



Government of Canada Gouvernement du Canada

Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

Quarterly Summary: *Salmonella* in Agri-food

Quarter One 2011: January - March 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 April 28, 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) May 9, 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 will be added in future quarterly summaries.

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 One 2011, we present diagnostic *Salmonella* isolates from turkeys (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 One (by species/surveillance component pair); CIPARS 2011.

Surveillance Component ¹	Chicken	Porcine	Other
Abattoir	Hadar	Heidelberg Schwarzengrund Typhimurium	
Retail		Senftenberg	
Animal Clinical			Thompson
Farm		Brandenburg Derby Typhimurium	

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

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

Serovar	2011		2010							
	Q1		Q1		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir¹										
Enteritidis	5	4	5	3	5	3	3	4	12	5
Heidelberg	4	9.5	10	9	4	10	9	12	7	11
Kentucky	13	16	9	23	12	19	25	17	13	17
Kiambu	1	1	0	1	0	1	0	0	1	0
Orion var.15+34+	2	0	0	0	0	0	0	0	0	0
Schwarzengrund	1	1	1	1	0	0	0	0	0	0
Senftenberg	1	0	1	0	0	0	0	0	0	0
Worthington	1	0	0	0	0	0	0	0	0	0
Pending	8	.	0	.	0	.	0	.	0	.
Total <i>Salmonella</i>	36	49	31	56	24	36	43	47	44	48
Retail^{1,2}										
Agona	3	1	1	0.5	0	1	1	1	0	0
Braenderup	1	0	1	0	0	0	1	0	4	0.5
Enteritidis	14	23	24	19	9	16.5	14	24.5	13	18
Hadar	5	6	6	6	1	3	12	10	4	5.5
Heidelberg	15	34	34	28.5	20	22	24	33	28	32
I 4,[5],12:i:-	1	1	1	1.5	0	0.5	1	2.5	2	2.5
I 6,7:r:-	1	.	0	.	0	.	0	.	0	.
I 8,20:-:z6	1	0	0	0.5	0	0	0	0	0	0
Indiana	1	1	1	0.5	1	0.5	0	0	1	0
Infantis	1	1	0	1.5	0	1.5	0	1.5	3	3
Kentucky	24	25	23	34.5	15	29	28	34.5	34	23.5
Litchfield	2	0	1	.	0	.	0	.	2	.
Montevideo	1	1	0	1	0	0.5	0	0	2	0.5
Ohio	1	0	1	.	1	.	0	.	0	.
Oranienburg	1	0	0	0	0	0	0	0.5	0	0
Saintpaul	1	.	0	.	0	.	0	.	0	.
Schwarzengrund	2	2	5	2	1	2	3	3.5	1	2
Thompson	1	1	1	2	2	4.5	5	3.5	1	2.5
Typhimurium	1	2	1	5	0	1	5	3	4	1.5
Typhimurium var. 5-	1	2	2	1	0	1.5	2	0.5	1	0
Worthington	3	2	2	2	0	0.5	0	0	1	0.5
Pending	38	.	0	.	0	.	0	.	0	.
Total <i>Salmonella</i>	119	117	117	115	55	91	105	124	104	98
Animal Clinical Isolates¹										
Enteritidis	42	18	38	14	22	9	19	5	26	9
Havana	1	.	0	.	0	.	0	.	0	.
Heidelberg	19	7.5	28	6	26	7	18	5	17	5
I 4,[5],12:r:-	1	0	0	0	0	0	0	0	0	0
I Rough:f,g:-	1	.	0	.	0	.	0	.	0	.
I Rough:g,m:-	1	0	0	0	1	0	0	0	0	0
Kentucky	3	7.5	42	7	6	2	8	4	4	1
Orion var.15+34+	1	0	0	0	0	0	0	0	0	0
Thompson	2	0.5	2	0	0	0	0	0	0	0
Typhimurium var. 5-	2	0	2	0	0	0	0	0	0	0
Total <i>Salmonella</i>	73	42	124	33	67	21	65	28	63	22
Research and Monitoring¹										
Anatum	1		0		0		0		0	
Braenderup	4		2		8		2		0	
Enteritidis	57		58		49		42		48	
Hadar	3		8		8		5		4	
Havana	1		0		0		0		0	
Heidelberg	68		79		72		99		54	
I 4,[5],12:i:-	1		3		0		0		3	
I 4,[5],12:r:-	1		4		1		1		0	
I 6,7:-:1,5	1		1		0		0		0	
I 8,20:-:z6	3		2		1		0		2	
I 8,20:i:-	1		0		1		0		1	

Serovar	2011		2010							
	Q1		Q1		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
I Rough:i:z6	4		1		2		1		0	
I Rough:r:1,2	3		2		3		4		0	
Indiana	8		0		0		0		0	
Infantis	5		20		7		7		3	
Kentucky	72		151		137		103		99	
Mbandaka	12		3		19		10		6	
Ohio	1		0		1		1		0	
Oranienburg	1		0		1		0		0	
Orion var.15+34+	6		0		15		0		4	
Schwarzengrund	4		13		7		5		2	
Senftenberg	4		6		7		2		10	
Thompson	2		15		1		5		4	
Typhimurium	4		15		12		11		11	
Worthington	2		2		1		1		0	
Total <i>Salmonella</i>	269		408		438		325		269	

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

² There were few retail meat samples collected in Ontario in quarter two

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

Serovar	2011		2010							
	Q1		Q1		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Abattoir¹										
Anatum	1	1	0	1	1	0	0	0	1	1
Brandenburg	2	2.5	1	4	6	2	4	3	4	3
California	1	0.5	0	1	1	1	0	0	0	1.5
Derby	11	11	11	11	12	11	5	7	8	11
I 4,[5],12:i:-	2	1	1	1	0	0	1	0	1	1.5
I 6,7:-:-	1	.	0	.	0	.	0	.	0	.
I 6,8:r:-	1	.	0	.	0	.	0	.	0	.
Infantis	1	3	3	3	4	3	11	2	4	2.5
Montevideo	1	0	0	0	0	0	0	0	0	2
Typhimurium var. 5-	2	4	10	3	1	7	7	6	3	3.5
Worthington	1	0.5	6	0	2	1	4	1	1	2
Pending	8	.	0	.	0	.	0	.	0	.
Total <i>Salmonella</i>	32	44.5	39	43	53	35	37	52	38	35
Retail^{1,2}										
Infantis	1	0	0	0	0	0	0	0	0	0
Total <i>Salmonella</i>	1	5	4	6	4	4	3	4	1	3
Animal Clinical Isolates¹										
Alachua	1	0	0	0	0	0	0	0	0	0
Cerro	1	0	0	0	1	0	0	0	0	0
Derby	4	5.5	5	6	7	5	10	5	6	5
Give	1	0	1	0	0	0	0	0	1	0
I 4,[5],12:d:-	3	.	0	.	0	.	0	.	0	.
I 4,[5],12:i:-	4	1.5	5	1	2	1	8	1	2	1
I 6,7:z10:-	1	.	0	.	0	.	0	.	0	.
IIIb 61:k:1,5,7	1	.	0	.	0	.	0	.	0	.
Infantis	4	2.5	4	2	3	2	0	2	1	1
London	1	0	0	0	1	0	0	0	0	0
Schwarzengrund	1	1.5	2	1	0	0	1	0	3	1
Typhimurium	8	15.5	16	15	13	14	3	19	18	19
Typhimurium var. 5-	9	8	4	9	10	8	2	10	7	10
Worthington	1	1	0	1	0	0	0	0	4	0
Total <i>Salmonella</i>	40	52.5	56	49	64	43	50	48	62	54
Farm¹										
Enteritidis	1	0	0	0.5	0	0	0	0	0	0
Infantis	1	2	4	1.5	0	2	2	1	1	2
Typhimurium var. 5-	2	7	7	6	4	4	12	5	14	6
Total <i>Salmonella</i>	4	18	16	21	24	18.5	43	26.5	61	36
Research and Monitoring¹										
Total <i>Salmonella</i>	0		1		5		0		2	

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

² There were few retail meat samples collected in Ontario in quarter two

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

Serovar	2011		2010							
	Q1		Q1		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Animal Clinical Isolates¹										
Albany	1	0	0	0	0	0	0	0	0	0
Dublin	1	0	5	0	0	0	1	0	0	0
Enteritidis	14	6.5	16	4	7	2	9	2	14	2
Hadar	1	0.5	2	0	1	1	6	3	3	2
Heidelberg	4	8.5	10	7	6	15	5	25	3	12
I 4,[5],12:i:-	2	1	5	1	1	1	2	2	6	2
I 40:b:-	1	.	0	.	0	.	0	.	0	.
I 43:-:-	1	.	0	.	0	.	0	.	0	.
I 6,14,18:-:-	3	2	2	2	0	2	0	1	0	2
I Rough:l,v:e,n,x	1	0	0	0	0	0	0	0	0	0
IIIb 61:k:1,5,7	1	0	0	0	0	0	4	0	0	0
Infantis	1	1	3	1	0	0	1	1	0	1
Kentucky	1	4	10	3	1	4	0	6	0	4
Kiambu	2	0	0	0	0	0	0	0	0	0
Milwaukee	2	.	0	.	0	.	0	.	0	.
Newport	1	1	0	1	0	2	1	2	0	1
Orion var.15+34+	1	0	0	0	0	1	0	0	0	0
Othmarschen	1	.	0	.	0	.	0	.	0	.
Panama	1	0	0	0	0	0	0	0	0	0
Senftenberg	2	2	4	2	2	2	1	2	0	2
Typhimurium	8	20	11	21	17	13	16	23	6	17
Typhimurium var. 5-	10	7	13	4	12	9	19	16	7	6
Woodinville	1	0	0	0	1	0	0	0	0	0
Worthington	1	0.5	1	0	0	0	0	0	0	0
Total <i>Salmonella</i>	62	96.5	73	94	108	84	103	113	76	82
Research and Monitoring¹										
Agona	6		2		1		5		5	
Anatum	1		0		1		0		0	
Braenderup	1		1		0		10		1	
Enteritidis	13		21		12		14		24	
Hadar	11		47		12		13		12	
Havana	2		0		1		0		0	
Heidelberg	17		23		24		14		18	
I 10:l,z13:-	1		0		0		0		0	
I 4,[5],12:i:-	2		0		0		0		1	
I Rough:d:1,7	2		1		1		0		0	
I Rough:e,h:1,2	2		3		2		1		0	
I Rough:i:z6	3		0		0		0		5	
I Rough:r:1,2	2		7		1		0		1	
I Rough:z10:e,n,x	1		0		0		1		0	
Infantis	2		0		0		0		2	
Kentucky	22		18		5		37		77	
Kinondoni	1		0		0		0		0	
Livingstone var.14+	1		0		2		0		0	
Muenster	2		1		1		0		0	
Newport	6		1		3		0		0	
Orion var.15+34+	8		8		16		30		22	
Rissen	1		0		0		0		1	
Saintpaul	1		13		15		1		1	
Schwarzengrund	22		19		12		24		13	
Senftenberg	15		7		3		14		18	
Tennessee	1		0		1		2		2	
Thompson	2		4		2		3		4	
Typhimurium	6		3		6		12		7	
Virchow	1		0		0		0		1	
Total <i>Salmonella</i>	155		225		148		220		236	

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

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

Serovar	Species	Number of Isolates
Albany	Environment ²	1
Dublin	Bovine	1
Enteritidis	Avian ¹	13
	Feline	1
I 40:b:-	Feed and Ingredients	1
I 43:-:-	Reptile	1
I Rough:l,v:e,n,x	Reptile	1
IIIb 61:k:1,5,7	Ovine	1
Kiambu	Feline	1
	Turkey	1
Milwaukee	Reptile	2
Orion var.15+34+	Turkey	1
Othmarschen	Avian ¹	1
Panama	Amphibian	1
Woodinville	Reptile	1

¹ Unspecified bird species

² No species/source provided

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

Animal Species	Surveillance Component	11b	13a	19	23	29	51	8	Atypical
Chicken	Abattoir		1	1	1			2	
	Retail		4	1			3	4	
	Clinical Animal Isolates		3		6		4	27	2
	Research and Monitoring	1	32		1	1	1	19	2
Porcine	Farm				1				
Other animal species	Clinical Animal Isolates				1		1	11	1
	Research and Monitoring		8		1			3	1

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

Serovar	2011		2010							
	Q1		Q1		Q2		Q3		Q4	
	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp	Obs	Exp
Animal Clinical Isolates										
Agona	0	0.5	3	0	0	0	1	0	2	0
Hadar	1	0	2	0	0	1	0	1	1	1
Heidelberg	0	1	2	1	0	3	0	2	2	1
Johannesburg	0	0	0	0	0	0	1	0	0	0
Kiambu	1	0	0	0	0	0	0	0	0	0
Montevideo	0	0	0	0	1	0	0	0	0	1
Orion var.15+34+	1	.	0	.	0	.	0	.	0	.
Saintpaul	0	0	0	0	2	0	0	0	0	1
Schwarzengrund	0	0	2	0	0	0	0	0	0	0
Senftenberg	2	1	3	1	1	2	1	1	0	1
Typhimurium var. 5-	0	0	2	0	0	0	0	0	0	0
Pending	0	.	0	.	0	.	1	.	3	.
Total <i>Salmonella</i>	5	10.5	14	10	4	12	4	12	8	9
Research and Monitoring¹										
Agona	4		0		0		5		5	
Albany	0		2		0		0		0	
Anatum	1		0		0		0		0	
Braenderup	0		0		0		1		0	
Bredeney	0		0		1		0		0	
Derby	0		0		2		0		1	
Ealing	0		0		0		0		2	
Give	0		1		0		3		0	
Hadar	11		47		11		9		7	
Heidelberg	3		14		19		2		7	
I 10:-:1,5	0		2		0		0		0	
I 10:e,h:-	0		3		0		0		0	
I 4,12:-:1,5	0		1		0		0		0	
I 4,[5],12:-:-	0		2		0		0		0	
I 4,[5],12:e,h:-	0		1		0		0		0	
I Rough:d:1,7	0		1		1		0		0	
I Rough:e,h:-	0		0		0		1		0	
I Rough:e,h:1,2	2		3		2		1		0	
I Rough:e,h:1,5	0		1		1		0		0	
I Rough:r:1,2	1		7		1		0		0	
I Rough:z10:e,n,x	1		0		0		1		0	
Kentucky	0		0		0		1		2	
Livingstone var.14+	1		0		0		0		0	
Mbandaka	0		0		0		1		0	
Montevideo	0		1		0		1		0	
Muenster	2		1		1		0		0	
Newport	6		1		0		0		0	
Orion var.15+34+	5		8		16		29		21	
Saintpaul	1		13		15		1		0	
Schwarzengrund	19		12		12		17		9	
Senftenberg	11		4		0		7		14	
Thompson	0		1		0		2		2	
Typhimurium	2		0		0		2		0	
Typhimurium var. 5-	0		10		1		0		0	
Total <i>Salmonella</i>	70		136		83		84		70	

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