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Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

Quarterly Summary: *Salmonella* in Agri-food

Quarter Three 2010: July - September 2010

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

Canada

Preamble

1. Data were extracted from CIPARS through DEXA October 25, 2010. 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 25, 2010. ***All data presented are preliminary***; counts may change in subsequent reports as more data become available.

2. 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.

   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 details 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)

3. **The listed serovars are those observed in the current quarter <u>ONLY</u>**. 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.

4. 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 2007-2009 data only because provinces were added in 2005 (Saskatchewan) and 2006 (British Columbia).
   b. Where the expected count is 0, that serovar has not been seen previously in that quarter for that species/component pair.
   c. Where the expected count is missing (= ’.’), that serovar has not been seen before in that species for that component.
   d. No expected values are provided for the research and monitoring sections as these submissions change from month to month.

5. Highlighted cells:
   a. Yellow cells indicate where:
      i. The number of isolates observed in a quarter is greater than the 75th 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 pair.
ii. A new serovar is identified in a species/component pair where it has **NOT** been observed previously.

6. 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/component pair).

7. Special feature: In each Quarterly Report we present isolates from a selected species. These are selected because of perceived increases in the number of isolates or because of interest from readers.
    a. For Quarter Three 2010, we present clinical *Salmonella* isolates from dogs and cats (Table 5).

8. 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/component pair); CIPARS 2010.

Component [1]	Chicken	Porcine	Other
Abattoir	Hadar Kiambu	Typhimurium	
Retail	Infantis		
Animal Clinical		Infantis Senftenberg	I 6,14,18:-:- Kentucky Thompson
Farm		Brandenburg	

[1] Further information about the surveillance components is included in item 2 of the report preamble.

Table 2. *Salmonella* isolates from chicken samples; third quarter 2009-third quarter 2010.

Serovar	2010						2009			
	Q1		Q2		Q3		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir[1,2]										
Braenderup	0	1	0	1	**1**	**0**	0	0	0	0
Enteritidis	5	4	5	3.5	1	5	**17**	**4**	**10**	**5**
Heidelberg	10	9	4	10	5	12	**21**	**11.5**	11	14
Infantis	0	1.5	0	1	1	1.5	1	2	0	1
Kentucky	9	23	12	19	14	17	19	14	16	18
Mbandaka	0	1.5	1	1	1	1	1	1	0	1
Typhimurium	0	2	0	2	1	1.5	2	1	1	1
Pending	0	.	0	.	**18**	**.**	0	.	0	.
Total *Salmonella*	31	56	24	36	42	47	**71**	**42.5**	47	51.5
Retail Meat[1,2,3]										
Agona	1	2	0	1.5	1	1.5	**2**	**1**	0	1
Albany	**4**	**2**	**2**	**0**	**2**	**0**	0	0	0	0
Anatum	0	.	0	.	**1**	**.**	0	.	0	.
Enteritidis	24	15	9	11	7	23	**26**	**12.5**	**23**	**9.5**
Hadar	6	6	1	3	10	8	**12**	**6**	5	6.5
Heidelberg	34	30	20	16	18	21	**45**	**18.5**	**41**	**26.5**
I 6,7:k:-	0	0	0	0	**2**	**1**	0	1	0	0
I 8,20:i:-	1	1	0	1	1	1	**1**	**0**	**3**	**0**
I Rough:z4,z23:-	0	.	0	.	**1**	**.**	0	.	0	.
Kentucky	23	38	14	23	16	32	32	30.5	24	24.5
Kiambu	3	2	0	2	1	1	1	2.5	0	3.5
Schwarzengrund	**5**	**2**	1	3	3	2	**5**	**1.5**	2	3
Thompson	1	4.5	2	5	4	4	3	4	**4**	**1.5**
Typhimurium	1	2	0	3	3	3	2	3.5	1	2
Typhimurium var. 5-	2	2	0	1.5	**2**	**1**	0	1	0	2
Pending	0	.	**3**	**.**	**29**	**.**	0	.	0	.
Total *Salmonella*	117	116	57	87	101	111	**136**	**91**	**112**	**90**
Animal Clinical Isolates[1]										
Agona	**1**	**0**	1	1	1	1	**1**	**0**	0	0
Braenderup	0	1	0	0	**1**	**0**	0	0	0	0
Enteritidis	38	29	22	9.5	11	9	**27**	**7**	**50**	**9**
Heidelberg	**28**	**6**	**21**	**7**	**10**	**5**	5	5.5	4	5
Kentucky	**42**	**9**	4	2.5	5	4	**11**	**3**	**14**	**1**
Mbandaka	0	1	0	1	1	2	0	2	0	1
Senftenberg	1	1.5	0	2	**3**	**1**	0	1	0	1.5
Typhimurium	2	2	3	2	1	1	**9**	**1**	1	1
Uganda	0	0	0	1	**1**	**0**	0	0	0	0
Total *Salmonella*	**124**	**33**	56	21	34	28	**68**	**23.5**	**75**	**17.5**
Research and Monitoring[1]										
Braenderup	2		6		2		3		2	
Enteritidis	51		32		38		63		66	
Hadar	7		6		4		2		1	
Heidelberg	74		66		52		69		57	
I 4,[5],12:r:-	4		1		1		0		1	
I Rough:g,m:-	1		2		1		6		2	
I Rough:i:z6	1		1		1		5		1	
I Rough:r:1,2	2		2		2		2		8	
Infantis	15		5		6		7		5	
Kentucky	145		103		49		93		88	
Kiambu	0		0		3		17		0	
Muenchen	0		0		1		0		0	
Schwarzengrund	13		1		3		27		2	
Senftenberg	6		2		2		1		3	
Tennessee	0		3		2		0		0	
Thompson	15		1		4		3		5	
Typhimurium	15		12		10		36		4	
Typhimurium var. 5-	3		1		4		0		2	
Worthington	2		1		1		5		0	
Total *Salmonella*	383		292		186		401		299	

[1] Further information about the surveillance components is included in item 2 of the report preamble.
[2] No serovar results were available for retail and abattoir sampling in September 2010 at the time the data were extracted.
[3] The number of retail meat samples collected in Ontario in quarter two was low.

Table 3. *Salmonella* isolates from porcine samples; third quarter 2009 - third quarter 2010.

Serovar	2010						2009			
	Q1		Q2		Q3		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir[1,2]										
Agona	1	2	0	2	**4**	**2**	0	2	1	1
Berta	0	2	0	1	1	1	**1**	**0**	0	2
Bovismorbificans	0	2	1	2	1	2	0	2	0	1.5
Brandenburg	1	4	**6**	**2**	2	3	3	4	2	3
Derby	11	11	12	11	3	7	5	12.5	7	11
Enteritidis	0	1	0	0	1	2	2	2	0	1
Hadar	0	1	0	1	1	1	**1**	**0**	0	0
Infantis	3	3.5	4	3	**7**	**2**	2	3	2	2.5
Johannesburg	0	1	0	1	1	1	0	1	0	0
Muenster	1	3	0	1	**1**	**0**	0	0	0	0
Ohio	0	1	1	1	1	1	**2**	**1**	0	4
Putten	0	2	0	0	1	2	**2**	**0**	0	1
Schwarzengrund	3	2	2	3	2	3	0	3	3	2
Typhimurium var. 5-	**10**	**3**	1	7	6	6	4	6.5	6	3.5
Worthington	**6**	**1**	2	2.5	**4**	**1**	1	1	2	2
Pending	0	.	0	.	**17**	**.**	0	.	0	.
Total *Salmonella*	52	43	39	35	53	52	37	55.5	35	41
Retail Meat[1,2,3]										
Braenderup	0	0	0	1	**1**	**0**	0	0	0	0
Typhimurium var. 5-	1	1	**1**	**0**	1	1	**2**	**1**	0	0
Pending	**2**	**.**	**2**	**.**	**3**	**.**	0	.	0	.
Total *Salmonella*	6	6	**7**	**4**	**5**	**4**	4	5	1	4
Animal Clinical Isolates[1]										
Derby	5	6	7	5	**9**	**5**	**6**	**5**	6	4.5
I 4,[5],12:i:-	**5**	**2**	2	1	**7**	**1.5**	1	2	2	1
I Rough:b:e,n,x	0	.	0	.	**1**	**.**	0	.	0	.
Johannesburg	0	3	0	1	**2**	**1**	0	1	0	0
Manhattan	0	1	0	0	**1**	**0**	0	0	0	0
Mbandaka	**3**	**1**	1	1	2	1.5	1	2	2	1
Typhimurium	16	15	13	14	3	19	16	19.5	18	19
Typhimurium var. 5-	4	9	10	8	2	10	3	10.5	7	11
Total *Salmonella*	53	49	47	43	27	48	41	48.5	**64**	**50.5**
Farm[1]										
Derby	6	3.5	2	1.5	2	4.5	**9**	**4**	**11**	**7**
Give	0	0	0	0	1	1	0	1	1	1
I Rough:z:l,w	0	0	0	0	**1**	**0**	0	.	0	.
Infantis	**4**	**2**	0	2	2	.	2	2	1	2
Typhimurium	0	4	0	3	2	3	2	3.5	**9**	**2**
Typhimurium var. 5-	7	8	4	4	**9**	**5**	3	6	**14**	**6**
Pending	0	.	0	.	**7**	**.**	0	.	0	.
Total *Salmonella*	18	21	16	18.5	24	26.5	25	28	**61**	**29**
Research and Monitoring[1]										
Chester	0		0		2		0		0	
Total *Salmonella*	7		1		2		1		2	

[1] Further information about the surveillance components is included in item 2 of the report preamble.

[2] No serovar results were available at the time of data extract for retail and abattoir sampling in September 2010

[3] There were few retail meat samples collected in Ontario in quarter two.

Table 4. *Salmonella* isolates from other species/sources (not chicken or porcine); third quarter 2009 - third quarter 2010.

	2010						2009			
	Q1		Q2		Q3		Q3		Q4	
Serovar	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Animal Clinical Isolates[1]										
Agona	**5**	**3**	0	1	2	2	1	2	**4**	**2**
Benin	0	.	0	.	**1**	**.**	0	.	0	.
Cerro	0	1	0	1	1	3.5	1	5	0	1
Choleraesuis	0	.	0	.	**1**	**.**	0	.	0	.
Dublin	**5**	**0**	0	0	1	1	**1**	**0**	**2**	**0**
Enteritidis	**17**	**9**	**7**	**3**	1	2	**8**	**2**	**16**	**2.5**
Hadar	2	2	1	3	**6**	**3**	3	2.5	2	3
Heidelberg	10	7	3	15	4	25	6	26.5	10	13
I 4,[5],12:i:-	**5**	**2**	1	2	2	2.5	3	2	0	2
IIIb 48:i:-	0	0	**1**	**0**	**1**	**0**	0	0	0	0
IIIb 61:-:1,5,7	1	1	0	0	1	1	**1**	**0**	0	0
IIIb 61:k:1,5,7	0	1	0	0	**3**	**1**	0	1	**1**	**0**
IIIb Rough:-:-	0	.	0	.	**1**	**.**	0	.	0	.
Infantis	3	1.5	0	2	1	1.5	1	2	1	2.5
Johannesburg	0	1	**2**	**0**	1	1	1	1	0	2
Litchfield	0	1	0	0	1	2	0	2	0	3
Manhattan	0	0	0	1	**4**	**0**	0	0	0	0
Mbandaka	0	2.5	1	2.5	2	1	1	1	0	1
Newport	0	2	0	3	1	2	1	2.5	0	2.5
Oranienburg	0	1	0	1	1	1	**4**	**1**	0	1
Senftenberg	**4**	**2**	2	3	1	2	2	2	3	2
Typhimurium	11	21	5	13	11	23	16	23.5	17	18
Typhimurium var. 5-	**13**	**4**	10	9	7	16	**25**	**13.5**	4	7
Total *Salmonella*	99	94	50	84	55	113	103	123	76	87.5
Research and Monitoring[1]										
Agona	2		1		5		4		1	
Albany	2		1		1		2		0	
Braenderup	1		0		9		2		2	
Enteritidis	17		7		8		25		6	
Gatuni	0		0		1		0		0	
Give	2		0		3		1		6	
Hadar	47		12		8		5		3	
Hartford	0		0		1		1		0	
Heidelberg	22		24		11		28		3	
I 4,12,27:z10:-	0		0		1		0		0	
I 8,20:-:z6	0		0		1		0		1	
I Rough:e,h:-	0		0		1		0		1	
I Rough:e,h:1,2	3		2		1		0		0	
Johannesburg	1		0		1		0		1	
Kentucky	18		5		24		11		7	
Kiambu	0		0		2		0		0	
Liverpool	0		0		2		0		0	
London	0		0		1		1		0	
Mbandaka	7		1		3		2		3	
Montevideo	1		0		1		3		0	
Ohio	1		0		2		0		0	
Ohio var. 14+	0		0		1		1		1	
Oranienburg	0		1		2		2		0	
Orion	8		16		23		2		0	
Saintpaul	13		15		1		0		3	
Schwarzengrund	19		12		20		8		14	
Senftenberg	7		1		8		11		6	
Tennessee	0		1		2		1		1	
Thompson	4		2		3		3		0	
Typhimurium	3		6		8		7		8	
Typhimurium var. 5-	10		6		4		15		2	
Uganda	0		2		1		0		0	
Weltevreden	0		2		1		1		3	
Total *Salmonella*	219		141		161		261		108	

[1] Further information about the surveillance components is included in item 2 of the report preamble.

Table 4a. *Salmonella* serovars exceeding the 75th percentile by animal species/source: Quarter Three, 2010.

Serovar	Species/Source	Number of Isolates
Benin	Reptile	1
Choleraesuis	Unknown[1]	1
IIIb 48:i:-	Reptile	1
IIIb 61:k:1,5,7	Ovine	3
IIIb Rough:-:-	Reptile	1
Manhattan	Canine	4

[1] No species/source provided.

Table 5. Special feature: *Salmonella* isolates from dogs and cats; third quarter 2009 - third quarter 2010.

	2010						2009			
	Q1		Q2		Q3		Q3		Q4	
Serovar	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Animal Clinical Isolates[1]										
Agona	**2**	**0**	0	0	**1**	**0**	0	0	**3**	**0**
Manhattan	0	0	0	0	**4**	**0**	0	0	0	0
Typhimurium	**1**	**0**	0	1	**2**	**1**	**2**	**1**	**3**	**1**
Typhimurium var. 5-	0	0	0	2	1	1	0	1	0	1
Total *Salmonella*	**6**	**3**	2	4	**8**	**5**	**6**	**5**	**8**	**4**

[1] Further information about the surveillance components is included in item 2 of the report preamble.