



Government of Canada Gouvernement du Canada

Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

Quarterly Summary: *Salmonella* in Agri-food

Quarter Four 2011: October - December 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 March 5, 2012. The observed counts for the current quarter were updated with data pulled directly from the *Salmonella* Typing Laboratory (Laboratory for Foodborne Zoonoses, Guelph, ON) February 1, 2012. **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 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 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 Four 2011, we present diagnostic *Salmonella* isolates from dogs and cats (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 Four (by species/surveillance component pair); CIPARS 2011.

Surveillance Component ¹	Chicken	Porcine	Other
Abattoir	Kiambu	Heidelberg	
Retail			
Animal Clinical		Senftenberg	Hadar 6,14,18:-:-
Farm		Infantis	

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

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

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir¹										
Enteritidis	7	4	9	3.5	9	3.5	3	5.5	12	5
Hadar	1	2.5	3	1.5	2	3	5	2.5	0	3
Heidelberg	4	9.5	3	9	4	11.5	8	11	7	11
I 4,[5],12:i:-	0	1	0	0	2	1	2	0.5	1	0
Infantis	0	0.5	0	0	0	1	2	1	0	1
Kentucky	18	16	16	15.5	7	18	16	16.5	13	17
Senftenberg	1	0	0	0	0	0	1	0	0	0
Pending	0	.	0	.	0	.	1	.	0	.
Total <i>Salmonella</i>	41	49	32	35.5	29	45	38	48	44	48
Retail¹										
Agona	3	1	0	0	0	1	1	0	0	0
Braenderup	1	0	0	0	0	0	2	1	4	0.5
Enteritidis	21	23	11	11	4	23	11	13	13	18
Hadar	7	6	4	2	4	12	8	5	4	5.5
Heidelberg	26	34	11	20	19	24	13	28	28	32
I 4,[5],12:r:-	0	0	0	0	0	0	3	0	0	0
I 8,20:i:-	0	1	0	0	1	1	1	0	0	1.5
Infantis	3	1	0	0	3	1	1	3	3	3
Kentucky	41	25	28	23	31	32	27	24	34	23.5
Kiambu	2	3	1	1	4	1	1	0	0	0.5
Litchfield	2	0	0	0	0	0	1	0	2	0
Orion	0	0	0	0	0	0	1	0	0	0
Rissen	0	0	0	0	0	0	1	0	0	0
Schwarzengrund	3	2	0	1	3	3	2	2	1	2
Senftenberg	0	1	0	1	0	0	1	0	0	0.5
Thompson	4	1	3	2	0	4	1	1	1	2.5
Typhimurium	2	2	0	0	0	4	1	2	4	1.5
Worthington	4	2	0	0	0	0	1	1	1	0.5
Pending	3	.	7	.	2	.	11	.	0	.
Total <i>Salmonella</i>	135	117	67	87	73	111	88	104	104	98
Animal Clinical Isolates¹										
Agona	0	0	0	0	1	0	7	0	0	0
Enteritidis	49	18	35	9.5	21	7	17	10	32	9
Heidelberg	19	7.5	12	9	23	5.5	10	5	19	5
I 6,7:-:-	0	0	0	0	0	0	1	0	0	0
I Rough:z10:e,n,z15	0	0	0	0	0	0	1	0	0	0
Infantis	0	0	0	0	1	0	1	0	1	0
Kentucky	12	7.5	5	2.5	14	4	7	1	11	1
Kiambu	0	0	0	0	0	0	1	0	0	0
Mbandaka	0	0	0	0	0	0	1	0	0	0
Worthington	0	0	0	0	0	0	1	0	0	0
Total <i>Salmonella</i>	90	42	58	30.5	68	31.5	47	25	63	22
Research and Monitoring¹										
Agona	0		5		1		6		4	
Anatum	1		0		0		1		0	
Anatum var.15+	0		0		0		1		0	
Braenderup	4		1		8		8		1	
Enteritidis	104		25		68		41		49	
Hadar	4		3		38		1		4	
Heidelberg	86		39		102		61		54	
I 4,[5],12:i:-	1		0		1		5		7	
I 8,20:i:-	1		1		0		1		1	
I Rough:b:1,2	0		0		0		2		0	
I Rough:d:1,7	0		0		0		1		0	
I Rough:g,m:-	0		0		0		1		1	
I Rough:i:z6	5		0		1		2		0	
I Rough:k:1,5	0		0		1		2		0	
I Rough:r:-	0		0		2		1		1	

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Research and Monitoring (continued)¹										
I Rough:r:1,2	3		3		0		4		0	
I Rough:z10:e,n,x	0		0		0		1		0	
Infantis	5		9		9		6		3	
Kentucky	128		64		227		89		105	
Litchfield	0		1		0		1		0	
Mbandaka	12		5		13		8		6	
Mbandaka var.14+	0		0		0		1		0	
Orion var.15+34+	6		2		4		3		4	
Schwarzengrund	4		0		3		3		2	
Senftenberg	9		7		9		1		10	
Thompson	4		1		7		2		4	
Typhimurium var. 5-	0		2		8		2		2	
Worthington	5		0		0		1		0	
Total <i>Salmonella</i>	439		189		524		256		269	

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

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

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir¹										
Bovismorbificans	0	1.5	3	0.5	3	1	4	1	1	1
Brandenburg	3	2.5	6	2.5	0	3	1	2.5	4	2
Derby	12	11	13	11	6	6.5	10	8.5	8	9
Enteritidis	0	0	0	0	0	0.5	1	0	0	0
Give	0	1	1	1.5	1	0.5	2	0	1	0
Infantis	5	3	5	3	1	3	3	2.5	4	2
Muenchen	0	0	0	0	0	0	1	0	0	0
Ohio	0	0.5	0	0	0	1	1	0	1	0
Putten	0	0	0	0	0	0	1	0	0	0
Schwarzengrund	0	1.5	0	0	0	0	1	1.5	4	1
Typhimurium	4	4	3	4.5	0	5	3	3.5	2	4
Typhimurium var. 5-	4	4	5	7	1	6.5	6	4	3	5
Uganda	0	0	0	0	3	0	1	0	0	0
Worthington	1	0.5	2	1.5	0	1	1	0	1	0
Total <i>Salmonella</i>	40	44.5	47	37	42	52.5	36	36.5	38	35
Retail¹										
Brandenburg	0	0.5	1	0	0	0	3	0	0	0
Derby	0	0.5	3	0.5	3	0	1	0	1	0
Enteritidis	0	0	0	0	0	0	1	0	1	0
Infantis	1	0	1	0	1	0	1	0	0	0
Newport	0	.	0	.	0	.	1	.	0	.
Ohio	0	.	0	.	0	.	1	.	0	.
Typhimurium var. 5-	0	1	0	0	0	1.5	1	1.5	1	0
Pending	0	.	1	.	2	.	1	.	0	.
Total <i>Salmonella</i>	2	5	9	4	8	4	10	4	3	3
Animal Clinical Isolates¹										
Anatum	0	0.5	0	0.5	0	0	1	0	1	0
Brandenburg	1	1	2	2	2	1	3	2	5	2
Derby	6	5.5	12	6	4	5	9	5.5	7	5
I 4,[5],12:i:-	7	1.5	1	1	5	1	2	0.5	0	1
I Rough:d:l,w	0	0	0	0	0	0	1	0	0	.
Infantis	5	2.5	2	2	0	2	4	2	5	1
Mbandaka	0	1	1	1	1	1.5	2	1	1	1
Muenster	0	0	0	0	0	0	2	0	0	0
Typhimurium	10	17	18	16	9	17.5	12	19	20	19
Typhimurium var. 5-	9	8	8	8	10	9	7	11	12	10
Total <i>Salmonella</i>	50	52.5	59	44.5	43	48.5	43	54	62	54
Farm¹										
Brandenburg	0	1	0	1	0	1	1	4	4	3.5
Derby	4	4	1	2	5	4	2	8	9	7.5
I 4,[5],12:i:-	0	0	2	0	1	1	2	3	5	2.5
Krefeld	0	0	0	0	0	0	1	0	0	0.5
Livingstone	0	0	0	0	1	0	4	0	0	0
London	0	0	0	0	0	0	1	0	0	0.5
Ohio	0	0	0	0	0	0	1	0	1	0
Typhimurium	0	0	0	2	0	2	5	2	2	2
Typhimurium var. 5-	2	7	0	4	4	6	6	6	8	6
Total <i>Salmonella</i>	11	18	18	17	25	25	23	43	43	36
Research and Monitoring¹										
Agona	0		0		3		2		0	
Alachua	0		0		0		3		0	
Anatum	0		0		0		1		0	
Choleraesuis	0		0		0		2		0	
Choleraesuis var. Kunzendorf	0		0		0		1		0	
Corvallis	0		0		2		4		0	
Derby	0		1		0		2		0	
I Rough:l,v:e,n,z15	0		0		0		1		0	
Infantis	0		1		2		1		0	

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Research and Monitoring (continued)¹										
Livingstone var.14+	0		0		0		2		0	
Typhimurium	0		0		0		1		0	
Total <i>Salmonella</i>	0		2		40		20		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); fourth quarter 2010 - fourth quarter 2011.

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Retail¹ (Turkey²)										
Agona	1		1		5		5			
Braenderup	0		0		0		1			
Hadar	1		2		1		2			
Heidelberg	3		0		1		6			
Indiana	0		0		2		1			
Infantis	0		1		0		1			
Kentucky	1		0		1		2			
Rissen	0		0		0		1			
Saintpaul	0		0		0		1			
Schwarzengrund	1		0		3		1			
Worthington	1		0		1		2			
Pending	0		0		0		2			
Total <i>Salmonella</i>	14		8		17		25			
Animal Clinical Isolates¹										
Agona	0	0.5	0	1	6	2	2	1.5	2	1
Brandenburg	0	0	0	0	0	0	1	0	3	0
Derby	0	0	1	0	1	0	1	0	0	0
Dublin	1	0	0	0	5	0	1	0	0	0
Enteritidis	16	6.5	6	2.5	3	2	5	2.5	17	2
Give	0	0	0	0	0	0	1	0	0	0
Heidelberg	4	8.5	5	13.5	6	21	3	11	3	12
I 4,[5],12:i:-	3	1	2	1	7	2	3	2	6	2
I 8,20:i:-	0	.	0	.	0	.	1	.	0	.
I Rough:l,z13:1,5	0	.	0	.	0	.	1	.	0	.
IIIb 61:-:1,5,7	0	0	0	0	0	0	1	0	0	0
Indiana	0	0	2	0	0	0	1	0	0	0
Infantis	1	1	1	0	4	1	2	1	0	1
Kentucky	9	4	2	4	4	5.5	2	4	1	4
Kiambu	2	0	0	0	0	0	1	0	0	0
Mbandaka	2	0.5	1	1	1	1	2	0.5	3	0
Newport	1	1	0	1.5	1	2	1	0.5	0	1
Ohio var. 14+	0	0	0	0	0	0	1	0	0	0
Oranienburg	0	0	0	0	1	1	1	0.5	1	0
Senftenberg	3	2	2	2	0	2	2	1.5	0	2
Thompson	0	1	3	1	2	3	1	1.5	0	2
Typhimurium	11	20	8	14.5	23	23.5	11	17	10	17
Typhimurium var. 5-	15	7	9	9	18	16	13	7	21	6
Uganda	0	0	0	0	3	0.5	2	0	0	0
Total <i>Salmonella</i>	88	99.5	60	80	115	112	60	87.5	76	82
Research and Monitoring¹										
Agona	7		6		12		5		5	
Bardo	0		0		0		1		0	
Braenderup	1		2		1		5		1	
Corvallis	0		0		0		17		0	
Ealing	0		0		0		1		2	
Enteritidis	13		35		13		9		24	
Give	0		0		1		1		0	
Hadar	11		26		8		8		12	
Heidelberg	20		14		31		18		18	
I 10:l,z13:-	1		0		0		1		0	
I 4,[5],12:-:1,2	0		0		0		1		0	
I 4,[5],12:b:-	0		0		21		8		0	
I 4,[5],12:i:-	2		3		8		1		1	
I 6,7:-:-	0		0		0		1		0	
I Rough:b:-	0		0		0		1		0	
I Rough:d:1,7	2		0		0		2		0	
I Rough:e,h:1,5	0		1		15		6		0	

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Research and Monitoring (continued)¹										
I Rough:f,g,s:-	0		0		0		1		0	
I Rough:i:z6	4		2		0		1		5	
I Rough:k:1,5	0		0		0		1		0	
I Rough:r:-	0		0		0		2		0	
I Rough:z10:e,n,x	1		0		0		2		0	
IIIa 51:z4,z23:-	0		0		0		1		0	
IIIb 11:k:z53	0		0		1		1		0	
Indiana	0		15		0		2		0	
Infantis	2		2		8		1		2	
Kentucky	30		10		35		15		77	
Livingstone	0		0		0		2		0	
Mbandaka	0		3		4		3		0	
Montevideo	0		0		1		2		0	
Muenster	2		0		11		9		0	
Newport	6		8		21		7		0	
Ohio var. 14+	0		0		1		1		0	
Oranienburg	0		1		12		5		2	
Orion var.15+34+	8		4		47		23		22	
Rissen	1		0		4		2		1	
Saintpaul	1		0		0		2		1	
Schwarzengrund	22		2		13		5		13	
Senftenberg	16		16		12		9		19	
Thompson	2		7		17		14		4	
Typhimurium	7		2		3		3		7	
Typhimurium var. 5-	0		0		3		5		2	
Uganda	0		1		6		9		0	
Virchow	1		0		0		1		1	
Weltevreden	0		0		0		1		0	
Total <i>Salmonella</i>	176		179		339		216		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 Four, 2011.

Serovar	Species	Number of Isolates
Derby	Turkey	1
Dublin	Bovine	1
I 8,20:i:-	Bovine	1
I Rough:l,z13:1,5	Reptile	1
IIIb 61:-:1,5,7	Ovine	1
Indiana	Turkey	1
Ohio var. 14+	Avian	1
Uganda	Bovine	1
	Equine	1

Unspecified bird species

Table 5. S. Enteritidis phagetypes observed in the fourth quarter of 2011.

Animal Species	Surveillance Component¹	13	13a	19	23	35	51	56	8	Atypical
Chicken	Abattoir		1	1					1	
	Retail	1	2	1					4	3
	Clinical Animal Isolates		1				2		10	4
	Research and Monitoring	10	2		2			1	22	4
Porcine	Abattoir									1
	Retail								1	
	Farm ²									
	Clinical Animal Isolates ²									
	Research and Monitoring ²									
Other animal species	Retail ² (Turkey)									
	Clinical Animal Isolates		1						1	2
	Research and Monitoring	2	3						1	3

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

² No S. Enteritidis isolates recovered in quarter four 2011

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

Serovar	2011								2010	
	Q1		Q2		Q3		Q4		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Animal Clinical Isolates										
Agona	0	0	0	0	1	0	0	0	0	0
Derby	0	.	1	.	0	.	0	.	0	.
Enteritidis	1	0	0	0	0	0	0	0	0	0
Heidelberg	0	0.5	1	0.5	0	1	0	0	0	0
IV 48:g,z51:-	0	.	1	.	0	.	0	.	0	.
Infantis	0	0	1	0	0	0	1	0	0	0
Kentucky	0	0	0	0	1	0	0	0	0	0
Kiambu	1	0	0	0	0	0	0	0	0	0
Thompson	0	0	0	0	1	0	0	0	0	0
Typhimurium	2	0	1	0.5	2	1	0	1	0	1
Pending	0	.	2	.	0	.	0	.	0	.
Total <i>Salmonella</i>	4	3	7	4	5	5	1	4	2	4
Research and Monitoring										
Total <i>Salmonella</i>	0		0		0		0		0	

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