

First and Second Quarter Results for Serotyping of Salmonellae from Meat and Poultry Products

January-June 2006

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.

In February 2006, FSIS announced, in the Federal Register, Vol. 71, No. 38, pp. 9772-9777, (<http://www.fsis.usda.gov/Frame/FrameRedirect.asp?main=http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/04-026N.htm>) that quarterly results from *Salmonella* verification testing would be posted and that the Agency would be providing individual test results to establishments before completion of a set. The Agency began publishing quarterly reports of *Salmonella* results (http://www.fsis.usda.gov/Science/Q1_2006_Salmonella_Testing/index.asp; http://www.fsis.usda.gov/Science/Q2_2006_Salmonella_Testing/index.asp) in 2006 and began a procedure to notify establishments of individual results (<http://www.fsis.usda.gov/OPPDE/rdad/FSISNotices/36-06.pdf>) on June 29, 2006. Additionally, with this report, the Agency will begin the quarterly reporting of *Salmonella* serotype data as such data provides an opportunity to examine, still further, the association among salmonellae isolated on-farm, from meat and poultry products, and from human cases of salmonellosis. The Agency recognizes that serotyping information alone does not provide definitive associations.

As in the Agency's quarterly *Salmonella* report, data are reported in two formats: Tables 1-7 show the top ten serotypes observed for each product class from "A" set samples for the first quarter of 2006; Tables 8-15 show the top ten serotypes observed in each product class from "A" set samples for the 2nd quarter of 2006; Figures 1-6 show quarterly, by product class, data for 2005-2006 for the top five serotypes associated with human illness in 2005 (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5514a2.htm>). Because *Salmonella* verification testing is conducted to establish regulatory compliance (http://www.fsis.usda.gov/Science/Scheduling_Criteria_Salmonella_Sets/index.asp), and not to establish prevalence, as are the Agency's baseline testing programs, data reported here are not intended to be reflective of national trends in prevalence. For further information on serotyping of isolates derived from *Salmonella* verification testing, please see the Agency's 1998-2005 report (http://www.fsis.usda.gov/Science/Serotypes_Profile_Salmonella_Isolates/index.asp).

Results

» Serotypes are reported by product class and by quarter based on the date of sample collection from January through March (1st Quarter) and April through June (2nd Quarter) 2006. The number of isolates of each serotype, the percent of isolates out of total positive, and the percent of isolates of total samples collected are displayed in Tables 1-7 (1st Quarter) and Tables 8-15 (2nd Quarter). In the 2nd quarter of 2006, turkey carcass samples were officially collected for the first time. These results are reported in Table 15.

» The ten most commonly isolated serotypes for each product class during each quarter are identified by name, while less commonly identified serotypes are included in the “other serotypes” category. Where there is more than one serotype in tenth place, all serotypes in tenth place are listed.

» Included in the tables are entries classified as “unidentified”, isolates for which a single specific serotype could not be determined.

» The figures display the percent of isolates identified out of total isolates serotyped for each product class by quarter for 2005 and for the first two quarters of 2006. 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. Because turkey carcass testing began in the 2nd quarter of 2006 and no data exists for 2005, turkey carcass results are not included in the figures.

For More Information:

Media – (202) 720-9113

Congressional – (202) 720-3897

Constituent – (202) 720-9113

Consumer inquiries - Consumers with food safety questions can "Ask Karen," the FSIS virtual representative available 24 hours a day at www.askkaren.gov . The toll-free USDA Meat and Poultry Hotline 1-888-MPHotline (1-888-674-6854) is available in English and Spanish and can be reached from 10 a.m. to 4 p.m. (Eastern Time) Monday through Friday. Recorded food safety messages are available 24 hours a day. The TTY number is 1-800-256-7072.

Technical inquiries – Division Director, Zoonotic Diseases and Residue Surveillance Division, Office of Public Health Science, (202) 690-6566

FSIS Web Site: <http://www.fsis.usda.gov>

Table 1
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Broilers – ‘A’ Sets – 1st Quarter 2006

Broilers	# Isolates	% of Total Positive	% Analyzed Samples
Kentucky	38	37.25	4.45
Enteritidis	16	15.69	1.88
Heidelberg	14	13.73	1.64
4,5,12:i:-	9	8.82	1.06
Typhimurium (var. Copenhagen)	9	8.82	1.06
4,12:i:-	6	5.88	0.70
Berta	2	1.96	0.23
Montevideo	2	1.96	0.23
Blockley	1	0.98	0.12
Schwarzengrund	1	0.98	0.12
Senftenberg	1	0.98	0.12
Thompson	1	0.98	0.12
Typhimurium	1	0.98	0.12
Worthington	1	0.98	0.12
Other serotypes	0		
Total Positive	102		11.96
Total number of analyzed samples	853		

Table 2
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Market Hogs – ‘A’ Sets – 1st Quarter 2006

Market Hogs	# Isolates	% of Total Positive	% Analyzed Samples
Heidelberg	13	16.46	0.63
Derby	11	13.92	0.53
Anatum var. 15+	8	10.13	0.39
Hadar	6	7.59	0.29
Agona	5	6.33	0.24
Johannesburg	5	6.33	0.24
Infantis	4	5.06	0.19
Manhattan	4	5.06	0.19
Anatum	3	3.80	0.15
Muenchen	3	3.80	0.15
Reading	3	3.80	0.15
Typhimurium (var. Copenhagen)	3	3.80	0.15
Other serotypes	11	13.92	0.53
Total Positive	79		3.82
Total number of analyzed samples	2068		

Table 3
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Cows/Bulls – ‘A’ Sets – 1st Quarter 2006

Cows/Bulls	# Isolates	% of Total Positive	% Analyzed Samples
Muenchen	1	100.00	0.34
Other serotypes	0		
Total Positive	1		0.34
Total number of analyzed samples	297		

Table 4
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Steers/Heifers – ‘A’ Sets – 1st Quarter 2006

Steers/Heifers	# Isolates	% of Total Positive	% Analyzed Samples
Total Positive	0		
Total number of analyzed samples		479	

Table 5
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Ground Beef – ‘A’ Sets – 1st Quarter 2006

Ground Beef	# Isolates	% of Total Positive	% Analyzed Samples
Montevideo	17	20.99	0.27
Muenster	9	11.11	0.14
Dublin	7	8.64	0.11
Infantis	7	8.64	0.11
Anatum	6	7.41	0.09
Cerro	3	3.70	0.05
Mbandaka	3	3.70	0.05
Newport	3	3.70	0.05
Senftenberg	3	3.70	0.05
Typhimurium	3	3.70	0.05
Other serotypes	20	24.69	0.31
Total Positive	81		1.27
Total number of analyzed samples		6396	

Table 6
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Ground Chicken – ‘A’ Sets – 1st Quarter 2006

Ground Chicken	# Isolates	% of Total Positive	% Analyzed Samples
Kentucky	11	61.11	30.56
Heidelberg	2	11.1	5.56
Enteritidis	2	11.1	5.56
4,5,12:i:-	1	5.56	2.78
Hadar	1	5.56	2.78
Schwarzengrund	1	5.56	2.78
Other serotypes	0		
Total Positive	18		50.00
Total number of analyzed samples	36		

Table 7
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Ground Turkey – ‘A’ Sets – 1st Quarter 2006

Ground Turkey	# Isolates	% of Total Positive	% Analyzed Samples
Hadar	21	34.43	7.53
Anatum	4	6.56	1.43
Muenchen	4	6.56	1.43
Saint-Paul	4	6.56	1.43
Derby	3	4.92	1.08
Heidelberg	3	4.92	1.08
Kentucky	3	4.92	1.08
Senftenberg	3	4.92	1.08
Worthington	3	4.92	1.08
¹ III 18:z4,z32:-	2	3.28	0.72
Agona	2	3.28	0.72
Typhimurium	2	3.28	0.72
Other serotypes	6	14.75	3.23
Unidentified	1	1.64	0.36
Total Positive	61		21.86
Total number of analyzed samples	279		

¹Previously reported as “Arizona”

Table 8
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Broilers – ‘A’ Sets – 2nd Quarter 2006

Broilers	# Isolates	% of Total Positive	% Analyzed Samples
Kentucky	49	36.03	3.73
Heidelberg	26	19.12	1.98
Enteritidis	21	15.44	1.60
Typhimurium (var. Copenhagen)	10	7.35	0.76
4,5,12:i:-	8	5.88	0.61
Schwarzengrund	4	2.94	0.30
Montevideo	3	2.21	0.23
Typhimurium	3	2.21	0.23
8,20:i:-	2	1.47	0.15
Infantis	2	1.47	0.15
Other serotypes	8	5.88	0.61
Total Positive	136		10.37
Total number of analyzed samples	1312		

Table 9
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Market Hogs – ‘A’ Sets – 2nd Quarter 2006

Market Hogs	# Isolates	% of Total Positive	% Analyzed Samples
Derby	8	21.05	0.63
Johannesburg	6	15.79	0.46
Anatum var. 15+	5	13.16	0.38
Infantis	4	10.53	0.31
Typhimurium (var. Copenhagen	3	7.89	0.23
Anatum	2	5.26	0.15
Saint-Paul	2	5.26	0.15
6,7:-:1,w	1	2.63	0.08
Agona	1	2.63	0.08
Adelaide	1	2.63	0.08
Anatum var. 15+, 34+	1	2.63	0.08
Hadar	1	2.63	0.08
Muenchen	1	2.63	0.08
Reading	1	2.63	0.08
Senftenberg	1	2.63	0.08
Other serotypes	0		
Total Positive	38		2.93
Total number of analyzed samples	1299		

Table 10
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Cows/Bulls – ‘A’ Sets – 2nd Quarter 2006

Cows/Bulls	# Isolates	% of Total Positive	% Analyzed Samples
Enteritidis	1	16.67	0.14
Heidelberg	1	16.67	0.14
Kentucky	1	16.67	0.14
Mbandaka	1	16.67	0.14
Muenster	1	16.67	0.14
Newport	1	16.67	0.14
Other serotypes	0		
Total Positive	6		0.86
Total number of analyzed samples	696		

Table 11
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Steers/Heifers – ‘A’ Sets – 2nd Quarter 2006

Steers/Heifers	# Isolates	% of Total Positive	% Analyzed Samples
Anatum var. 15+, 34+	1	50.00	0.12
Typhimurium	1	50.00	0.12
Other serotypes	0		
Total Positive	2		0.24
Total number of analyzed samples	830		

Table 12
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Ground Beef – ‘A’ Sets – 2nd Quarter 2006

Ground Beef	# Isolates	% of Total Positive	% Analyzed Samples
Muenster	13	18.57	0.26
Cerro	8	11.43	0.16
Montevideo	6	8.57	0.12
Dublin	5	7.14	0.10
Agona	4	5.71	0.08
Mbandaka	4	5.71	0.08
Reading	4	5.71	0.08
Anatum	3	4.29	0.06
Newport	3	4.29	0.06
Typhimurium	3	4.29	0.06
Other serotypes	17	24.29	0.34
Total Positive	70		1.38
Total number of analyzed samples	5071		

Table 13
 Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
 Ground Chicken – ‘A’ Sets – 2nd Quarter 2006

Ground Chicken	# Isolates	% of Total Positive	% Analyzed Samples
Kentucky	13	68.42	37.14
8,(20):-:z6	1	5.26	2.86
Berta	1	5.26	2.86
Enteritidis	1	5.26	2.86
Infantis	1	5.26	2.86
Schwarzengrund	1	5.26	2.86
Typhimurium (var. Copenhagen)	1	5.26	2.86
Other serotypes	0		
Total Positive	19		54.29
Total number of analyzed samples	35		

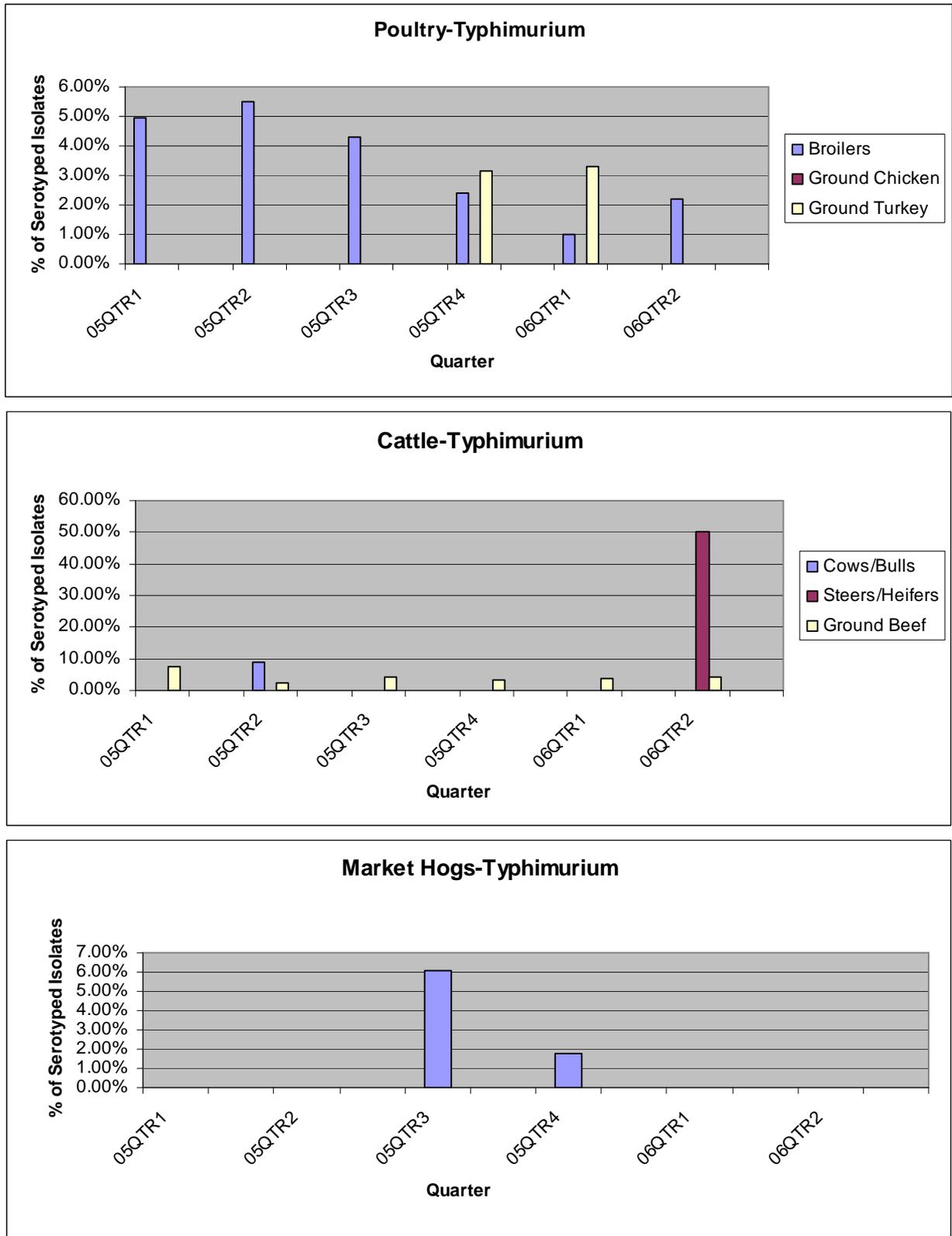
Table 14
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
Ground Turkey – ‘A’ Sets – 2nd Quarter 2006

Ground Turkey	# Isolates	% of Total Positive	% Analyzed Samples
Hadar	5	26.32	4.76
Heidelberg	4	21.05	3.81
Saint-Paul	3	15.79	2.86
Enteritidis	2	10.53	1.90
Agona	1	5.26	0.95
Berta	1	5.26	0.95
Cerro	1	5.26	0.95
Kentucky	1	5.26	0.95
Kiambu	1	5.26	0.95
Other serotypes	0		
Total Positive	19		18.10
Total number of analyzed samples	105		

Table 15
Serotypes Profile of Analyzed PR/HACCP Verification Samples by Quarter.
Turkeys – ‘A’ Sets – 2nd Quarter 2006

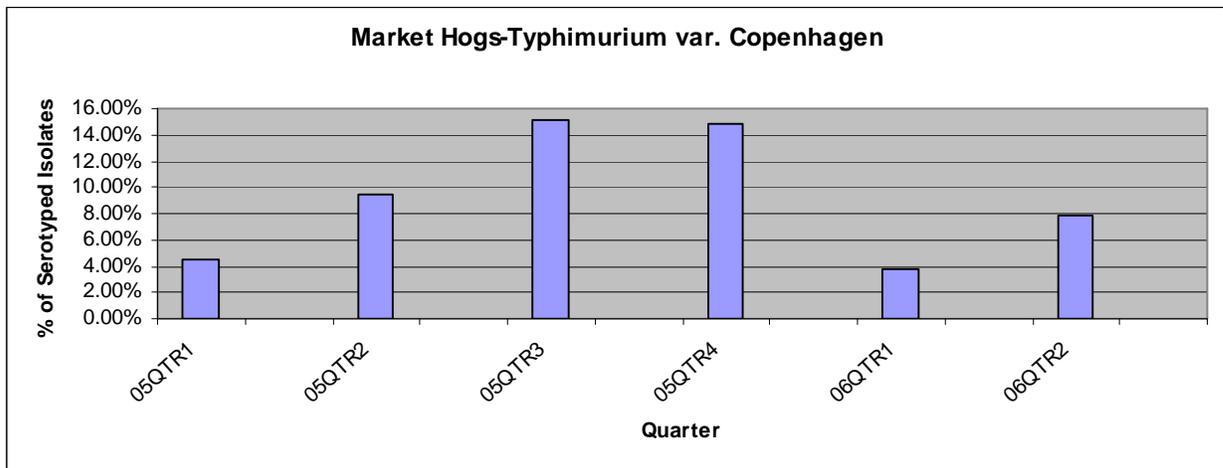
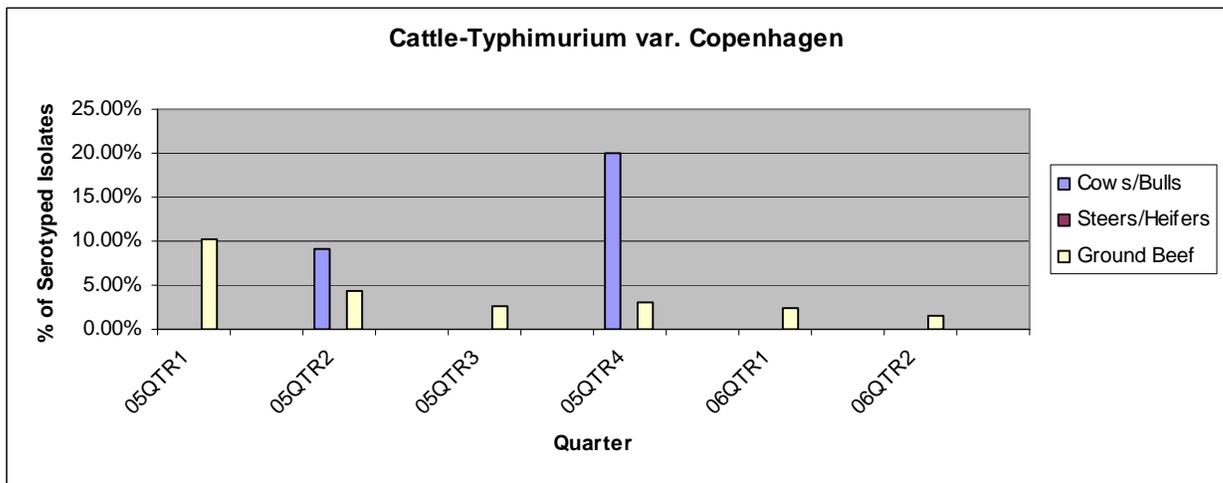
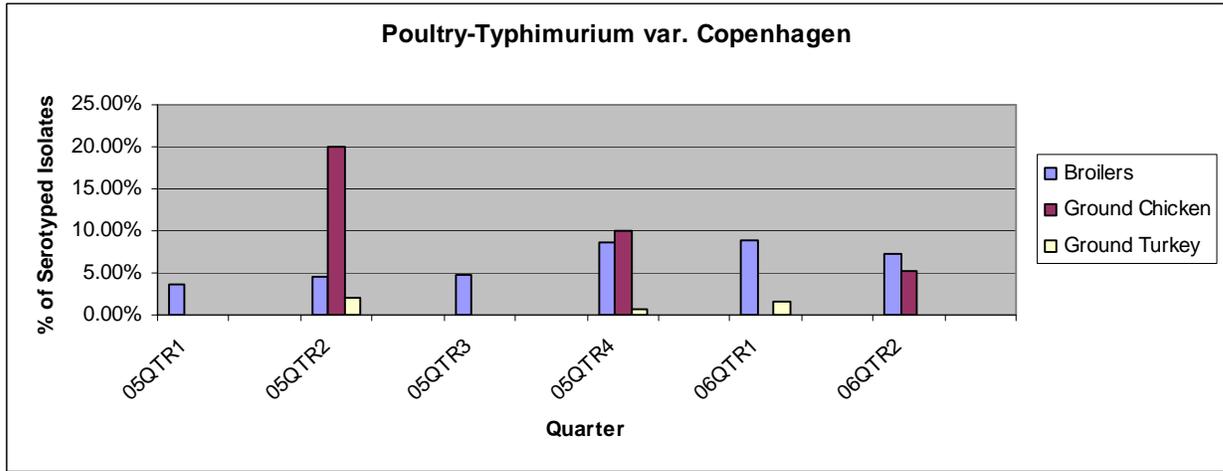
Turkeys	# Isolates	% of Total Positive	% Analyzed Samples
Hadar	16	39.02	3.93
Heidelberg	10	24.39	2.46
Schwarzengrund	4	9.76	0.98
Derby	2	4.88	0.49
Agona	1	2.44	0.25
Albany	1	2.44	0.25
III 18:z4,z23:-	1	2.44	0.25
Kentucky	1	2.44	0.25
Muenster	1	2.44	0.25
Montevideo	1	2.44	0.25
Orion var.15+, 34+	1	2.44	0.25
Saint-Paul	1	2.44	0.25
Senftenberg	1	2.44	0.25
Other serotypes	0		
Total Positive	41		10.07
Total number of analyzed samples	407		

Figure 1
 Typhimurium - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



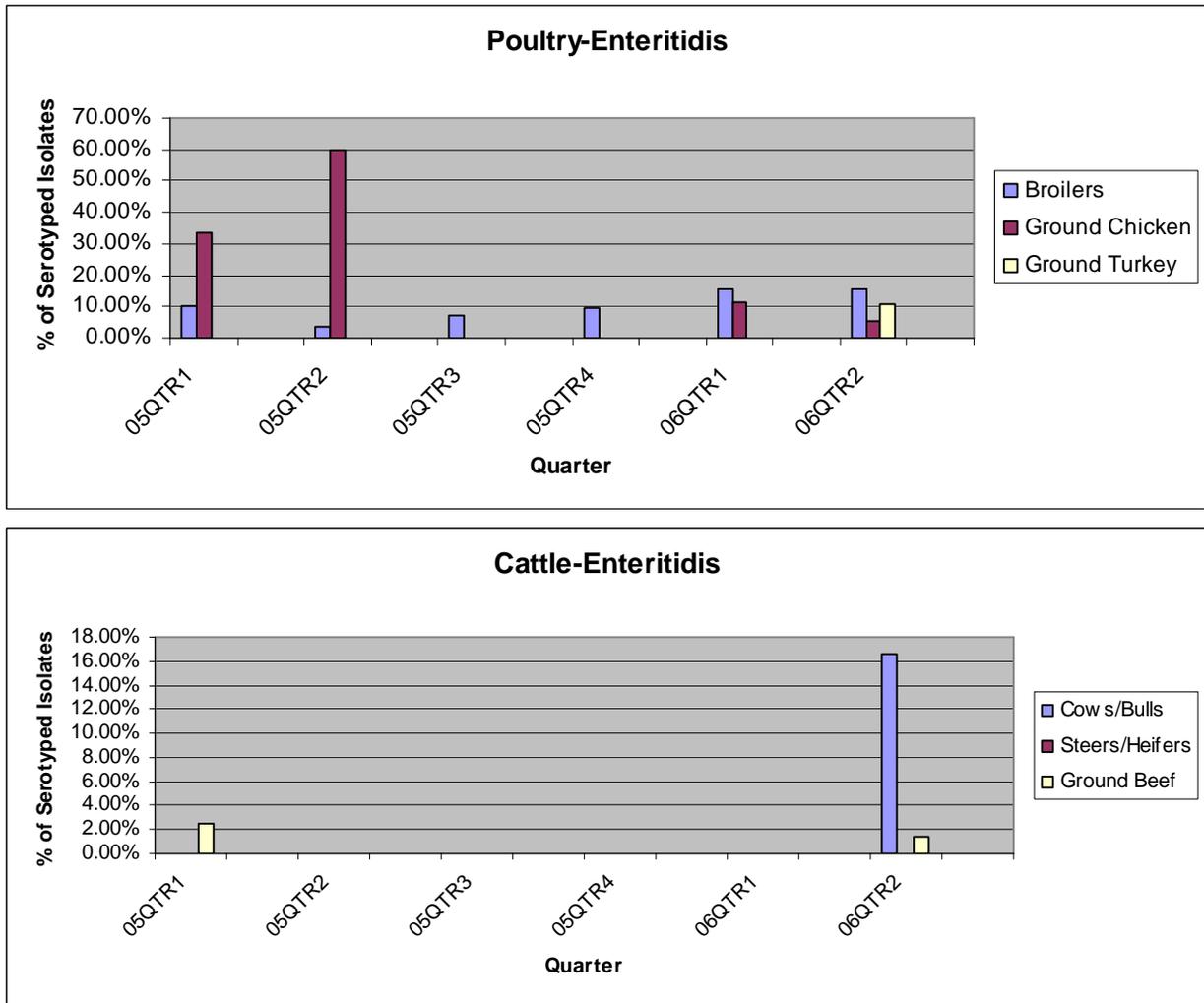
*Please note that the y-axis % varies from graph to graph.

Figure 2
 Typhimurium var. Copenhagen - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



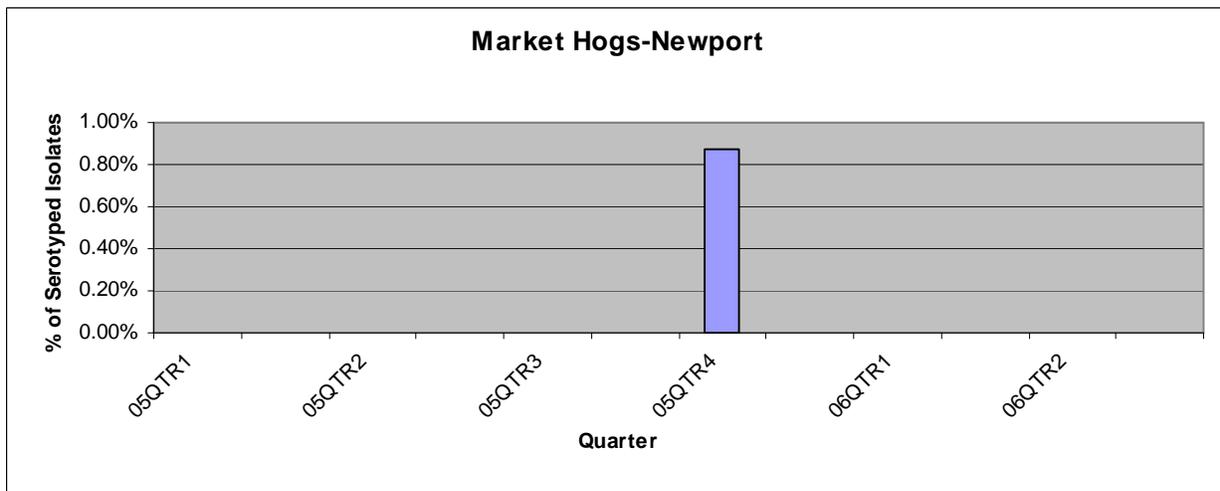
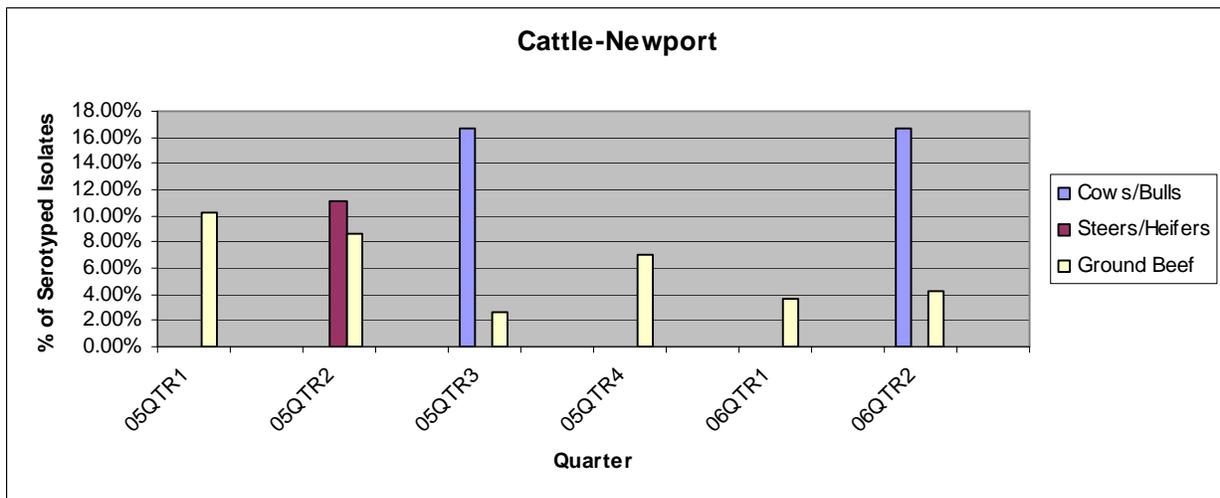
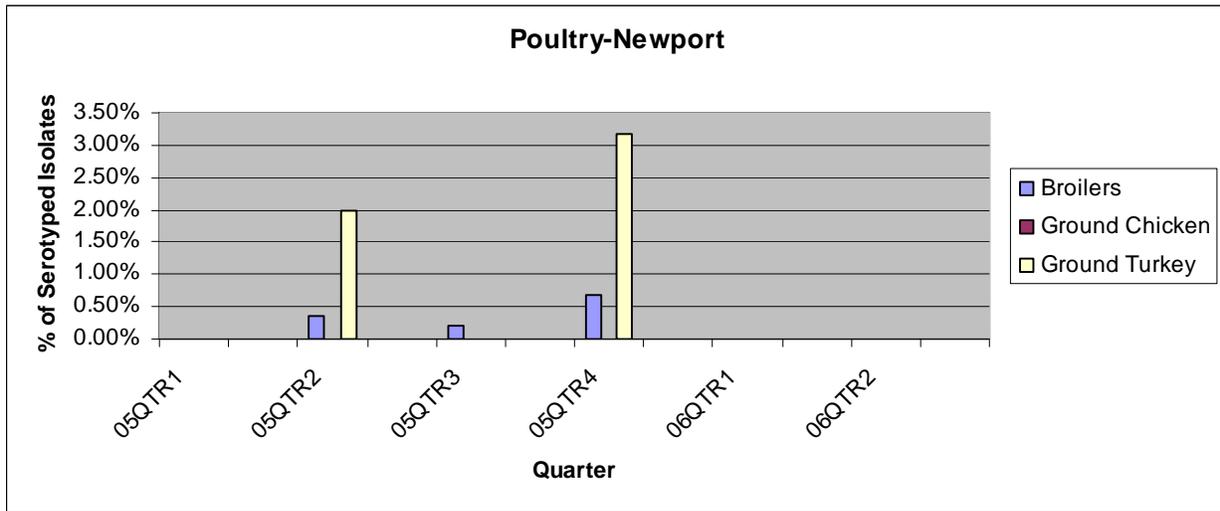
*Please note that the y-axis % varies from graph to graph.

Figure 3
 Enteritidis - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



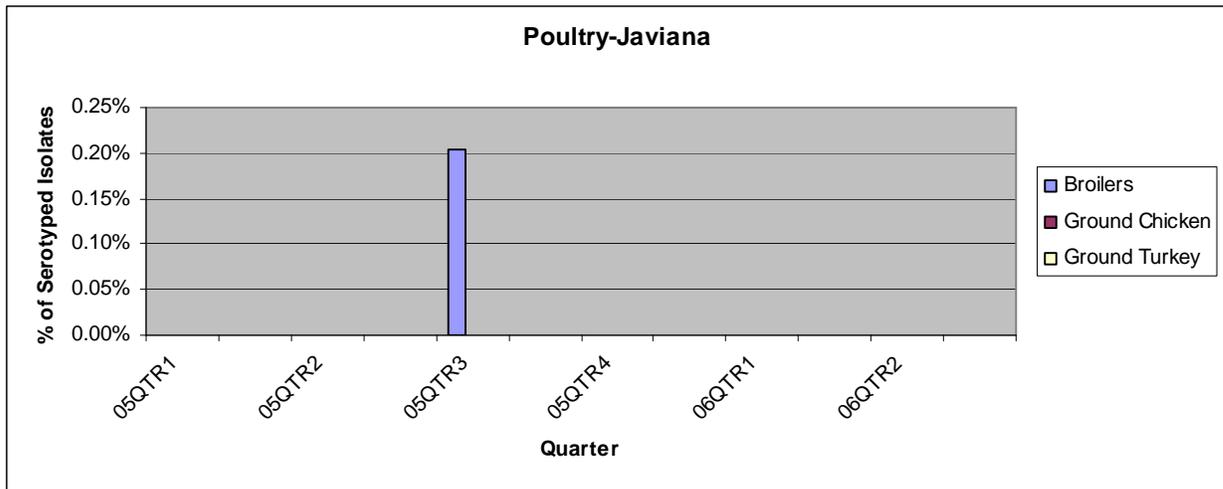
*Please note that the y-axis % varies from graph to graph. There were no Enteritidis isolates recovered for the time period in market hogs.

Figure 4
Newport - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



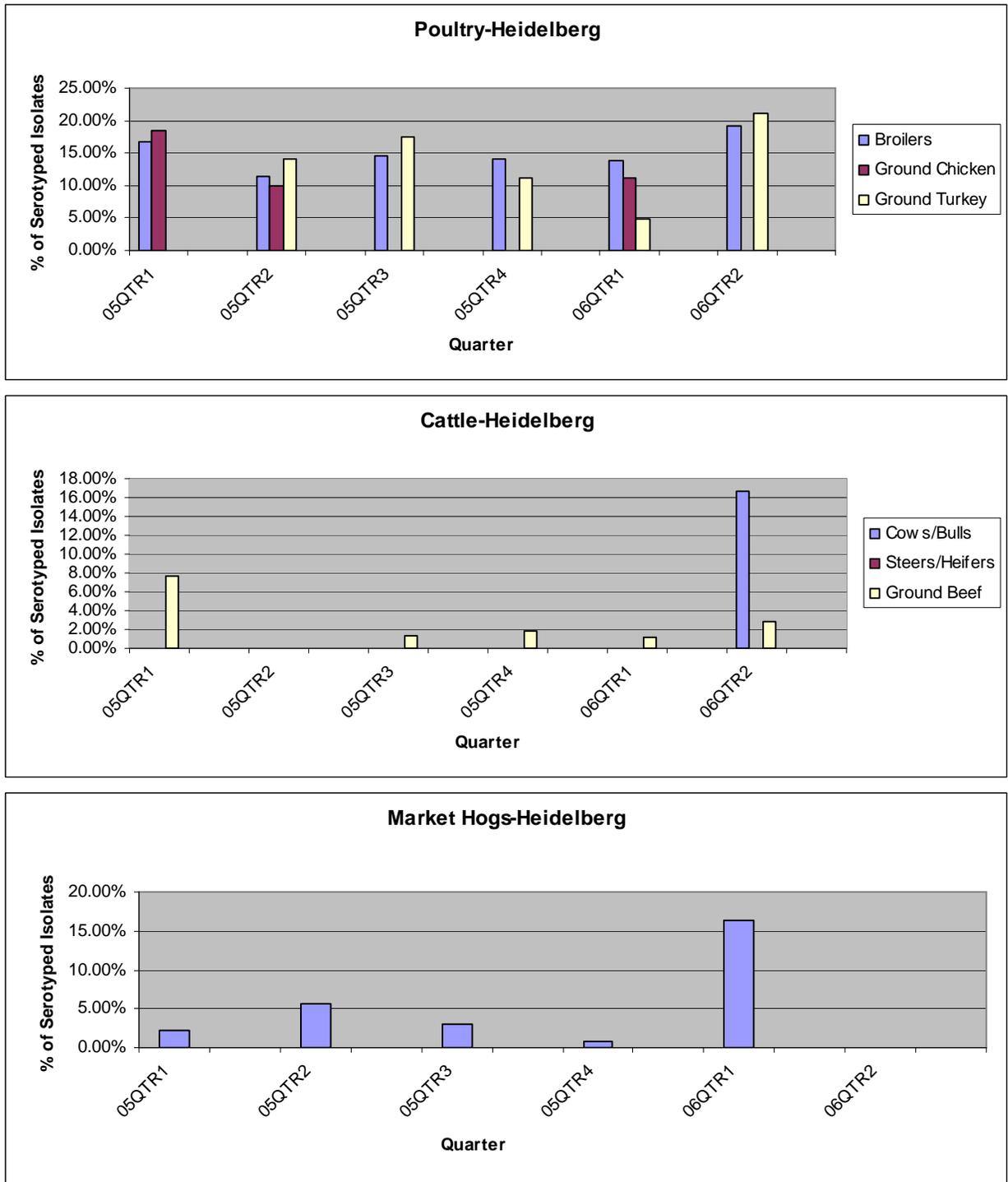
*Please note that the y-axis % varies from graph to graph.

Figure 5
Javiana - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



*Please note that the y-axis % varies from graph to graph. There were no Javiana isolates recovered for the time period in cattle and market hogs.

Figure 6
 Heidelberg - PR/HACCP Verification Sampling by Quarter – ‘A’ Sets -2006*



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