



United States
Department of
Agriculture

Food Safety
And Inspection
Service

Serotypes Profile of *Salmonella* Isolates from Meat and Poultry Products

January 1998 through December 2007

Background

The Food Safety and Inspection Service (FSIS) issued the Pathogen Reduction; Hazard Analysis and Critical Control Point (PR/HACCP) Systems, Final Rule on July 25, 1996: Federal Register, Vol. 61, No. 144, pp. 38805-38989 (<http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/93-016F.pdf>). The PR/HACCP rule sets *Salmonella* performance standards for establishments slaughtering selected classes of food animals or producing selected classes of raw ground products to verify that industry systems are effective in controlling the contamination of raw meat and poultry products with disease-causing bacteria. Raw products with established performance standards include: carcasses of cows/bulls, steers/heifers, market hogs, broilers and turkeys. Processed products measured by performance standards include: ground beef, ground chicken, and ground turkey. The performance standards for these product classes are based on the prevalence of *Salmonella* as determined from the Agency's nationwide microbiological baseline studies conducted before PR/HACCP was implemented. Guidance using young turkey carcass baseline levels can be found in the Federal Register, Vol.70, No. 32, pp.8058-8060 (<http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/02-046N.pdf>).

The product-specific FSIS *Salmonella* limits became effective in large establishments on January 26, 1998, in small establishments on January 25, 1999, and in very small establishments on January 25, 2000. FSIS inspection personnel verify that establishments are meeting the standards by collecting randomly selected product samples and submitting them to one of three FSIS laboratories for *Salmonella* analysis, according to procedures described in Appendix E of the PR/HACCP Final Rule: Federal Register, Vol. 61, No. 144, pp. 38917-38928 (<http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/93-016F.pdf>).

After one of the FSIS Field Service laboratories in Athens, GA; Alameda, CA; or St. Louis, MO, reports the analysis results, isolates of *Salmonella*-positive samples become eligible for serotyping at the USDA Animal and Plant Health Inspection Service's National Veterinary Services Laboratories in Ames, IA. *Salmonella* testing and serotype data, along with complementary data from molecular and phenotypic analyses, provide an opportunity to examine the association among serotypes isolated on-farm, from meat and poultry products, and from human cases of salmonellosis.

Prior to 2006, there were two phases of the FSIS regulatory program for *Salmonella* in raw products: non-targeted and targeted testing. FSIS collected non-targeted or "A" set samples at



establishments randomly selected from the population of eligible establishments, with a goal of scheduling every eligible establishment at least once a year. Other codes (such as "B", "C", and "D") represented sample sets collected from establishments targeted for follow-up testing following a failed set.

Beginning June 2006, establishments were scheduled based on new criteria (http://www.fsis.usda.gov/pdf/scheduling_criteria_salmonella_sets.pdf) that are risk-based, not random, and are designed to focus FSIS resources on establishments with the most samples positive for *Salmonella* and the greatest number of samples with serotypes most frequently associated with human salmonellosis, as identified by the Centers for Disease Control and Prevention (CDC) (<http://www.cdc.gov/ncidod/dbmd/phlisdata/salmonella.htm>). Beginning with the second 2006 quarterly report, serotype data are summarized from all sample sets.

Note: Restructuring how *Salmonella* sets are scheduled means that comparison of results from 2006 onwards to previous years would not be appropriate. For such comparisons, the results of upcoming nationwide baseline studies can provide valid estimates of the prevalence of certain pathogens of public health concern and will permit valid statistical comparisons to be made over time.

From January 1998 through December 2005, *Salmonella* isolates were serotyped for four carcass and three raw ground product classes. Starting in June 2006, *Salmonella* isolates were also serotyped for turkey carcasses. Each of the eight tables presented in this report identifies the ten most commonly isolated *Salmonella* serotypes by calendar year in a specific carcass or raw ground product class. When more than one serotype ranks in tenth place, each serotype in tenth place is listed. The Agency believes that researchers can use this product-specific serotype information to support foodborne pathogen surveillance. Future updates of serotype distribution results will be provided. Figure 1 displays, by year, the most common serotype isolated in combined chicken classes (Kentucky), the ground turkey class (Hadar), combined cattle classes (Montevideo), and the market hog class (Derby) in 2007.

FSIS keeps abreast of serotypes emerging as human health concerns. Links are provided to the CDC data on the serotypes isolated from human cases of salmonellosis so that the reader has easy access to data on both the serotypes found in meat and poultry products and those causing human illness (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5714a2.htm>; http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf). Some of the more common serotypes isolated from meat and poultry products are rarely isolated from human patients. Conversely, some of the serotypes frequently found in human cases of salmonellosis are found in various meat and poultry products. Serotypes identified from human cases of salmonellosis can also be found in other food and non food sources.

CDC identifies Enteritidis, Typhimurium, Newport, I 4, [5],12:i:-, Javiana, Heidelberg and Montevideo as the seven most commonly identified serotypes causing human infection in the United States. Combined, these serotypes accounted for a majority (61.6%) of human infections in the Foodborne Diseases Active Surveillance Network (FoodNet) sites in 2007



(<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5714a2.htm>). The percentages at which the top seven human serotypes are identified in meat and poultry product classes are presented in Figures 2-9. These serotypes are among the more commonly identified serotypes in meat and poultry products with the exception of Javiana, which is uncommon. Year-to-year variation both within and between product classes, with respect to these more common human serotypes, can be observed. Kentucky, Hadar, and Derby, the predominant serotypes identified in 2007 from meat and poultry products (Figure 1), were not found among the top seven serotypes identified in human surveillance data. As reported by the CDC, the incidence of Typhimurium and Heidelberg decreased, Newport and I4, [5],12:i:- increased, and the others did not change significantly.

Human illnesses attributable to *Salmonella* Newport began to rise in the late 1990's. Newport is detected in all FSIS commodities; most frequently, the cattle classes (Figure 5). In 2003, Newport peaked as the most commonly isolated serotype in ground beef, which was the cattle class in which the most isolates were recovered. In 2007, Newport was the fourth most commonly identified serotype in ground beef. Newport isolations appear to have risen in frequency in 2007 in the other cattle classes (Figure 5). There were seven cow/bull (Table 3) and one steer/heifer (Table 4) isolates recovered.

CDC reported that a *Salmonella* serotype having the antigenic formula I 4, [5],12:i:- has been increasingly recognized since the mid 1990's in human illness cases. In 2007, the serotype was the 4th most commonly identified serotype in U.S. human surveillance data (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5714a2.htm>).

FSIS laboratories did not report antigenic formulas until 2004. Prior to 2004, serotypes identified solely by antigenic formulas that would classify them as "monophasic" were included in the "unidentified" isolates category. In 2007, I 4,[5],12:i:- was the sixth most commonly identified serotype in broiler isolates (Table 1).

FSIS launched a *Salmonella* initiative in 2006 to prevent *Salmonella* contamination of poultry products and other meats. In 2007 in broiler establishments, the total percentage of positive samples was 8.5%, down from 11.4% in 2006 and from a high of 16.3% in 2005. FSIS verification testing showed a decrease in the proportion of *Salmonella* that are Enteritidis in broilers, an increase in the proportion that are Enteritidis in ground chicken (Figure 4), and an increase in the proportion that are Heidelberg in all poultry classes (Figure 7) in 2007.

Verification testing is a regulatory sampling program intended to assess the ability of meat and poultry establishments to comply with existing, product-specific performance standards. Serotype profile results are not intended to indicate a national prevalence for a specific serotype within a respective product class. Despite program limitations, FSIS believes that verification testing results presented in this report provide a good indication of relative serotype distributions in raw products for each product class for the ten years following implementation of the PR/HACCP final rule in federally inspected meat and poultry establishments. FSIS continues to work with public health partners to better identify the proportion of human salmonellosis attributable to FSIS-regulated products.



Results

- Serotypes are reported by product class and by calendar year based on the date of sample collection from 1998 through 2007. The number of isolates of each serotype and category, the percent of total serotyped isolates, and the percent of total samples collected are displayed in Tables 1-8.
- The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.
- Included in the serotype profile are entries classified as “not typed” and “unidentified.” Entries identified as not typed are those in which *Salmonella* serotyping was not performed. Unidentified entries include isolates in which a single specific serotype could not be determined. Prior to 2004, serotypes identified solely by antigenic formulas that would classify them as monophasic, such as I4,[5]12:i:-, were included in the unidentified isolates category.
- From 1998-2005, only “A” set samples were included in the report. Beginning with the second 2006 quarterly report, data from all samples collected are summarized in the reports.
- Variants of serotypes have been reported separately. Tables 1-3 and 5-8 display data for each product class when variants are combined for 2007. Table 4 (Steers/Heifers) do not require merging of variants as only one variant per serotype was observed. Merging variants is most useful in facilitating comparisons of the proportion of *Salmonella* Typhimurium in product classes with human health surveillance data: Typhimurium and Typhimurium variant Copenhagen (an O:5-negative variant of *Salmonella* Typhimurium) are combined and reported as Typhimurium in U.S. human health surveillance data (http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf).
- The figures display the percent of isolates identified out of total isolates serotyped for each product class. The y-axis, representing the serotype percentage, varies from graph to graph because the level of different serotypes by commodity varies greatly and year-to-year variations in percentages are difficult to discern on one scale of high value.



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Tables and Figures

All tables and figures are available in this 86 page PDF* document.

*Note: To read and print a **PDF** file, you must have the Adobe® Acrobat® Reader installed on your PC. You can download a version suitable for your system, free of charge, from the Adobe Home Page. Adobe also provides tools and information to help make Adobe PDF files accessible to users with visual disabilities at <http://access.adobe.com>.



Table 1
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	139	26.68	2.46
Heidelberg	92	17.66	1.63
Typhimurium (var. Copenhagen)	41	7.87	0.72
Typhimurium	40	7.68	0.71
Hadar	33	6.33	0.58
Schwarzengrund	21	4.03	0.37
Montevideo	16	3.07	0.28
Enteritidis	14	2.69	0.25
Thompson	14	2.69	0.25
Infantis	7	1.34	0.12
Istanbul	7	1.34	0.12
^a Other serotypes	58	11.13	1.02
^b Unidentified isolates	39	7.49	0.69
Total serotyped isolates	521		9.21
Not typed	92		1.63
Total positive	613		10.83
Total number of analyzed samples			
		5,659	
Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	188	25.72	2.78
Heidelberg	138	18.88	2.04
Hadar	83	11.35	1.23
Typhimurium (var. Copenhagen)	52	7.11	0.77
Typhimurium	41	5.61	0.61
Thompson	30	4.10	0.44
Litchfield	16	2.19	0.24
Infantis	15	2.05	0.22
Schwarzengrund	12	1.64	0.18
Istanbul	11	1.50	0.16
^a Other serotypes	102	13.95	1.51
^b Unidentified isolates	43	5.88	0.64
Total serotyped isolates	731		10.80
Not typed	41		0.61
Total positive	772		11.41
Total number of analyzed samples			
		6,768	



Table 1—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	219	25.49	2.18
Heidelberg	198	23.05	1.97
Typhimurium (var. Copenhagen)	57	6.64	0.57
Typhimurium	55	6.40	0.55
Hadar	42	4.89	0.42
Montevideo	37	4.31	0.37
Thompson	27	3.14	0.27
Schwarzengrund	25	2.91	0.25
Enteritidis	23	2.68	0.23
Berta	18	2.10	0.18
^a Other serotypes	112	13.04	1.11
^b Unidentified isolates	46	5.36	0.46
Total serotyped isolates	859		8.54
Not typed	55		0.55
Total positive	914		9.09
Total number of analyzed samples			
		10,057	

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	352	33.59	3.93
Heidelberg	260	24.81	2.90
Typhimurium	67	6.39	0.75
Typhimurium (var. Copenhagen)	35	3.34	0.39
Montevideo	32	3.05	0.36
Schwarzengrund	32	3.05	0.36
Hadar	31	2.96	0.35
Thompson	26	2.48	0.29
Enteritidis	17	1.62	0.19
Berta	13	1.24	0.15
^a Other serotypes	121	11.55	1.35
^b Unidentified isolates	62	5.92	0.69
Total serotyped isolates	1048		11.70
Not typed	17		0.19
Total positive	1065		11.89
Total number of analyzed samples			
		8,955	



Table 1—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	382	36.28	4.16
Heidelberg	262	24.88	2.85
Typhimurium (var. Copenhagen)	67	6.36	0.73
Hadar	46	4.37	0.50
Typhimurium	46	4.37	0.50
Enteritidis	33	3.13	0.36
Thompson	23	2.18	0.25
Montevideo	20	1.90	0.22
Schwarzengrund	18	1.71	0.20
Infantis	14	1.33	0.15
Mbandaka	14	1.33	0.15
^a Other serotypes	70	6.65	0.76
^b Unidentified isolates	58	5.51	0.63
Total serotyped isolates	1053		11.47
Not typed	6		0.07
Total positive	1059		11.53
Total number of analyzed samples			
		9,183	

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	297	35.96	4.59
Heidelberg	164	19.85	2.54
Typhimurium (var. Copenhagen)	79	9.56	1.22
Typhimurium	50	6.05	0.77
Enteritidis	29	3.51	0.45
Infantis	20	2.42	0.31
Thompson	17	2.06	0.26
Montevideo	17	2.06	0.26
Hadar	15	1.82	0.23
Mbandaka	15	1.82	0.23
^a Other serotypes	79	9.56	1.22
^b Unidentified isolates	44	5.33	0.68
Total serotyped isolates	826		12.77
Not typed	2		0.03
Total positive	828		12.80
Total number of analyzed samples			
		6,468	



Table 1—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	409	42.74	5.78
Heidelberg	145	15.15	2.05
Typhimurium (var. Copenhagen)	84	8.78	1.19
Enteritidis	58	6.06	0.82
Typhimurium	50	5.22	0.71
^q I 4,5,12:i:-	29	3.03	0.41
Schwarzengrund	27	2.82	0.38
Montevideo	20	2.09	0.28
Mbandaka	15	1.57	0.21
Infantis	12	1.25	0.17
^a Other serotypes	105	10.97	1.48
^b Unidentified isolates	3	0.31	0.04
Total serotyped isolates	957		13.53
Not typed	0		
Total positive	957		13.53
Total number of analyzed samples			
		7,072	

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	703	45.18	7.33
Heidelberg	226	14.52	2.36
Enteritidis	120	7.71	1.25
Typhimurium (var. Copenhagen)	79	5.08	0.82
Typhimurium	68	4.37	0.71
^q I 4,5,12:i:-	65	4.18	0.68
Montevideo	54	3.47	0.56
Schwarzengrund	44	2.83	0.46
^q I 4,12:i:-	22	1.41	0.23
Thompson	18	1.16	0.19
^a Other serotypes	153	9.83	1.60
^b Unidentified isolates	4	0.26	0.04
Total serotyped isolates	1556		16.22
Not typed	3		0.03
Total positive	1559		16.25
Total number of analyzed samples			
		9,592	



Table 1—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	703	45.18	7.33
Heidelberg	226	14.52	2.36
^d Typhimurium	147	9.45	1.53
Enteritidis	120	7.71	1.25
^c l 4,5,12:i:-	65	4.18	0.68
Montevideo	54	3.47	0.56
Schwarzengrund	44	2.83	0.46
^c l 4,12:i:-	22	1.41	0.23
Thompson	18	1.16	0.19
Hadar	16	1.03	0.17
Mbandaka	16	1.03	0.17
^a Other serotypes	121	7.78	1.26
^b Unidentified isolates	4	0.26	0.04
Total serotyped isolates	1556		16.22
Not typed	3		0.03
Total positive	1559		16.25
Total number of analyzed samples	9,592		



Table 1 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	570	48.97	5.58
Enteritidis	159	13.66	1.56
Heidelberg	132	11.34	1.29
Typhimurium (var. Copenhagen)	57	4.90	0.56
^c 4,5,12:i:-	50	4.30	0.49
Typhimurium	37	3.18	0.36
^c 4,12;j:-	20	1.72	0.20
Montevideo	19	1.63	0.19
Schwarzengrund	15	1.29	0.15
Infantis	12	1.03	0.12
Mbandaka	12	1.03	0.12
^a Other serotypes	75	6.44	0.73
^b Unidentified	6	0.52	0.06
Total serotyped isolates	1164		11.41
Not typed	0		
Total positive	1164		11.41
Total number of analyzed samples			
		10,206	



Table 1 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	570	48.97	5.58
Enteritidis	159	13.66	1.56
Heidelberg	132	11.34	1.29
^d Typhimurium	94	8.08	0.92
^c 4,5,12:i:-	50	4.30	0.49
^c 4,12;i:-	20	1.72	0.20
Montevideo	19	1.63	0.19
Schwarzengrund	15	1.29	0.15
Infantis	12	1.03	0.12
Mbandaka	12	1.03	0.12
^a Other serotypes	75	6.44	0.73
^b Unidentified	6	0.52	0.06
Total serotyped isolates	1164		11.41
Not typed	0		
Total positive	1164		11.41
Total number of analyzed samples			
		10,206	



Table 1 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	379	47.14	4.03
Heidelberg	108	13.43	1.15
Enteritidis	87	10.82	0.92
Typhimurium (var. Copenhagen)	43	5.35	0.46
Typhimurium	29	3.61	0.31
^c 4,5,12:i:-	20	2.49	0.21
Montevideo	18	2.24	0.19
4,12:i:-	17	2.11	0.18
Berta	12	1.49	0.13
Infantis	12	1.49	0.13
^a Other serotypes	76	9.45	0.81
^b Unidentified	3	0.37	0.03
Total serotyped isolates	804		8.55
Not typed	0		
Total positive	804		8.55
Total number of analyzed samples			
		9408	



Table 1 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Broilers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	379	47.14	4.03
Heidelberg	108	13.43	1.15
Enteritidis	87	10.82	0.92
^d Typhimurium	72	8.96	0.77
^c 4,5,12:i:-	20	2.49	0.21
Montevideo	18	2.24	0.19
4,12:i:-	17	2.11	0.18
Berta	12	1.49	0.13
Infantis	12	1.49	0.13
Mbandaka	9	1.12	0.10
^a Other serotypes	67	8.33	0.71
^b Unidentified	3	0.37	0.03
Total serotyped isolates	804		8.55
Not typed	0		
Total positive	804		8.55
Total number of analyzed samples	9408		

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cPrior to 2004, isolates fitting the designation were included in the “unidentified isolates” category.

^dTyphimurium includes Typhimurium var. Copenhagen.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 2
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	13	20.63	0.94
Typhimurium (var. Copenhagen)	10	15.87	0.72
Agona	5	7.94	0.36
Schwarzengrund	4	6.35	0.29
Heidelberg	3	4.76	0.22
London	3	4.76	0.22
Muenchen	3	4.76	0.22
Brandenburg	2	3.17	0.14
Hadar	2	3.17	0.14
Infantis	2	3.17	0.14
Typhimurium	2	3.17	0.14
Worthington	2	3.17	0.14
^a Other serotypes	11	17.46	0.79
^b Unidentified isolates	1	1.59	0.07
Total serotyped isolates	63		4.53
Not typed	18		1.29
Total positive	81		5.83
Total number of analyzed samples			
		1,390	

Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	40	28.99	2.08
Typhimurium (var. Copenhagen)	11	7.97	0.57
Heidelberg	8	5.80	0.42
Anatum	7	5.07	0.36
Infantis	7	5.07	0.36
Johannesburg	7	5.07	0.36
Uganda	7	5.07	0.36
Agona	5	3.62	0.26
Manhattan	5	3.62	0.26
Reading	5	3.62	0.26
^a Other serotypes	33	23.91	1.72
^b Unidentified isolates	3	2.17	0.16
Total serotyped isolates	138		7.18
Not typed	51		2.65
Total positive	189		9.83
Total number of analyzed samples			
		1,923	



Table 2—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	66	22.60	1.28
Typhimurium (var. Copenhagen)	47	16.10	0.91
Johannesburg	24	8.22	0.46
Infantis	20	6.85	0.39
Heidelberg	17	5.82	0.33
Anatum	10	3.42	0.19
Typhimurium	9	3.08	0.17
Minnesota	8	2.74	0.15
Brandenburg	7	2.40	0.14
Manhattan	7	2.40	0.14
Reading	7	2.40	0.14
Saint-Paul	7	2.40	0.14
Senftenberg	7	2.40	0.14
^a Other serotypes	51	17.47	0.99
^b Unidentified isolates	5	1.71	0.10
Total serotyped isolates	292		5.65
Not typed	31		0.60
Total positive	323		6.25
Total number of analyzed samples			
		5,170	

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	101	33.01	1.25
Infantis	26	8.50	0.32
Anatum	22	7.19	0.27
Typhimurium (var. Copenhagen)	21	6.86	0.26
Saint-Paul	14	4.58	0.17
Heidelberg	13	4.25	0.16
Reading	13	4.25	0.16
Johannesburg	11	3.59	0.14
Uganda	10	3.27	0.12
Typhimurium	9	2.94	0.11
^a Other serotypes	63	20.59	0.78
^b Unidentified isolates	3	0.98	0.04
Total serotyped isolates	306		3.78
Not typed	1		0.01
Total positive	307		3.79
Total number of analyzed samples			
		8,090	



Table 2—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	72	30.38	0.96
Typhimurium (var. Copenhagen)	31	13.08	0.41
Infantis	14	5.91	0.19
Saint-Paul	14	5.91	0.19
Anatum	13	5.49	0.17
Reading	8	3.38	0.11
Heidelberg	7	2.95	0.09
Johannesburg	7	2.95	0.09
Typhimurium	7	2.95	0.09
Uganda	7	2.95	0.09
^a Other serotypes	57	24.05	0.76
^b Unidentified isolates	0		
Total serotyped isolates	237		3.17
Not typed	0		
Total positive	237		3.17
Total number of analyzed samples			
		7,479	

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	26	17.22	0.44
Typhimurium (var. Copenhagen)	16	10.60	0.27
Infantis	11	7.28	0.19
Heidelberg	10	6.62	0.17
Saint-Paul	8	5.30	0.14
Anatum	8	5.30	0.14
Johannesburg	7	4.64	0.12
Typhimurium	6	3.97	0.10
Reading	5	3.31	0.08
Uganda	4	2.65	0.07
Adelaide	4	2.65	0.07
Brandenburg	4	2.65	0.07
^a Other serotypes	38	25.17	0.64
^b Unidentified isolates	4	2.65	0.07
Total serotyped isolates	151		2.55
Not typed	0		
Total positive	151		2.55
Total number of analyzed samples			
		5,924	



Table 2—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	70	28.34	0.89
Typhimurium (var. Copenhagen)	42	17.00	0.53
Anatum	27	10.93	0.34
Infantis	19	7.69	0.24
Adelaide	10	4.05	0.13
Johannesburg	9	3.64	0.11
Reading	8	3.24	0.10
Mbandaka	6	2.43	0.08
Muenchen	5	2.02	0.06
Agona	4	1.62	0.05
Brandenburg	4	1.62	0.05
Choleraesuis (var. Kunzendorf)	4	1.62	0.05
Hadar	4	1.62	0.05
Heidelberg	4	1.62	0.05
Typhimurium	4	1.62	0.05
^a Other serotypes	24	9.72	0.31
^b Unidentified isolates	3	1.21	0.04
Total serotyped isolates	247		3.14
Not typed	0		
Total positive	247		3.14
Total number of analyzed samples			
		7,860	

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	73	29.80	1.10
Typhimurium (var. Copenhagen)	29	11.84	0.44
Infantis	22	8.98	0.33
Saint-Paul	11	4.49	0.17
Anatum	11	4.49	0.17
Reading	10	4.08	0.15
Johannesburg	9	3.67	0.14
London	9	3.67	0.14
Adelaide	8	3.27	0.12
Heidelberg	6	2.45	0.09
^a Other serotypes	56	22.86	0.84
^b Unidentified isolates	1	0.41	0.02
Total serotyped isolates	245		3.69
Not typed	1		0.02
Total positive	246		3.70
Total number of analyzed samples			
		6,648	



Table 2—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	73	29.80	1.10
^c Typhimurium	33	13.47	0.50
Infantis	22	8.98	0.33
^c Anatum	13	5.31	0.20
Saint-Paul	11	4.49	0.17
Reading	10	4.08	0.15
Johannesburg	9	3.67	0.14
London	9	3.67	0.14
Adelaide	8	3.27	0.12
Heidelberg	6	2.45	0.09
^a Other serotypes	50	20.41	0.75
^b Unidentified isolates	1	0.41	0.02
Total serotyped isolates	245		3.69
Not typed	1		0.02
Total positive	246		3.70
Total number of analyzed samples			
		6,648	

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	54	18.49	0.75
Anatum	31	10.62	0.43
Johannesburg	28	9.59	0.39
Anatum var. 15+	26	8.90	0.36
Typhimurium (var. Copenhagen)	20	6.85	0.28
Infantis	16	5.48	0.22
Saint-Paul	16	5.48	0.22
Heidelberg	13	4.45	0.18
Agona	10	3.42	0.14
Hadar	10	3.42	0.14
^a Other serotypes	67	22.95	0.93
^b Unidentified	1	0.34	0.01
Total serotyped isolates	292		4.03
Not typed	0		
Total positive	292		4.03
Total number of analyzed samples			
		7,242	



Table 2 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006 (Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	54	18.49	0.75
^c Anatum	63	21.58	0.87
Johannesburg	28	9.59	0.39
^c Typhimurium	24	8.22	0.33
Infantis	16	5.48	0.22
Saint-Paul	16	5.48	0.22
Heidelberg	13	4.45	0.18
Agona	10	3.42	0.14
Hadar	10	3.42	0.14
Manhattan	7	2.40	0.10
^a Other serotypes	50	17.12	0.69
^b Unidentified	1	0.34	0.01
Total serotyped isolates	292		4.03
Not typed	0		
Total positive	292		4.03
Total number of analyzed samples			
		7,242	



Table 2 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	27	13.30	0.37
Typhimurium (var. Copenhagen)	25	12.32	0.34
Johannesburg	20	9.85	0.27
Infantis	17	8.37	0.23
Typhimurium	17	8.37	0.23
Saint-Paul	13	6.40	0.18
Adelaide	10	4.93	0.14
London	10	4.93	0.14
Anatum	9	4.43	0.12
Agona	8	3.94	0.11
Hadar	8	3.94	0.11
^a Other serotypes	36	17.73	0.49
^b Unidentified	3	1.48	0.04
Total serotyped isolates	203		2.78
Not typed	0		
Total positive	203		2.78
Total number of analyzed samples			
		7308	



Table 2 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Market Hogs
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007(Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
^c Typhimurium	42	20.69	0.57
Derby	27	13.30	0.37
Johannesburg	20	9.85	0.27
Infantis	17	8.37	0.23
^c Anatum	13	6.40	0.18
Saint-Paul	13	6.40	0.18
Adelaide	10	4.93	0.14
London	10	4.93	0.14
Agona	8	3.94	0.11
Hadar	8	3.94	0.11
^a Other serotypes	32	15.76	0.44
^b Unidentified	3	1.48	0.04
Total serotyped isolates	203		2.78
Not typed	0		
Total positive	203		2.78
Total number of analyzed samples		7308	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the "other serotypes" category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe "unidentified" designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cTyphimurium includes Typhimurium var. Copenhagen and Anatum includes Anatum var. 15+ (formerly Newington) and Anatum var. 15+,34+.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 3
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	1	50.00	0.56
Muenchen	1	50.00	0.56
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	2		1.12
Not typed	0		
Total positive	2		1.12
Total number of analyzed samples	179		

Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	4	14.29	0.26
Muenster	4	14.29	0.26
Montevideo	3	10.71	0.20
Typhimurium	3	10.71	0.20
Typhimurium (var. Copenhagen)	2	7.14	0.13
Anatum	1	3.57	0.07
Berta	1	3.57	0.07
Derby	1	3.57	0.07
Give	1	3.57	0.07
Litchfield	1	3.57	0.07
London	1	3.57	0.07
Mbandaka	1	3.57	0.07
Meleagridis	1	3.57	0.07
Newport	1	3.57	0.07
^a Other serotypes	0		
^b Unidentified isolates	3	10.71	0.20
Total serotyped isolates	28		1.84
Not typed	5		0.33
Total positive	33		2.17
Total number of analyzed samples	1,521		



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Newport	6	15.00	0.30
Muenster	5	12.50	0.25
Montevideo	4	10.00	0.20
Typhimurium	4	10.00	0.20
Kentucky	3	7.50	0.15
Meleagridis	3	7.50	0.15
Typhimurium (var. Copenhagen)	3	7.50	0.15
Albany	1	2.50	0.05
Cerro	1	2.50	0.05
Derby	1	2.50	0.05
Dublin	1	2.50	0.05
Fresno	1	2.50	0.05
Infantis	1	2.50	0.05
London	1	2.50	0.05
Mbandaka	1	2.50	0.05
Muenchen	1	2.50	0.05
Reading	1	2.50	0.05
Schwarzengrund	1	2.50	0.05
^a Other serotypes	0		
^b Unidentified isolates	1	2.50	0.05
Total serotyped isolates	40		2.01
Not typed	3		0.15
Total positive	43		2.16
Total number of analyzed samples		1,995	



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	7	13.46	0.32
Anatum	5	9.62	0.23
Kentucky	5	9.62	0.23
Typhimurium	4	7.69	0.18
Dublin	3	5.77	0.14
Newport	3	5.77	0.14
Albany	2	3.85	0.09
Heidelberg	2	3.85	0.09
Mbandaka	2	3.85	0.09
Meleagridis	2	3.85	0.09
Newbrunswick	2	3.85	0.09
Reading	2	3.85	0.09
Typhimurium (var. Copenhagen)	2	3.85	0.09
^a Other serotypes	10	19.23	0.46
^b Unidentified isolates	1	1.92	0.05
Total serotyped isolates	52		2.39
Not typed	1		0.05
Total positive	53		2.44
Total number of analyzed samples			
		2,176	

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Newport	18	24.66	0.41
Muenster	8	10.96	0.18
Agona	5	6.85	0.11
Kentucky	5	6.85	0.11
Typhimurium	5	6.85	0.11
Infantis	4	5.48	0.09
Montevideo	4	5.48	0.09
Derby	3	4.11	0.07
Mbandaka	3	4.11	0.07
Reading	3	4.11	0.07
^a Other serotypes	14	19.18	0.32
^b Unidentified isolates	1	1.37	0.02
Total serotyped isolates	73		1.65
Not typed	0		
Total positive	73		1.65
Total number of analyzed samples			
		4,414	



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Muenster	7	18.42	0.27
Newport	5	13.16	0.19
Typhimurium (var. Copenhagen)	5	13.16	0.19
Typhimurium	3	7.89	0.12
Cerro	3	7.89	0.12
Agona	2	5.26	0.08
Derby	2	5.26	0.08
Give	2	5.26	0.08
Meleagridis	2	5.26	0.08
Anatum	1	2.63	0.04
Cubana	1	2.63	0.04
Havana	1	2.63	0.04
Infantis	1	2.63	0.04
Montevideo	1	2.63	0.04
Newbrunswick	1	2.63	0.04
Soerenga	1	2.63	0.04
^a Other serotypes	6	15.79	0.23
^b Unidentified isolates	0		
Total serotyped isolates	38		1.46
Not typed	0		
Total positive	38		1.46
Total number of analyzed samples		2,599	



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Cerro	2	8.33	0.06
Derby	2	8.33	0.06
Dublin	2	8.33	0.06
Muenster	2	8.33	0.06
Newport	2	8.33	0.06
Typhimurium	2	8.33	0.06
Agona	1	4.17	0.03
Anatum	1	4.17	0.03
Brandenburg	1	4.17	0.03
Infantis	1	4.17	0.03
Johannesburg	1	4.17	0.03
Livingston	1	4.17	0.03
London	1	4.17	0.03
Meleagridis	1	4.17	0.03
Montevideo	1	4.17	0.03
Muenchen	1	4.17	0.03
Typhimurium (var. Copenhagen)	1	4.17	0.03
^a Other serotypes	0		
^b Unidentified isolates	1	4.17	0.03
Total serotyped isolates	24		0.76
Not typed	0		
Total positive	24		0.76
Total number of analyzed samples	3,175		



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	3	11.54	0.15
Agona	2	7.69	0.10
Anatum	2	7.69	0.10
Cerro	2	7.69	0.10
Infantis	2	7.69	0.10
Kentucky	2	7.69	0.10
Muenster	2	7.69	0.10
Typhimurium (var. Copenhagen)	2	7.69	0.10
Bareilly	1	3.85	0.05
Bovismorbificans	1	3.85	0.05
Derby	1	3.85	0.05
Dublin	1	3.85	0.05
Hadar	1	3.85	0.05
Meleagridis	1	3.85	0.05
Newport	1	3.85	0.05
Panama	1	3.85	0.05
Typhimurium	1	3.85	0.05
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	26		1.33
Not typed	0		
Total positive	26		1.33
Total number of analyzed samples		1,949	



Table 3—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	3	11.54	0.15
^c Typhimurium	3	11.54	0.15
Agona	2	7.69	0.10
Anatum	2	7.69	0.10
Cerro	2	7.69	0.10
Infantis	2	7.69	0.10
Kentucky	2	7.69	0.10
Muenster	2	7.69	0.10
Bareilly	1	3.85	0.05
Bovismorbificans	1	3.85	0.05
Derby	1	3.85	0.05
Dublin	1	3.85	0.05
Hadar	1	3.85	0.05
Meleagridis	1	3.85	0.05
Newport	1	3.85	0.05
Panama	1	3.85	0.05
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	26		1.33
Not typed	0		
Total positive	26		1.33
Total number of analyzed samples			
		1,949	



Table 3 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	4	21.05	0.18
Montevideo	3	15.79	0.13
Agona	2	10.53	0.09
Muenster	2	10.53	0.09
Cerro	1	5.26	0.04
Dublin	1	5.26	0.04
Enteritidis	1	5.26	0.04
Heidelberg	1	5.26	0.04
Mbandaka	1	5.26	0.04
Meleagridis	1	5.26	0.04
Muenchen	1	5.26	0.04
Newport	1	5.26	0.04
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	19		0.85
Not typed	0		
Total positive	19		0.85
Total number of analyzed samples			
		2,246	



Table 3 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Anatum	7	16.67	0.18
Newport	7	16.67	0.18
Cerro	5	11.90	0.13
Montevideo	4	9.52	0.10
Muenster	4	9.52	0.10
Infantis	2	4.76	0.05
^c 3.10:e,h:-	1	2.38	0.03
^c 6,7:z10:-	1	2.38	0.03
Enteritidis	1	2.38	0.03
Gaminara	1	2.38	0.03
Kentucky	1	2.38	0.03
Mbandaka	1	2.38	0.03
Meleagridis	1	2.38	0.03
Miami	1	2.38	0.03
Muenchen	1	2.38	0.03
Saint-Paul	1	2.38	0.03
Typhimurium (var. Copenhagen)	1	2.38	0.03
Typhimurium	1	2.38	0.03
^a Other serotypes	0	2.38	0.03
^b Unidentified isolates	1	2.38	0.03
Total serotyped isolates	42		1.07
Not typed	0		
Total positive	42		1.07
Total number of analyzed samples		3918	



Table 3 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Cows/Bulls
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007(Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Anatum	7	16.67	0.18
Newport	7	16.67	0.18
Cerro	5	11.90	0.13
Montevideo	4	9.52	0.10
Muenster	4	9.52	0.10
Infantis	2	4.76	0.05
^d Typhimurium	2	4.76	0.05
^c 3.10:e,h:-	1	2.38	0.03
^c 6,7:z10:-	1	2.38	0.03
Enteritidis	1	2.38	0.03
Gaminara	1	2.38	0.03
Kentucky	1	2.38	0.03
Mbandaka	1	2.38	0.03
Meleagridis	1	2.38	0.03
Miami	1	2.38	0.03
Muenchen	1	2.38	0.03
Saint-Paul	1	2.38	0.03
^a Other serotypes	0	2.38	0.03
^b Unidentified isolates	1	2.38	0.03
Total serotyped isolates	42		1.07
Not typed	0		
Total positive	42		1.07
Total number of analyzed samples			
		3918	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cPrior to 2004, isolates fitting the designation were included in the “unidentified isolates” category.

^dTyphimurium includes Typhimurium var. Copenhagen.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 4
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Total positive	0		
Total number of analyzed samples	214		

Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	1	50.00	0.13
Panama	1	50.00	0.13
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	2		0.26
Not typed	0		
Total positive	2		0.26
Total number of analyzed samples	782		

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	2	50.00	0.18
Minnesota	1	25.00	0.09
Typhimurium (var. Copenhagen)	1	25.00	0.09
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	4		0.37
Not typed	0		
Total positive	4		0.37
Total number of analyzed samples	1,092		



Table 4—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	4	36.36	0.24
Dublin	2	18.18	0.12
Cerro	1	9.09	0.06
Heidelberg	1	9.09	0.06
Kentucky	1	9.09	0.06
Montevideo	1	9.09	0.06
Saint-Paul	1	9.09	0.06
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	11		0.65
Not typed	0		
Total positive	11		0.65
Total number of analyzed samples			
		1,695	

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Reading	3	21.43	0.07
Agona	2	14.29	0.04
Kentucky	2	14.29	0.04
Braenderup	1	7.14	0.02
Derby	1	7.14	0.02
Heidelberg	1	7.14	0.02
Montevideo	1	7.14	0.02
Muenster	1	7.14	0.02
Sandiego	1	7.14	0.02
^a Other serotypes	0		
^b Unidentified isolates	1	7.14	0.02
Total serotyped isolates	14		0.31
Not typed	0		
Total positive	14		0.31
Total number of analyzed samples			
		4,572	



Table 4—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	3	15.79	0.07
Kentucky	2	10.53	0.04
Montevideo	2	10.53	0.04
Anatum	2	10.53	0.04
Oranienburg	2	10.53	0.04
Heidelberg	1	5.26	0.02
Bovismorbificans	1	5.26	0.02
Dublin	1	5.26	0.02
Mbandaka	1	5.26	0.02
Muenchen	1	5.26	0.02
Newport	1	5.26	0.02
Ohio	1	5.26	0.02
Uganda	1	5.26	0.02
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	19		0.42
Not typed	0		
Total positive	19		0.42
Total number of analyzed samples		4,480	



Table 4—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Derby	4	33.33	0.09
^c l 6,8:-:1,2	1	8.33	0.02
Anatum	1	8.33	0.02
Dublin	1	8.33	0.02
Indiana	1	8.33	0.02
Infantis	1	8.33	0.02
Newport	1	8.33	0.02
Senftenberg	1	8.33	0.02
Typhimurium	1	8.33	0.02
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	12		0.28
Not typed	0		
Total positive	12		0.28
Total number of analyzed samples			
		4,227	

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Dublin	2	16.67	0.10
Muenchen	2	16.67	0.10
Paratyphi B var. L-tartrate+	2	16.67	0.10
Poona	2	16.67	0.10
Gaminara	1	8.33	0.05
Havana	1	8.33	0.05
Muenster	1	8.33	0.05
Newport	1	8.33	0.05
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	12		0.57
Not typed	0		
Total positive	12		0.57
Total number of analyzed samples			
		2,090	



Table 4 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Newport	2	20.00	0.05
Adelaide	1	10.00	0.03
Anatum var. 15+,34+	1	10.00	0.03
Bere	1	10.00	0.03
Montevideo	1	10.00	0.03
Muenster	1	10.00	0.03
Reading	1	10.00	0.03
Saint-Paul	1	10.00	0.03
Typhimurium	1	10.00	0.03
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	10		0.27
Not typed	0		
Total positive	10		0.27
Total number of analyzed samples			
		3,674	



Table 4 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Steers/Heifers
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Dublin	2	22.22	0.05
Anatum	1	11.11	0.02
Give var. 15+	1	11.11	0.02
Infantis	1	11.11	0.02
Kentucky	1	11.11	0.02
Montevideo	1	11.11	0.02
Newport	1	11.11	0.02
^a Other serotypes	0	11.11	0.02
^b Unidentified isolates	1	11.11	0.02
Total serotyped isolates	9		0.20
Not typed	0		
Total positive	9		0.20
Total number of analyzed samples		4406	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cPrior to 2004, isolates fitting the designation were included in the “unidentified isolates” category.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 5
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Anatum	13	18.06	1.00
Montevideo	9	12.50	0.69
Meleagridis	7	9.72	0.54
Muenster	7	9.72	0.54
Hadar	4	5.56	0.31
Typhimurium (var. Copenhagen)	4	5.56	0.31
Infantis	3	4.17	0.23
Kentucky	3	4.17	0.23
Newport	3	4.17	0.23
Reading	3	4.17	0.23
^a Other serotypes	15	20.83	1.16
^b Unidentified isolates	1	1.39	0.08
Total serotyped isolates	72		5.56
Not typed	11		0.85
Total positive	83		6.40
Total number of analyzed samples			
		1,296	

Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	148	22.77	0.90
Anatum	70	10.77	0.43
Muenster	46	7.08	0.28
Typhimurium	36	5.54	0.22
Cerro	32	4.92	0.20
Kentucky	31	4.77	0.19
Mbandaka	28	4.31	0.17
Typhimurium (var. Copenhagen)	28	4.31	0.17
Meleagridis	23	3.54	0.14
Newport	21	3.23	0.13
^a Other serotypes	180	27.69	1.10
^b Unidentified isolates	7	1.08	0.04
Total serotyped isolates	650		3.97
Not typed	60		0.37
Total positive	710		4.34
Total number of analyzed samples			
		16,375	



Table 5—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	131	12.72	0.40
Senftenberg	102	9.90	0.31
Newport	85	8.25	0.26
Typhimurium (var. Copenhagen)	80	7.77	0.24
Anatum	70	6.80	0.21
Typhimurium	65	6.31	0.20
Cerro	52	5.05	0.16
Muenster	46	4.47	0.14
Mbandaka	45	4.37	0.14
Kentucky	44	4.27	0.13
^a Other serotypes	287	27.86	0.87
^b Unidentified isolates	23	2.23	0.07
Total serotyped isolates	1030		3.14
Not typed	50		0.15
Total positive	1080		3.29
Total number of analyzed samples			
		32,844	

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	94	14.05	0.39
Newport	73	10.91	0.30
Anatum	62	9.27	0.26
Muenster	52	7.77	0.21
Kentucky	46	6.88	0.19
Typhimurium	37	5.53	0.15
Mbandaka	36	5.38	0.15
Cerro	26	3.89	0.11
Typhimurium (var. Copenhagen)	25	3.74	0.10
Reading	17	2.54	0.07
^a Other serotypes	185	27.65	0.76
^b Unidentified isolates	16	2.39	0.07
Total serotyped isolates	669		2.76
Not typed	17		0.07
Total positive	686		2.83
Total number of analyzed samples			
		24,243	



Table 5—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	89	11.32	0.29
Newport	84	10.69	0.27
Anatum	77	9.80	0.25
Muenster	65	8.27	0.21
Agona	52	6.62	0.17
Typhimurium (var. Copenhagen)	51	6.49	0.16
Kentucky	38	4.83	0.12
Mbandaka	36	4.58	0.12
Typhimurium	32	4.07	0.10
Cerro	30	3.82	0.10
^a Other serotypes	221	28.12	0.71
^b Unidentified isolates	11	1.40	0.04
Total serotyped isolates	786		2.54
Not typed	4		0.01
Total positive	790		2.55
Total number of analyzed samples			
		30,933	

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Newport	54	11.02	0.19
Montevideo	49	10.00	0.17
Anatum	45	9.18	0.15
Agona	29	5.92	0.10
Typhimurium (var. Copenhagen)	27	5.51	0.09
Typhimurium	27	5.51	0.09
Dublin	26	5.31	0.09
Muenster	24	4.90	0.08
Kentucky	23	4.69	0.08
Mbandaka	22	4.49	0.08
^a Other serotypes	154	31.43	0.53
^b Unidentified isolates	10	2.04	0.03
Total serotyped isolates	490		1.68
Not typed	0		
Total positive	490		1.68
Total number of analyzed samples			
		29,097	



Table 5—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	71	14.06	0.23
Anatum	55	10.89	0.18
Muenster	47	9.31	0.15
Newport	38	7.52	0.12
Agona	36	7.13	0.12
Dublin	25	4.95	0.08
Kentucky	21	4.16	0.07
Typhimurium	21	4.16	0.07
Typhimurium (var. Copenhagen)	18	3.56	0.06
Mbandaka	17	3.37	0.05
^a Other serotypes	154	30.50	0.50
^b Unidentified isolates	2	0.40	0.01
Total serotyped isolates	505		1.63
Not typed	0		
Total positive	505		1.63
Total number of analyzed samples			
		30,984	

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	30	13.89	0.15
Anatum	18	8.33	0.09
Muenster	17	7.87	0.09
Newport	14	6.48	0.07
Mbandaka	12	5.56	0.06
Typhimurium (var. Copenhagen)	11	5.09	0.06
Dublin	9	4.17	0.05
Reading	9	4.17	0.05
Typhimurium	9	4.17	0.05
Cerro	8	3.70	0.04
^a Other serotypes	76	35.19	0.39
^b Unidentified isolates	3	1.39	0.02
Total serotyped isolates	216		1.12
Not typed	1		0.01
Total positive	217		1.12
Total number of analyzed samples			
		19,365	



Table 5—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	30	13.89	0.15
^c Typhimurium	20	9.26	0.10
^c Anatum	20	9.26	0.10
Muenster	17	7.87	0.09
Newport	14	6.48	0.07
Mbandaka	12	5.56	0.06
Dublin	9	4.17	0.05
Reading	9	4.17	0.05
Cerro	8	3.70	0.04
Agona	7	3.24	0.04
Give	7	3.24	0.04
Meleagridis	7	3.24	0.04
^a Other serotypes	53	24.54	0.27
^b Unidentified isolates	3	1.39	0.02
Total serotyped isolates	216		1.12
Not typed	1		0.01
Total positive	217		1.12
Total number of analyzed samples			
		19,365	



Table 5 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	59	16.86	0.33
Muenster	34	9.71	0.19
Anatum	24	6.86	0.13
Newport	24	6.86	0.13
Cerro	22	6.29	0.12
Dublin	18	5.14	0.10
Reading	18	5.14	0.10
Mbandaka	14	4.00	0.08
Typhimurium	14	4.00	0.08
Infantis	13	3.71	0.07
^a Other serotypes	109	31.14	0.61
^b Unidentified	1	0.29	0.01
Total serotyped isolates	350		1.96
Not typed	0		
Total positive	350		1.96
Total number of analyzed samples			
		17,849	



Table 5 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006 (Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	59	16.86	0.33
Muenster	34	9.71	0.19
^c Anatum	27	7.71	0.15
Newport	24	6.86	0.13
Cerro	22	6.29	0.12
^c Typhimurium	21	6.00	0.12
Dublin	18	5.14	0.10
Reading	18	5.14	0.10
Mbandaka	14	4.00	0.08
Infantis	13	3.71	0.07
^a Other serotypes	99	28.29	0.55
^b Unidentified	1	0.29	0.01
Total serotyped isolates	350		1.96
Not typed	0		
Total positive	350		1.96
Total number of analyzed samples			
			17,849

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	86	23.43	0.63
Dublin	36	9.81	0.26
Muenster	28	7.63	0.20
Mbandaka	23	6.27	0.17
Newport	22	5.99	0.16
Cerro	18	4.90	0.13
Meleagridis	16	4.36	0.12
Agona	15	4.09	0.11
Anatum	14	3.81	0.10
Infantis	10	2.72	0.07
Kentucky	10	2.72	0.07
Typhimurium	10	2.72	0.07
^a Other serotypes	74	20.16	0.54
^b Unidentified	5	1.36	0.04
Total serotyped isolates	367		2.68
Not typed	0		
Total positive	367		2.68
Total number of analyzed samples			
			13695



Table 5 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Beef
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007(Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Montevideo	86	23.43	0.63
Dublin	36	9.81	0.26
Muenster	28	7.63	0.20
Mbandaka	23	6.27	0.17
Newport	22	5.99	0.16
^c Typhimurium	19	5.18	0.14
Cerro	18	4.90	0.13
Meleagridis	16	4.36	0.12
Agona	15	4.09	0.11
Anatum	14	3.81	0.10
Infantis	10	2.72	0.07
Kentucky	10	2.72	0.07
^a Other serotypes	65	17.71	0.47
^b Unidentified	5	1.36	0.04
Total serotyped isolates	367		2.68
Not typed	0		
Total positive	367		2.68
Total number of analyzed samples		13695	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the "other serotypes" category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe "unidentified" designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cTyphimurium includes Typhimurium var. Copenhagen and Anatum includes Anatum var. 15+ (formerly Newington).

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf.



Table 6
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Thompson	1	100.00	4.17
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	1		4.17
Not typed	0		
Total positive	1		4.17
Total number of analyzed samples			
		24	
Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	12	27.27	4.04
Heidelberg	7	15.91	2.36
Typhimurium (var. Copenhagen)	6	13.64	2.02
Typhimurium	5	11.36	1.68
Istanbul	2	4.55	0.67
Reading	2	4.55	0.67
Enteritidis	1	2.27	0.34
Infantis	1	2.27	0.34
Litchfield	1	2.27	0.34
Newington	1	2.27	0.34
Schwarzengrund	1	2.27	0.34
Thompson	1	2.27	0.34
^a Other serotypes	0		
^b Unidentified isolates	4	9.09	1.35
Total serotyped isolates	44		14.81
Not typed	4		1.35
Total positive	48		16.16
Total number of analyzed samples			
		297	



Table 6—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	13	26.53	3.14
Heidelberg	9	18.37	2.17
Typhimurium (var. Copenhagen)	6	12.24	1.45
Hadar	3	6.12	0.72
Typhimurium	3	6.12	0.72
Infantis	2	4.08	0.48
Newport	2	4.08	0.48
Thompson	2	4.08	0.48
Berta	1	2.04	0.24
Enteritidis	1	2.04	0.24
Reading	1	2.04	0.24
Schwarzengrund	1	2.04	0.24
^a Other serotypes	0		
^b Unidentified isolates	5	10.20	1.21
Total serotyped isolates	49		11.84
Not typed	8		1.93
Total positive	57		13.77
Total number of analyzed samples			
		414	

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	13	26.00	4.96
Schwarzengrund	10	20.00	3.82
Kentucky	9	18.00	3.44
Typhimurium	5	10.00	1.91
Hadar	2	4.00	0.76
Thompson	2	4.00	0.76
Brandenburg	1	2.00	0.38
Johannesburg	1	2.00	0.38
Ohio	1	2.00	0.38
Typhimurium (var. Copenhagen)	1	2.00	0.38
^a Other serotypes	0		
^b Unidentified isolates	5	10.00	1.91
Total serotyped isolates	50		19.08
Not typed	1		0.38
Total positive	51		19.47
Total number of analyzed samples			
		262	



Table 6—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	37	29.60	8.62
Kentucky	20	16.00	4.66
Typhimurium (var. Copenhagen)	12	9.60	2.80
Typhimurium	10	8.00	2.33
Enteritidis	6	4.80	1.40
Montevideo	6	4.80	1.40
Hadar	4	3.20	0.93
Schwarzengrund	4	3.20	0.93
Infantis	3	2.40	0.70
Thompson	3	2.40	0.70
^a Other serotypes	9	7.20	2.10
^b Unidentified isolates	11	8.80	2.56
Total serotyped isolates	125		29.14
Not typed	0		
Total positive	125		29.14
Total number of analyzed samples			
		429	

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	29	27.62	9.80
Heidelberg	27	25.71	9.12
Kentucky	21	20.00	7.09
Thompson	6	5.71	2.03
Infantis	4	3.81	1.35
Montevideo	2	1.90	0.68
Istanbul	2	1.90	0.68
Haardt	2	1.90	0.68
Oranienburg	2	1.90	0.68
Typhimurium (var. Copenhagen)	1	0.95	0.34
Typhimurium	1	0.95	0.34
Arizona	1	0.95	0.34
Bredeney	1	0.95	0.34
Mbandaka	1	0.95	0.34
Taksony	1	0.95	0.34
^a Other serotypes	0		
^b Unidentified isolates	4	3.81	1.35
Total serotyped isolates	105		35.47
Not typed	0		
Total positive	105		35.47
Total number of analyzed samples			
		296	



Table 6—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	50	50.51	12.89
Enteritidis	7	7.07	1.80
Typhimurium	7	7.07	1.80
Heidelberg	6	6.06	1.55
Montevideo	5	5.05	1.29
Schwarzengrund	5	5.05	1.29
Thompson	4	4.04	1.03
Infantis	2	2.02	0.52
^o l 4,12:i:-	1	1.01	0.26
^o l 4,5,12:i:-	1	1.01	0.26
^o l 4,5,12:r:-	1	1.01	0.26
^o l 6,7:k:-	1	1.01	0.26
Agona	1	1.01	0.26
Braenderup	1	1.01	0.26
Hadar	1	1.01	0.26
Havana	1	1.01	0.26
Mbandaka	1	1.01	0.26
Oranienburg	1	1.01	0.26
Senftenberg	1	1.01	0.26
Typhimurium (var. Copenhagen)	1	1.01	0.26
Uganda	1	1.01	0.26
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	99		25.52
Not typed	0		
Total positive	99		25.52
Total number of analyzed samples		388	



Table 6—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Enteritidis	15	31.91	10.34
Kentucky	15	31.91	10.34
Heidelberg	6	12.77	4.14
Typhimurium (var. Copenhagen)	3	6.38	2.07
^c l 4,5,12:i:-	1	2.13	0.69
Alachua	1	2.13	0.69
Hadar	1	2.13	0.69
Kiambu	1	2.13	0.69
Muenster	1	2.13	0.69
Schwarzengrund	1	2.13	0.69
Senftenberg	1	2.13	0.69
Thompson	1	2.13	0.69
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	47		32.41
Not typed	0		
Total positive	47		32.41
Total number of analyzed samples	145		



Table 6—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Enteritidis	15	31.91	10.34
Kentucky	15	31.91	10.34
Heidelberg	6	12.77	4.14
^d Typhimurium	3	6.38	2.07
^c l 4,5,12:i:-	1	2.13	0.69
Alachua	1	2.13	0.69
Hadar	1	2.13	0.69
Kiambu	1	2.13	0.69
Muenster	1	2.13	0.69
Schwarzengrund	1	2.13	0.69
Senftenberg	1	2.13	0.69
Thompson	1	2.13	0.69
^a Other serotypes	0		
^b Unidentified isolates	0		
Total serotyped isolates	47		32.41
Not typed	0		
Total positive	47		32.41
Total number of analyzed samples		145	



Table 6 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	42	42.00	18.92
Heidelberg	16	16.00	7.21
Enteritidis	16	16.00	7.21
^c 4,5,12:i:-	4	4.00	1.80
Berta	3	3.00	1.35
Infantis	3	3.00	1.35
Schwarzengrund	3	3.00	1.35
Typhimurium	2	2.00	0.90
Typhimurium (var. Copenhagen)	2	2.00	0.90
^c 8,(20):z6	1	1.00	0.45
Anatum	1	1.00	0.45
Hadar	1	1.00	0.45
Mbandaka	1	1.00	0.45
Montevideo	1	1.00	0.45
Thompson	1	1.00	0.45
^a Other serotypes	2	2.00	0.90
^b Unidentified	3	3.00	1.35
Total serotyped isolates	100		45.05
Not typed	0		
Total positive	100		45.05
Total number of analyzed samples		222	



Table 6 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Kentucky	42	42.00	18.92
Heidelberg	16	16.00	7.21
Enteritidis	16	16.00	7.21
^c 4,5,12:i:-	4	4.00	1.80
^d Typhimurium	4	4.00	1.80
Berta	3	3.00	1.35
Infantis	3	3.00	1.35
Schwarzengrund	3	3.00	1.35
^c 8,(20):z6	1	1.00	0.45
Anatum	1	1.00	0.45
Hadar	1	1.00	0.45
Mbandaka	1	1.00	0.45
Montevideo	1	1.00	0.45
Thompson	1	1.00	0.45
^a Other serotypes	2	2.00	0.90
^b Unidentified	3	3.00	1.35
Total serotyped isolates	100		45.05
Not typed	0		
Total positive	100		45.05
Total number of analyzed samples		222	



Table 6 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Enteritidis	34	25.56	6.72
Kentucky	33	24.81	6.52
Heidelberg	27	20.30	5.34
^c 4,5,12:i:-	7	5.26	1.38
Typhimurium (var. Copenhagen)	5	3.76	0.99
Infantis	3	2.26	0.59
Thompson	3	2.26	0.59
Typhimurium	3	2.26	0.59
4,12:i:-	2	1.50	0.40
Minnesota	2	1.50	0.40
Schwarzengrund	2	1.50	0.40
^a Other serotypes	10	7.52	1.98
^b Unidentified	2	1.50	0.40
Total serotyped isolates	133		26.28
Not typed	0		
Total positive	133		26.28
Total number of analyzed samples	506		



Table 6 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Chicken
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Enteritidis	34	25.56	6.72
Kentucky	33	24.81	6.52
Heidelberg	27	20.30	5.34
^d Typhimurium	8	6.02	1.58
^c 4,5,12:i:-	7	5.26	1.38
Infantis	3	2.26	0.59
Thompson	3	2.26	0.59
4,12:i:-	2	1.50	0.40
Minnesota	2	1.50	0.40
Schwarzengrund	2	1.50	0.40
^a Other serotypes	10	7.52	1.98
^b Unidentified	2	1.50	0.40
Total serotyped isolates	133		26.28
Not typed	0		
Total positive	133		26.28
Total number of analyzed samples		506	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cPrior to 2004, isolates fitting the designation were included in the “unidentified isolates” category.

^dTyphimurium includes Typhimurium var. Copenhagen.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 7
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 1998	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	36	19.15	6.09
Heidelberg	35	18.62	5.92
Senftenberg	21	11.17	3.55
Reading	17	9.04	2.88
Schwarzengrund	17	9.04	2.88
Muenster	7	3.72	1.18
Saint-Paul	7	3.72	1.18
Anatum	5	2.66	0.85
Kentucky	5	2.66	0.85
Typhimurium	5	2.66	0.85
^a Other serotypes	32	17.02	5.41
^b Unidentified isolates	1	0.53	0.17
Total serotyped isolates	188		31.81
Not typed	28		4.74
Total positive	216		36.55
Total number of analyzed samples			
		591	

Serotypes 1999	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	72	22.15	6.86
Heidelberg	61	18.77	5.81
Senftenberg	27	8.31	2.57
Reading	26	8.00	2.48
Muenster	18	5.54	1.71
Agona	16	4.92	1.52
Saint-Paul	13	4.00	1.24
Schwarzengrund	12	3.69	1.14
Typhimurium (var. Copenhagen)	12	3.69	1.14
Typhimurium	7	2.15	0.67
^a Other serotypes	54	16.62	5.14
^b Unidentified isolates	7	2.15	0.67
Total serotyped isolates	325		30.95
Not typed	7		0.67
Total positive	332		31.62
Total number of analyzed samples			
		1,050	



Table 7—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2000	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	80	21.33	5.16
Hadar	57	15.20	3.68
Agona	35	9.33	2.26
Senftenberg	31	8.27	2.00
Schwarzengrund	29	7.73	1.87
Reading	22	5.87	1.42
Saint-Paul	18	4.80	1.16
Muenster	12	3.20	0.77
Brandenburg	10	2.67	0.64
Arizona	8	2.13	0.52
Muenchen	8	2.13	0.52
^a Other serotypes	61	16.27	3.93
^b Unidentified isolates	4	1.07	0.26
Total serotyped isolates	375		24.18
Not typed	24		1.55
Total positive	399		25.73
Total number of analyzed samples			
		1,551	

Serotypes 2001	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	33	24.81	6.35
Senftenberg	18	13.53	3.46
Hadar	14	10.53	2.69
Arizona	10	7.52	1.92
Reading	10	7.52	1.92
Agona	8	6.02	1.54
Newport	7	5.26	1.35
Saint-Paul	5	3.76	0.96
Schwarzengrund	4	3.01	0.77
Derby	3	2.26	0.58
Typhimurium	3	2.26	0.58
Worthington	3	2.26	0.58
^a Other serotypes	15	11.28	2.88
^b Unidentified isolates	0		
Total serotyped isolates	133		25.58
Not typed	3		0.58
Total positive	136		26.15
Total number of analyzed samples			
		520	



Table 7—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2002	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	37	19.27	3.44
Reading	24	12.50	2.23
Hadar	23	11.98	2.14
Saint-Paul	14	7.29	1.30
Senftenberg	14	7.29	1.30
Arizona	10	5.21	0.93
Newport	10	5.21	0.93
Schwarzengrund	9	4.69	0.84
Uganda	8	4.17	0.74
Typhimurium	5	2.60	0.47
^a Other serotypes	30	15.63	2.79
^b Unidentified isolates	8	4.17	0.74
Total serotyped isolates	192		17.86
Not typed	0		
Total positive	192		17.86
Total number of analyzed samples			
		1,075	

Serotypes 2003	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	55	21.57	5.48
Hadar	44	17.25	4.38
Arizona	31	12.16	3.09
Reading	28	10.98	2.79
Saint-Paul	19	7.45	1.89
Newport	18	7.06	1.79
Senftenberg	11	4.31	1.10
Kentucky	9	3.53	0.90
Schwarzengrund	6	2.35	0.60
Typhimurium	5	1.96	0.50
^a Other serotypes	24	9.41	2.39
^b Unidentified isolates	5	1.96	0.50
Total serotyped isolates	255		25.40
Not typed	0		
Total positive	255		25.40
Total number of analyzed samples			
		1,004	



Table 7—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2004	# Isolates	% Total Serotyped	% Analyzed Samples
Heidelberg	38	18.27	3.64
Hadar	27	12.98	2.59
Reading	16	7.69	1.53
Derby	15	7.21	1.44
Saint-Paul	15	7.21	1.44
Senftenberg	10	4.81	0.96
^o IIla 18:z4,z23:-	9	4.33	0.86
Typhimurium	9	4.33	0.86
Schwarzengrund	8	3.85	0.77
Kentucky	6	2.88	0.57
Newport	6	2.88	0.57
^a Other serotypes	47	22.60	4.50
^b Unidentified isolates	2	0.96	0.19
Total serotyped isolates	208		19.92
Not typed	0		
Total positive	208		19.92
Total number of analyzed samples			
		1,044	

Serotypes 2005	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	44	20.47	4.76
Saint-Paul	27	12.56	2.92
Heidelberg	25	11.63	2.70
Reading	18	8.37	1.95
Schwarzengrund	12	5.58	1.30
^o IIla 18:z4,z23:-	11	5.12	1.19
Senftenberg	8	3.72	0.86
Agona	7	3.26	0.76
Albany	6	2.79	0.65
Kentucky	5	2.33	0.54
Muenchen	5	2.33	0.54
Newport	5	2.33	0.54
^a Other serotypes	40	18.60	4.32
^b Unidentified isolates	2	0.93	0.22
Total serotyped isolates	215		23.24
Not typed	0		
Total positive	215		23.24
Total number of analyzed samples			
		925	



Table 7—Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2005 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	44	20.47	4.76
Saint-Paul	27	12.56	2.92
Heidelberg	25	11.63	2.70
Reading	18	8.37	1.95
Schwarzengrund	12	5.58	1.30
^c IIIa 18:z4,z23:-	11	5.12	1.19
Senftenberg	8	3.72	0.86
Agona	7	3.26	0.76
Albany	6	2.79	0.65
^d Typhimurium	6	2.79	0.65
^a Other serotypes	40	18.60	4.32
^b Unidentified isolates	2	0.93	0.22
Total serotyped isolates	215		23.24
Not typed	0		
Total positive	215		23.24
Total number of analyzed samples			
		925	

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	31	34.44	6.98
Saint-Paul	8	8.89	1.80
Heidelberg	7	7.78	1.58
Agona	5	5.56	1.13
Anatum	4	4.44	0.90
Kentucky	4	4.44	0.90
Muenchen	4	4.44	0.90
Derby	3	3.33	0.68
Senftenberg	3	3.33	0.68
Worthington	3	3.33	0.68
^a Other serotypes	17	18.89	3.83
^b Unidentified	1	1.11	0.23
Total serotyped isolates	90		20.27
Not typed	0		
Total positive	90		20.27
Total number of analyzed samples			
		444	



Table 7 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006 (Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	31	34.44	6.98
Saint-Paul	8	8.89	1.80
Heidelberg	7	7.78	1.58
Agona	5	5.56	1.13
Anatum	4	4.44	0.90
Kentucky	4	4.44	0.90
Muenchen	4	4.44	0.90
Derby	3	3.33	0.68
Senftenberg	3	3.33	0.68
^d Typhimurium	3	3.33	0.68
Worthington	3	3.33	0.68
^a Other serotypes	14	15.56	3.15
^b Unidentified	1	1.11	0.23
Total serotyped isolates	90		20.27
Not typed	0		
Total positive	90		20.27
Total number of analyzed samples			
		444	



Table 7 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	62	43.36	7.56
Heidelberg	17	11.89	2.07
Saint-Paul	13	9.09	1.59
Agona	11	7.69	1.34
Newport	8	5.59	0.98
Reading	6	4.20	0.73
London	2	1.40	0.24
Minnesota	2	1.40	0.24
Muenchen	2	1.40	0.24
Schwarzengund	2	1.40	0.24
Typhimurium	2	1.40	0.24
Uganda	2	1.40	0.24
^a Other serotypes	14	9.79	1.71
^b Unidentified	0		
Total serotyped isolates	143		17.44
Not typed	0		
Total positive	143		17.44
Total number of analyzed samples		820	



Table 7 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Ground Turkey
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007(Variants Combined) ^d	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	62	43.36	7.56
Heidelberg	17	11.89	2.07
Saint-Paul	13	9.09	1.59
Agona	11	7.69	1.34
Newport	8	5.59	0.98
Reading	6	4.20	0.73
^d Anatum	2	1.40	0.24
London	2	1.40	0.24
Minnesota	2	1.40	0.24
Muenchen	2	1.40	0.24
Schwarzengund	2	1.40	0.24
Typhimurium	2	1.40	0.24
Uganda	2	1.40	0.24
^a Other serotypes	12	8.39	1.46
^b Unidentified	0		
Total serotyped isolates	143		17.44
Not typed	0		
Total positive	143		17.44
Total number of analyzed samples		820	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

^cPrior to 2004, isolates fitting the designation were included in the “unidentified isolates” category.

^d Typhimurium includes Typhimurium var. Copenhagen and Anatum includes Anatum var 15+,34+.

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phlisdata/salmtab/2005/SalmonellaTable1_2005.pdf



Table 8
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Turkeys
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	65	32.83	2.33
Heidelberg	33	16.67	1.18
Reading	13	6.57	0.47
Schwarzengrund	13	6.57	0.47
Saint-Paul	10	5.05	0.36
Agona	8	4.04	0.29
Senftenberg	8	4.04	0.29
Anatum	4	2.02	0.14
Derby	4	2.02	0.14
Muenster	4	2.02	0.14
^a Other serotypes	32	16.16	1.15
^b Unidentified	4	2.02	0.14
Total serotyped isolates	198		7.11
Not typed	0		
Total positive	198		7.11
Total number of analyzed samples			
		2,785	



Table 8 - Continued
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Turkeys
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2006(Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	65	32.83	2.33
Heidelberg	33	16.67	1.18
Reading	13	6.57	0.47
Schwarzengrund	13	6.57	0.47
Saint-Paul	10	5.05	0.36
Agona	8	4.04	0.29
Senftenberg	8	4.04	0.29
^c Anatum	5	2.53	0.18
Derby	4	2.02	0.14
Muenster	4	2.02	0.14
^a Other serotypes	31	15.66	1.11
^b Unidentified	4	2.02	0.14
Total serotyped isolates	198		7.11
Not typed	0		
Total positive	198		7.11
Total number of analyzed samples			
		2,785	



Table 8
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Turkeys
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	54	50.00	3.10
Senftenberg	9	8.33	0.52
Saint-Paul	8	7.41	0.46
Heidelberg	6	5.56	0.34
Newport	5	4.63	0.29
Agona	3	2.78	0.17
Berta	3	2.78	0.17
Montevideo	3	2.78	0.17
Mbandaka	2	1.85	0.11
Muenchen	2	1.85	0.11
Reading	2	1.85	0.11
Schwarzengrund	2	1.85	0.11
^a Other serotypes	8	7.41	0.46
^b Unidentified	1	0.93	0.06
Total serotyped isolates	108		6.19
Not typed	0		
Total positive	108		6.19
Total number of analyzed samples			
		1744	



Table 8
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Calendar Year.
Turkeys
(1998-2005 'A' Set Samples; 2006-2007 All Samples)

Serotypes 2007(Variants Combined) ^c	# Isolates	% Total Serotyped	% Analyzed Samples
Hadar	54	50.00	3.10
Senftenberg	9	8.33	0.52
Saint-Paul	8	7.41	0.46
Heidelberg	6	5.56	0.34
Newport	5	4.63	0.29
Agona	3	2.78	0.17
Berta	3	2.78	0.17
Montevideo	3	2.78	0.17
Mbandaka	2	1.85	0.11
Muenchen	2	1.85	0.11
Reading	2	1.85	0.11
Schwarzengrund	2	1.85	0.11
^c Typhimurium	2	1.85	0.11
^a Other serotypes	6	5.56	0.34
^b Unidentified	1	0.93	0.06
Total serotyped isolates	108		6.19
Not typed	0		
Total positive	108		6.19
Total number of analyzed samples			
		1744	

^a The ten most commonly isolated serotypes for a specified product class during a listed year are identified by name while less commonly identified serotypes are included in the “other serotypes” category. When there is more than one serotype in tenth place, all serotypes in tenth place are listed.

^bThe “unidentified” designation includes isolates for which a single specific serotype could not be determined including those that were solely named through antigenic formulas that would classify them as monophasic.

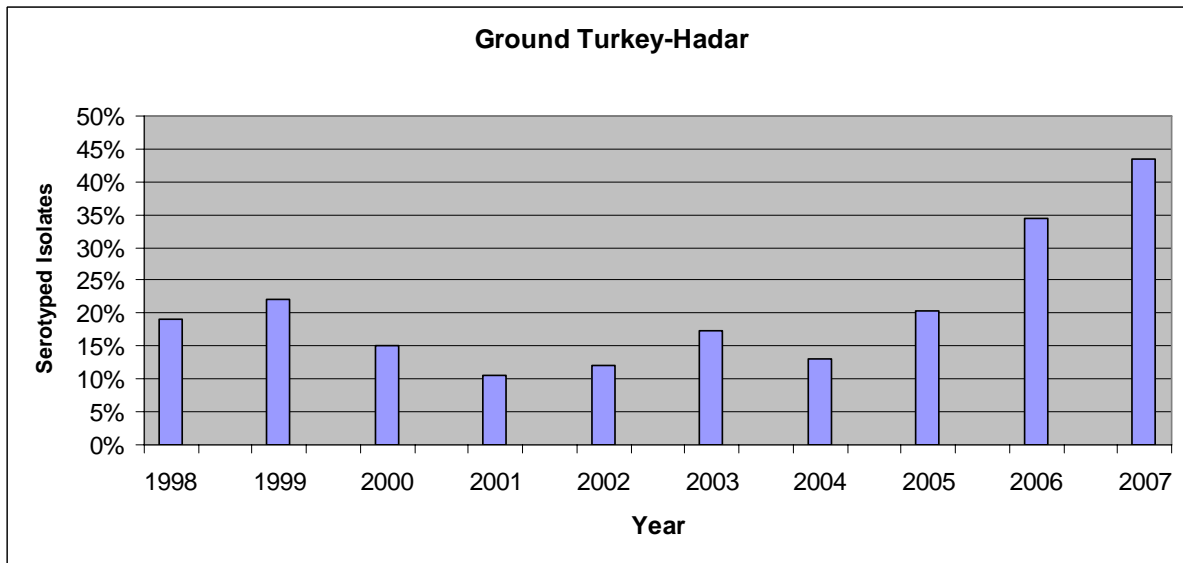
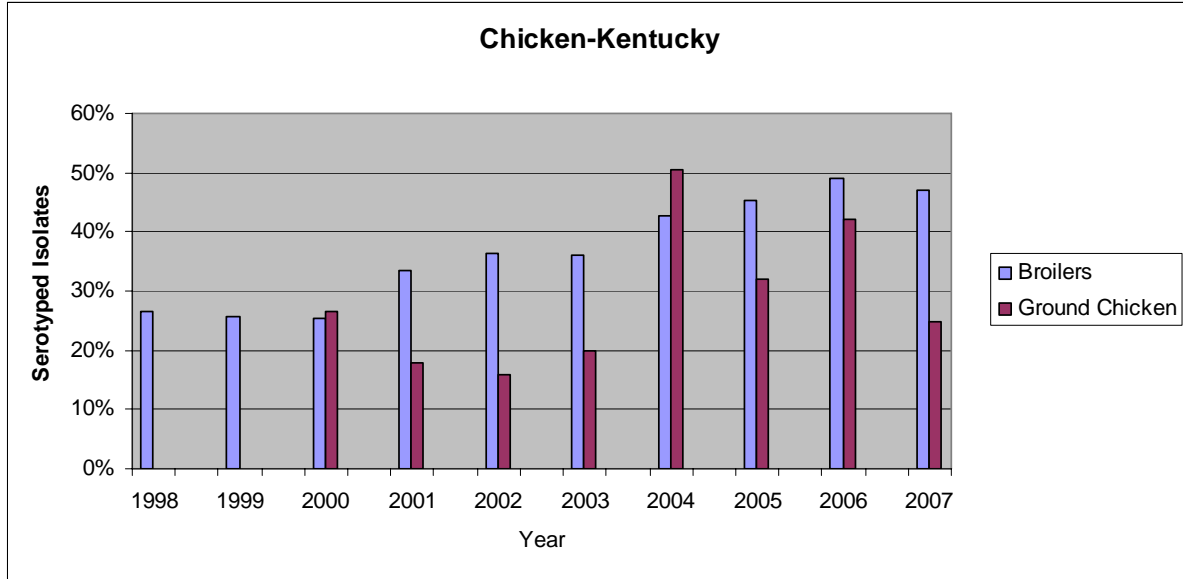
^c Typhimurium includes Typhimurium var. Copenhagen and Anatum includes Anatum var. 15+ (formerly Newington).

Note: For information on the most commonly identified serotypes causing human infection in the United States see

http://www.cdc.gov/ncidod/dbmd/phisdata/salmtab/2005/SalmonellaTable1_2005.pdf



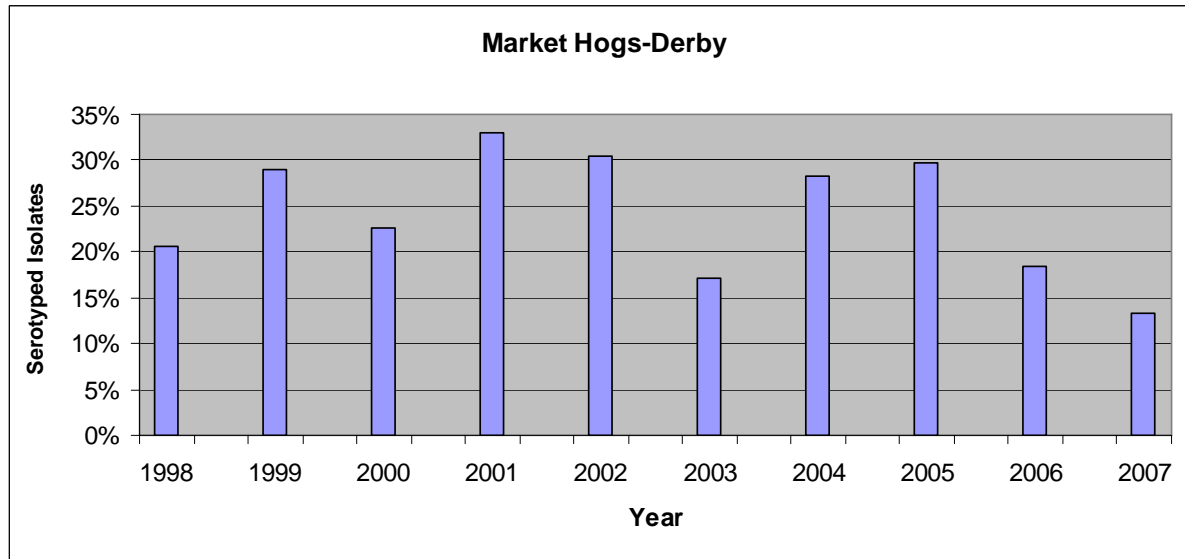
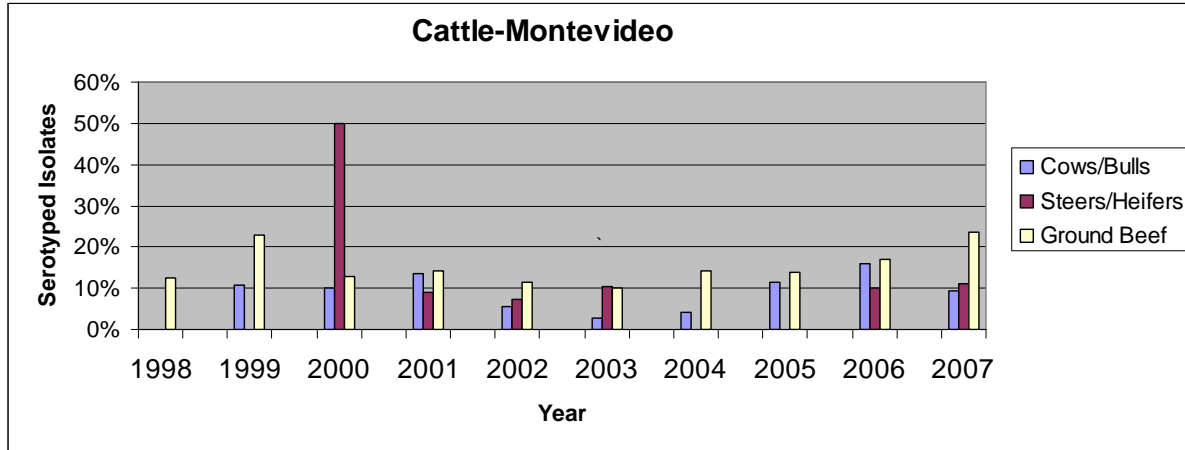
Figure 1
Top Serotypes by Species – PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph



Figure 1 - Continued
Top Serotypes by Species – PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 2
Typhimurium – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

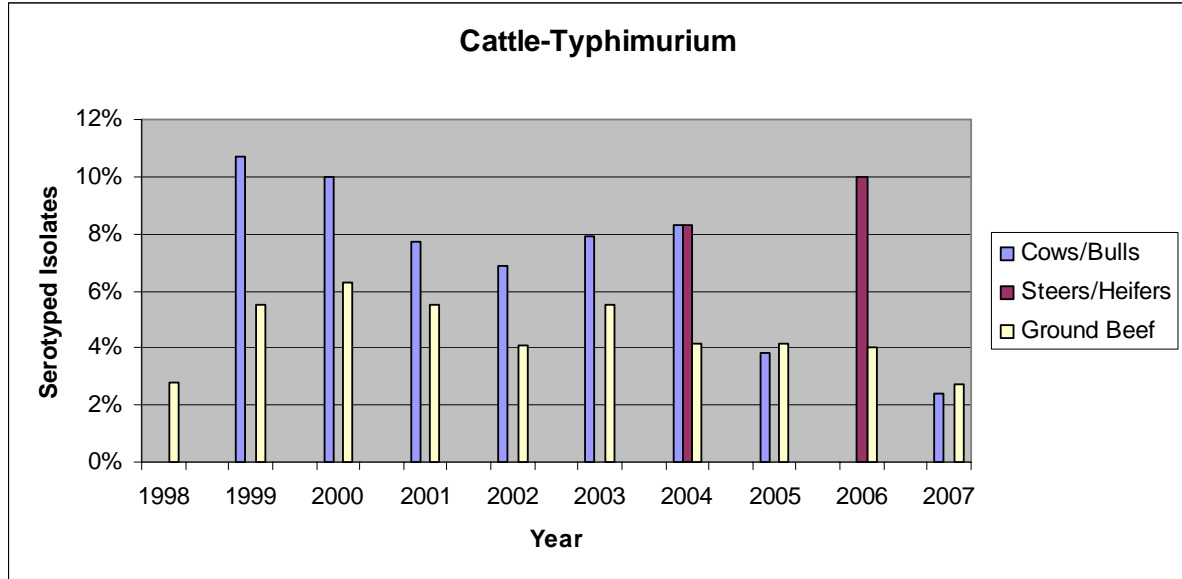
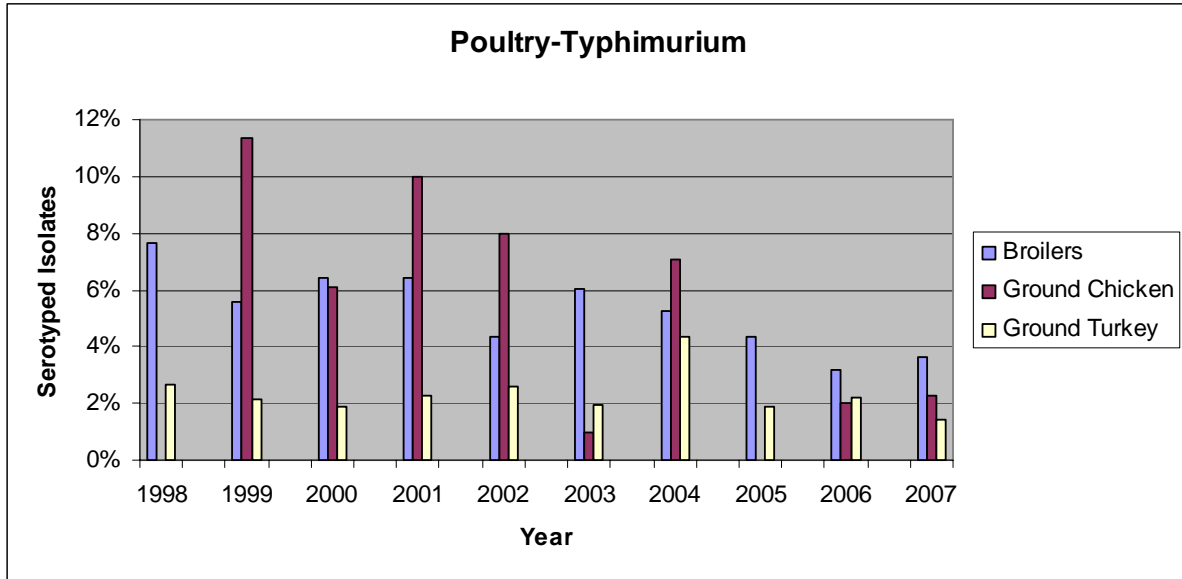
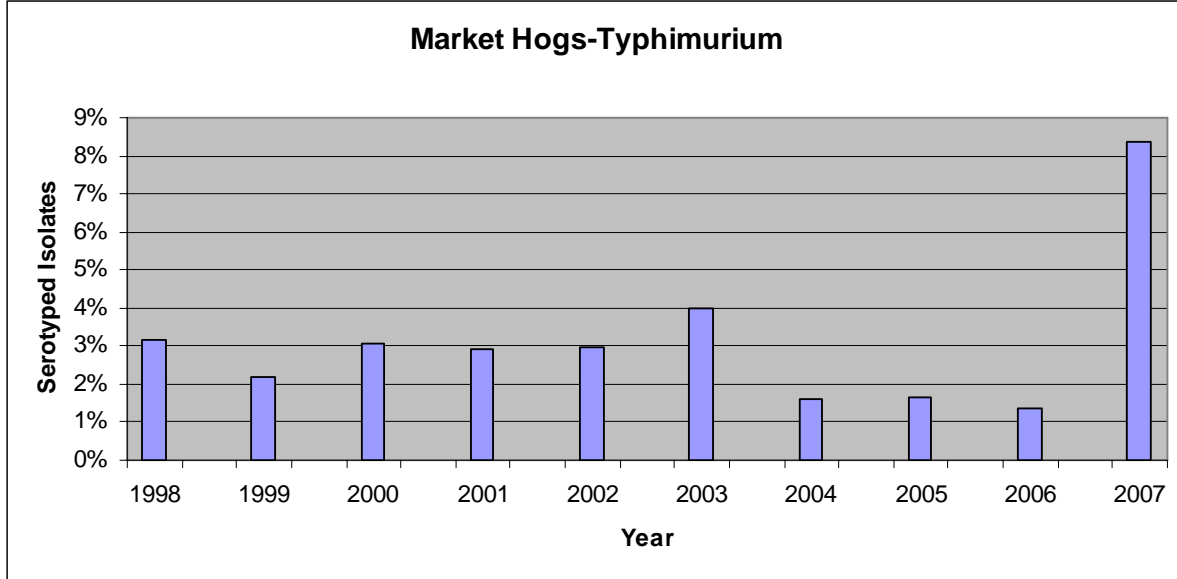




Figure 2 - Continued
Typhimurium – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 3
Typhimurium var. Copenhagen – USDA, FSIS, PR/HACCP Verification Sampling by
Calendar Year* (1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

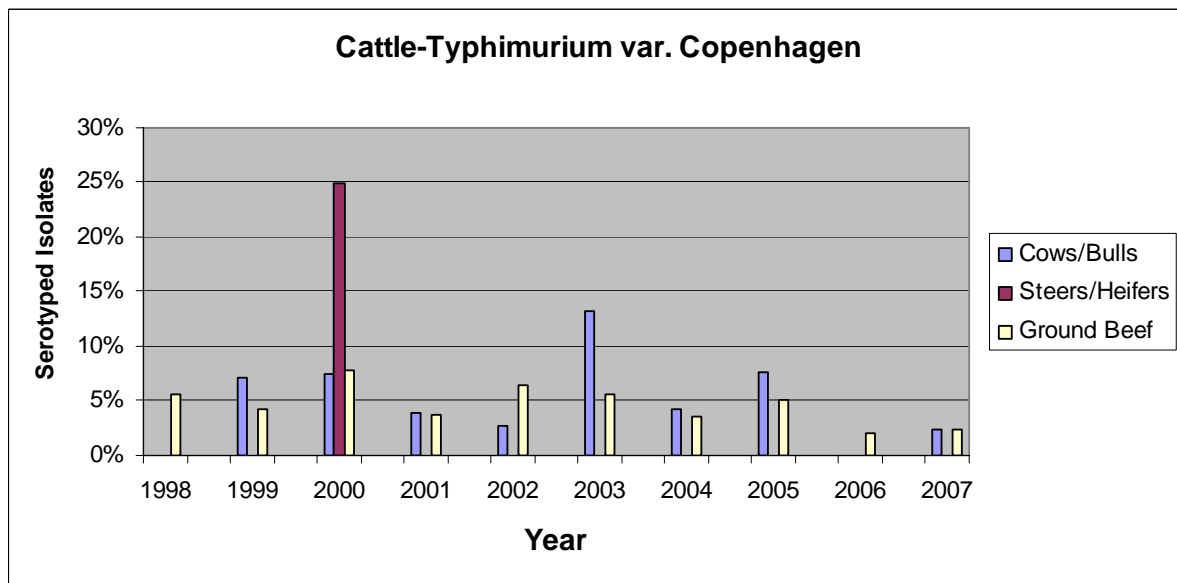
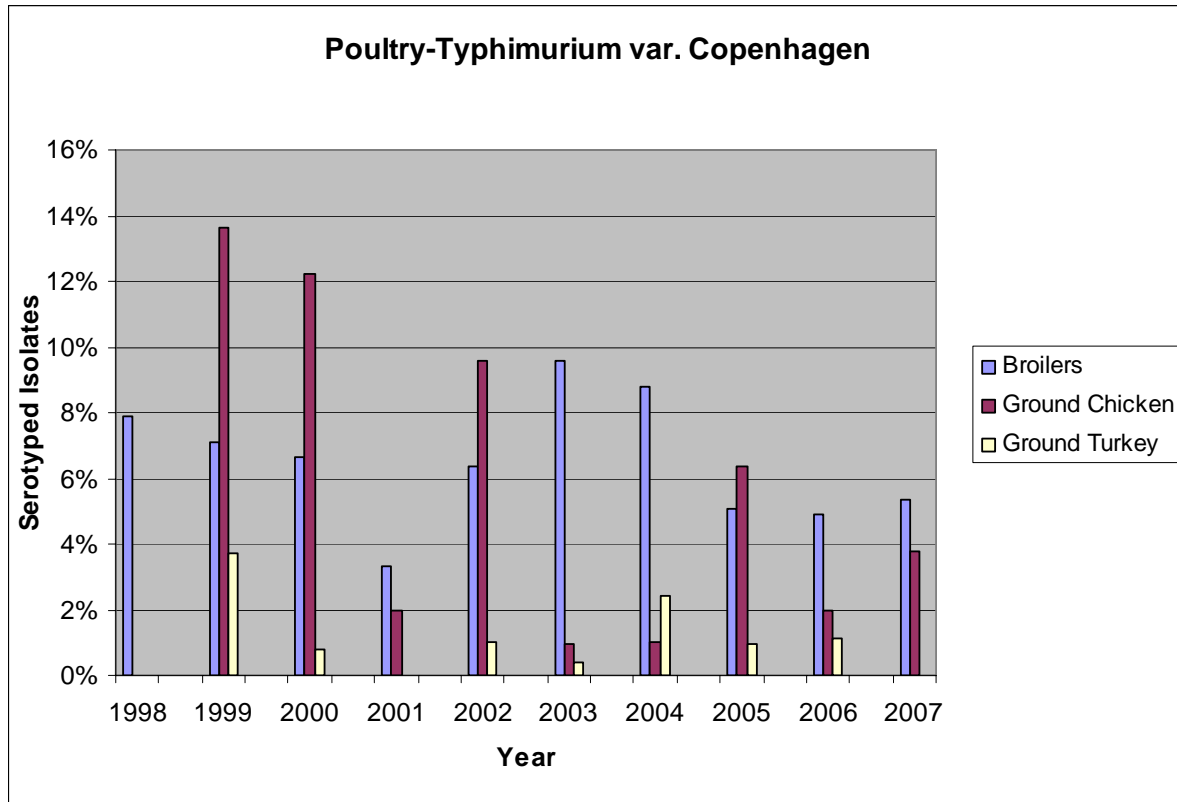
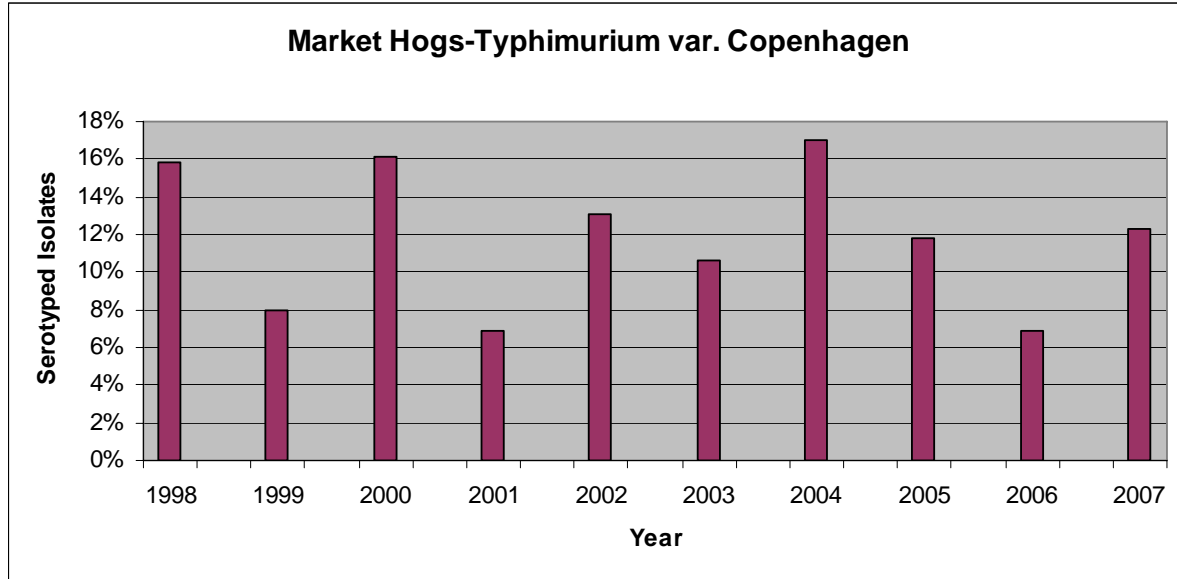




Figure 3 - Continued
Typhimurium var. Copenhagen – USDA, FSIS, PR/HACCP Verification Sampling by
Calendar Year* (1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 4
Enteritidis – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

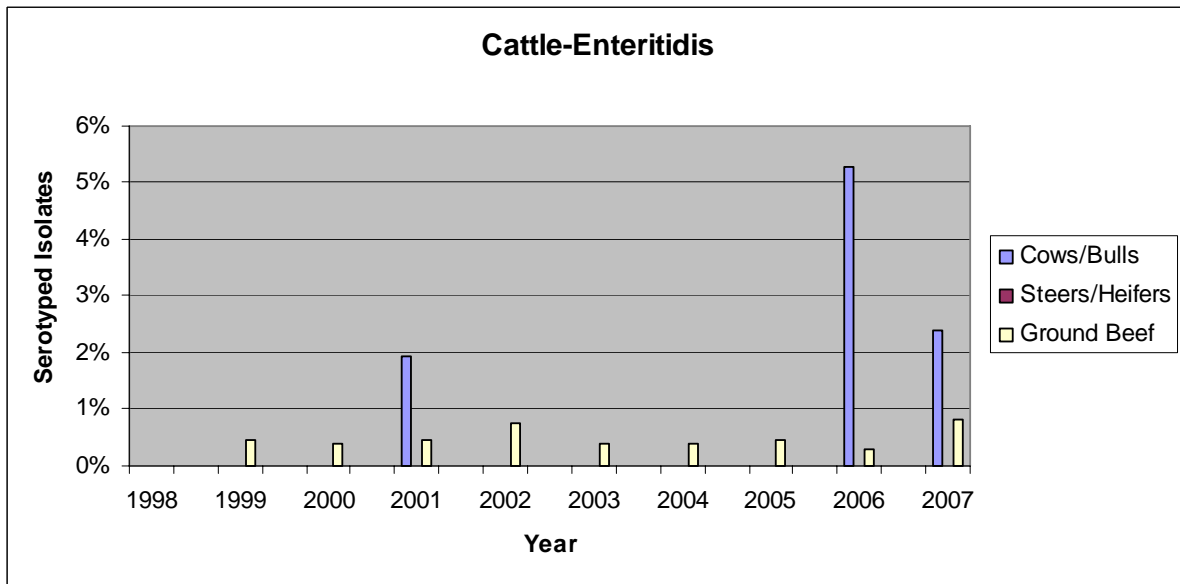
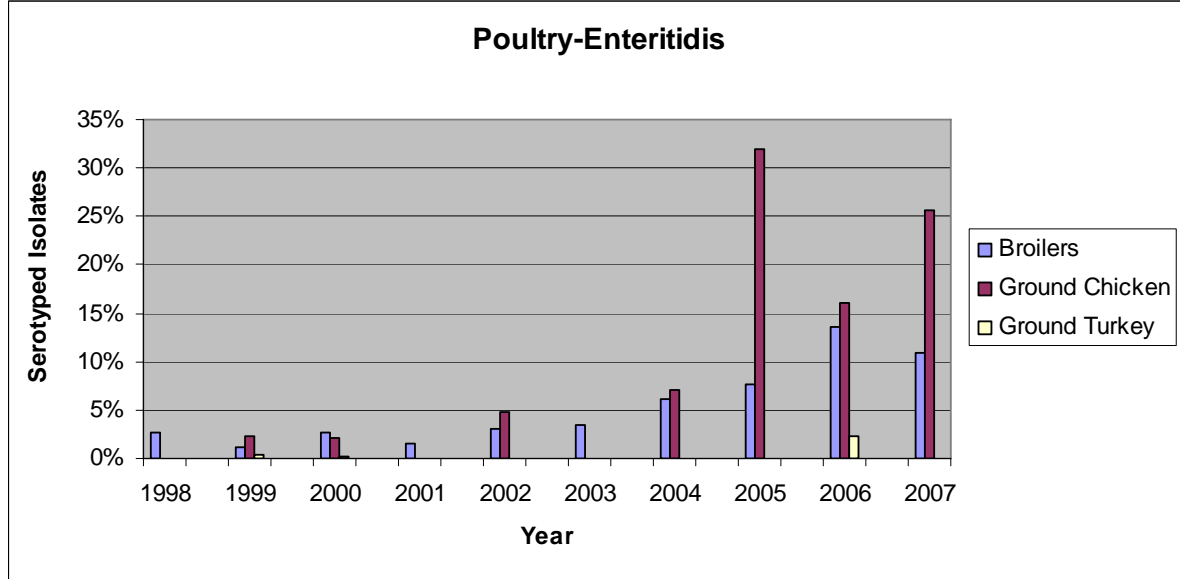
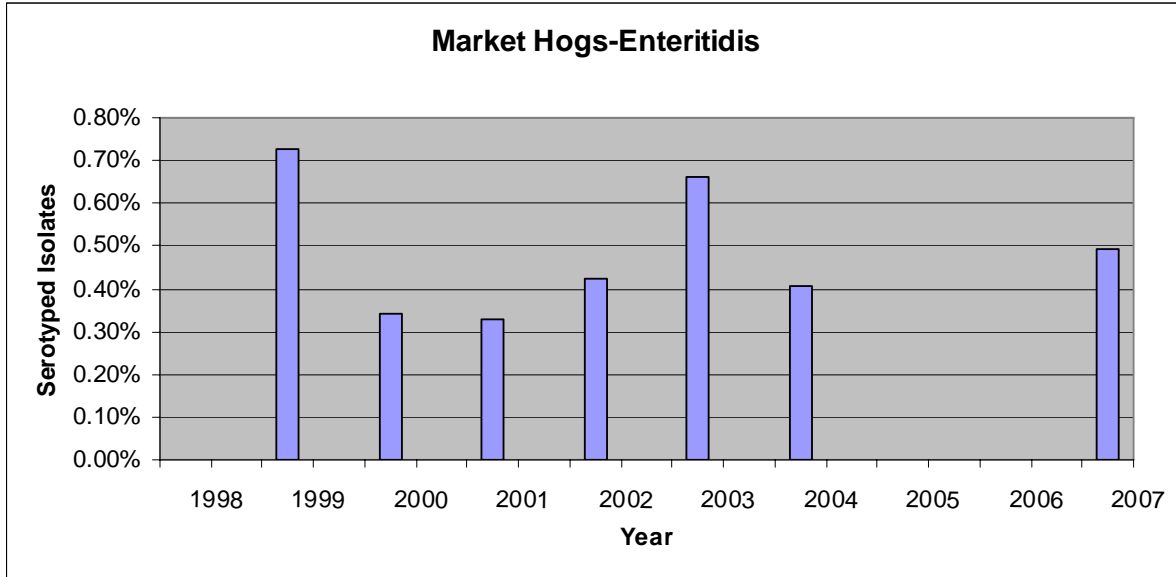




Figure 4 - Continued
Enteritidis – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis %varies from graph to graph.



Figure 5
Newport – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

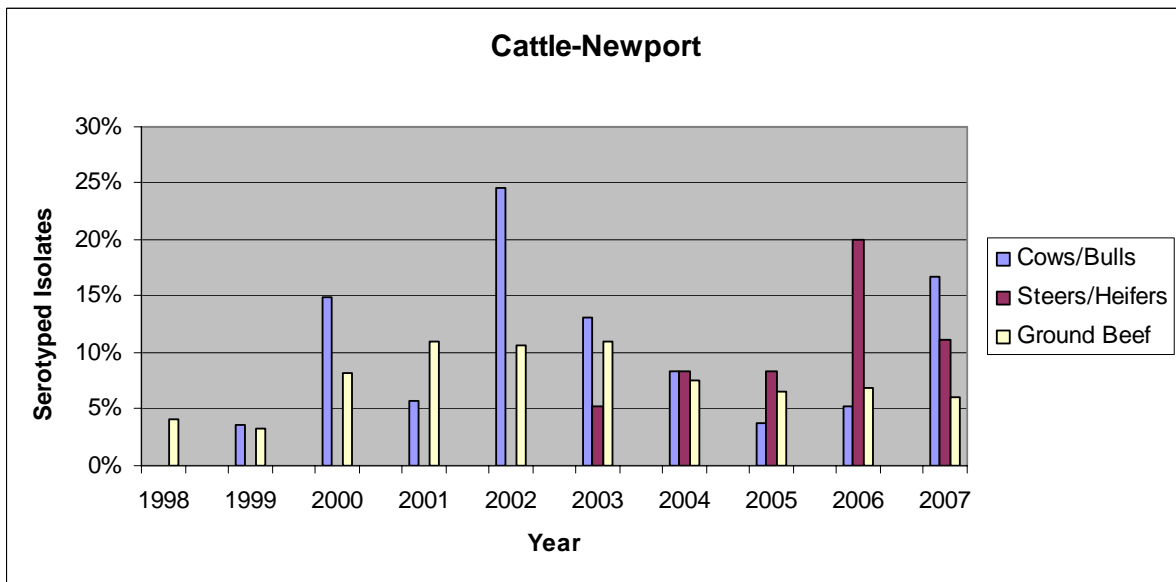
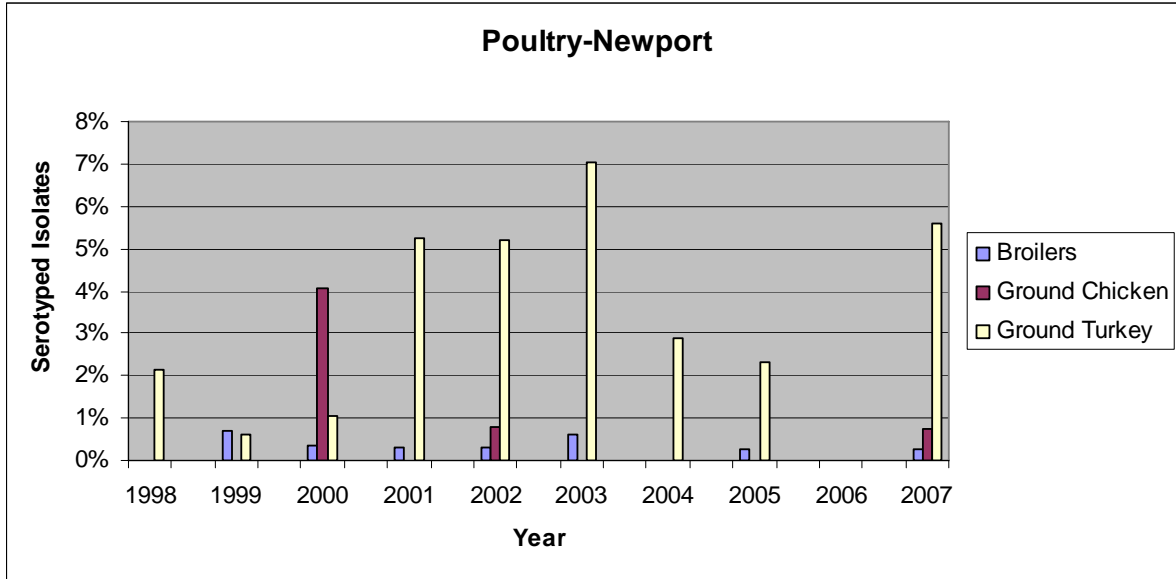
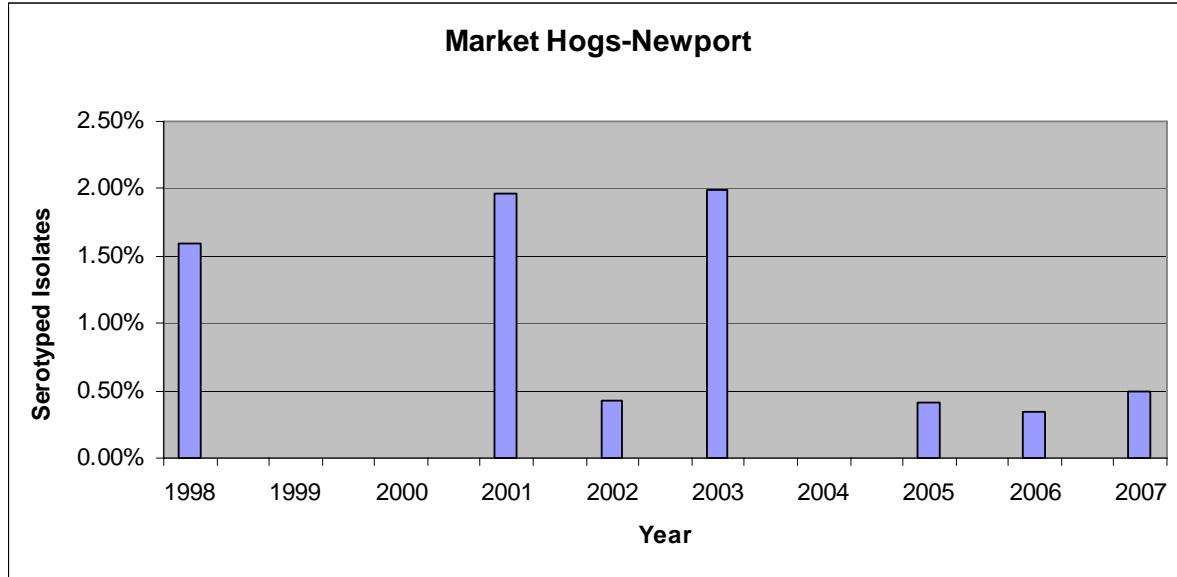




Figure 5 - Continued
Newport – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 6
Javiana – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 –2007 All Samples)

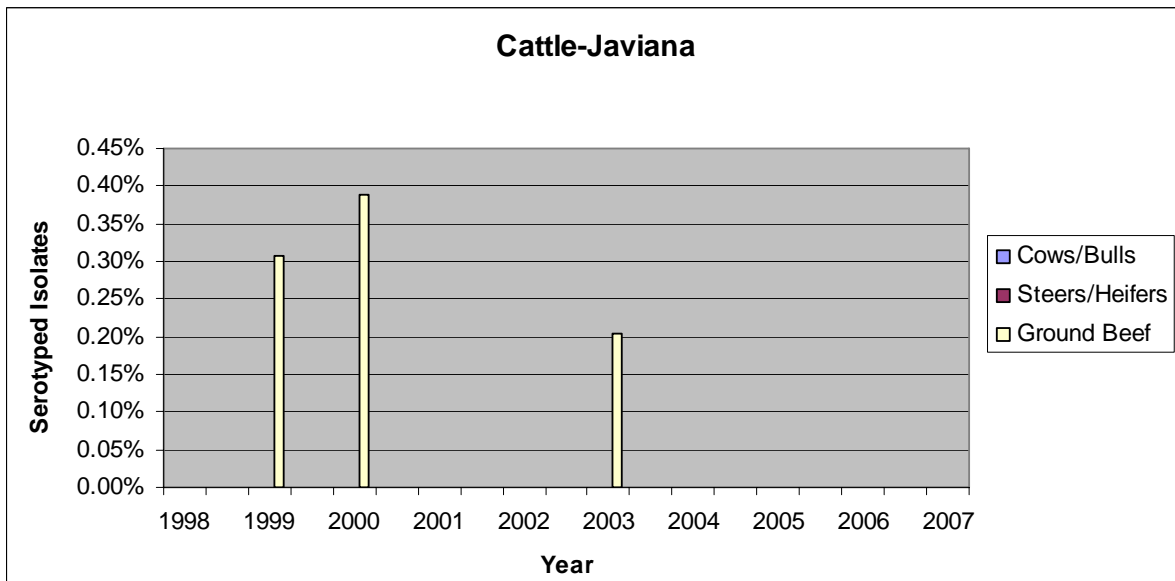
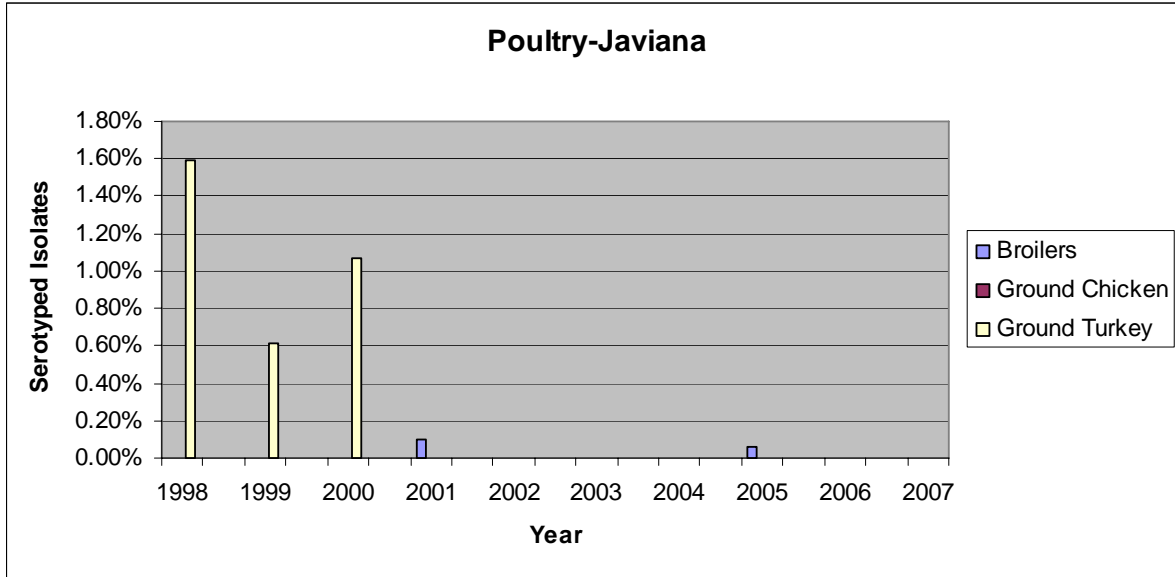
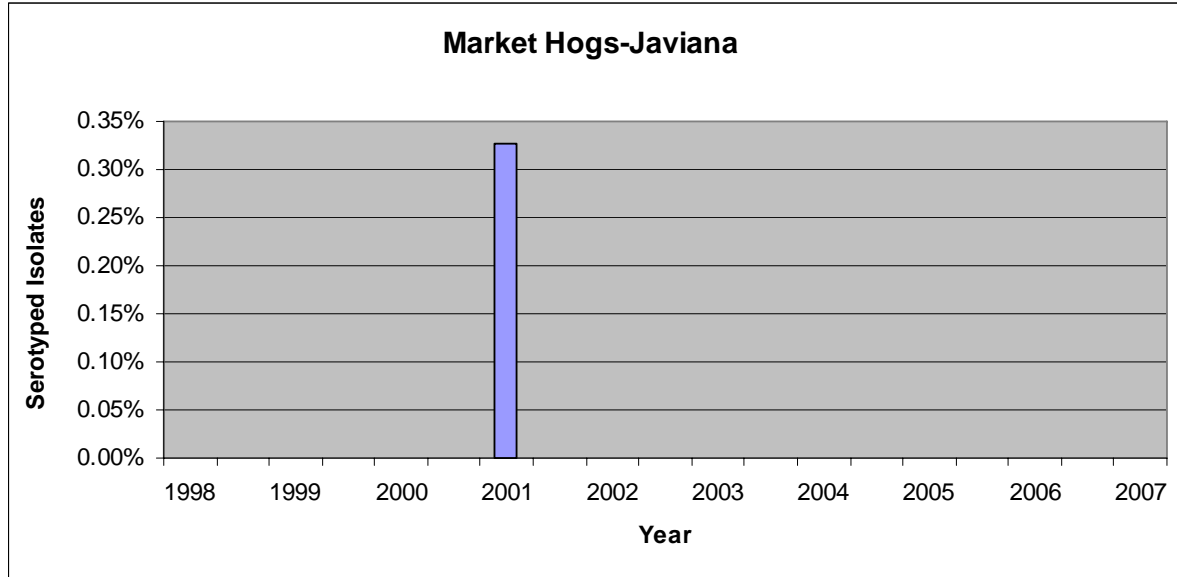




Figure 6 - Continued
Javiana – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 –2007 All Samples)



*Please note that the y-axis %varies from graph to graph.



Figure 7
Heidelberg – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

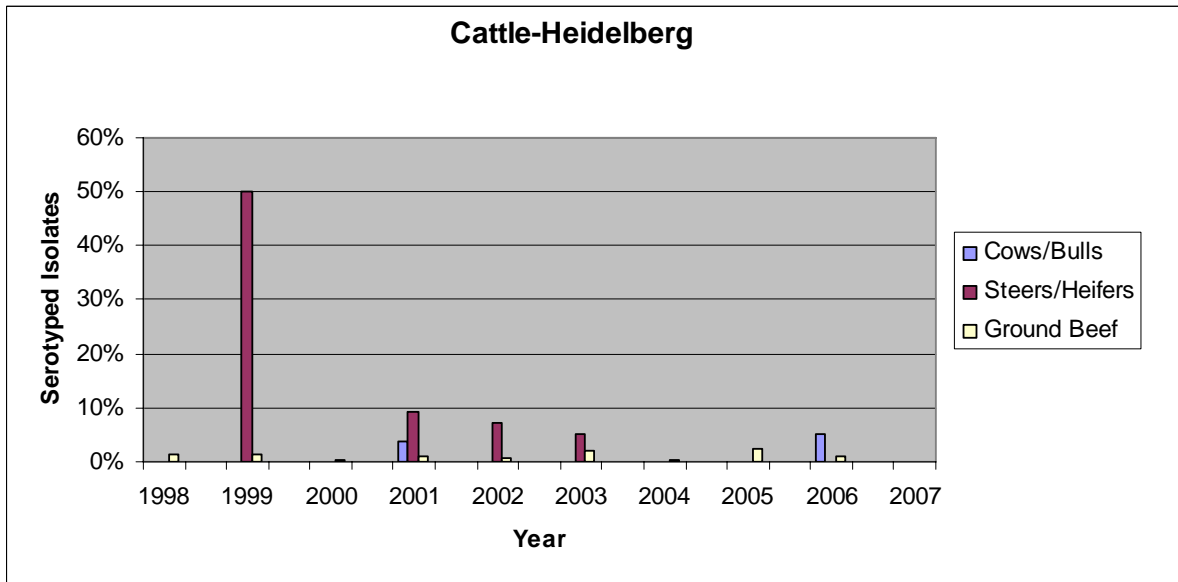
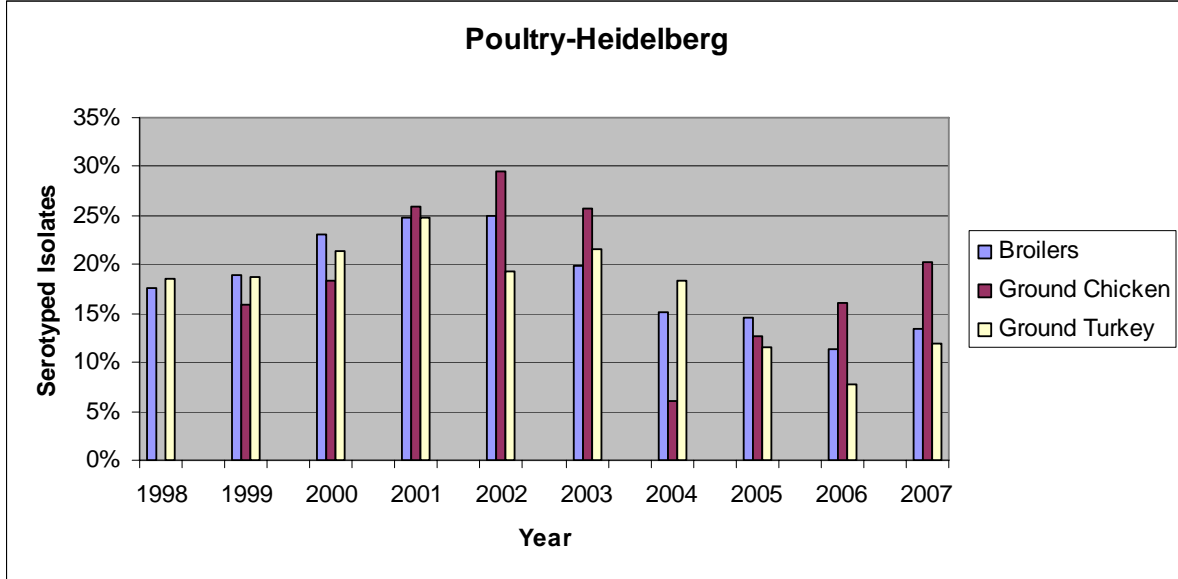
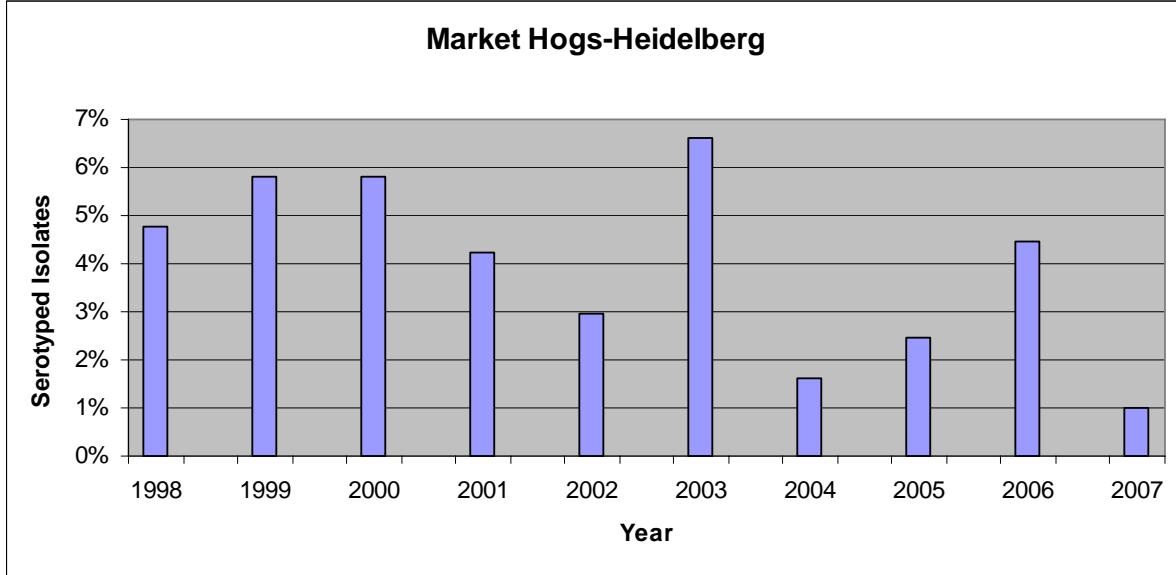




Figure 7 - Continued
Heidelberg – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 8
Montevideo – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

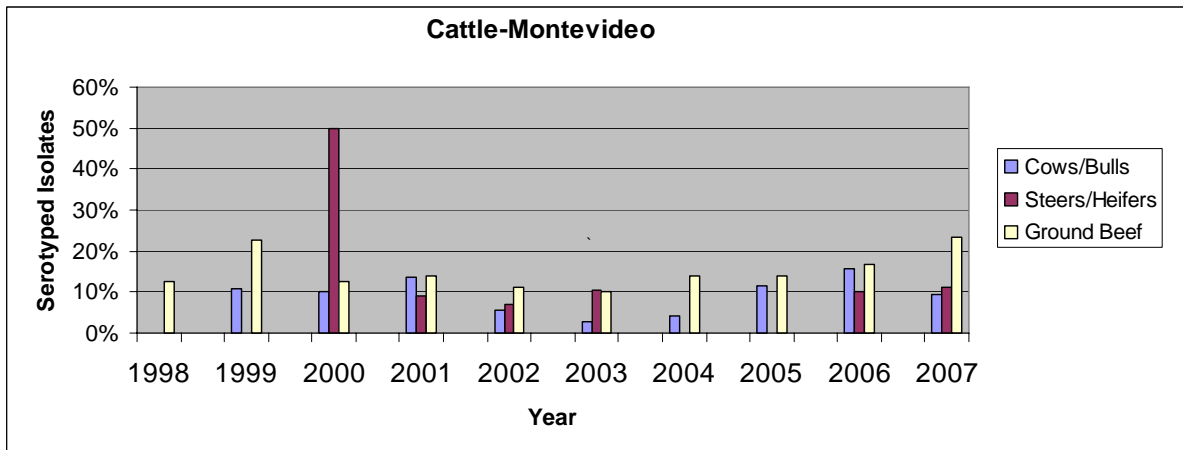
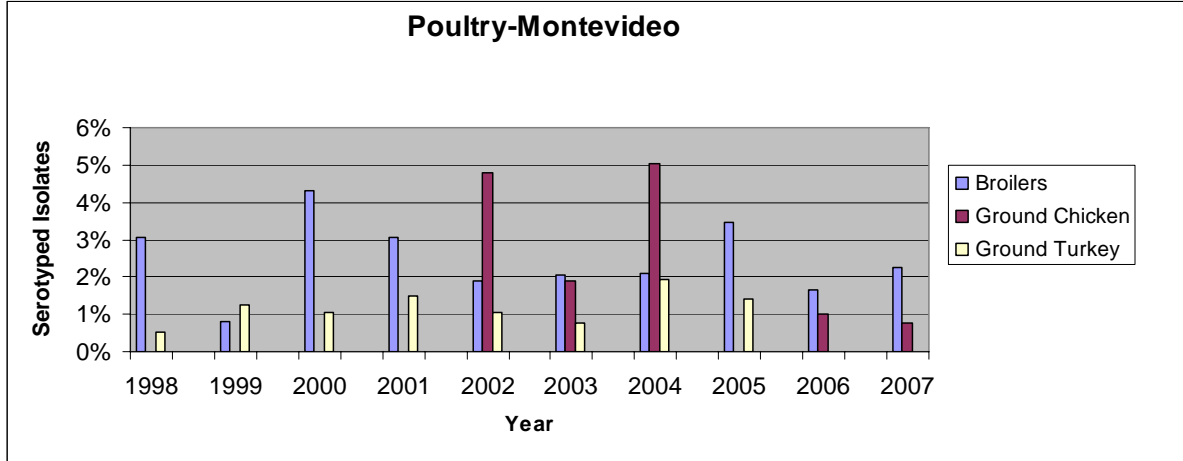
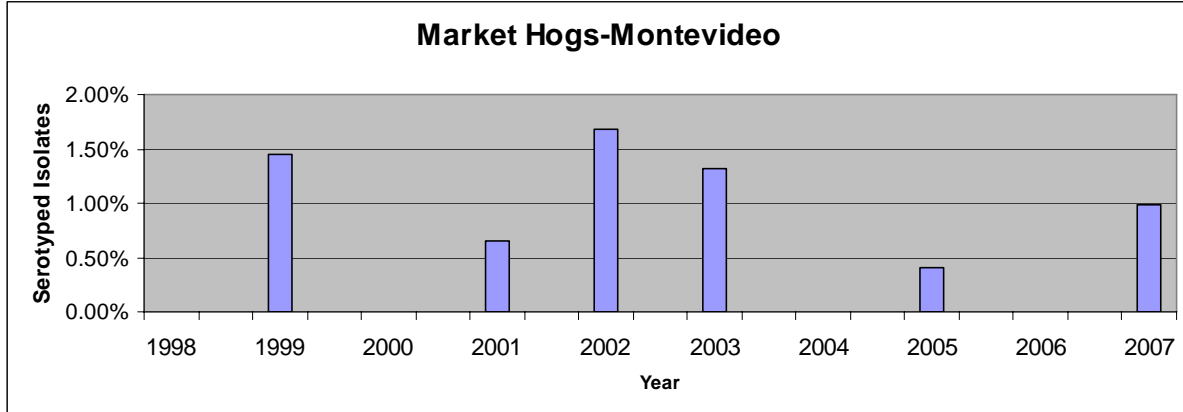




Figure 8 - Continued
Montevideo – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.



Figure 9
I 4, [5],12:i:- – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)

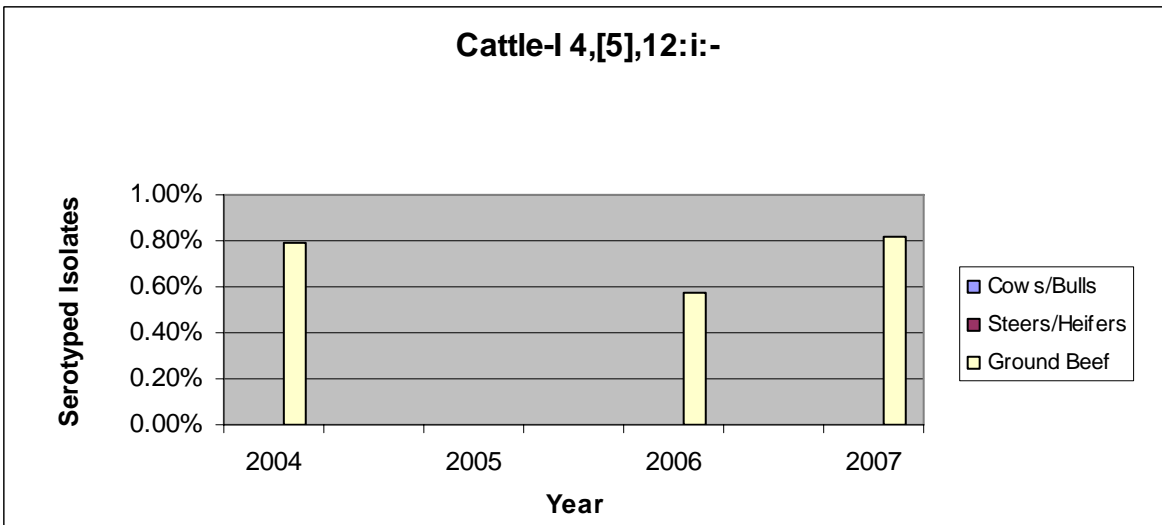
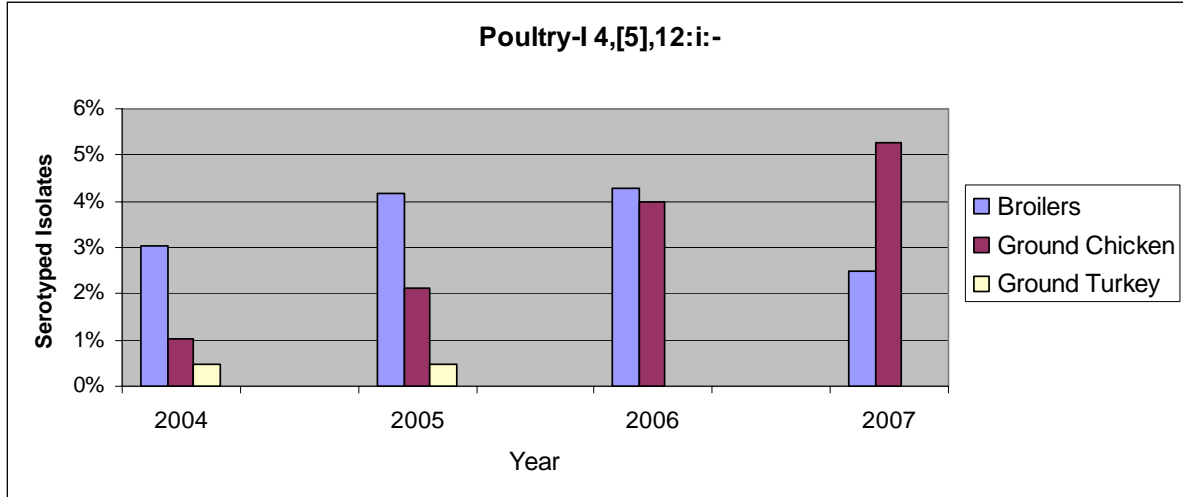
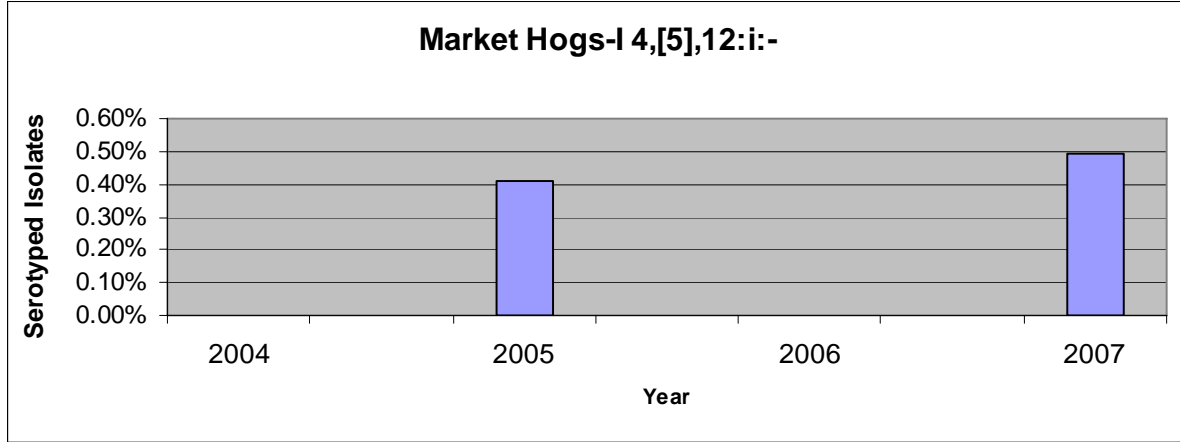




Figure 9 - Continued
I 4,[5],12:i:- – USDA, FSIS, PR/HACCP Verification Sampling by Calendar Year*
(1998 – 2005 “A” Set Samples; 2006 – 2007 All Samples)



*Please note that the y-axis % varies from graph to graph.