

Salmonella in Animals 2014Table 1: *Salmonella* in breeding and commercial poultry flocks

Flock Type	Age/Stage	Tested	Positive	Species
<b>Convenience Sampling</b>				
	Grandparent breeder flocks ( <i>Gallus gallus</i> )	6	0	
	Parent breeding flocks ( <i>Gallus gallus</i> )	155	0	
	Laying hens ( <i>Gallus gallus</i> )	190	0	
	Broilers ( <i>Gallus gallus</i> )	39	1 (2.6%)	S. Tennessee (n = 1)
<b>Total</b>		<b>390</b>	<b>1 (0.3%)</b>	<b>S. Tennessee (n = 1)</b>
<b>Suspect Sampling</b>				
	Breeding flocks (Turkeys)	5	0	
	Fattening flocks (Turkeys)	8	0	
	Broilers ( <i>Gallus gallus</i> )	195	0	
<b>Total</b>		<b>208</b>	<b>0</b>	
<b>Overall total</b>		<b>598</b>	<b>1 (0.2%)</b>	<b>S. Tennessee (n = 1)</b>

Source: Department of Agriculture, Food and the Marine (DAFM)

Table 2: *Salmonella* spp. in other animals

Animal	Tested	Positive	Species
<b>Suspect Sampling</b>			
Bison (zoo animals)	56	1 (1.8%)	<i>Salmonella</i> spp. unspecified (n = 1)
Cats	6	0	
Cattle adult (bovine >2 years)	1092	52 (4.8%)	<i>S. Dublin</i> (n = 32) <i>S. Typhimurium</i> (n = 20)
3/Cattle calves (bovine under 1 year)	4929	75 (1.5%)	<i>S. Dublin</i> (n = 65) <i>S. Goldcoast</i> (n = 1) <i>S. Manhattan</i> (n = 1) <i>S. Montevideo</i> (n = 1) <i>S. Typhimurium</i> (n = 7)
Cattle (bovine animals – other)	2482	136 (5.5%)	<i>S. Dublin</i> (n = 132) <i>S. Montevideo</i> (n = 2) <i>S. Typhimurium</i> (n = 2)
Deer (farmed)	14	0	
Dogs	155	3 (1.9%)	<i>S. Kentucky</i> (n = 3)
Broilers (suspect)	195	0	
Goats	85	0	
Exotic pet animals	34	0	
Pheasants	16	0	
Pigeons	3	0	
Pigs (breeders)	15	0	
Pigs (fattening)	903	36 (4%)	<i>S. Dublin</i> (n = 1) <i>S. Livingstone</i> (n = 1) <i>S. Panama</i> (n = 1) <i>S. Typhimurium</i> (n = 31) <i>Salmonella</i> spp. Unspecified (n = 2)
Rabbits (pets)	30	0	
Sheep	1858	16 (0.9%)	<i>S. Derby</i> (n = 1) <i>S. Dublin</i> (n = 10) <i>S. Enterica</i> subsp. <i>diarizonae</i> (n = 5)
Solipeds	106	5 (4.7%)	<i>S. Dublin</i> (n = 1) <i>S. Enteritidis</i> (n = 1) <i>S. Typhimurium</i> (n = 3)
Turkeys (suspect)	60	0	
<b>Total</b>	<b>12039</b>	<b>324 (2.7%)</b>	<b><i>S. Dublin</i> (n = 241) <i>S. Typhimurium</i> (n = 63) <i>S. Enterica</i> subsp. <i>Diarizonae</i> (n = 5) <i>Salmonella</i> spp. unspecified (n = 3) <i>S. Kentucky</i> (n = 3) <i>S. Montevideo</i> (n = 3) <i>S. Derby</i> (n = 1) <i>S. Manhattan</i> (n = 1) <i>S. Goldcoast</i> (n = 1) <i>S. Panama</i> (n = 1) <i>S. Livingstone</i> (n = 1) <i>S. Enteritidis</i> (n = 1)</b>

Source: DAFM

Table 3: *Salmonella* spp. in animal feed materials

Type of feed material	Tested	Positive	Species
<b>Convenience Sampling</b>			
<b><i>Feed material of land animal origin</i></b>			
Dairy products	1	0	
<b><i>Feed material of vegetable origin</i></b>			
Cereals	70	0	
Oilseeds or fruits	45	2 (4.4%)	<i>Salmonella</i> spp. unspecified (n = 2)
Other feed material	12	0	
<b><i>Feed material of marine animal origin</i></b>			
Fish meal	0	0	
<b><i>Compound feed for:</i></b>			
Cattle	76	0	
Pig	21	0	
Poultry (non-specified)	2	0	
Poultry (laying hens)	7	0	
Poultry (broilers)	3	0	
Horses	5	0	
Sheep	11	0	
<b>Total</b>	<b>253</b>	<b>2 (0.8%)</b>	<b><i>Salmonella</i> spp. unspecified (n = 2)</b>

Source: DAFM

**Antimicrobial Resistance in *S. Typhimurium* and Non *S. Typhimurium* Poultry Isolates**

**Table 4: Percentage of *S. Typhimurium* poultry isolates (including the monophasic variant 4,[5],12:i:-) resistant to antimicrobials in 2012, 2013 and 2014\***

<b>Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Number of isolates tested</b>	<b>n = 2</b>	<b>n = 2</b>	<b>n = 5</b>
<b>Antimicrobial</b>	<b>Percentage of resistant isolates</b>		
Ampicillin	0	0	20
Chloramphenicol	0	0	0
Streptomycin	0	50	- <sup>1</sup>
Sulfamethoxazol	0	0	20
Tetracycline	0	0	20
Trimethoprim	0	0	0
Nalidixic acid	0	0	0
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>0</b>	<b>50</b>	<b>20</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>100</b>	<b>50</b>	<b>80</b>

\*Isolated from dust, boot swabs and neck skin.

<sup>1</sup>No *S. Typhimurium* poultry isolates were tested for streptomycin resistance in 2014

Source: Central Research Veterinary Laboratory (CVRL)

**Table 5: Percentage of Non *S. Typhimurium* poultry isolates resistant to antimicrobials in 2012, 2013 and 2014\***

Year	2012	2013	2014
Number of isolates tested	n = 32	n = 63	n = 40
Antimicrobial	Percentage of resistant isolates		
Ampicillin	16	6	2.5
Chloramphenicol	0	5	0
Streptomycin	9	35	- <sup>1</sup>
Sulfamethoxazol	19	6	2.5
Tetracycline	13	8	0
Trimethoprim	16	2	0
Nalidixic acid	13	8	0
Ceftazidime	3	0	2.5
Cefotaxime	3	2	2.5
Ciprofloxacin	13	11	0
Gentamicin	6	0	0
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>22</b>	<b>48</b>	<b>7.5</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>78</b>	<b>52</b>	<b>92.5</b>

\*Isolated from faeces, boot swabs and neck skin.

<sup>1</sup>No *S. Typhimurium* poultry isolates were tested for streptomycin resistance in 2014

Source: CVRL

**Antimicrobial Resistance in *S. Typhimurium* and Non *S. Typhimurium* Bovine Isolates**

**Table 6: Percentage of *S. Typhimurium* bovine isolates (including the monophasic variant 4,[5],12:i:-) resistant to antimicrobials in 2012, 2013 and 2014\***

Year	2012	2013	2014
Number of isolates tested	n=1	n=39	n = 8
Antimicrobial	Percentage of resistant isolates		
Ampicillin	0	62	100
Chloramphenicol	0	28	0
Streptomycin	100	62	100
Sulfamethoxazol	100	69	100
Tetracycline	0	59	100
Trimethoprim	0	3	0
Nalidixic acid	0	0	0
Gentamicin	0	3	0
Florfenicol	0	0	0
Ciprofloxacin	0	3	0
Ceftazidime	0	0	0
Cefotaxime	0	0	0
Azithromycin	NT	NT	0
Tigecycline	NT	NT	0
Meropenem	0	0	0
Cefepime	0	0	0
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>100</b>	<b>72</b>	<b>100</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>0</b>	<b>28</b>	<b>0</b>

\*Isolated from foetus, faeces and live animals

NT: Not tested

Source: National Salmonella, Shigella and Listeria Research Laboratory (NSSLRL)

**Table 7: Percentage of Non *S. Typhimurium* bovine isolates resistant to antimicrobials in 2012, 2013 and 2014**

<b>Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Number of isolates tested</b>	<b>n=14</b>	<b>n=13</b>	<b>n = 0</b>
<b>Antimicrobial</b>	<b>Percentage of resistant isolates</b>		
Ampicillin	14	0	NT
Chloramphenicol	7	0	NT
Streptomycin	7	23	NT
Sulfamethoxazol	14	0	NT
Tetracycline	14	0	NT
Trimethoprim	21	0	NT
Nalidixic acid	7	0	NT
Gentamicin	0	0	NT
Florfenicol	7	0	NT
Ciprofloxacin	7	0	NT
Ceftazidime	0	0	NT
Cefotaxime	0	0	NT
Azithromycin	NT	NT	NT
Tigecycline	NT	NT	NT
Meropenem	0	0	NT
Cefepime	0	0	NT
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>36</b>	<b>23</b>	<b>0</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>64</b>	<b>77</b>	<b>0</b>

NT: Not tested

Source: NSSLRL

**Antimicrobial Resistance in *S. Typhimurium* and Non *S. Typhimurium* Porcine Isolates**

**Table 8: Percentage of *S. Typhimurium* porcine isolates (including the monophasic variant 4,[5],12:i:-) resistant to antimicrobials in 2012, 2013 and 2014**

<b>Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Number of isolates tested</b>	<b>n=19</b>	<b>n=48</b>	<b>n = 2*</b>
<b>Antimicrobial</b>	<b>Percentage of resistant isolates</b>		
Ampicillin	74	90	100
Chloramphenicol	0	48	0
Streptomycin	95	83	100
Sulfamethoxazol	95	94	100
Tetracycline	95	83	100
Trimethoprim	11	25	50
Nalidixic acid	0	6	0
Gentamicin	11	2	50
Florfenicol	0	NT	0
Ciprofloxacin	0	13	0
Kanamycin	0	NT	0
Ceftazidime	0	0	0
Cefotaxime	0	0	0
Azithromycin	NT	NT	0
Tigecycline	NT	NT	0
Meropenem	0	0	0
Cefepime	0	0	0
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>95</b>	<b>98</b>	<b>100</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>5</b>	<b>2</b>	<b>0</b>

\*Isolated from live swine

NT: Not tested

Source: NSSRL

**Table 9: Percentage of Non *S. Typhimurium* porcine isolates resistant to antimicrobials in 2012, 2013 and 2014**

Year	2012	2013	2014
Number of isolates tested	n=14	n=13	n = 2*
Antimicrobial	Percentage of resistant isolates		
Ampicillin	51	5	50
Chloramphenicol	19	10	50
Streptomycin	49	25	100
Sulfamethoxazol	57	30	100
Tetracycline	55	45	100
Trimethoprim	11	20	100
Nalidixic acid	0	5	0
Gentamicin	0	0	0
Florfenicol	15	NT	0
Ciprofloxacin	0	20	0
Kanamycin	0	NT	0
Ceftazidime	0	0	0
Cefotaxime	0	0	0
Azithromycin	NT	NT	0
Tigecycline	NT	NT	0
Meropenem	0	0	0
Cefepime	0	0	0
<b>Isolates resistant to one or more antimicrobials (%)</b>	<b>64</b>	<b>70</b>	<b>100</b>
<b>Isolates susceptible to all tested antimicrobials (%)</b>	<b>36</b>	<b>30</b>	<b>0</b>

\*Isolated from raw swine meat

NT: Not tested

Source: NSSLRL

### Sources of data:

**CVRL, DAFM:** Unpublished data submitted to FSAI.

**NSSLRL:** National *Salmonella, Shigella & Listeria* Reference Laboratory of Ireland (Human Health). Annual Report for 2014.

[http://www.nuigalway.ie/salmonella\\_lab/downloads/national\\_salmonella\\_shigella\\_listeria\\_reference\\_laboratory\\_annual\\_report\\_human\\_for\\_ireland\\_2014.pdf](http://www.nuigalway.ie/salmonella_lab/downloads/national_salmonella_shigella_listeria_reference_laboratory_annual_report_human_for_ireland_2014.pdf)

**NSSLRL:** Unpublished data.