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## Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

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

Quarter Two 2011: April - June 2011



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

# 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 August 8, 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) July 19, 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<sup>th</sup> 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 Two 2011, we present diagnostic *Salmonella* isolates from horses (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](mailto:cipars-picra@phac-aspc.gc.ca).

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

<b>Surveillance Component<sup>1</sup></b>	<b>Chicken</b>	<b>Porcine</b>	<b>Other</b>
Abattoir	Kiambu	Schwarzengrund	
Retail	Infantis Typhimurium		
Animal Clinical		Infantis Senftenberg	Hadar I 6,14,18:-:- Newport
Farm		Brandenburg Typhimurium Typhimurium var. 5-	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.

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

Serovar	2011				2010 <sup>2</sup>					
	Q1		Q2		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
<b>Abattoir<sup>1</sup></b>										
Enteritidis	7	4	9	3.5	5	3	3	4	12	5
Hadar	1	2.5	3	1.5	2	1	0	3	0	3
Heidelberg	4	9.5	3	9	4	10	9	12	7	11
Kentucky	18	16	11	15.5	12	19	25	17	13	17
Schwarzengrund	1	1	1	0	0	0	0	0	0	0
Total <i>Salmonella</i>	41	49	27	35.5	24	36	43	47	44	48
<b>Retail<sup>1,2</sup></b>										
Albany	0	2	1	0	2	0	2	0	1	0
Enteritidis	21	23	10	11	9	16.5	14	24.5	13	18
Hadar	7	6	2	2	1	3	12	10	4	5.5
Heidelberg	26	34	6	20	20	22	24	33	28	32
Johannesburg	0	.	1	.	0	.	0	.	0	.
Kentucky	41	25	22	23	15	29	28	34.5	34	23.5
Thompson	4	1	3	2	2	4.5	5	3.5	1	2.5
Pending	4	.	10	.	0	.	0	.	0	.
Total <i>Salmonella</i>	136	117	55	87	55	91	105	124	104	98
<b>Animal Clinical Isolates<sup>1</sup></b>										
Enteritidis	49	18	35	9.5	24	9	20	5	32	9
Heidelberg	19	7.5	10	9	26	7	22	5	19	5
I 6,8:-:e,n,x	0	0	1	0	0	0	0	0	0	0
Kentucky	12	7.5	4	2.5	6	2	9	4	11	1
Thompson	2	0.5	1	0	0	0	0	0	0	0
Typhimurium	0	1.5	2	2	5	2	4	1	2	1
Total <i>Salmonella</i>	90	42	53	30.5	67	21	65	28	63	22
<b>Research and Monitoring<sup>1</sup></b>										
Bietri	0		1		0		0		0	
Enteritidis	90		20		49		42		48	
Hadar	4		3		8		5		4	
Heidelberg	75		32		72		99		54	
I 8,20:i:-	1		1		1		0		1	
I Rough:r:1,2	3		1		3		4		0	
IIIa 23:g,z51:-	0		1		0		0		0	
Indiana	8		1		0		0		0	
Infantis	5		8		7		7		3	
Johannesburg	2		1		3		2		3	
Kentucky	91		51		137		103		99	
Kiambu	0		1		0		5		3	
Litchfield	0		1		0		0		0	
Mbandaka	12		3		19		10		6	
Ohio var. 14+	0		1		0		0		0	
Orion var.15+34+	6		2		15		0		4	
Senftenberg	4		7		7		2		10	
Thompson	4		1		1		5		4	
Typhimurium	4		1		12		11		11	
Pending	0		6		0		0		0	
Total <i>Salmonella</i>	336		143		438		325		269	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.

<sup>2</sup> There were few retail meat samples collected in Ontario in quarter two - 2010

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

Serovar	2011				2010					
	Q1		Q2		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
<b>Abattoir<sup>1</sup></b>										
Bovismorbificans	0	1.5	3	0.5	1	0	1	1	1	1
Brandenburg	3	2.5	3	2.5	6	2	4	3	4	2
Bredeney	0	0	1	0	0	0	0	0	0	0
California	1	0.5	1	1	1	1	0	0	0	1
Derby	12	11	11	11	12	11	5	7	8	9
Give	0	1	1	1.5	0	2	1	0	1	0
Heidelberg	1	0.5	2	1	1	1	0	2	0	2
Infantis	5	3	4	3	4	3	11	2	4	2
Johannesburg	0	0	1	0	0	0	1	0	0	0
Mbandaka	0	1	1	1	2	1	2	1	2	0
Typhimurium	4	4	3	4.5	5	4	2	6	2	4
Typhimurium var. 5-	4	4	3	7	1	7	7	6	3	5
Worthington	1	0.5	2	1.5	2	1	4	1	1	0
Total <i>Salmonella</i>	40	44.5	36	37	39	35	37	52	38	35
<b>Retail<sup>1,2</sup></b>										
Brandenburg	0	0.5	1	0	1	0	0	0	0	0
Derby	0	0.5	2	0.5	2	0	0	0	1	0
Give	0	0	2	0	0	0	0	0	0	0
I Rough:r:1,5	0	.	1	.	0	.	0	.	0	.
Infantis	1	0	1	0	0	0	0	0	0	0
Pending	3	.	2	.	0	.	0	.	0	.
Total <i>Salmonella</i>	5	5	9	4	5	4	4	4	1	3
<b>Animal Clinical Isolates<sup>1</sup></b>										
Derby	6	5.5	7	6	12	5	14	5	7	5
I 4,[5],12:d:-	3	.	2	.	0	.	0	.	0	.
I 4,[5],12:i:-	7	1.5	1	1	2	1	8	1	0	1
I 6,7:r:-	0	.	1	.	0	.	0	.	0	.
I Rough:f,g:-	0	.	1	.	0	.	0	.	0	.
Johannesburg	0	0	2	0	0	0	3	0	0	0
Mbandaka	0	1	1	1	2	1	2	1	1	1
Ohio	0	0	2	0	1	0	0	0	0	1
Typhimurium	8	15.5	6	13.5	21	14	15	19	20	19
Typhimurium var. 5-	9	8	6	8	10	8	2	10	12	10
Worthington	1	1	4	0	0	0	0	0	0	0
Total <i>Salmonella</i>	48	52.5	33	44.5	64	43	50	48	62	54
<b>Farm<sup>1</sup></b>										
Alachua	0	.	4	.	0	.	0	.	0	.
Derby	4	4	1	2	2	1.5	2	4.5	9	7.5
I 4,[5],12:i:-	0	0	2	0	1	0	0	2	5	2.5
I 6,7,14:z10:-	0	.	1	.	0	.	0	.	0	.
Infantis	1	2	4	1	0	2	2	1	8	2
Johannesburg	0	0	1	0	0	0.5	0	0	1	0
Mbandaka	0	1	1	0	0	0	0	0.5	1	0.5
Senftenberg	0	0	2	0	0	0	0	0	0	0
Pending	0	.	2	.	0	.	0	.	0	.
Total <i>Salmonella</i>	11	18	18	17	16	18.5	24	26.5	43	36
<b>Research and Monitoring<sup>1</sup></b>										
Derby	0		1		1		0		0	
Infantis	0		1		0		0		0	
Total <i>Salmonella</i>	0		2		1		5		0	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.

<sup>2</sup> There were few retail meat samples collected in Ontario in quarter two - 2010

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

Serovar	2011				2010					
	Q1		Q2		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
<b>Retail Isolates (Turkey)<sup>1,2</sup></b>										
Agona	1		1							
Enteritidis	3		1							
Hadar	1		2							
Infantis	0		1							
Mbandaka	0		1							
Muenster	0		1							
Uganda	0		1							
Total <i>Salmonella</i>	14		8							
<b>Animal Clinical Isolates<sup>1</sup></b>										
Abony	0	.	1	.	0	.	0	.	0	.
Derby	0	0	1	0	0	0	0	0	0	0
Enteritidis	14	6.5	2	2.5	7	2	9	2	14	2
Heidelberg	4	8.5	3	13.5	6	15	5	25	3	12
I 4,[5],12:-:-	0	0	1	0	0	0	0	0	1	0
I 4,[5],12:i:-	3	1	2	1	1	1	2	2	6	2
IIIb 61:-:1,5	0	0	2	0.5	0	1	1	0	0	0
IIIb 61:k:1,5	0	0	2	0	0	0	0	0	0	0
IIIb Rough:-:-	0	0	1	0	0	.	1	.	0	.
IV 48:g,z51:-	0	0	1	0	0	0	0	0	0	0
Indiana	0	0	2	0	0	0	0	0	0	0
Infantis	1	1	1	0	0	0	1	1	0	1
Kentucky	7	4	1	4	1	4	0	6	0	4
Ouakam	0	0	2	0	0	0	0	0	0	0
Senftenberg	3	2	1	2	2	2	1	2	0	2
Stanley	0	.	1	.	0	.	0	.	0	.
Thompson	0	1	3	1	1	1	0	3	0	2
Typhimurium	9	20	5	14.5	17	13	16	23	6	17
Typhimurium var. 5-	10	7	5	9	12	9	19	16	7	6
Total <i>Salmonella</i>	75	96.5	37	80	108	84	103	113	76	82
<b>Research and Monitoring<sup>1</sup></b>										
Agona	7		3		1		5		5	
Albany	0		2		1		1		0	
Braenderup	1		2		0		10		1	
Enteritidis	13		33		12		14		24	
Hadar	11		26		12		13		12	
Heidelberg	17		10		24		14		18	
I 4,12:-:1,7	0		1		0		0		0	
I 4,[5],12:i:-	2		2		0		0		1	
I 4,[5],12:r:-	0		1		0		0		0	
I 42:z4,z23:-	0		1		0		0		0	
I 8,20:-:-	0		2		0		0		1	
I Rough:e,h:-	0		1		0		1		0	
I Rough:e,h:1,2	2		4		2		1		0	
I Rough:e,h:1,5	0		1		1		0		0	
I Rough:i:z6	4		2		0		0		5	
I Rough:r:1,2	2		1		1		0		1	
Indiana	0		15		0		0		0	
Infantis	2		2		0		0		2	
Johannesburg	0		3		0		1		0	
Kentucky	30		10		5		37		77	
Mbandaka	0		3		1		4		0	
Newport	6		8		3		0		0	
Orion var.15+34+	8		4		16		30		22	
Poona	0		1		0		0		0	
Schwarzengrund	22		2		12		24		13	
Senftenberg	16		16		3		14		18	

Serovar	2011				2010					
	Q1		Q2		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Tennessee	1		1		1		2		2	
Thompson	2		2		2		3		4	
Typhimurium	6		2		6		12		7	
Uganda	0		1		2		1		0	
Worthington	0		1		1		0		0	
Total <i>Salmonella</i>	169		163		148		220		236	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.

<sup>2</sup> Surveillance of turkey at retail started in February 2011; no data available before 2011



**Table 4a. *Salmonella* serovars exceeding the 75<sup>th</sup> percentile by species: Quarter Two, 2011.**

<b>Serovar</b>	<b>Species</b>	<b>Number of Isolates</b>
Abony	Bovine	1
Derby	Canine	1
I 4,[5],12:-:-	Turkey	1
IIIb 61:-:1,5	Ovine	2
IIIb 61:k:1,5	Ovine	2
IIIb Rough:-:-	Reptile	1
IV 48:g,z51:-	Canine	1
Indiana	Turkey	2
Ouakam	Avian <sup>†</sup>	1
	Turkey	1
Stanley	Equine	1

<sup>†</sup> Unspecified bird species

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

<b>Animal Species</b>	<b>Surveillance Component<sup>1</sup></b>	<b>13</b>	<b>13a</b>	<b>19</b>	<b>23</b>	<b>51</b>	<b>8</b>	<b>9b</b>	<b>911</b>	<b>Atypical</b>	<b>Untypeable</b>
Chicken	Abattoir		3			3	2		1		
	Retail		4	1		2	2			1	
	Clinical Animal Isolates		11		1		19			3	1
	Research and Monitoring	3	7			1	8			1	
Porcine <sup>2</sup>											
Other animal species	Retail (Turkey)		1								
	Clinical Animal Isolates									2	
	Research and Monitoring		23			6	2	1		1	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.

<sup>2</sup> No S. Enteritidis isolates were recovered from pigs in quarter two 2011

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

Serovar	2011				2010					
	Q1		Q2		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
<b>Animal Clinical Isolates</b>										
Braenderup	0	0	0	0	0	0	1	0	0	0
Heidelberg	0	3	1	6.5	0	7	0	10	0	8
Muenster	0	0	0	0	0	0	2	0	0	0
Oranienburg	0	0	0	0	0	0	0	0	1	0
Saintpaul	0	0	0	0	0	0	1	0	0	0
Senftenberg	1	0	0	0	0	0	0	0	0	0
Stanley	0	.	1	.	0	.	0	.	0	.
Thompson	0	0.5	1	0	0	0	0	1	0	0
Typhimurium	0	1	1	1	3	1	0	2	0	3
Typhimurium var. 5-	0	0	2	0	0	0	0	0	0	0
Total <i>Salmonella</i>	1	10.5	6	14	3	17	4	25	1	12
<b>Research and Monitoring<sup>1</sup></b>										
Total <i>Salmonella</i>	0		0		0		0		0	

<sup>1</sup> Further information about the surveillance components is included in item 3 of the report preamble.