



Quarterly Results for Serotyping of *Salmonellae* from Meat and Poultry Products

January – June 2010

Background

The Food Safety and Inspection Service (FSIS) *Pathogen Reduction; Hazard Analysis and Critical Control Point (PR/HACCP) Systems, Final Rule* sets *Salmonella* performance standards for establishments that slaughter or produce selected classes of food animals or raw ground products (Federal Register, 1996). Under PR/HACCP, performance standards were established for carcasses of cows/bulls, steers/heifers, market hogs, broilers, ground beef, ground chicken, and ground turkey based on nationwide microbiological baseline studies conducted before implementation of the rule. In June 2006, FSIS began sampling turkey carcasses for *Salmonella*. Guidance on standards for turkey carcasses is available in the Federal Register (2005).

Prior to 2006, there were two phases of the FSIS regulatory program for *Salmonella* in raw products: non-targeted and targeted testing. Non-targeted or "A" set samples were collected at randomly selected establishments with a goal of scheduling every eligible establishment at least once a year. Other codes (e.g., "B", "C", and "D") represented sample sets collected from establishments targeted for follow-up testing after a subsequent failed "A" set. FSIS replaced the targeted/non-targeted approach with risk-based scheduling in 2006. The serotype data in this report are from all sample sets.

The Agency provided individual test results to establishments before completion of a set (Federal Register 2006; Federal Register 2008). In February 2006, FSIS began reporting quarterly results from *Salmonella* verification testing:

www.fsis.usda.gov/PDF/Q1_2010_Salmonella_Testing.pdf; and
www.fsis.usda.gov/PDF/Q2_2010_Salmonella_Testing.pdf.

In June 2006, FSIS developed new criteria for scheduling establishments that are risk-based and designed to focus FSIS resources on establishments that have the most samples positive for *Salmonella* (FSIS 2006) and the greatest number of samples with serotypes most frequently associated with human salmonellosis as defined by the Centers for Disease Control and Prevention (2009). Therefore, establishments are no longer selected at random. One of the goals of the revised risk-based program is to identify the source of serotypes of the greatest human health concern and to report those findings directly to establishments. Through this process, FSIS identifies all pathogens of public health concern using subtype (serotype and PFGE pattern) and drug resistance profiles.

Results

This report includes two quarters of *Salmonella* serotype data for 2010. Data depicted represent samples collected from January 1 through June 30, 2010. Tables 1-16 display the number of isolates of each serotype, the percent of isolates out of total positive, and the percent of isolates of total samples collected. The second quarter results (April-June) do not match the Agency's published quarterly *Salmonella* results due to a reassessment of a broiler and a ground beef sample. The initial report listed the samples as positive and later identified them as negative.



Each table in this report identifies the 10 most commonly isolated serotypes by name for each product class during each quarter. 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. The tables also include entries classified as “unidentified” isolates. A single, specific serotype could not be determined for these isolates.

Figures 1-11 display the percent of isolates identified out of the top 10 serotypes associated with human illness (CDC, 2009) for each product class by quarter from July 2005. For consistency in the graphs, data collected prior to the 2006 were updated to include results from all sets. The Y-axis in Figures 1-11 represents the serotype percentage and varies from graph to graph because the incidence of different serotypes by commodity varies greatly and year-to-year variations in percentages are difficult to discern on one scale.

Limitations

Restructuring how *Salmonella* sets are scheduled means that comparison of results from 2006 onwards to previous years will be less meaningful in terms of trends. Similarly, the changes to the verification program will prevent valid comparisons of testing results over time (e.g., quarter-to-quarter or year-to-year).

References

CDC, “PHLIS Surveillance Data, *Salmonella* Annual Summary,” 2006.

<http://www.cdc.gov/ncidod/dbmd/phlisdata/salmonella.htm>. Accessed January 19, 2011.

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<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5914a2.htm>.

Accessed on January 19, 2011.

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<http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/93-016F.pdf>. Accessed on January 19, 2011.

Federal Register, “Generic *E. Coli* and *Salmonella* Baseline Results,” Vol.70, No. 32, pp.8058-8060, 2005. <http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/02-046N.pdf>. Accessed on January 19, 2011.

Federal Register, “*Salmonella* Verification Sample Results Reporting: Agency Policy and Use in Public Health Protection,” Vol. 71, No. 38, pp. 9772-9777, 2006.

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Federal Register, “Salmonella Verification Sampling Program: Response to Comments and New Agency Policies,” Vol 73, No. 18, pp. 4767-4774, 2008.

<http://www.fsis.usda.gov/Frame/FrameRedirect.asp?main=http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/2006-0034.htm>. Accessed on January 19, 2011.

FSIS, “Scheduling Criteria for *Salmonella* Sets in Raw Classes of Product,” 2006.

www.fsis.usda.gov/pdf/scheduling_criteria_salmonella_sets.pdf. Accessed on January 19, 2011.



Table 1
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Broilers
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Kentucky | 12 | 21.82 | 1.52 |
| Enteritidis | 9 | 16.36 | 1.14 |
| Typhimurium | 8 | 14.55 | 1.01 |
| Typhimurium 5- | 6 | 10.91 | 0.76 |
| Schwarzengrund | 4 | 7.27 | 0.51 |
| Heidelberg | 3 | 5.45 | 0.38 |
| 4,12:i:- | 2 | 3.64 | 0.25 |
| 4,5,12:i:- | 2 | 3.64 | 0.25 |
| Ouakam | 2 | 3.64 | 0.25 |
| 21:y:- | 1 | 1.82 | 0.13 |
| Albany | 1 | 1.82 | 0.13 |
| Give var 15+ | 1 | 1.82 | 0.13 |
| Mbandaka | 1 | 1.82 | 0.13 |
| Montevideo | 1 | 1.82 | 0.13 |
| Senftenber | 1 | 1.82 | 0.13 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Unidentified | 1 | 1.82 | 0.13 |
| ^a Total positive | 55 | | 6.96 |
| Total number of analyzed samples | 790 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding



Table 2
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Market Hogs
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Derby | 7 | 18.42 | 0.53 |
| Adelaide | 6 | 15.79 | 0.45 |
| Typhimurium 5- | 5 | 13.16 | 0.38 |
| Heidelberg | 3 | 7.89 | 0.23 |
| Saintpaul | 3 | 7.89 | 0.23 |
| Anatum | 2 | 5.26 | 0.15 |
| Johannesburg | 2 | 5.26 | 0.15 |
| Worthington | 2 | 5.26 | 0.15 |
| Agona | 1 | 2.63 | 0.08 |
| Cerro | 1 | 2.63 | 0.08 |
| Infantis | 1 | 2.63 | 0.08 |
| London | 1 | 2.63 | 0.08 |
| Manhattan | 1 | 2.63 | 0.08 |
| Ohio | 1 | 2.63 | 0.08 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Unidentified | 2 | 5.26 | 0.15 |
| ^a Total positive | 38 | | 2.86 |
| Total number of analyzed samples | 1329 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 3
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Cows/Bulls
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Montevideo | 2 | 33.33 | 0.36 |
| Bredeney | 1 | 16.67 | 0.18 |
| Meleagridis | 1 | 16.67 | 0.18 |
| Senftenber | 1 | 16.67 | 0.18 |
| Typhimurium 5- | 1 | 16.67 | 0.18 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 6 | | 1.07 |
| Total number of analyzed samples | 560 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 4
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Steers/Heifers
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Derby | 1 | 50.00 | 0.11 |
| Montevideo | 1 | 50.00 | 0.11 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Total positive | 2 | | 0.22 |
| Total number of analyzed samples | 914 | | |



Table 5
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Beef
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Dublin | 20 | 35.09 | 0.58 |
| Anatum | 4 | 7.02 | 0.12 |
| Montevideo | 4 | 7.02 | 0.12 |
| Kentucky | 3 | 5.26 | 0.09 |
| Senftenber | 3 | 5.26 | 0.09 |
| Typhimurium | 3 | 5.26 | 0.09 |
| Agona | 2 | 3.51 | 0.06 |
| Cerro | 2 | 3.51 | 0.06 |
| Mbandaka | 2 | 3.51 | 0.06 |
| Meleagridis | 2 | 3.51 | 0.06 |
| Typhimurium 5- | 2 | 3.51 | 0.06 |
| Other serotypes | 6 | 10.53 | 0.18 |
| Unidentified | 4 | 7.02 | 0.12 |
| ^a Total positive | 57 | | 1.67 |
| Total number of analyzed samples | 3422 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding



Table 6
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Chicken
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Kentucky | 7 | 43.75 | 5.74 |
| Berta | 2 | 12.50 | 1.64 |
| Enteritidis | 2 | 12.50 | 1.64 |
| 4,12:l:- | 1 | 6.25 | 0.82 |
| 4,5,12:i:- | 1 | 6.25 | 0.82 |
| 8,20:-:z6 | 1 | 6.25 | 0.82 |
| Newport | 1 | 6.25 | 0.82 |
| Typhimurium 5- | 1 | 6.25 | 0.82 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 16 | | 13.11 |
| Total number of analyzed samples | | 122 | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 7
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Turkey
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Hadar | 8 | 47.06 | 3.72 |
| III_18:z4,z23 | 2 | 11.76 | 0.93 |
| Reading | 2 | 11.76 | 0.93 |
| Senftenber | 2 | 11.76 | 0.93 |
| Albert | 1 | 5.88 | 0.47 |
| Mbandaka | 1 | 5.88 | 0.47 |
| Muenchen | 1 | 5.88 | 0.47 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 17 | | 7.91 |
| Total number of analyzed samples | 215 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 8
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Turkeys
All Samples – 1st Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| | 0 | 0.00 | 0.00 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Total positive | 0 | 0.00 | 0.00 |
| Total number of analyzed samples | 121 | | |



Table 9
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Broilers
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Kentucky | 82 | 44.81 | 2.43 |
| Enteritidis | 48 | 26.23 | 1.43 |
| Typhimurium 5- | 14 | 7.65 | 0.42 |
| Heidelberg | 13 | 7.10 | 0.39 |
| 4,5,12:i:- | 6 | 3.28 | 0.18 |
| Senftenber | 3 | 1.64 | 0.09 |
| Thompson | 3 | 1.64 | 0.09 |
| Typhimurium | 2 | 1.09 | 0.06 |
| 4,12:i:- | 1 | 0.55 | 0.03 |
| 8,20:-z6 | 1 | 0.55 | 0.03 |
| Berta | 1 | 0.55 | 0.03 |
| Bredeney | 1 | 0.55 | 0.03 |
| Hadar | 1 | 0.55 | 0.03 |
| Infantis | 1 | 0.55 | 0.03 |
| Litchfield | 1 | 0.55 | 0.03 |
| Montevideo | 1 | 0.55 | 0.03 |
| Tennessee | 1 | 0.55 | 0.03 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Unidentified | 3 | 1.64 | 0.09 |
| ^a Total positive | 183 | | 5.43 |
| Total number of analyzed samples | 3368 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 10
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Market Hogs
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Derby | 4 | 18.18 | 0.39 |
| Saintpaul | 4 | 18.18 | 0.39 |
| Johannesburg | 3 | 13.64 | 0.29 |
| Infantis | 2 | 9.09 | 0.20 |
| Typhimurium 5- | 2 | 9.09 | 0.20 |
| Anatum | 1 | 4.55 | 0.10 |
| Cerro | 1 | 4.55 | 0.10 |
| Choleraesuis | 1 | 4.55 | 0.10 |
| Heidelberg | 1 | 4.55 | 0.10 |
| Muenster | 1 | 4.55 | 0.10 |
| Ohio | 1 | 4.55 | 0.10 |
| Typhimurium | 1 | 4.55 | 0.10 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 22 | | 2.15 |
| Total number of analyzed samples | 1023 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 11
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Cows/Bulls
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| | 0 | 0.00 | 0.00 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Total positive | 0 | 0.00 | 0.00 |
| Total number of analyzed samples | 293 | | |



Table 12
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Steers/Heifers
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Anatum | 2 | 100.00 | 0.16 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Total positive | 2 | | 0.16 |
| Total number of analyzed samples | 1222 | | |



Table 13
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Beef
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Montevideo | 17 | 36.17 | 0.78 |
| Dublin | 6 | 12.77 | 0.28 |
| Typhimurium | 4 | 8.51 | 0.18 |
| Cerro | 2 | 4.26 | 0.09 |
| Newport | 2 | 4.26 | 0.09 |
| Typhimurium 5- 3,10:-1,7 | 2 | 4.26 | 0.09 |
| III_18:24,z23:- | 1 | 2.13 | 0.05 |
| Agona | 1 | 2.13 | 0.05 |
| Anatum | 1 | 2.13 | 0.05 |
| Anatum var. 15+ | 1 | 2.13 | 0.05 |
| Fresno | 1 | 2.13 | 0.05 |
| Give var. 15+ | 1 | 2.13 | 0.05 |
| Hartford | 1 | 2.13 | 0.05 |
| Jodhpur | 1 | 2.13 | 0.05 |
| Kentucky | 1 | 2.13 | 0.05 |
| Mbandaka | 1 | 2.13 | 0.05 |
| Muenster | 1 | 2.13 | 0.05 |
| Saintpaul | 1 | 2.13 | 0.05 |
| Other serotypes | 0 | 0.00 | 0.00 |
| Unidentified | 1 | 2.13 | 0.05 |
| ^a Total positive | 47 | | 2.15 |
| Total number of analyzed samples | 2181 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 14
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Chicken
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| 4,12:i:- | 2 | 25.00 | 3.85 |
| Enteritidis | 2 | 25.00 | 3.85 |
| Kentucky | 2 | 25.00 | 3.85 |
| Ohio | 1 | 12.50 | 1.92 |
| Typhimurium 5- | 1 | 12.50 | 1.92 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 8 | | 15.38 |
| Total number of analyzed samples | | 52 | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Table 15
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Ground Turkey
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| III 18:z4,z32:- | 6 | 50.00 | 3.68 |
| Albany | 1 | 8.33 | 0.61 |
| Anatum | 1 | 8.33 | 0.61 |
| Heidelberg | 1 | 8.33 | 0.61 |
| Montevideo | 1 | 8.33 | 0.61 |
| Saintpaul | 1 | 8.33 | 0.61 |
| Schwarzengrund | 1 | 8.33 | 0.61 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 12 | | 7.36 |
| Total number of analyzed samples | 163 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



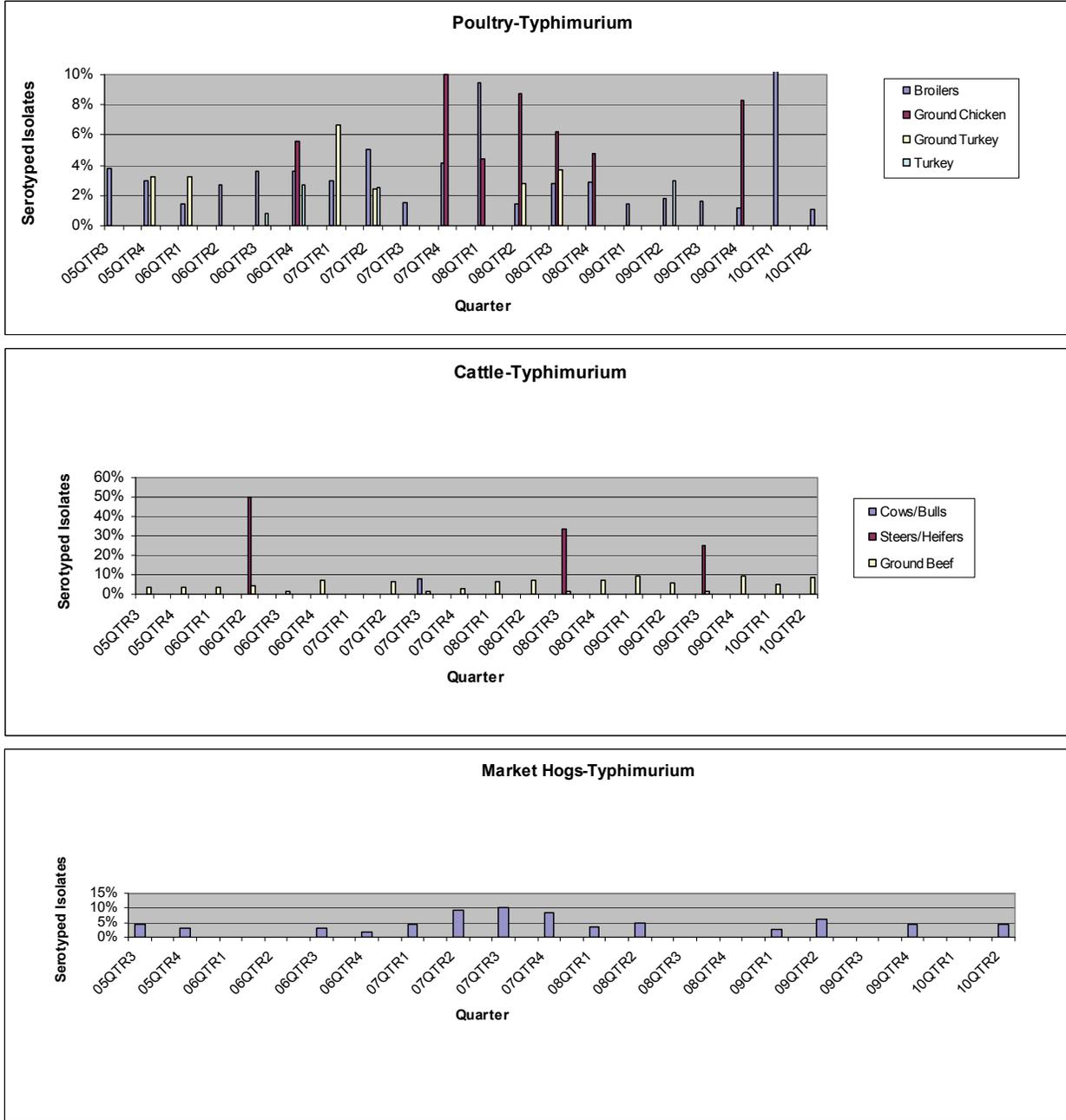
Table 16
Profile of Serotypes from Analyzed PR/HACCP Verification Samples by Quarter.
Turkeys
All Samples –2nd Quarter 2010

| Serotypes | # Isolates | % of Total Positive | % Analyzed Samples |
|----------------------------------|------------|---------------------|--------------------|
| Hadar | 7 | 28.00 | 1.00 |
| Berta | 2 | 8.00 | 0.29 |
| Brandenburg | 2 | 8.00 | 0.29 |
| Heidelberg | 2 | 8.00 | 0.29 |
| Saintpaul | 2 | 8.00 | 0.29 |
| Schwarzengrund | 2 | 8.00 | 0.29 |
| Agona | 1 | 4.00 | 0.14 |
| Alachua | 1 | 4.00 | 0.14 |
| Albany | 1 | 4.00 | 0.14 |
| Anatum var. 15+ | 1 | 4.00 | 0.14 |
| Enteriditis | 1 | 4.00 | 0.14 |
| Muenchen | 1 | 4.00 | 0.14 |
| Newport | 1 | 4.00 | 0.14 |
| Typhimurium 5- | 1 | 4.00 | 0.14 |
| Other serotypes | 0 | 0.00 | 0.00 |
| ^a Total positive | 25 | | 3.59 |
| Total number of analyzed samples | 697 | | |

^a The percentages listed for total positive isolates may not equal the sum of percent analyzed samples due to rounding.



Figure 1
Quarterly Percent of Typhimurium Isolates by Product Class, 2005-2010*
All Samples

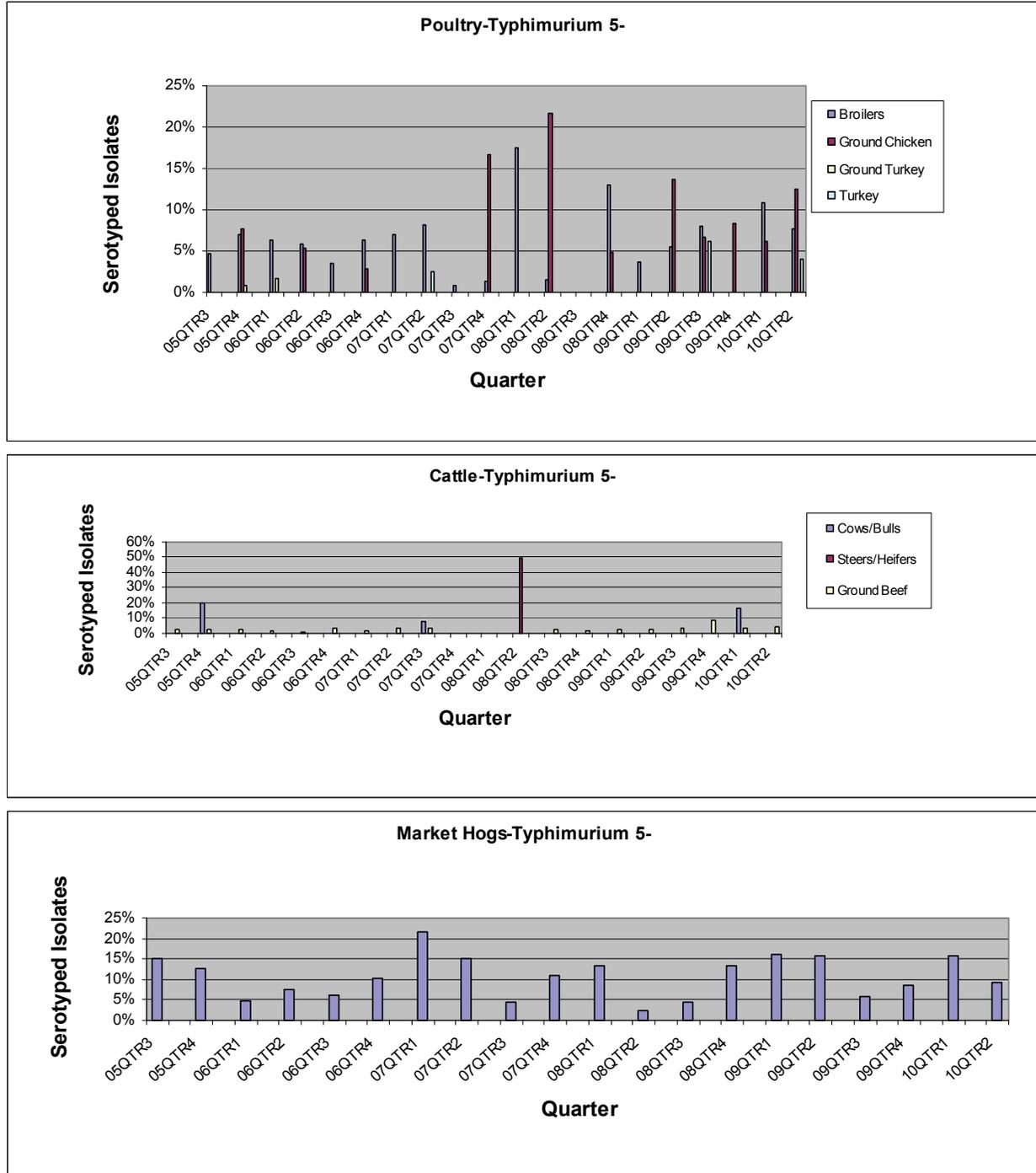


*Please note that the y-axis percent varies from graph to graph.

Source: USDA, FSIS, PR/HACCP



Figure 2
Quarterly Percent of Typhimurium 5-** Isolates by Product Class, 2005-2010*
All Samples



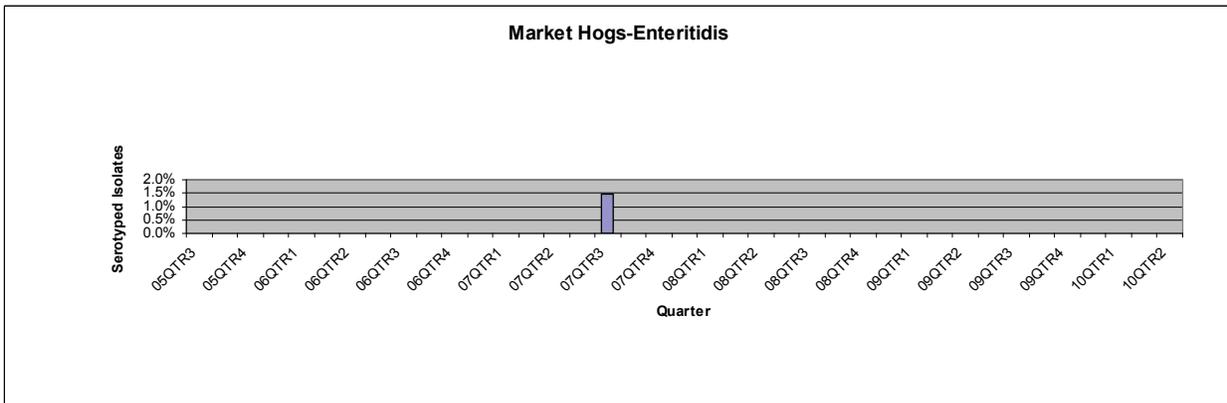
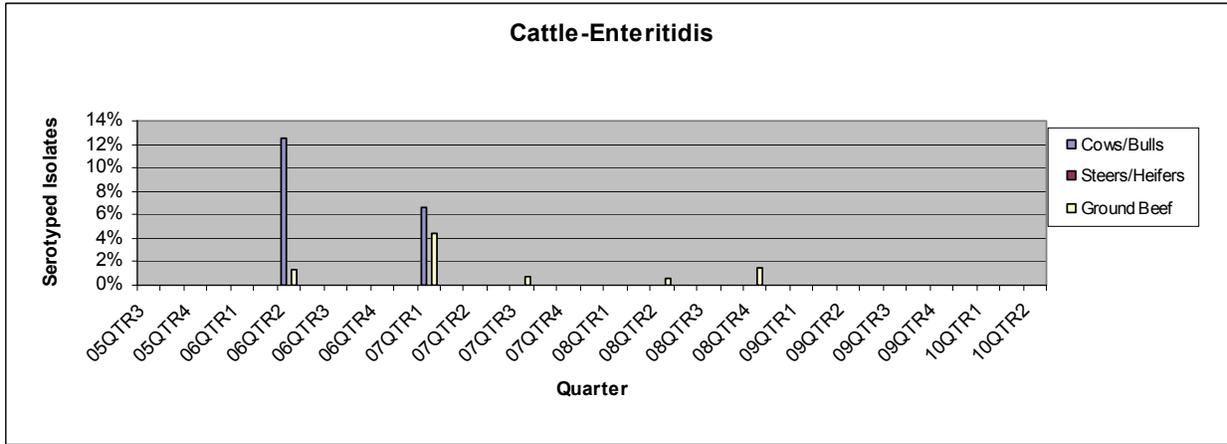
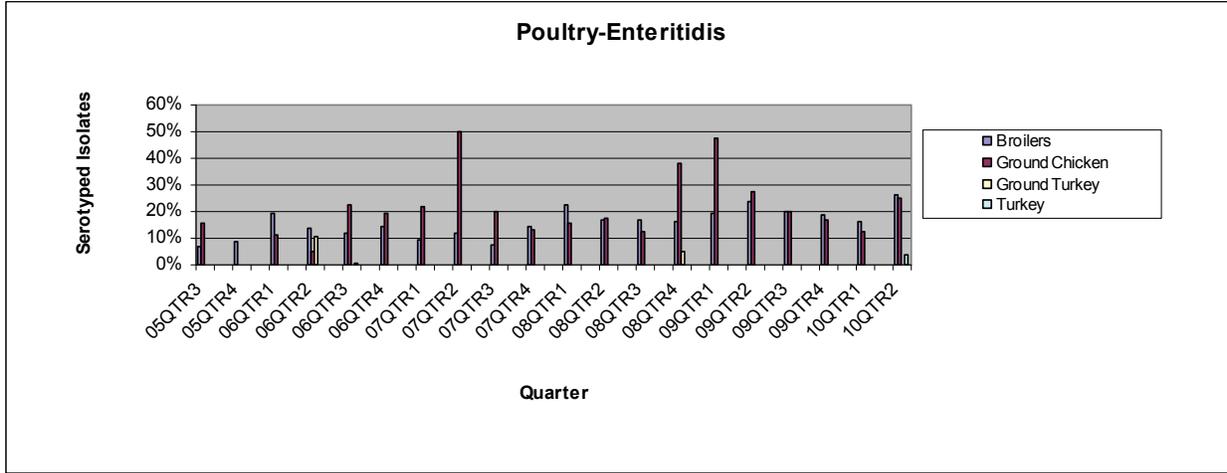
*Please note that the y-axis percent varies from graph to graph.

** Formerly Typhimurium var. Copenhagen

Source: USDA, FSIS, PR/HACCP



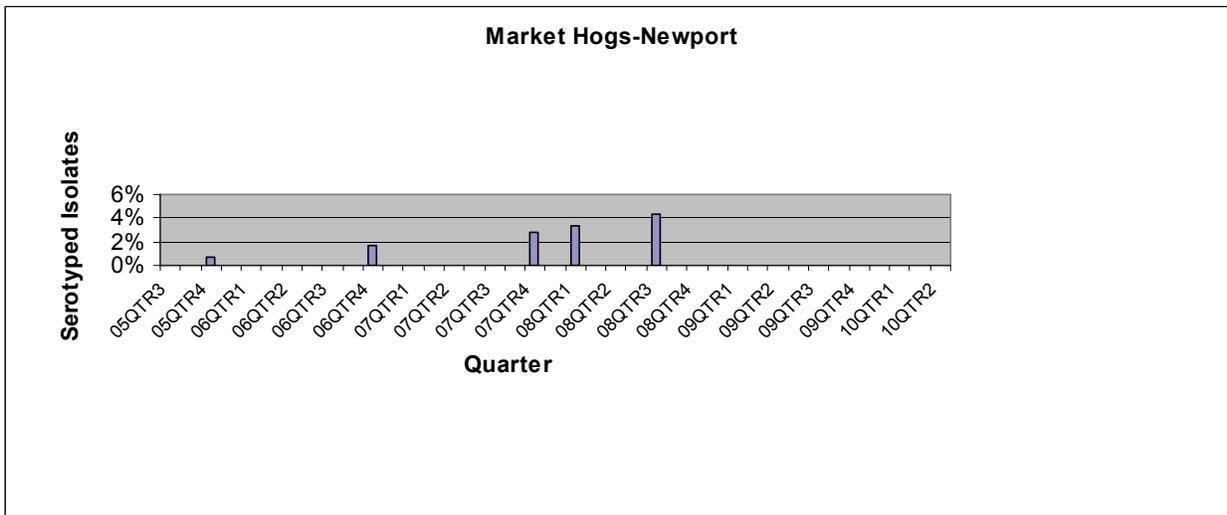
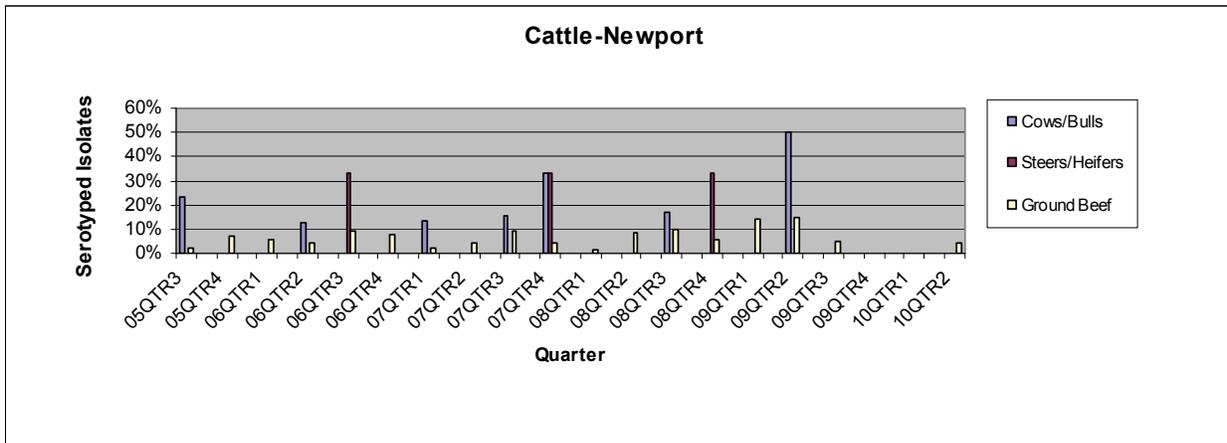
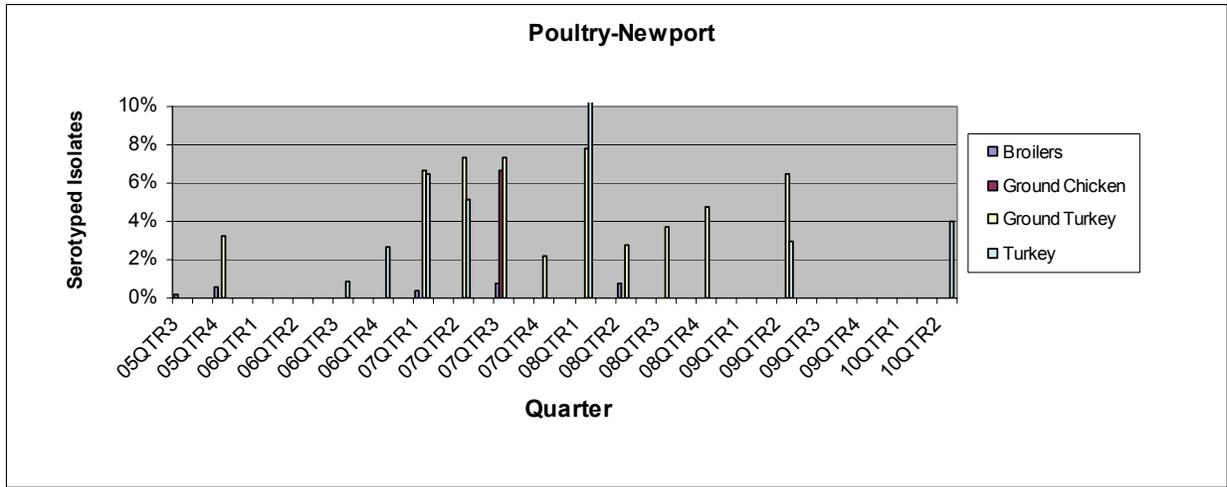
Figure 3
Quarterly Percent of Enteritidis Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP



Figure 4
Quarterly Percent of Newport Isolates by Product Class, 2005-2010*
All Samples

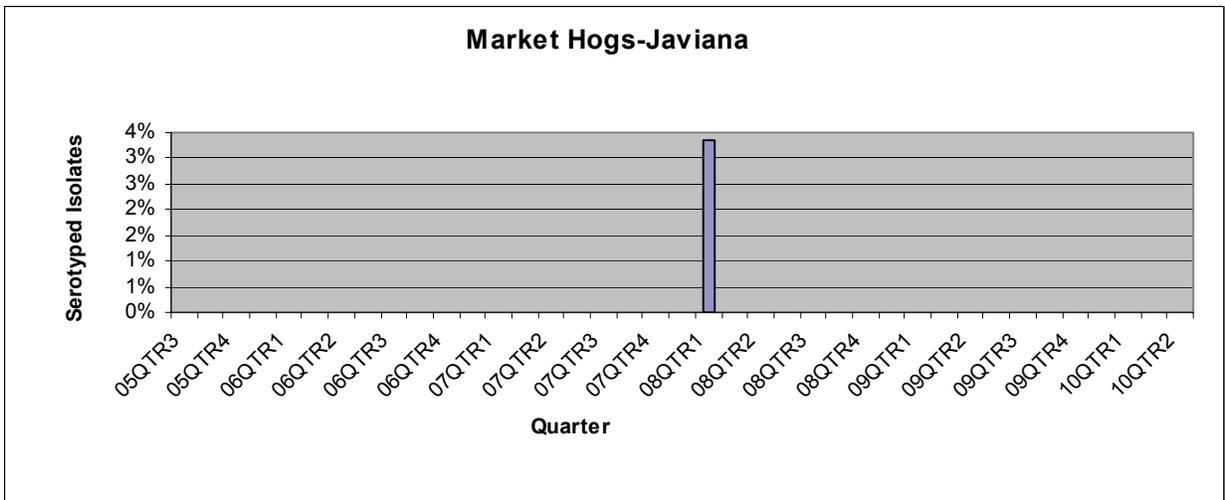
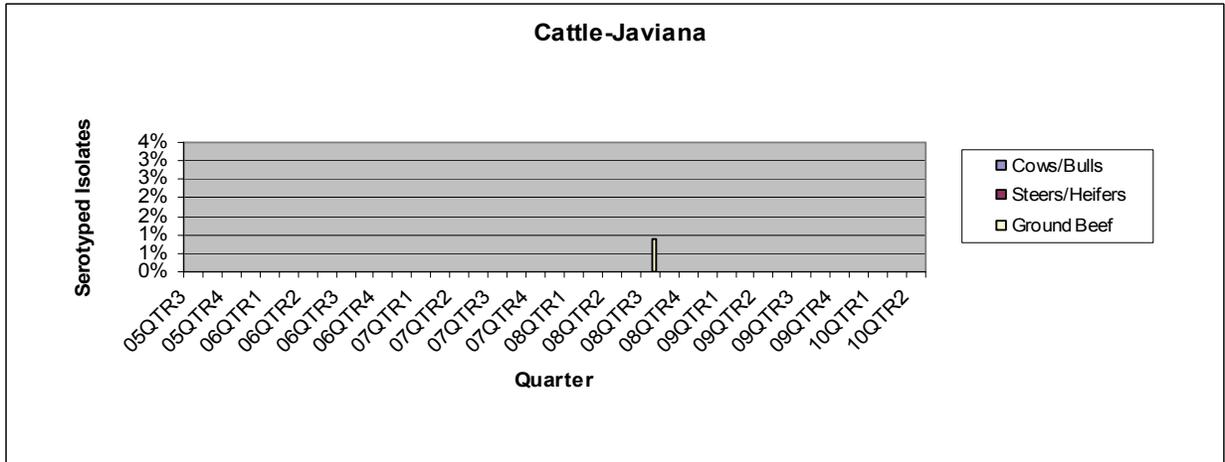
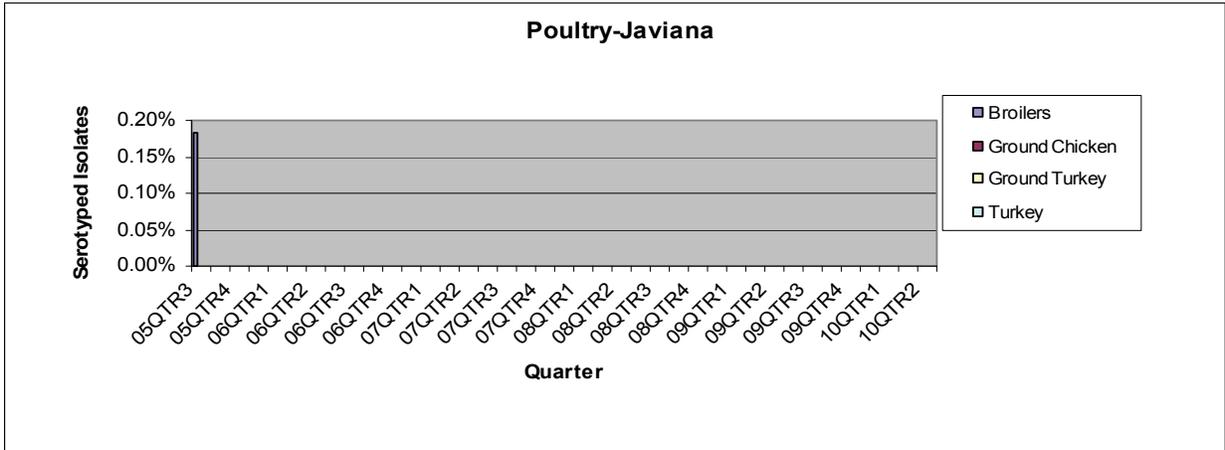


*Please note that the y-axis percent varies from graph to graph.

Source: USDA, FSIS, PR/HACCP



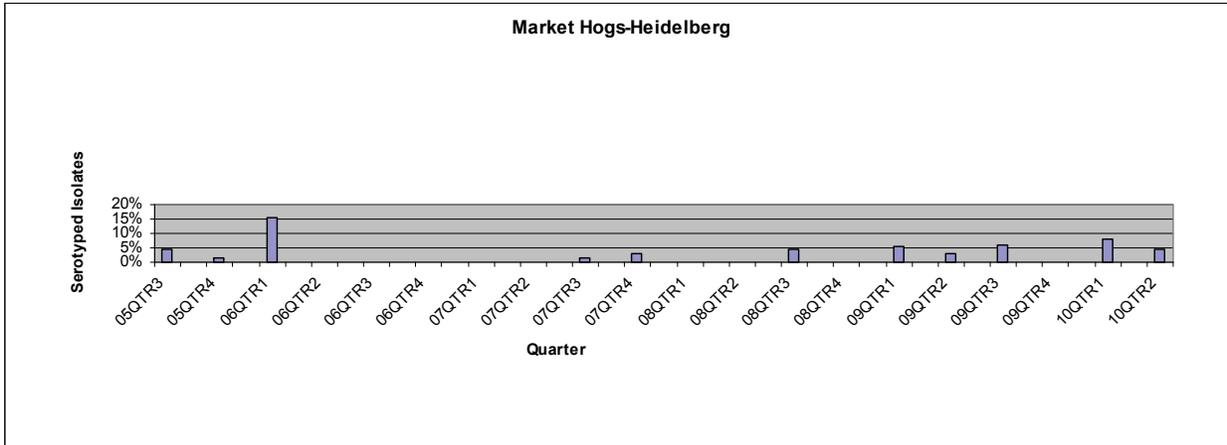
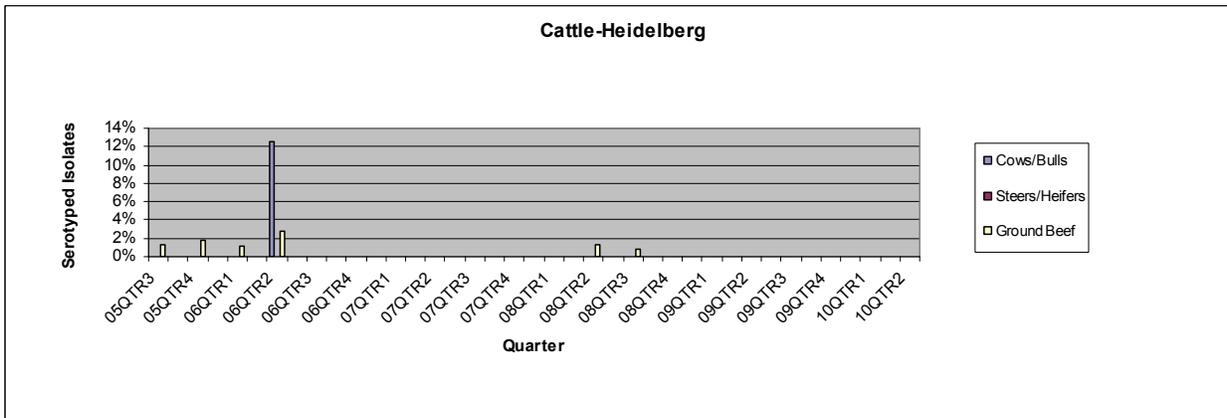
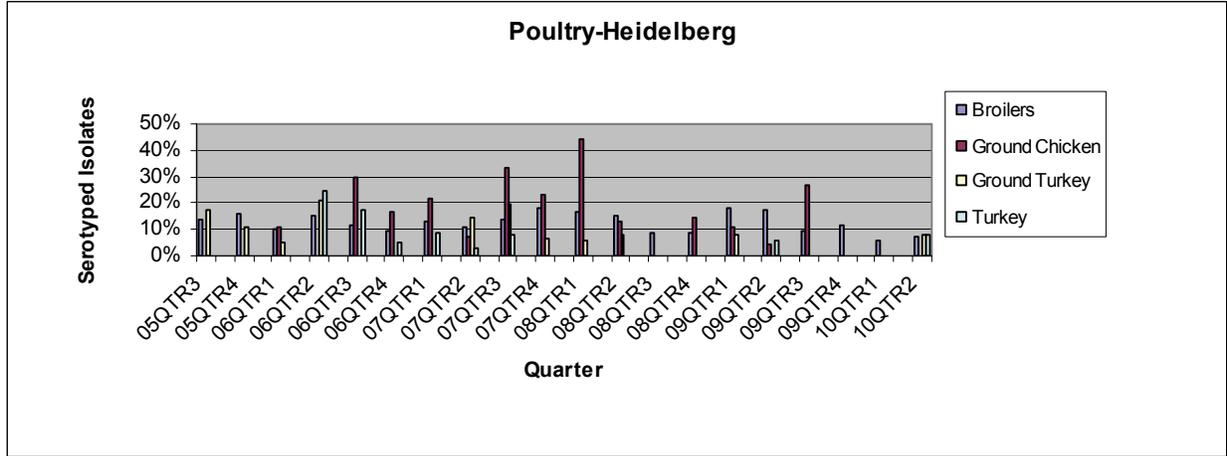
Figure 5
Quarterly Percent of Javiana Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph
Source: USDA, FSIS, PR/HACCP



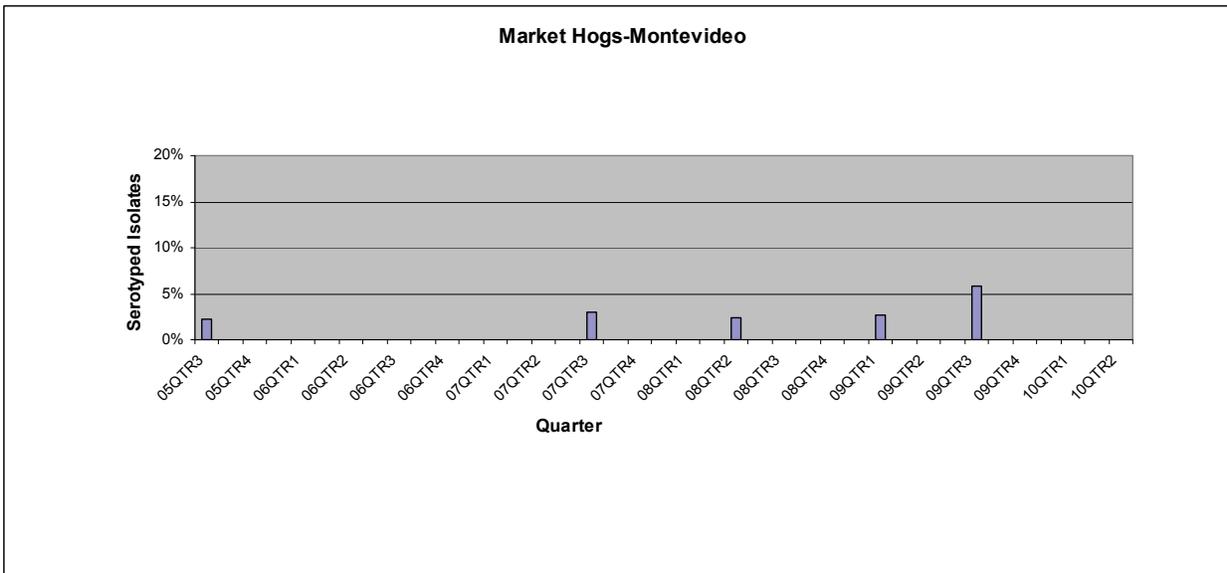
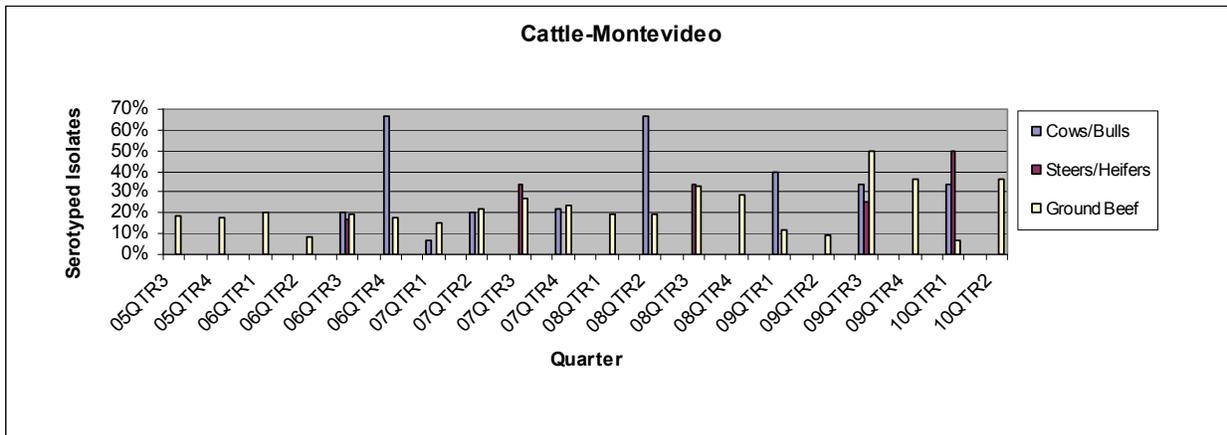
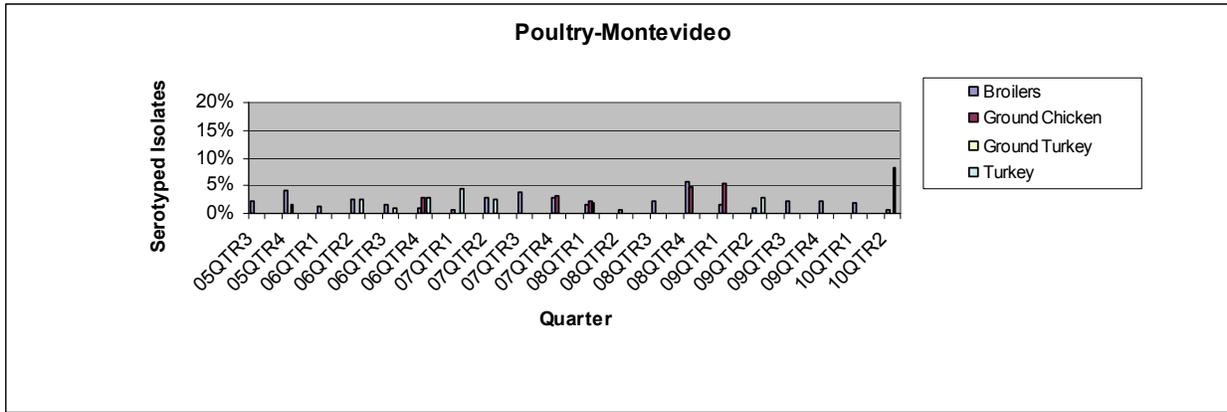
Figure 6
Quarterly Percent of Heidelberg Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP



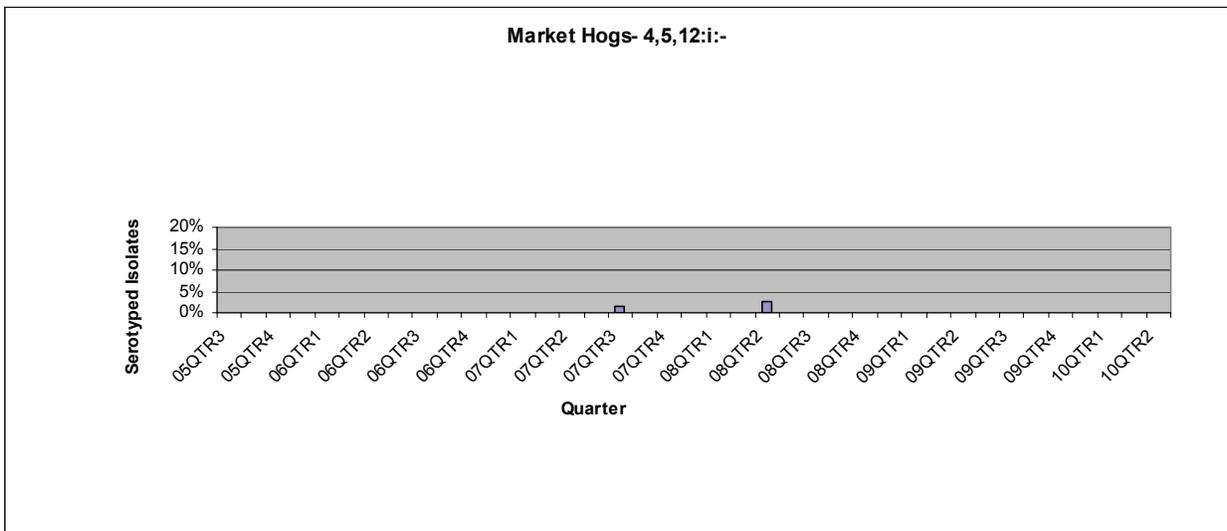
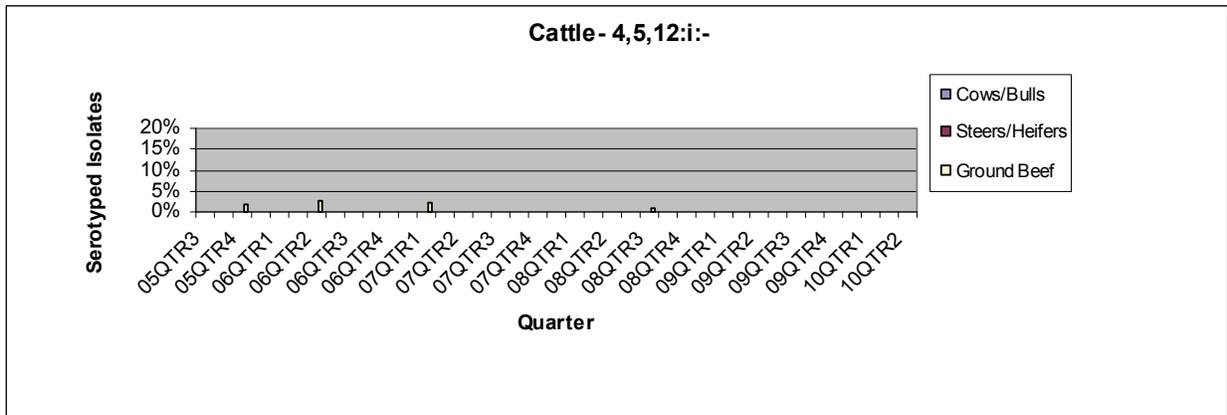
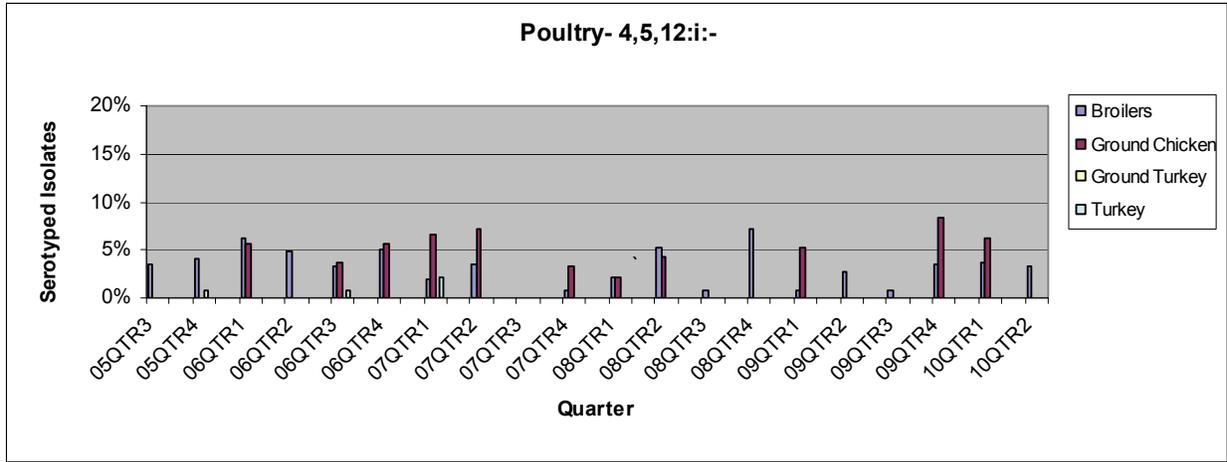
Figure 7
Quarterly Percent of Montevideo Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP



Figure 8 Quarterly Percent of 4,5,12:i- Isolates by Product Class, 2005-2010* All Samples

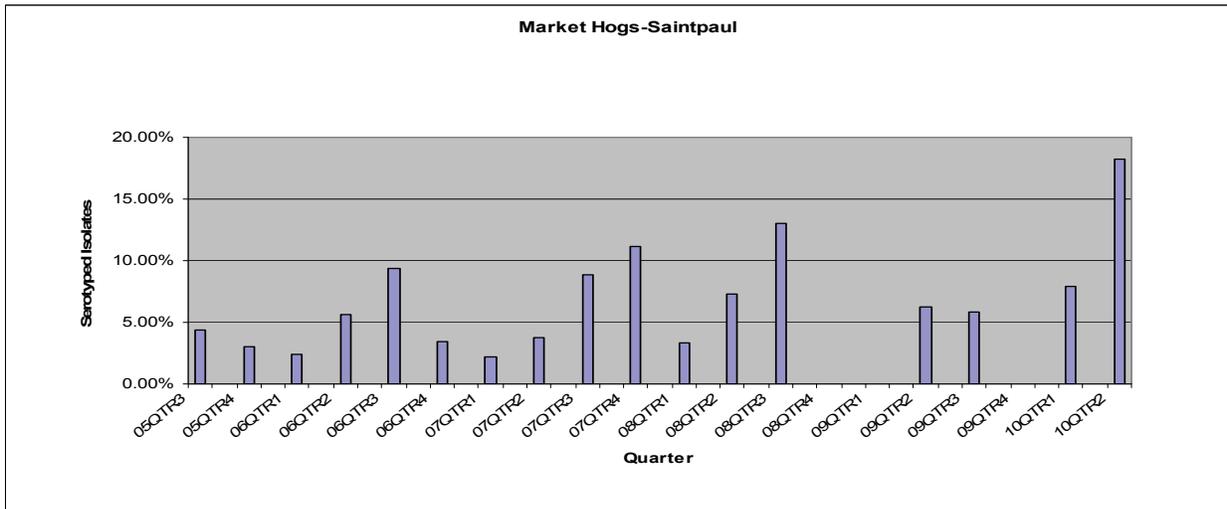
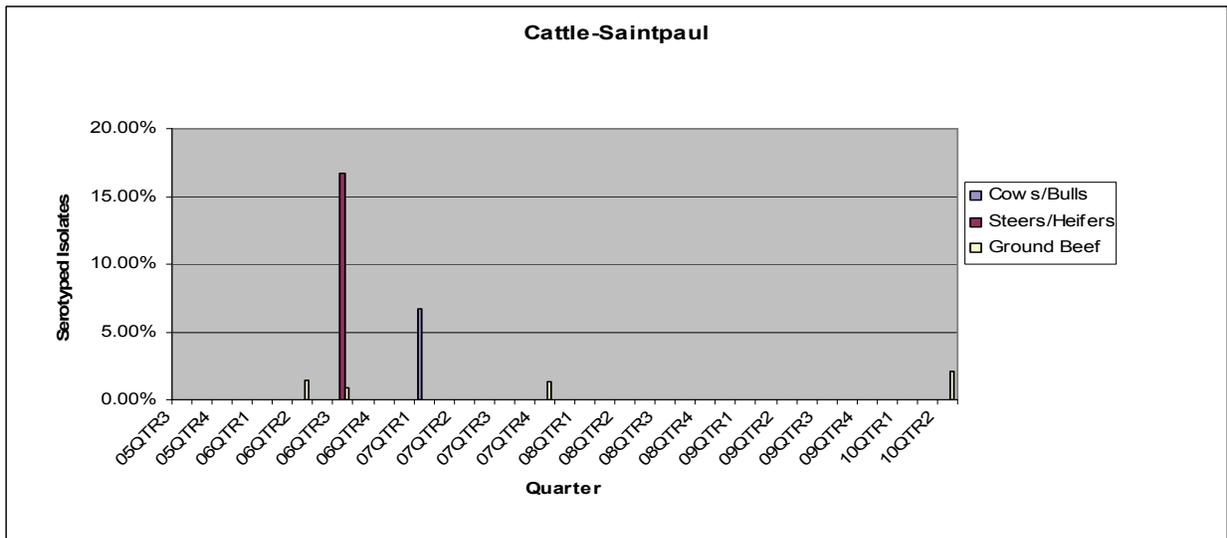
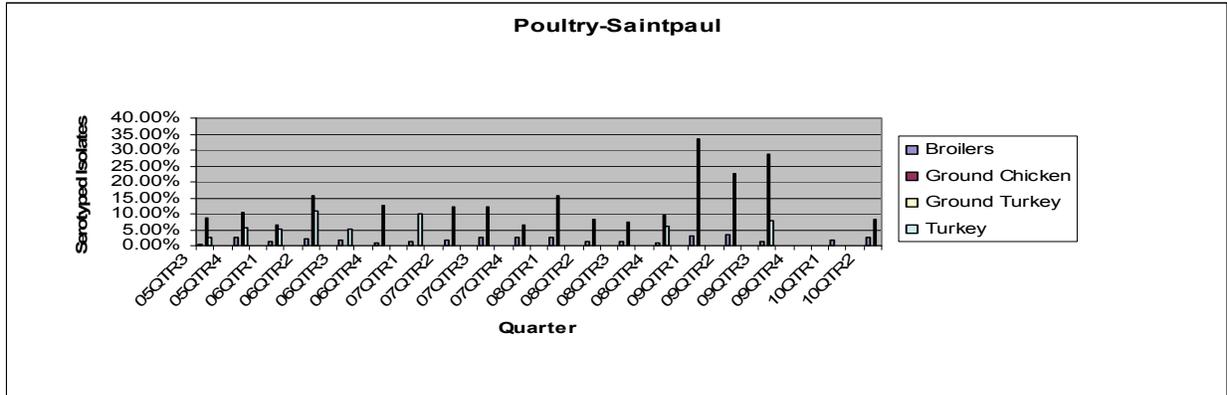


*Please note that the y-axis percent varies from graph to graph.

Source: USDA, FSIS, PR/HACCP



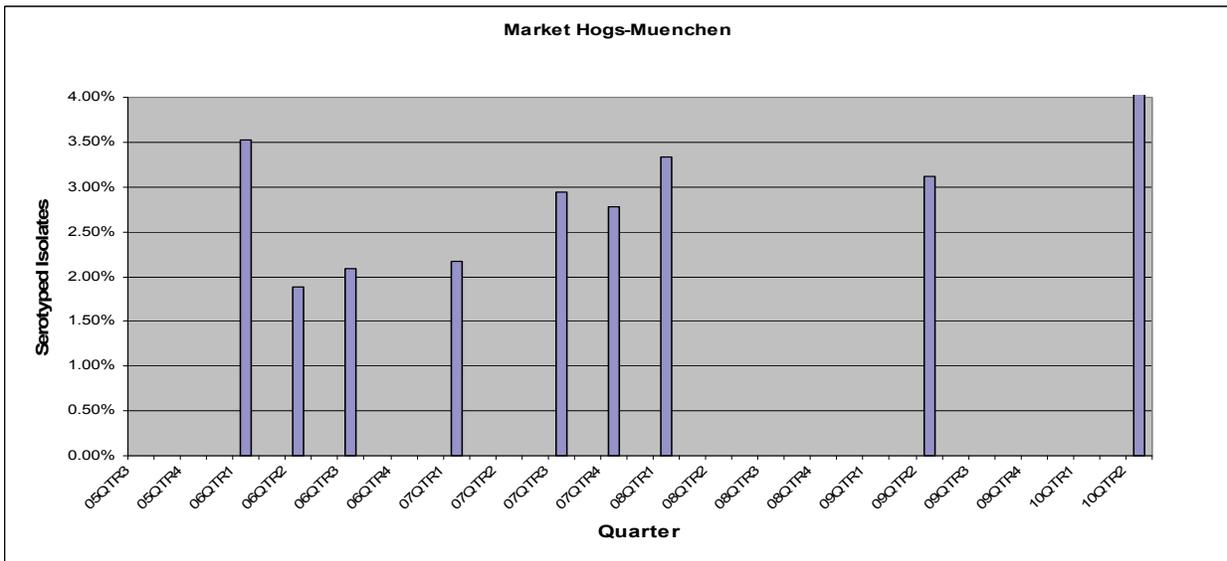
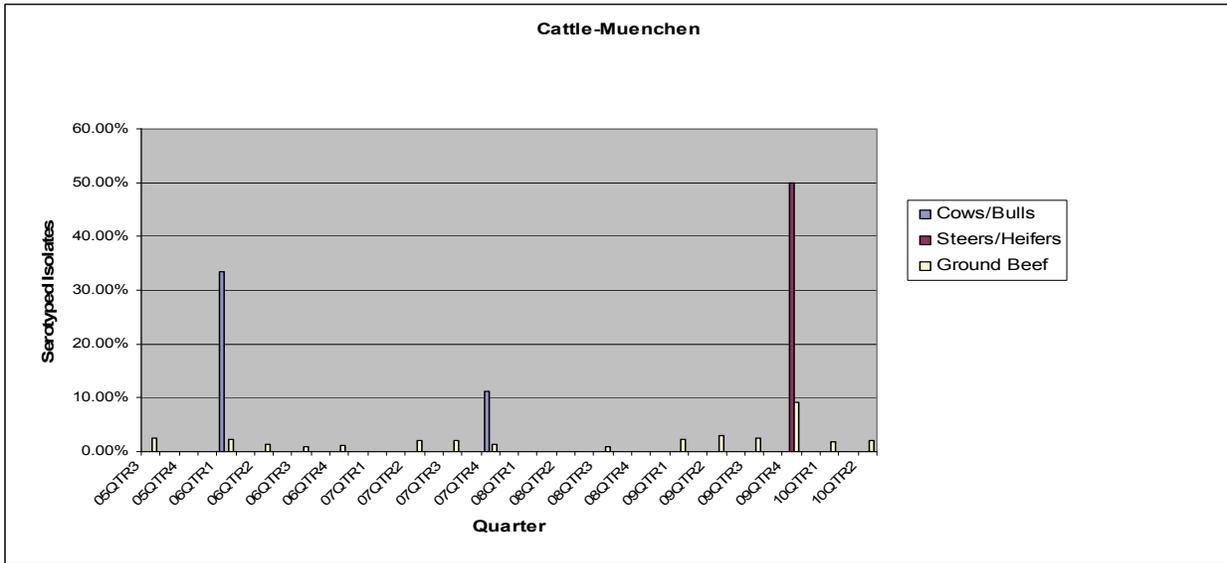
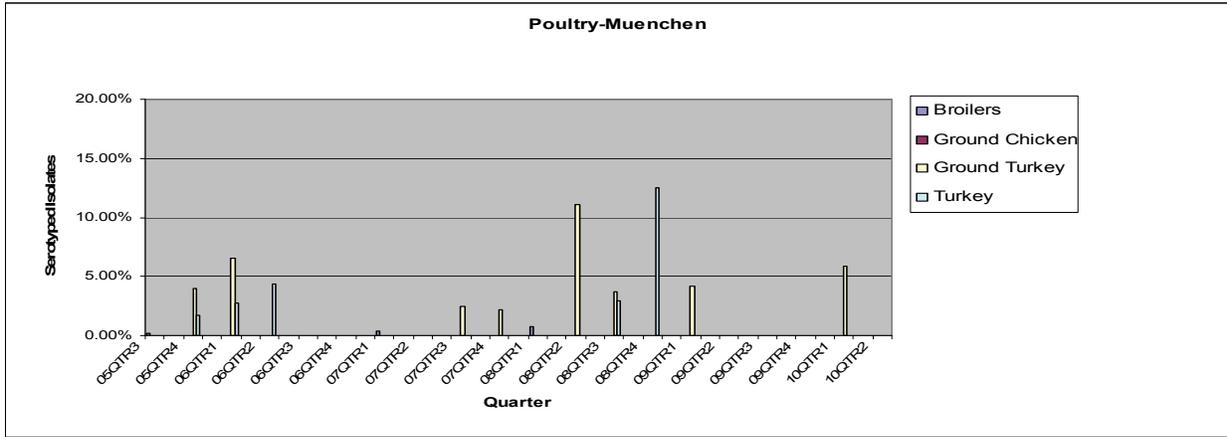
Figure 9
Quarterly Percent of Saintpaul Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP



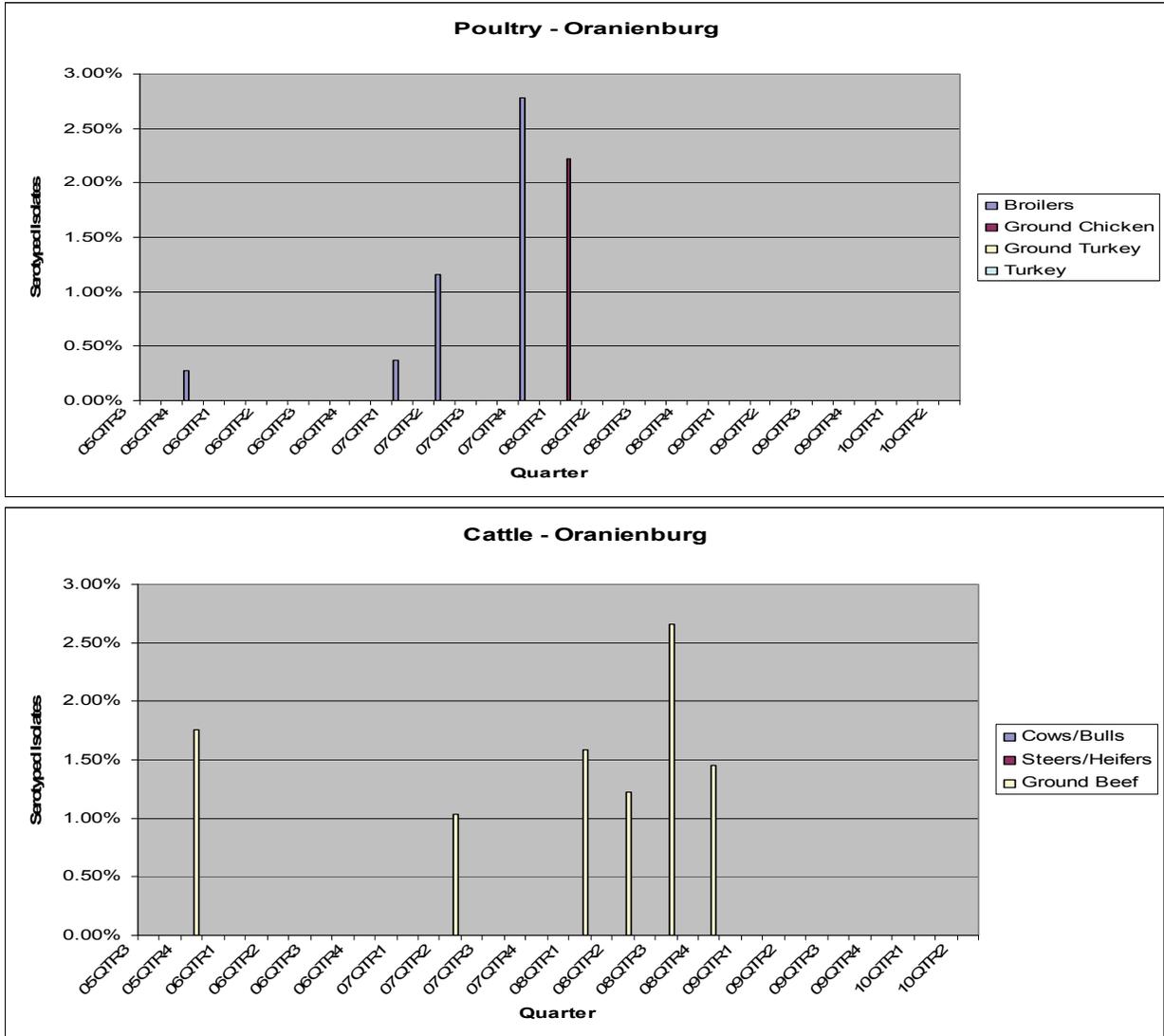
Figure 10
Quarterly Percent of Muenchen Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP



Figure 11
Quarterly Percent of Oranienburg Isolates by Product Class, 2005-2010*
All Samples



*Please note that the y-axis percent varies from graph to graph.
Source: USDA, FSIS, PR/HACCP

Market Hogs – Oranienburg: There were no positive samples reported.