 1	0.0% 0	12.5% 1

Table 14b. Antimicrobial Resistance among Salmonella Heidelberg Isolates from Food Animals, by Year, 1997-2005

Year			1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of Isolates Tested		Chickens	51	143	297	259	329	403	226	167	283
		Turkeys	14	39	139	125	142	60	57	46	25
		Cattle	1	11	28	6	10	8	9	1	6
		Swine	7	37	33	22	16	11	11	4	8
Antimicrobial Class	**Antimicrobial**	**Isolate Source**									
β-Lactam/β-Lactamase Inhibitor Combinations	Amoxicillin-Clavulanic Acid	Chickens	2.0% 1	1.4% 2	1.3% 4	13.5% 35	7.0% 23	8.7% 35	9.3% 21	10.2% 17	21.9% 62
		Turkeys	0.0% 0	2.6% 1	0.7% 1	2.4% 3	5.6% 8	5.0% 3	0.0% 0	6.5% 3	0.0% 0
		Cattle	0.0% 0	27.3% 3	42.9% 12	0.0% 0	0.0% 0	50.0% 4	55.6% 5	100.0% 1	83.3% 5
		Swine	0.0% 0	0.0% 0	0.0% 0	4.5% 1	0.0% 0	9.1% 1	9.1% 1	0.0% 0	0.0% 0
Cephalosporins	Ceftiofur	Chickens	2.0% 1	1.4% 2	1.7% 5	13.9% 36	5.8% 19	8.9% 36	9.3% 21	10.2% 17	21.9% 62
		Turkeys	0.0% 0	2.6% 1	0.7% 1	3.2% 4	5.6% 8	5.0% 3	0.0% 0	6.5% 3	0.0% 0
		Cattle	0.0% 0	27.3% 3	42.9% 12	0.0% 0	0.0% 0	37.5% 3	55.6% 5	100.0% 1	83.3% 5
		Swine	0.0% 0	0.0% 0	0.0% 0	4.5% 1	0.0% 0	9.1% 1	9.1% 1	0.0% 0	0.0% 0
	Ceftriaxone	Chickens	0.0% 0	≤0.7%[1] ≤1	0.0% 0	0.4% 1	0.0% 0	0.2% 1	0.0% 0	0.6% 1	1.4% 4
		Turkeys	0.0% 0	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% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
	Cephalothin	Chickens	2.0% 1	9.8% 14	5.7% 17	15.4% 40	8.5% 28	9.9% 40	12.8% 29		
		Turkeys	0.0% 0	5.1% 2	2.2% 3	2.4% 3	7.0% 10	5.0% 3	1.8% 1		
		Cattle	0.0% 0	27.3% 3	42.9% 12	0.0% 0	0.0% 0	50.0% 4	55.6% 5		
		Swine	0.0% 0	0.0% 0	0.0% 0	4.5% 1	0.0% 0	9.1% 1	9.1% 1		
Cephamycins	Cefoxitin	Chickens				13.5% 35	5.2% 17	7.4% 30	7.1% 16	10.2% 17	21.6% 61
		Turkeys				2.4% 3	4.9% 7	1.7% 1	0.0% 0	6.5% 3	0.0% 0
		Cattle				0.0% 0	0.0% 0	37.5% 3	44.4% 4	100.0% 1	66.7% 4
		Swine				4.5% 1	0.0% 0	9.1% 1	9.1% 1	0.0% 0	0.0% 0

[1] In 1998, there was 1 isolate from chickens that grew in all ceftriaxone dilutions on the Sensititre plate (MIC >16 µg/mL). Further testing was not conducted

Table 14c. Antimicrobial Resistance among Salmonella Heidelberg Isolates from Food Animals, by Year, 1997-2005

Year			1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of Isolates Tested		Chickens	51	143	297	259	329	403	226	167	283
		Turkeys	14	39	139	125	142	60	57	46	25
		Cattle	1	11	28	6	10	8	9	1	6
		Swine	7	37	33	22	16	11	11	4	8
Antimicrobial Class	**Antimicrobial**	**Isolate Source**									
Folate Pathway Inhibitors	Sulfonamides	Chickens	45.1% 23	33.6% 48	26.6% 79	33.2% 86	16.4% 54	9.7% 39	11.1% 25	12.6% 21	10.6% 30
		Turkeys	50.0% 7	35.9% 14	33.8% 47	15.2% 19	27.5% 39	30.0% 18	19.3% 11	26.1% 12	52.0% 13
		Cattle	0.0% 0	36.4% 4	57.1% 16	0.0% 0	10.0% 1	12.5% 1	44.4% 4	100.0% 1	50.0% 3
		Swine	0.0% 0	21.6% 8	21.2% 7	13.6% 3	0.0% 0	0.0% 0	0.0% 0	0.0% 0	12.5% 1
	Trimethoprim-Sulfamethoxazole	Chickens	0.0% 0	0.7% 1	0.7% 2	0.4% 1	0.3% 1	0.7% 3	0.9% 2	0.0% 0	0.4% 1
		Turkeys	7.1% 1	5.1% 2	4.3% 6	0.8% 1	3.5% 5	3.3% 2	3.5% 2	0.0% 0	0.0% 0
		Cattle	0.0% 0	27.3% 3	42.9% 12	0.0% 0	10.0% 1	0.0% 0	55.6% 5	100.0% 1	50.0% 3
		Swine	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	9.1% 1	0.0% 0	0.0% 0	0.0% 0
Phenicols	Chloramphenicol	Chickens	0.0% 0	0.7% 1	1.3% 4	11.6% 30	3.3% 11	1.7% 7	3.1% 7	4.2% 7	3.2% 9
		Turkeys	0.0% 0	2.6% 1	0.7% 1	1.6% 2	2.8% 4	1.7% 1	0.0% 0	0.0% 0	0.0% 0
		Cattle	0.0% 0	27.3% 3	42.9% 12	0.0% 0	10.0% 1	25.0% 2	44.4% 4	100.0% 1	50.0% 3
		Swine	0.0% 0	0.0% 0	3.0% 1	4.5% 1	0.0% 0	9.1% 1	0.0% 0	0.0% 0	0.0% 0
Quinolones	Ciprofloxacin	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
		Turkeys	0.0% 0	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% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
		Swine	0.0% 0	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	Chickens	0.0% 0	0.0% 0	0.3% 1	0.0% 0	0.0% 0	0.7% 3	0.0% 0	0.0% 0	0.0% 0
		Turkeys	0.0% 0	0.0% 0	0.7% 1	0.8% 1	0.0% 0	1.7% 1	0.0% 0	0.0% 0	0.0% 0
		Cattle	0.0% 0	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	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Tetracyclines	Tetracycline	Chickens	2.0% 1	7.7% 11	7.7% 23	20.1% 52	14.9% 49	11.7% 47	16.4% 37	15.0% 25	14.5% 41
		Turkeys	14.3% 2	23.1% 9	38.1% 53	64.0% 80	54.2% 77	70.0% 42	84.2% 48	73.9% 34	64.0% 16
		Cattle	0.0% 0	63.6% 7	60.7% 17	33.3% 2	40.0% 4	62.5% 5	55.6% 5	100.0% 1	66.7% 4
		Swine	85.7% 6	73.0% 27	72.7% 24	81.8% 18	93.8% 15	72.7% 8	100.0% 11	75.0% 3	87.5% 7