

Chapter 5

SALMONELLA IN FEEDINGSTUFFS 2007

The reported isolation rate of *Salmonella* from all samples reduced slightly, but significantly, between 2006 and 2007. In 2006 these were 387 isolations of *Salmonella* from 35,520 samples (1.1%); in 2007, these were 318 isolations from 35,999 samples (0.9%). The isolation rates of *Salmonella* from processed animal protein and oilseed meals decreased in 2007 compared to 2006, but increased for protein concentrates and mineral ingredients (Table 68).

The number of reported isolations of *Salmonella* considered to be of greatest potential public health significance (*S. Typhimurium*, *S. Enteritidis*, *S. Hadar*, *S. Virchow*, *S. Infantis*) was six in 2007, compared with 18 in 2006. *Salmonella Typhimurium* isolations showed a reduction from nine in 2006 to four in 2007. There were a variety of definitive phage types of *S. Typhimurium* isolated. The isolates made in 2007 were from a variety of materials: DT99 from ingredient sieve waste, DT193 from nailed oats, UNTY from compound pig feed and from rice bran *S. Typhimurium* which is as yet untyped. There were two isolations of *S. Infantis* recorded; one from rape, the other material being unspecified and there were no reports of *S. Enteritidis*, *S. Hadar* or *S. Virchow* in 2007.

Three isolations of *S. Poona* were reported from tests of imported protein in 2007. Those laboratories using this as a control organism for their testing should consider the use of another rare serotype as their control organism.

One isolate of *Salmonella Paratyphi B var Java* was made from an environmental sample at a feed mill. The isolate was sensitive to all antimicrobials tested.

A reduction in the reported *Salmonella* isolates made in compound ruminant feed was noted, from seven in 2006 to one in 2007.

A marked reduction in the numbers of isolates made of *S. Mbandaka* (18 in 2006 to zero in 2007) and *S. Rissen* (36 in 2006 to 8 in 2007) in rape was evident. The lack of detail in the submission data of reports submitted (e.g. no country of origin, product type, etc.) makes it difficult to draw any worthwhile conclusions on surveillance trends. The same comment regarding lack of detail creates problems in interpretation of possible reasons for the increase in the number of *S. Agona* reports (five in 2006, 15 in 2007) reported from soya.

There were 246 batches of home produced protein subjected to official testing under ABPR during 2007 and six of these (2.44%) were positive for *Salmonella*. This compares to 2006 when 1.65% of batches were positive (Table 75). The serovars reported during 2007 were *S. Agona* (6 isolations), *S. Bareilly* (2 isolations), *S. Kedougou* (1 isolation) and *S. Schwarzengrund* (1 isolation).

There were 35 batches of imported protein tested under IPAPO during 2007 and of these one (2.86%) was positive for *Salmonella*; this compares to 2006 when there were 44 batches tested and no positives reported (Table 77). The serovars reported in 2007 were *S. Poona* (three isolations) and *S. Schwarzengrund* (two isolations).

**Table 68: Animal feedingstuffs and ingredients contamination rates
(Tests being performed under the Animal By-Products Regulations 2005 and
Defra Codes of Practice) 2006 - 2007**

Product	2006			2007		
	No of tests	No of tests positive	Percent positive	No of tests	No of tests positive	Percent positive
Processed animal protein at a GB protein processing premises	7205	148	2.1	9529	146	1.5
GB and imported processed animal protein arriving for feedingstuffs use	576	10	1.7	1302	18	1.4
Oilseed meals and products for feedingstuffs use	9393	155	1.7	8331	84	1.0
Non-oilseed meal vegetable products	7506	22	0.3	7106	26	0.4
Ruminant concentrates	1898	10	0.5	1733	5	0.3
Pig extrusions	1258	3	0.2	1219	1	0.1
Pig and poultry meals	3114	19	0.6	2644	19	0.7
Poultry extrusions	3640	14	0.4	3411	3	0.1
Protein concentrate	374	5	1.3	405	11	2.7
Minerals/other	556	1	0.2	319	5	1.6
Total	35520	387	1.1	35999	318	0.9

Table 69: *Salmonella* serovars of public health significance in animal feedingstuffs 2006 - 2007

<i>Salmonella</i>	Type of material - 2006				Type of material - 2007		
	Finished feeds	Animal protein	Vegetable material	Misc.	Finished feeds	Vegetable material	Misc.
Enteritidis untyped	-	-	1	-	-	-	-
Hadar PT4	-	1	-	-	-	-	-
Hadar untyped	1	-	-	-	-	-	-
Infantis	1	-	4	-	-	1	1
Typhimurium DT85	-	-	-	2	-	-	-
Typhimurium DT99	-	-	-	-	-	-	1
Typhimurium DT104	-	-	4	2	-	-	-
Typhimurium DT193	-	-	-	-	-	1	-
Typhimurium U288	-	-	-	1	-	-	-
Typhimurium UNTY	-	-	-	-	1	-	-
Typhimurium untyped	-	-	-	-	-	1	-
Virchow untyped	-	-	1	-	-	-	-
Total	2	1	10	5	1	3	2

Misc - miscellaneous

Table 70: Isolations of *Salmonella* of public health importance from products monitored under the Defra Codes of Practice, 2007

<i>Salmonella</i>	Feedingstuff	Number
Infantis	rape	1
Infantis	unspecified ingredient	1
Typhimurium DT99	ingredient sieve waste	1
Typhimurium DT193	nailed oats	1
Typhimurium UNTY	compound pig feed	1
Typhimurium untyped	ricebran	1
Total		6

Table 71: The serotypes of *Salmonella* isolated from compound ruminant feed in 2007, compared with the previous year

<i>Salmonella</i> serotype	Isolations 2006	<i>Salmonella</i> serotype	Isolations 2007
Agama	2	15:y:-	1
Stanleyville	2		
Hull	1		
Montevideo	1		
9,46:-:-	1		

Table 72: The serotypes of *Salmonella* isolated from compound pig feed in 2007, compared with the previous year

<i>Salmonella</i> serotype	Isolations 2006	<i>Salmonella</i> serotype	Isolations 2007
Agona	2	Agona	1
Anatum	1	Cerro	1
Rissen	1	Kedougou	1
Tennessee	1	Typhimurium	1

Table 73: The serotypes of *Salmonella* isolated from compound poultry feed in 2007, compared with the previous year

<i>Salmonella</i> serotype	Isolations 2006	<i>Salmonella</i> serotype	Isolations 2007
Ohio	5	Ohio	2
Rissen	3	Ouakam	2
Agona	2	Agona	1
Senftenberg	2	Havana	1
		Manhattan	1
		Meleagridis	1
		Rissen	1
		Thompson	1
		Yoruba	1
		0:10:h:y	1
		3,19:-:-	1
		4,12:-:-	1

Table 74: The serotypes of *Salmonella* in feedingstuff ingredients 2007, compared with the previous year

Feedingstuff	<i>Salmonella</i> serotype	Isolations 2006	Isolations 2007
Barley	Typhimurium	3	0
Cocoa	Agama	1	0
	Enteritidis	1	0
	Ibadan	3	0
	Okatie	1	0
	Stanleyville	0	1
	Stockholm	0	1
	3:10:y:-	1	0
	4:z:-	1	0
	4:-:1,5	1	0
	6,7:-:-	1	0
	Group C	0	1
	Palm Kernel	Emek	1
Kentucky		0	1
Livingstone		1	0
Rissen		1	0
Schwarzengrund		0	1
Senftenberg		1	0
Tennessee		1	0
Rape	Agona	3	1
	Binza	1	0
	Cubana	1	0
	Ealing	1	0
	Eimsbuettel	0	1
	Havana	8	0
	Infantis	0	1
	Livingstone	2	1
	Mbandaka	18	0
	Montevideo	4	0
	Ohio	1	0
	Oranienburg	1	0
	Orion	1	0
	Rissen	36	8
	Senftenberg	1	0
	Stanleyville	1	0
	Tennessee	1	3
	Umbilo	1	0
	Virchow	1	0
	4,12:-:-	1	0
7:GMS:-	0	1	
Rice Bran	Javiana	0	1
	Typhimurium	0	1

Table 74 (continued): The serotypes of *Salmonella* in feedingstuff ingredients 2007, compared with the previous year

Feedingstuff	<i>Salmonella</i> serotype	Isolations 2006	Isolations 2007
Soya	Aberdeen	0	1
	Adelaide	1	0
	Agona	5	15
	Anatum	0	3
	Bredeney	1	0
	Cerro	1	0
	Corvallis	1	0
	Cubana	0	2
	Derby	1	0
	Dublin	1	0
	Give	1	0
	Havana	2	0
	Infantis	4	0
	Kentucky	0	1
	Kottbus	1	0
	Lexington	1	0
	Livingstone	1	1
	Mbandaka	4	3
	Meleagridis	2	0
	Montevideo	1	0
	Orion	1	0
	Rissen	2	3
	Schwarzengrund	3	1
	Senftenberg	4	4
	Sundsvall	1	0
	Tennessee	1	1
	Typhimurium	1	0
	Yoruba	2	0
	3,19:-:-	0	2
	3,19:-:rough	0	2
	3,19:rough:-	1	0
	4,12:-:-	0	1
	4:G:S	0	5
9,46:-:-	1	0	
16:z4,z24:-	0	1	
Group E	0	1	
untyped	1	0	
Sunflower	Agona	0	4
	Give	3	0
	Indiana	0	1
	Lexington	1	0
	Senftenberg	5	1
	Tennessee	1	0
	0:6:7:H:Z10	0	1
	Group B	0	1
Group G	0	1	

Table 74 (continued): The serotypes of *Salmonella* in feedingstuff ingredients 2007, compared with the previous year

Feedingstuff	<i>Salmonella</i> serotype	Isolations 2006	Isolations 2007
Wheat	Chomedy	0	1
	Mbandaka	0	1
	4:G:S	0	1
Fishmeal	Agona	1	0
	Cerro	1	0
	Derby	0	2
	Fresno	1	0
	Hadar	1	0
	Havana	2	0
	Meleagridis	0	1
	Montevideo	1	0
	Oranienburg	0	1
	Poona	0	2
	Rissen	0	1
	Rubislaw	0	2
	Schwarzengrund	0	1
	Senftenberg	0	1
	Tennessee	3	0
	3,19:rough:-	1	0
	6,7:-:-	2	0
	8,20:z4,z23:-	1	0
	untyped	3	0
Other	Abony	1	0
	Africana	0	1
	Agama	4	1
	Agona	3	2
	Ajiobo	1	0
	Anatum	6	1
	Cannstatt	1	0
	Derby	2	0
	Give	1	0
	Havana	1	0
	Isangi	1	0
	Kedougou	2	0
	Kottbus	0	1
	Leiden	0	1
	Liverpool	0	1
	Malstatt	1	0
	Mbandaka	0	1
	Meleagridis	4	0
	Molade	0	1
	Montevideo	3	1
	Newport	0	1
	Odozi	0	1
	Orion	0	2
	Rissen	1	1
	Schwarzengrund	1	0
	Senftenberg	5	3

Table 74 (continued): The serotypes of *Salmonella* in feedingstuff ingredients 2007, compared with the previous year

Feedingstuff	<i>Salmonella</i> serotype	Isolations 2006	Isolations 2007
Other - cont	Stanleyville	0	2
	Stockholm	0	1
	Tennessee	4	0
	Typhimurium	1	1
	3,19:rough:-	1	0
	7:-:-	0	1
	10:y:-	0	1
	Group C	0	1
Mill environment	Agama	2	5
	Anatum	0	1
	Kedougou	1	0
	Kottbus	1	0
	Paratyphi B var Java	0	1
	Poona	0	1
	4,12:d:-	1	2
Unspecified	Agama	1	2
	Agona	1	2
	Ajiobo	0	1
	Bareilly	0	1
	Bredeney	0	1
	Butantan	1	0
	Corvallis	2	0
	Cubana	1	0
	Derby	0	2
	Havana	1	0
	Indiana	0	1
	Infantis	0	1
	Isangi	0	1
	Johannesburg	0	1
	Kedougou	1	4
	Kentucky	0	2
	Livingstone	0	1
	Liverpool	0	1
	Livingstone	0	1
	Mbandaka	0	1
	Minnesota	0	1
	Montevideo	10	3
	Muenster	0	1
	Nchanga	0	1
	Newport	0	2
	Ohio	1	0
	Oslo	2	1
	Schwarzengrund	1	0
	Stanleyville	1	0
	Stourbridge	0	1
	Thompson	0	1
	Typhimurium	3	1
Utah	1	0	

Table 74 (continued): The serotypes of *Salmonella* in feedingstuff ingredients 2007, compared with the previous year

Feedingstuff	<i>Salmonella</i> serotype	Isolations 2006	Isolations 2007
Unspecified - cont	Winston	0	1
	Yoruba	0	1
	O rough:e,h:1,6	0	1
	3,19:-:-	0	1
	4,5,12:i:-	0	1
	4,12:d:-	1	1
	42:z4,z23:-	0	1
	44:z10:-	0	1

Table 75: Animal By-Products Regulations 2005 - domestic protein official testing - contamination rates in 2007 compared with the previous year

Sample Type	Batches Tested in 2006			Batches Tested in 2007		
	No	+ve	% +ve	No	+ve	% +ve
Blood meal	1	0	-	3	0	-
Bone meal	1	0	-	0	0	-
Feather meal	13	0	-	8	0	-
Meat & Bone Meal	21	1	4.76	16	2	12.50
Poultry Offal Meal	13	0	-	12	0	-
Greaves	10	0	-	14	0	-
Herring Meal	1	0	-	0	0	-
Other Fish Meal	7	1	14.29	7	0	-
White Fish Meal	9	0	-	5	0	-
Others	160	2	1.25	181	4	2.21
Unspecified	6	0	-	0	0	-
Total	242	4	1.65	246	6	2.44

NB: This table excludes the results of private testing

Table 76: Animal By-Products Regulations 2005 - serotypes isolated during 2007 from official and private testing of domestic protein, compared with previous year

<i>Salmonella</i> serotype	Isolations 2006	<i>Salmonella</i> serotype	Isolations 2007
Montevideo	4	Agona	6
		Bareilly	2
		Kedougou	1
		Schwarzengrund	1
Total isolations	4	Total isolations	10
No. of positive batches	4	No. of positive batches	6

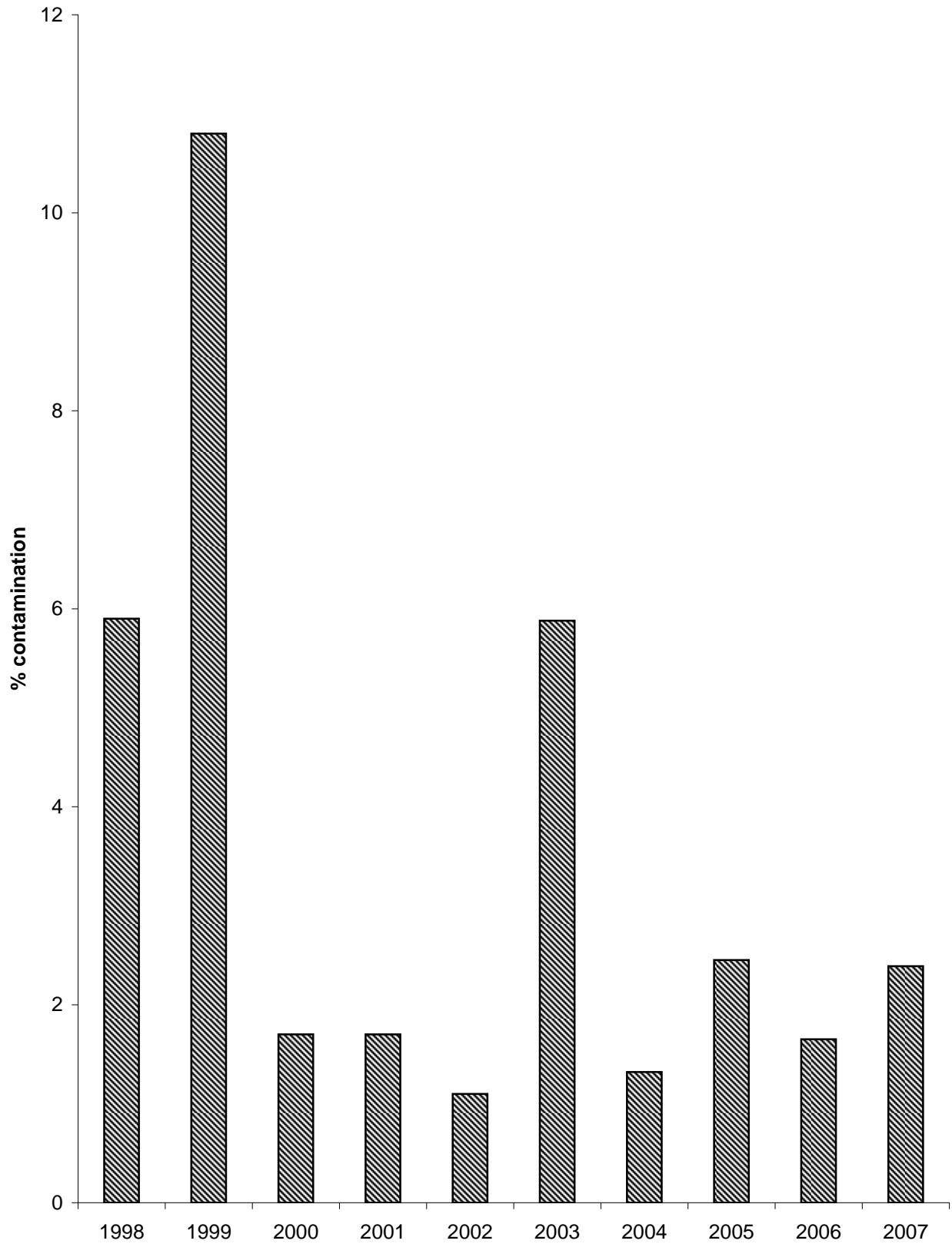
Table 77: The Importation of Processed Animal Protein Order, 1981 - imported protein contamination rates in 2007, compared with the previous year

Sample Type	Batches Tested in 2006			Batches Tested in 2007		
	No	+ve	% +ve	No	+ve	% +ve
Meat & Bone Meal	1	0	-	0	0	-
Other Fish Meal	39	0	-	30	1	3.33
Others	4	0	-	5	0	-
Total	44	0	-	35	1	2.86

Table 78: The Importation of Processed Animal Protein Order, 1981 - serotypes isolated during 2007 from imported protein, compared with the previous year

<i>Salmonella</i> serotype	Isolations 2006	<i>Salmonella</i> serotype	Isolations 2007
		Poona	3
		Schwarzengrund	2
Total isolations	0	Total isolations	5
No. of positive batches	0	No. of positive batches	1

**Fig 45: Contamination rate - domestic processed animal protein
(official and private testing - batches) 1998 - 2007**



**Fig 46: Contamination rate: imported processed animal protein
(batches tested) 1998 - 2007**

