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# Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

## Quarterly Summary: *Salmonella* in Agri-food

## Quarter Three 2011: July - September 2011


***... working towards the preservation of effective antimicrobials for humans and animals…***

Canada

# Preamble

1. The purpose of the quarterly summary is to provide more timely data about *Salmonella* serovars recovered from CIPARS agri-food components. No human data and no data about antimicrobial resistance are included.

2. Data were extracted from CIPARS through DEXA October 26, 2011. The observed counts for the current quarter were updated with data pulled directly from the *Salmonella* Typing Laboratory (Laboratory for Foodborne Zoonoses, Guelph, ON) October 26, 2011. ***All data presented are preliminary***; counts may change in subsequent reports as more data become available.

3. The data presented in this report are from the following CIPARS surveillance components:

   ***Abattoir***
   Abattoir Surveillance involves the collection of caecal contents from slaughtered food animals (chickens, pigs and beef cattle) from across Canada. *Salmonella* are isolated from chickens and pigs only.

   ***Retail Meat***
   Retail Meat Surveillance involves the collection of chicken, pork and beef at retail stores in British Columbia, Saskatchewan, Ontario, Québec, and the Maritime provinces. *Salmonella* are isolated from chicken and pork only. In February 2011, sampling of ground turkey was added to the retail meat component; retail turkey *Salmonella* data have been added to Table 4 (*Salmonella* isolates from other animal species (not chicken or porcine)).

   ***Animal Clinical Isolates***
   Surveillance of Animal Clinical Isolates involves the collection of data about *Salmonella* isolates from local or provincial animal health laboratories across Canada that are submitted to the Laboratory for Foodborne Zoonoses (LFZ) for further characterisation.

   ***Farm***
   Farm Surveillance uses a sentinel farm framework to collect pooled swine fecal samples in Alberta, Saskatchewan, Manitoba, Ontario and Québec

   ***Research and Monitoring***
   Research and Monitoring includes *Salmonella* isolates that are submitted to LFZ for further characterisation. These isolates originate from specific research projects carried out at various universities and government agencies across Canada, as well as *Salmonella* that are isolated as part of government monitoring programs. These isolates may have originated from animal, environmental, or feed and ingredient samples.

   For more detail about the CIPARS agri-food surveillance components and methods used, please see: http://www.phac-aspc.gc.ca/cipars-picra/pdf/cipars-picra-2007-eng.pdf (page 87)

4. The listed serovars are those observed in the current quarter **ONLY**. Consequently, the total number of *Salmonella* isolates in previous quarters is not equal to the sum of the serovar count numbers presented here. Please refer to earlier quarterly summaries for counts of serovars that were not isolated in this quarter.

5. The “expected” value (Exp) is the median count by quarter (based on all previous full years of data and excluding the current year). The reference years used to calculate these values will be updated as new surveillance components are added or if changes are made to the existing components (Tables 2, 3, 4).
   a. Retail median values are based on 2008-2010 data only because provinces were added in 2005 (Saskatchewan), 2007 (British Columbia), and 2008 (Maritimes).
   b. Where the expected count is 0, that serovar has not been seen previously in that quarter for that species/surveillance component group pair.

c. Where the expected count is missing (= '.'), that serovar has not been seen before the current year in that species for that surveillance component group.
d. No expected values are provided for the research and monitoring sections as these submissions change from month to month.

6. Highlighted cells:
    a. Yellow cells indicate where:
        i. The number of isolates observed in a quarter is greater than the 75$^{th}$ percentile for that quarter based on counts in all full previous years.
        ii. Serovar information has not yet been determined (i.e. 'Pending')
    b. Red cells indicate where:
        i. The number of isolates observed is more than has ever been reported in **ANY** quarter for that serovar in that species/component group pair.
        ii. A new serovar is identified in a species/component group pair where it has **NOT** been observed previously.

7. Table 1 lists the serovars that we expected to see but were **NOT** observed in the current quarter (i.e. >1 isolate expected per quarter for each species and component pair).

8. New in 2011, we have added a table of the *S*. Enteritidis phagetypes observed in the current quarter (Table 5).

9. Special feature: In each Quarterly Report we present isolates from a selected surveillance component/species pair. These are selected because of the historical number of isolates submitted to the *Salmonella* Typing Laboratory, perceived increases in the number of isolates or because of interest from readers. For these selected species, ALL serovars recovered in the quarters presented are shown (not only those in the current quarter).
    a. For Quarter Three 2011, we present diagnostic *Salmonella* isolates from cattle (Table 6).

10. If you have any questions about the information presented in the report or if you have suggestions for improving the report or topics for the Special Feature, please contact us at cipars-picra@phac-aspc.gc.ca.

**Table 1. Serovars expected but not observed in Quarter Three (by species/surveillance component pair); CIPARS 2011.**

| Surveillance Component [1] | Chicken | Porcine | Other |
|---|---|---|---|
| Abattoir | Kiambu | Brandenburg<br>Schwarzengrund<br>Typhimurium | |
| Retail | Typhimurium | | |
| Animal Clinical | | Infantis<br>Senftenberg | Senftenberg |
| Farm | | Brandenburg<br>Infantis<br>Typhimurium | |

[1] Further information about the surveillance components is included in item 3 of the report preamble.

**Table 2. *Salmonella* isolates from chicken samples; third quarter 2010-third quarter 2011.**

| Serovar | 2011 | | | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | | Q2 | | Q3 | | Q3 | | Q4 | |
| | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp |
| **Abattoir[1]** | | | | | | | | | | |
| Agona | 0 | 0.5 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 1 |
| Alachua | 0 | . | 0 | . | **1** | **.** | 0 | . | 0 | . |
| Derby | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Enteritidis | 7 | 4 | **9** | **3.5** | 9 | 3.5 | 3 | 4 | **12** | **5** |
| Hadar | 1 | 2.5 | **3** | **1.5** | 2 | 3 | 0 | 3 | 0 | 3 |
| Heidelberg | 4 | 9.5 | 3 | 9 | 4 | 11.5 | 9 | 12 | 7 | 11 |
| I 4,[5],12:i:- | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| Kentucky | 18 | 16 | 16 | 15.5 | 5 | 18 | **25** | **17** | 13 | 17 |
| Montevideo | 0 | 0.5 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Total *Salmonella* | 41 | 49 | 32 | 35.5 | 26 | 45 | 43 | 47 | 44 | 48 |
| **Retail[1]** | | | | | | | | | | |
| Enteritidis | 21 | 23 | 11 | 11 | 4 | 23 | 14 | 24.5 | 13 | 18 |
| Hadar | **7** | **6** | **5** | **2** | 4 | 12 | 12 | 10 | 4 | 5.5 |
| Heidelberg | 26 | 34 | 12 | 20 | 14 | 24 | 24 | 33 | 28 | 32 |
| I 8,20:i:- | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0.5 | 0 | 1.5 |
| I Rough:i:z6 | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 1 | 1 |
| Infantis | **3** | **1** | 0 | 0 | 1 | 1 | 0 | 1.5 | 3 | 3 |
| Kentucky | 44 | 25 | 30 | 23 | 23 | 32 | 28 | 34.5 | **34** | **23.5** |
| Kiambu | 2 | 3 | 2 | 1 | **3** | **1** | 1 | 1 | 0 | 0.5 |
| Montevideo | 1 | 1 | 0 | 0 | **1** | **0** | 0 | 0 | **2** | **0.5** |
| Schwarzengrund | 3 | 2 | 0 | 1 | 3 | 3 | 3 | 3.5 | 1 | 2 |
| Pending | 0 | . | 0 | . | **16** | **.** | 0 | . | 0 | . |
| Total *Salmonella* | 135 | 117 | 67 | 87 | 71 | 111 | 105 | 124 | 104 | 98 |
| **Animal Clinical Isolates[1]** | | | | | | | | | | |
| Agona | 0 | 0 | 0 | 0 | **1** | **0** | **1** | **0** | 0 | 0 |
| Braenderup | 0 | 0 | 0 | 0 | **1** | **0** | **1** | **0** | **1** | **0** |
| Enteritidis | **49** | **18** | **35** | **9.5** | **21** | **7** | 20 | 5 | **32** | **9** |
| Heidelberg | **19** | **7.5** | 10 | 9 | **15** | **5.5** | **22** | **5** | **19** | **5** |
| I 4,[5],12:-:- | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Infantis | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | **1** | **0** |
| Kentucky | **12** | **7.5** | 5 | 2.5 | 4 | 4 | **9** | **4** | **11** | **1** |
| Orion var.15+34+ | **1** | **0** | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Typhimurium var. 5- | **2** | **0** | 0 | 0 | **2** | **0** | 0 | 0 | 0 | 0 |
| Total *Salmonella* | 90 | 42 | 55 | 30.5 | **67** | **31.5** | **65** | **28** | **63** | **22** |
| **Research and Monitoring[1]** | | | | | | | | | | |
| Agona | 0 | | 0 | | 1 | | 0 | | 4 | |
| Braenderup | 4 | | 1 | | 6 | | 3 | | 1 | |
| Enteritidis | 101 | | 25 | | 53 | | 42 | | 49 | |
| Hadar | 4 | | 3 | | 35 | | 5 | | 4 | |
| Heidelberg | 80 | | 35 | | 97 | | 104 | | 54 | |
| I 4,[5],12:-:- | 0 | | 0 | | 1 | | 0 | | 0 | |
| I 4,[5],12:b:- | 0 | | 0 | | 4 | | 0 | | 0 | |
| I 4,[5],12:r:- | 1 | | 0 | | 1 | | 1 | | 0 | |
| I 6,7:z10:- | 0 | | 0 | | 1 | | 0 | | 0 | |
| I Rough:r:- | 0 | | 0 | | 1 | | 1 | | 1 | |
| Infantis | 5 | | 8 | | 5 | | 7 | | 3 | |
| Kentucky | 109 | | 55 | | 175 | | 113 | | 105 | |
| Kiambu | 0 | | 1 | | 4 | | 5 | | 3 | |
| Mbandaka | 12 | | 3 | | 6 | | 13 | | 6 | |
| Newport | 0 | | 0 | | 4 | | 0 | | 0 | |
| Orion var.15+34+ | 6 | | 2 | | 4 | | 0 | | 4 | |
| Schwarzengrund | 4 | | 0 | | 3 | | 5 | | 2 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Senftenberg | 9 | | 7 | | 9 | | 2 | | 10 | |
| Tennessee | 0 | | 0 | | 1 | | 2 | | 0 | |
| Thompson | 4 | | 1 | | 4 | | 5 | | 4 | |
| Typhimurium | 4 | | 1 | | 2 | | 11 | | 11 | |
| Typhimurium var. 5- | 0 | | 0 | | 6 | | 4 | | 2 | |
| Total *Salmonella* | 409 | | 156 | | 423 | | 325 | | 269 | |

[1] Further information about the surveillance components is included in item 3 of the report preamble.

**Table 3. *Salmonella* isolates from porcine samples; third quarter 2010 - third quarter 2011.**

| Serovar | 2011 | | | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | | Q2 | | Q3 | | Q3 | | Q4 | |
| | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp |
| **Abattoir[1]** | | | | | | | | | | |
| Albany | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Anatum | 1 | 1 | 0 | 0 | **2** | **0** | 0 | 0 | 1 | 1 |
| Bovismorbificans | 0 | 1.5 | **3** | **0.5** | 3 | 1 | 1 | 1 | 1 | 1 |
| Cerro | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Derby | 12 | 11 | 13 | 11 | 8 | 6.5 | 5 | 7 | 8 | 9 |
| Give | 0 | 1 | 1 | 1.5 | 1 | 0.5 | 1 | 0 | 1 | 0 |
| Havana | 0 | 0 | 0 | 0 | **1** | **0** | **1** | **0** | **2** | **0** |
| Heidelberg | 1 | 0.5 | 2 | 1 | 2 | 1.5 | 0 | 2 | 0 | 2 |
| I 4,[5],12:i:- | **2** | **1** | 0 | 0 | **2** | **0** | 1 | 0 | 1 | 0 |
| Infantis | 5 | 3 | 5 | 3 | 6 | 3 | **11** | **2** | **4** | **2** |
| Muenster | 0 | 0 | 0 | 0 | **1** | **0** | **1** | **0** | 0 | 0 |
| Ohio | 0 | 0.5 | 0 | 0 | **2** | **1** | **2** | **1** | 1 | 0 |
| Typhimurium var. 5- | 4 | 4 | 5 | 7 | 3 | 6.5 | 7 | 6 | 3 | 5 |
| Uganda | 0 | 0 | 0 | 0 | **3** | **0** | 0 | 0 | 0 | 0 |
| Worthington | 1 | 0.5 | 2 | 1.5 | 2 | 1 | **4** | **1** | 1 | 0 |
| Total *Salmonella* | 40 | 44.5 | 47 | 37 | 38 | 52.5 | 37 | 52 | 38 | 35 |
| **Retail[1]** | | | | | | | | | | |
| Bovismorbificans | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Derby | 0 | 0.5 | **3** | **0.5** | **3** | **0** | 0 | 0 | 1 | 0 |
| I 4,[5],12:i:- | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Infantis | **1** | **0** | **1** | **0** | **1** | **0** | 0 | 0 | 0 | 0 |
| Pending | **3** | **.** | **2** | **.** | **1** | **.** | 0 | . | 0 | . |
| Total *Salmonella* | 5 | 5 | **10** | **4** | **7** | **4** | 4 | 4 | 1 | 3 |
| **Animal Clinical Isolates[1]** | | | | | | | | | | |
| Derby | 6 | 5.5 | 7 | 6 | 1 | 5 | **14** | **5** | **7** | **5** |
| I 4,[5],12:i:- | **7** | **1.5** | 1 | 1 | 1 | 1 | **8** | **1** | 0 | 1 |
| I 6,7:-:l,w | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | **1** | **0** |
| I 6,8:r:- | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| IIIa Rough:-:- | 0 | 0 | 0 | 0 | **1** | **0** | 0 | . | 0 | . |
| Johannesburg | 0 | 0 | **2** | **0** | 1 | 0 | **3** | **0** | 0 | 0 |
| Mbandaka | 0 | 1 | 1 | 1 | 1 | 1.5 | 2 | 1 | 1 | 1 |
| Rissen | 0 | 0 | 0 | 0.5 | **1** | **0** | 0 | 0 | **1** | **0** |
| Schwarzengrund | 1 | 1.5 | 0 | 0 | 1 | 0.5 | 1 | 0 | 1 | 1 |
| Typhimurium | 8 | 15.5 | 6 | 13.5 | 1 | 17.5 | 15 | 19 | 20 | 19 |
| Typhimurium var. 5- | 9 | 8 | 8 | 8 | 1 | 9 | 2 | 10 | 12 | 10 |
| Uganda | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Worthington | 1 | 1 | **4** | **0** | **1** | **0** | 0 | 0 | 0 | 0 |
| Total *Salmonella* | 48 | 52.5 | 36 | 44.5 | 27 | 48.5 | 50 | 48 | 62 | 54 |
| **Farm[1]** | | | | | | | | | | |
| Derby | 4 | 4 | 1 | 2 | 5 | 4 | 2 | 4.5 | 9 | 7.5 |
| I 4,[5],12:i:- | 0 | 0 | **2** | **0** | 1 | 1 | 0 | 2 | **5** | **2.5** |
| I 6,7:-:l,w | 0 | . | 0 | . | **2** | **.** | 0 | . | 0 | . |
| Livingstone | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Mbandaka | 0 | 1 | **1** | **0** | 1 | 0 | 0 | 0.5 | 1 | 0.5 |
| Muenster | 0 | . | 0 | . | **1** | **.** | 0 | . | 0 | . |
| Schwarzengrund | 0 | 0 | 0 | 0 | **6** | **0** | 0 | 0 | 0 | 1 |
| Typhimurium var. 5- | 2 | 7 | 0 | 4 | 4 | 6 | **12** | **5** | 8 | 6 |
| Worthington | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.5 | 0 | 0 |
| Pending | 0 | . | **2** | **.** | **3** | **.** | 0 | . | 0 | . |
| Total *Salmonella* | 11 | 18 | 18 | 17 | 25 | 25 | 24 | 26.5 | 43 | 36 |
| **Research and Monitoring[1]** | | | | | | | | | | |
| Brandenburg | 0 | | 0 | | 1 | | 0 | | 0 | |
| I 39:-:- | 0 | | 0 | | 1 | | 0 | | 0 | |
| I 4,[5],12:i:- | 0 | | 0 | | 7 | | 0 | | 0 | |
| I Rough:f,g:- | 0 | | 0 | | 3 | | 0 | | 0 | |
| Infantis | 0 | | 1 | | 1 | | 0 | | 0 | |
| Schwarzengrund | 0 | | 0 | | 1 | | 0 | | 0 | |
| Uganda | 0 | | 0 | | 7 | | 0 | | 0 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Total *Salmonella* | 0 | | 2 | | 21 | | 5 | | 0 | |

[1] Further information about the surveillance components is included in item 3 of the report preamble.

**Table 4. *Salmonella* isolates from other animal species (not chicken or porcine); third quarter 2010 - third quarter 2011.**

| Serovar | 2011 | | | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | | Q2 | | Q3 | | Q3 | | Q4 | |
| | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp |
| **Retail Isolates (Turkey)[1,2]** | | | | | | | | | | |
| Agona | 1 | | 1 | | 2 | | | | | |
| Hadar | 3 | | 1 | | 1 | | | | | |
| Indiana | 1 | | 2 | | 2 | | | | | |
| Newport | 0 | | 1 | | 1 | | | | | |
| Schwarzengrund | 0 | | 1 | | 1 | | | | | |
| Pending | 0 | | 1 | | 10 | | | | | |
| Total *Salmonella* | 14 | | 8 | | 17 | | | | | |
| **Animal Clinical Isolates[1]** | | | | | | | | | | |
| Agona | 0 | 0.5 | 0 | 0.5 | 4 | 2 | 4 | 2 | 2 | 1 |
| Anatum | 0 | 0 | 0 | 1 | 1 | 0.5 | 0 | 1 | 0 | 1 |
| Apapa | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| Berta | 0 | 0 | 0 | 0 | **2** | **0** | 0 | 0 | 0 | 0 |
| Braenderup | 0 | 0 | 0 | 0 | **1** | **0** | **1** | **0** | **3** | **0** |
| Bredeney | 0 | 1 | 0 | 0.5 | 1 | 0.5 | 0 | 1 | 0 | 1 |
| Dublin | **1** | **0** | 0 | 0 | **5** | **0** | **1** | **0** | 0 | 0 |
| Enteritidis | **16** | **6.5** | **6** | **2.5** | 2 | 2 | **9** | **2** | **17** | **2** |
| Hadar | 1 | 0.5 | 0 | 1 | **7** | **3** | **6** | **3** | 3 | 2 |
| Heidelberg | 4 | 8.5 | 5 | 13.5 | 4 | 21 | 5 | 25 | 3 | 12 |
| I 4,[5],12:i:- | 3 | 1 | 2 | 1 | **6** | **2** | 2 | 2 | **6** | **2** |
| I 6,14,18:-:- | 3 | 2 | 0 | 1.5 | 1 | 0.5 | 0 | 1 | 0 | 2 |
| IIIa 41:z4,z23:- | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | 0 | 0 |
| IIIb 60:r:- | 0 | . | 0 | . | **1** | **.** | 0 | . | 0 | . |
| IIIb 61:-:1,5 | 0 | 0 | **2** | **0.5** | **1** | **0** | **1** | **0** | 0 | 0 |
| IIIb 61:k:1,5,7 | **1** | **0** | 0 | 0 | **1** | **0** | **4** | **0** | 0 | 0 |
| Infantis | 1 | 1 | 1 | 0 | **4** | **1** | 1 | 1 | 0 | 1 |
| Kentucky | 9 | 4 | 1 | 4 | 3 | 5.5 | 1 | 6 | 1 | 4 |
| Muenster | 0 | 0 | 0 | 1 | 1 | 1 | **4** | **1** | 2 | 0 |
| Newport | 1 | 1 | 0 | 1.5 | 1 | 2 | 1 | 2 | 0 | 1 |
| Reading | 0 | 0 | 0 | 0 | **2** | **0** | 0 | 0 | 0 | 0 |
| Rissen | 0 | 0.5 | 0 | 0.5 | **1** | **0** | 0 | 0 | 0 | 0 |
| Schwarzengrund | 0 | 1 | 0 | 1 | **3** | **1.5** | 0 | 2 | 1 | 0 |
| Thompson | 0 | 1 | 3 | 1 | 2 | 3 | 0 | 3 | 0 | 2 |
| Typhimurium | 9 | 20 | 5 | 14.5 | 17 | 20.5 | 24 | 23 | 10 | 17 |
| Typhimurium var. 5- | **15** | **7** | 9 | 9 | 18 | 16 | 20 | 16 | **21** | **6** |
| Uganda | 0 | 0 | 0 | 0 | **3** | **0.5** | 0 | 1 | 0 | 0 |
| Total *Salmonella* | 84 | 96.5 | 54 | 80 | 94 | 112 | 103 | 113 | 76 | 82 |
| **Research and Monitoring[1]** | | | | | | | | | | |
| Agona | 7 | | 6 | | 8 | | 5 | | 5 | |
| Anatum | 1 | | 0 | | 1 | | 0 | | 0 | |
| Arechavaleta | 0 | | 0 | | 1 | | 0 | | 0 | |
| Cubana | 0 | | 0 | | 2 | | 0 | | 1 | |
| Enteritidis | 13 | | 35 | | 9 | | 14 | | 24 | |
| Give | 0 | | 0 | | 1 | | 3 | | 0 | |
| Hadar | 11 | | 26 | | 6 | | 13 | | 12 | |
| Hartford | 0 | | 0 | | 2 | | 1 | | 0 | |
| Heidelberg | 17 | | 14 | | 26 | | 14 | | 18 | |
| I 4,[5],12:b:- | 0 | | 0 | | 2 | | 0 | | 0 | |
| I 4,[5],12:i:- | 2 | | 2 | | 8 | | 0 | | 1 | |
| I 4,[5],12:r:- | 0 | | 1 | | 2 | | 0 | | 0 | |
| I 40:b:- | 0 | | 0 | | 1 | | 0 | | 0 | |
| I 6,7,14:-:- | 0 | | 0 | | 1 | | 0 | | 0 | |
| I 8,20:-:- | 0 | | 2 | | 1 | | 0 | | 1 | |
| I 8,20:-:z6 | 0 | | 0 | | 1 | | 1 | | 0 | |
| I Rough:-:1,5 | 0 | | 0 | | 1 | | 0 | | 0 | |
| I Rough:e,h:- | 0 | | 1 | | 1 | | 1 | | 0 | |
| I Rough:e,h:1,5 | 0 | | 1 | | 15 | | 0 | | 0 | |
| I Rough:z4,z23:- | 0 | | 0 | | 1 | | 0 | | 0 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| IIIb 11:k:z53 | 0 | | 0 | | 1 | | 0 | | 0 | |
| Infantis | 2 | | 2 | | 2 | | 0 | | 2 | |
| Johannesburg | 0 | | 3 | | 2 | | 1 | | 0 | |
| Kentucky | 30 | | 10 | | 15 | | 37 | | 77 | |
| Litchfield | 0 | | 0 | | 1 | | 0 | | 0 | |
| Mbandaka | 0 | | 3 | | 2 | | 4 | | 0 | |
| Montevideo | 0 | | 0 | | 1 | | 1 | | 0 | |
| Muenster | 2 | | 0 | | 11 | | 0 | | 0 | |
| Newport | 6 | | 8 | | 4 | | 0 | | 0 | |
| Ohio | 0 | | 0 | | 2 | | 2 | | 1 | |
| Ohio var. 14+ | 0 | | 0 | | 1 | | 2 | | 0 | |
| Oranienburg | 0 | | 1 | | 5 | | 2 | | 2 | |
| Orion var.15+34+ | 8 | | 4 | | 47 | | 30 | | 22 | |
| Ouakam | 0 | | 0 | | 1 | | 0 | | 0 | |
| Rissen | 1 | | 0 | | 4 | | 0 | | 1 | |
| Schwarzengrund | 22 | | 2 | | 6 | | 24 | | 13 | |
| Senftenberg | 16 | | 16 | | 10 | | 14 | | 19 | |
| Thompson | 2 | | 7 | | 4 | | 3 | | 4 | |
| Typhimurium | 6 | | 2 | | 3 | | 12 | | 7 | |
| Typhimurium var. 5- | 0 | | 0 | | 2 | | 8 | | 2 | |
| Uganda | 0 | | 1 | | 6 | | 1 | | 0 | |
| Total *Salmonella* | 169 | | 178 | | 220 | | 220 | | 236 | |

[1] Further information about the surveillance components is included in item 3 of the report preamble.
[2] Surveillance of turkey at retail started in February 2011; no data available before 2011

**Table 4a. *Salmonella* serovars exceeding the 75th percentile by species: Quarter Three, 2011.**

| Serovar | Species | Number of Isolates |
|---|---|---|
| Apapa | Reptile | **1** |
| Berta | Environment[2] | **1** |
| | Equine | **1** |
| Braenderup | Bovine | **1** |
| Dublin | Bovine | **5** |
| Hadar | Turkey | **5** |
| | Mink | **1** |
| | Environment[2] | **1** |
| I 4,[5],12:i:- | Avian[1] | **2** |
| | Bovine | **3** |
| | Equine | **1** |
| IIIa 41:z4,z23:- | Reptile | **1** |
| IIIb 60:r:- | Reptile | **1** |
| IIIb 61:-:1,5 | Ovine | **1** |
| IIIb 61:k:1,5,7 | Ovine | **1** |
| Infantis | Avian[1] | **4** |
| Reading | Aquatic mammal | **2** |
| Rissen | Turkey | **1** |
| Schwarzengrund | Goose | **1** |
| | Turkey | **2** |
| Uganda | Bovine | **2** |
| | Ovine | **1** |

[1] Unspecified bird species
[2] No species/source provided

**Table 5: *S*. Enteritidis phagetypes observed in the third quarter of 2011.**

| Animal Species | Surveillance Component[1] | 13 | 13a | 14c | 22 | 23 | 51 | 8 | 9b | Atypical |
|---|---|---|---|---|---|---|---|---|---|---|
| Chicken | Abattoir | | 3 | | | 1 | | 3 | | |
| | Retail | | | | | | 1 | | | |
| | Clinical Animal Isolates | | 12 | | 1 | | 6 | 2 | | |
| | Research and Monitoring | 8 | 16 | 1 | | | 2 | 18 | | 8 |
| Porcine[2] | Farm | | | | | | | | | |
| Other animal species | Retail[2] (Turkey) | | | | | | | | | |
| | Clinical Animal Isolates | | 2 | | | | | | | |
| | Research and Monitoring | | 1 | | | 3 | 1 | 3 | 1 | |

[1] Further information about the surveillance components is included in item 3 of the report preamble; phagetype not yet available for all S. Enteritidis isolates.
[2] No *S*. Enteritidis isolates recovered in quarter three 2011

**Table 6. Special feature: *Salmonella* isolates from cattle; third quarter 2010 – third quarter 2011 (**all serovars recovered in the quarters presented are shown (not only those in the current quarter))**.**

| Serovar | 2011 | | | | | | 2010 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | | Q2 | | Q3 | | Q3 | | Q4 | |
| | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp | Obs | Exp |
| **Animal Clinical Isolates** | | | | | | | | | | |
| Abony | 0 | . | **1** | **.** | 0 | . | 0 | . | 0 | . |
| Agona | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Braenderup | 0 | 0 | 0 | 0 | **1** | **0** | 0 | 0 | **1** | **0** |
| Brandenburg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **0** |
| Cerro | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Dublin | **1** | **0** | 0 | 0 | **5** | **0** | **1** | **0** | 0 | 0 |
| Enteritidis | 0 | 0 | **1** | **0** | 0 | 1 | 1 | 1 | **9** | **0** |
| Heidelberg | 1 | 1 | 0 | 1 | 0 | 1.5 | 1 | 2 | 0 | 0 |
| I 4,[5],12:i:- | **2** | **0.5** | 0 | 0 | **3** | **0** | 0 | 0 | 0 | 0 |
| I 6,-,18:-:- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | . | **1** | **.** |
| I 6,14,18:-:- | 3 | 2 | 0 | 1.5 | 1 | 0.5 | 0 | 1 | 0 | 2 |
| I Rough:i:z6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | **0** |
| Infantis | 0 | 0.5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Kentucky | 0 | 3 | 1 | 3.5 | 1 | 5 | 1 | 5 | 1 | 4 |
| Mbandaka | 0 | 0 | 0 | 0 | 0 | 0.5 | 1 | 0 | **3** | **0** |
| Muenster | 0 | 0 | 0 | 0.5 | 1 | 1 | 2 | 1 | 1 | 0 |
| Ohio var. 14+ | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **.** | 0 | . |
| Schwarzengrund | 0 | 0 | 0 | 0 | 0 | 0.5 | 0 | 1 | 1 | 0 |
| Thompson | 0 | 0 | **2** | **0.5** | 1 | 1 | 0 | 1 | 0 | 2 |
| Typhimurium | 5 | 6.5 | 2 | 9 | 10 | 13 | 14 | 13 | 5 | 11 |
| Typhimurium var. 5- | **14** | **3.5** | 6 | 3.5 | 12 | 9 | 17 | 6 | **19** | **4** |
| Uganda | 0 | 0 | 0 | 0 | **2** | **0** | 0 | 0 | 0 | 0 |
| Worthington | **1** | **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total *Salmonella* | 28 | 32.5 | 13 | 27.5 | 37 | 43 | 43 | 43 | **45** | **35** |
| **Research and Monitoring** | | | | | | | | | | |
| Infantis | 0 | | 2 | | 1 | | 0 | | 0 | |
| Typhimurium | 0 | | 0 | | 0 | | 0 | | 1 | |
| Typhimurium var. 5- | 0 | | 0 | | 0 | | 1 | | 0 | |
| Total *Salmonella* | 0 | | 2 | | 1 | | 1 | | 1 | |

[1] Further information about the surveillance components is included in item 3 of the report preamble.