

Chapter 2.3

REPORTS OF *SALMONELLA* IN PIGS

The Agricultural Census showed a slight fall in the national pig herd again in 2007, following the long-term trend – the total number of animals in June was estimated at 4,423,000 representing nearly a 3% drop compared with 2006. The fall in Scotland was slightly smaller at around 1.5%. The number of animals slaughtered remained stable throughout the first half of the year but was indirectly impacted by the outbreaks of FMD and Bluetongue in the autumn. Numbers increased to high levels following the lifting of restrictions. Exports of meat were also seriously affected during the period of these disease outbreaks, though overall exports and imports both rose. The price of feed cereals rose sharply throughout the year adding to concern about the sustainability of the industry.

There were 6,176 pig submissions to the VLA/SAC during 2007 compared with 6,572 during 2006, a fall of 6%. The numbers of diagnostic pig submissions fell by over 20% from 1,776 in 2006 to 1,360 and the number of non-diagnostic submissions increased from 4,796 in 2006 to 4,816 in 2007.

Sampling for the EU survey of *Salmonella* in finishing pigs was completed in September 2007, with results to be released during 2008. Following this, a survey of breeding pigs commenced in January 2008. Isolates identified from the EU survey of *Salmonella* in finishing pigs and the BPEX ZAP Programme are not included in the tabulations and figures of this report.

The BPEX Zoonoses Action Plan (ZAP) *Salmonella* Programme continued to monitor all farm assured herds for *Salmonella* antibodies in samples from assured abattoirs. Of nearly 140,000 samples taken in the year to June 2007, 26% of samples were positive. This is an increase compared to the previous year. However, there were also important changes to the method of sample selection, which was focused on herds with a higher prevalence. Overall, there is no evidence that the ZAP Programme has stimulated any important reduction in the prevalence of salmonella infection on pig farms and plans have been made to refocus efforts in 2008.

VLA Veterinary Investigation Officers continued to make advisory visits to farms requesting assistance with managing high *Salmonella* seroprevalence. The year 2007 started out with very high numbers of visits, and declined significantly in the second half of the year due in

part to the changed requirements of the ZAP scheme. A total of 133 visits were carried out overall. BPEX promoted the use of Demonstration Farms to examine specific intervention approaches in more detail.

Work continues on other projects at the VLA aimed at informing *Salmonella* control throughout the food chain.

The number of pig *Salmonella* incidents and isolations reported fell this year (Table 30). *Salmonella* Typhimurium remained the most common serovar, being found in 70% of incidents, which was a rise in the relative contribution of this serovar after previous falls. *S. Derby* was the second most common again, though has fallen in relative contribution to 8% of all serovars from pigs. *S. London* was the third most common serovar, increasing to nearly 4% of pig incidents in 2007.

There were four reports of *S. Anatum* during 2007, the first time this serovar has been reported in pigs since 2002. Other serovars reported from pigs during 2007 that have not been reported in the last five years were *S. Havana* (last reported from pigs in 1999) and *Salmonella enterica diarizonae*, which is usually a sheep-related serovar (last reported from pigs in 1998). The number of reports of *S. Bovismorbificans* increased to four during 2007 compared with one report in 2006.

There were no reports of serovars of public health significance, apart from *S. Typhimurium* reported from pigs in 2007. *S. Enteritidis* was occasionally isolated from pigs during sampling for other studies.

The main definitive (DTs) and undefined (U) phage types (DTs) of *S. Typhimurium*, U288 and DT193 were found again. The number of incidents of DT193 rose by over 30%, while the number of incidents of U288 remained stable. There were three unusual DTs of *S. Typhimurium* reported during 2007, these were: DT194 (last reported in pigs in 1993), DT170b (never reported before from routine surveillance of pigs, but was reported from project work in 2006) and DT15a, which has never been reported before from pigs.

Table 29: *Salmonella* in pigs on all premises

<i>Salmonella</i> Incidents (Isolations)	2003		2004		2005		2006		2007	
ENTERICA ENTERICA										
Agona	1	(1)	-	(-)	-	(-)	1	(1)	-	(-)
Anatum	-	(-)	-	(-)	-	(-)	-	(-)	4	(4)
Bovismorbificans	-	(-)	-	(-)	-	(-)	1	(2)	4	(4)
Brandenburg	-	(-)	1	(1)	-	(-)	-	(-)	-	(-)
Bredeney	-	(-)	-	(-)	-	(-)	3	(3)	-	(-)
Choleraesuis	-	(-)	1	(1)	1	(1)	-	(-)	-	(-)
Derby	28	(32)	25	(28)	22	(24)	23	(30)	13	(14)
Dublin	-	(-)	2	(2)	-	(-)	1	(1)	1	(1)
Durham	-	(-)	1	(1)	-	(-)	-	(-)	-	(-)
Enteritidis	-	(2)	-	(-)	-	(-)	-	(-)	-	(-)
Give	-	(-)	2	(2)	-	(1)	-	(-)	-	(-)
Goldcoast	1	(1)	4	(5)	6	(6)	5	(5)	-	(-)
Havana	-	(-)	-	(-)	-	(-)	-	(-)	1	(1)
Heidelberg	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
Idikan	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
Infantis	-	(-)	2	(2)	-	(-)	1	(1)	-	(-)
Kedougou	7	(7)	5	(5)	4	(5)	10	(13)	4	(4)
Livingstone	-	(-)	-	(-)	-	(-)	1	(1)	-	(-)
London	3	(3)	3	(4)	2	(2)	2	(2)	6	(7)
Manhattan	-	(1)	-	(-)	-	(-)	-	(-)	-	(-)
Mbandaka	-	(-)	-	(-)	-	(-)	1	(1)	-	(-)
Montevideo	3	(3)	-	(-)	-	(-)	-	(-)	-	(-)
Newport	-	(-)	-	(-)	1	(1)	1	(1)	1	(1)
Ohio	-	(-)	-	(-)	1	(1)	-	(-)	-	(-)
Panama	-	(-)	-	(-)	-	(-)	-	(1)	-	(-)
Reading	6	(6)	6	(6)	8	(9)	7	(7)	3	(4)
Saint Paul	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
Senftenberg	1	(1)	-	(-)	-	(-)	-	(-)	1	(1)
Stanley	-	(-)	-	(-)	-	(-)	1	(1)	-	(-)
Typhimurium	139	(157)	120	(136)	108	(135)	126	(164)	115	(125)

Table 29: *Salmonella* in pigs on all premises

<i>Salmonella</i> Incidents (Isolations)	2003	2004	2005	2006	2007
ENTERICA DIARIZONAE					
61:-:1,5,7	- (-)	- (-)	- (-)	- (-)	1 (1)
UNSPECIFIED					
structure only	2 (2)	1 (1)	2 (6)	3 (5)	9 (10)
rough strain	- (-)	- (-)	1 (2)	2 (2)	2 (2)
TOTAL	194 (219)	173 (194)	156 (193)	189 (241)	165 (179)

Fig 26: Incidents of *Salmonella* serotypes in pigs in 2007

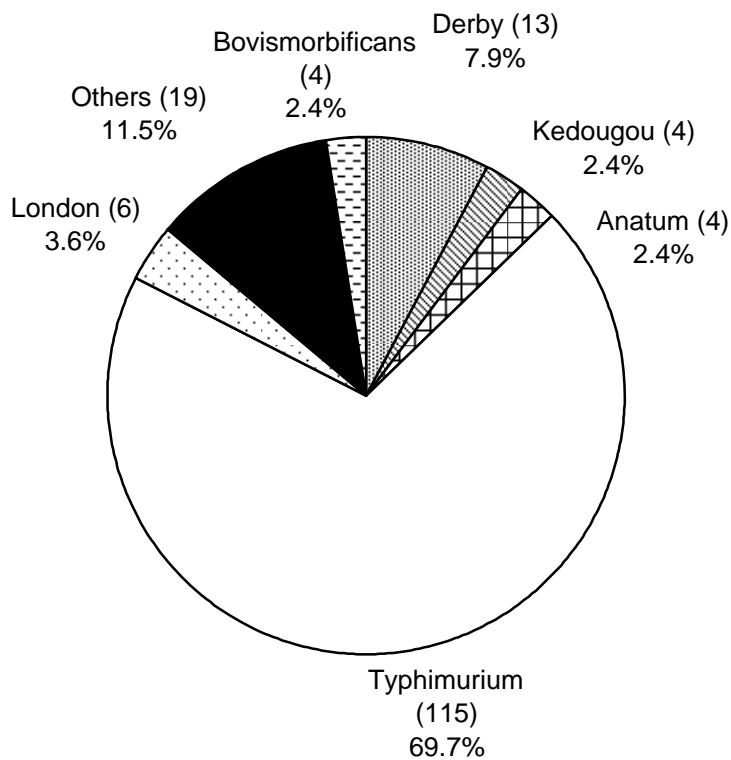


Table 30: Incidents of the top 4 *Salmonella* serotypes in pigs in 2007 as a % of all incidents compared to previous years

Serotype	2003	2004	2005	2006	2007
S. Typhimurium %	71.6	69.4	69.2	66.7	69.7
S. Derby %	14.4	14.5	14.1	12.2	7.9
S. London %	1.5	1.7	1.3	1.1	3.6
S. Anatum %	0	0	0	0	2.4
S. Bovismorbificans %	0	0	0	0.5	2.4
S. Kedougou %	3.6	2.9	2.6	5.3	2.4
Total no. incidents	194	173	156	189	165

Fig 27: Incidents of *Salmonella* serotypes in pigs 2003 - 2007

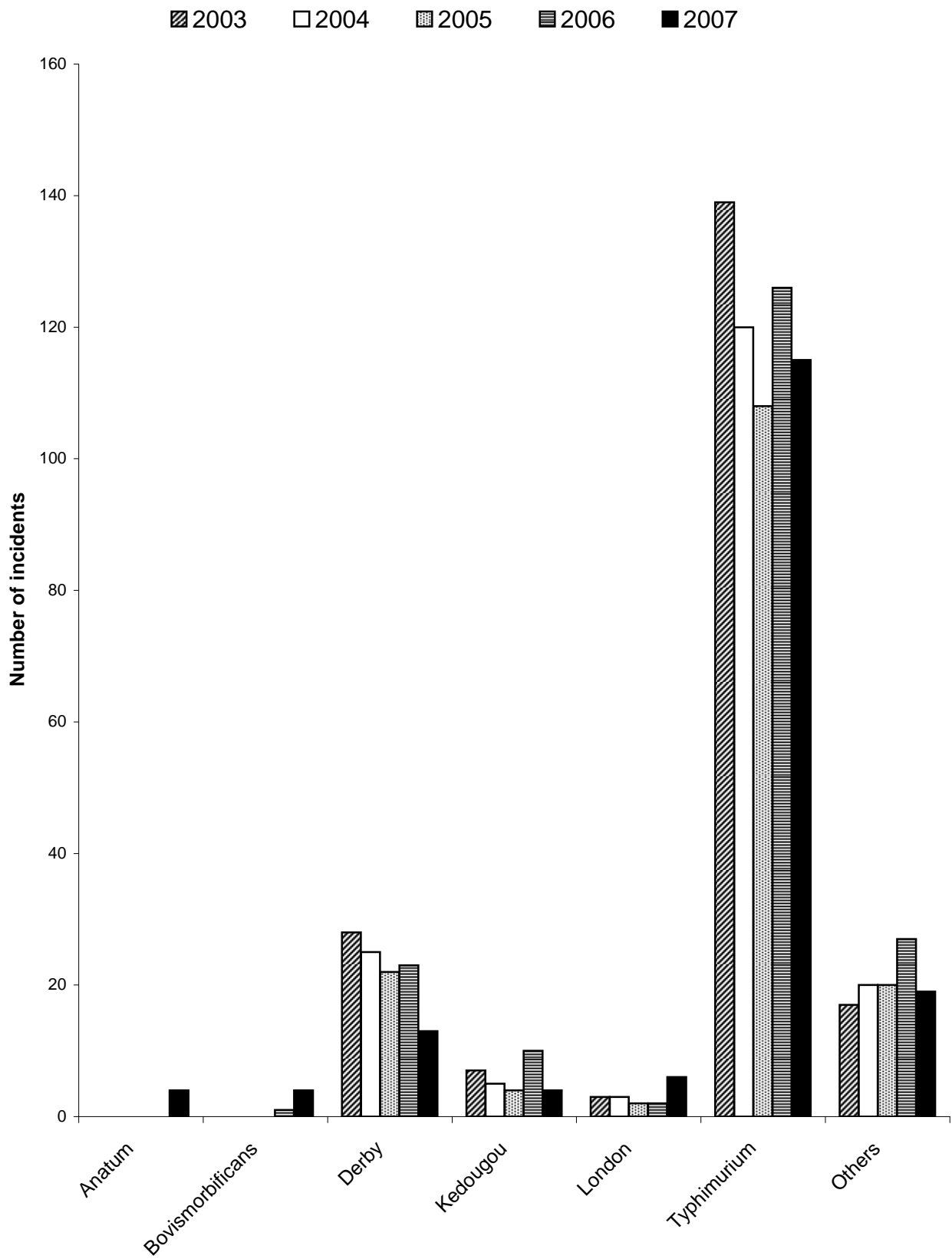


Table 31: S. Typhimurium in pigs on all premises

Definitive Types Incidents (Isolations)	2003		2004		2005		2006		2007	
7	-	(-)	1	(1)	-	(-)	-	(-)	-	(-)
12	2	(2)	1	(1)	-	(-)	-	(-)	-	(-)
12a	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
15a	-	(-)	-	(-)	-	(-)	-	(-)	1	(1)
40	-	(-)	1	(1)	-	(-)	-	(-)	-	(-)
41	-	(-)	1	(1)	-	(-)	1	(1)	-	(-)
56	-	(-)	-	(1)	1	(1)	-	(-)	1	(1)
99	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
104	19	(20)	11	(12)	4	(4)	5	(7)	6	(6)
104a	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
104b	4	(4)	3	(3)	9	(9)	4	(4)	2	(2)
120	1	(1)	-	(1)	-	(-)	4	(5)	-	(-)
141	-	(-)	-	(-)	1	(1)	-	(-)	-	(-)
146	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
170	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
170b	-	(-)	-	(-)	-	(-)	-	(-)	2	(3)
193	24	(27)	22	(24)	21	(29)	22	(32)	30	(30)
193a	1	(2)	1	(1)	2	(4)	1	(1)	-	(-)
194	-	(-)	-	(-)	-	(-)	-	(-)	1	(1)
195	1	(1)	-	(-)	2	(2)	2	(2)	-	(-)
203	1	(1)	-	(-)	3	(3)	-	(-)	-	(-)
208	5	(6)	3	(4)	-	(-)	-	(-)	-	(-)
U288	48	(52)	60	(64)	43	(52)	63	(77)	62	(66)
U302	15	(16)	3	(3)	5	(9)	8	(12)	7	(7)
U308	2	(2)	2	(2)	2	(2)	2	(3)	-	(-)
U309	-	(-)	-	(-)	1	(1)	-	(-)	1	(1)
U310	1	(1)	2	(2)	5	(5)	6	(7)	-	(-)
U314	-	(-)	1	(1)	-	(-)	-	(-)	-	(-)
U315	1	(1)	-	(-)	-	(-)	-	(-)	-	(-)
RDNC	-	(5)	-	(4)	-	(3)	-	(1)	-	(2)
NOPT	-	(-)	-	(-)	-	(-)	-	(1)	-	(1)
UNTY	7	(8)	8	(10)	9	(10)	8	(10)	2	(4)
untyped	-	(1)	-	(-)	-	(-)	-	(1)	-	(-)
untypeable	2	(2)	-	(-)	-	(-)	-	(-)	-	(-)
TOTAL	139	(157)	120	(136)	108	(135)	126	(164)	115	(125)

Fig 28: Incidents of *Salmonella* Typhimurium definitive types in pigs in 2007

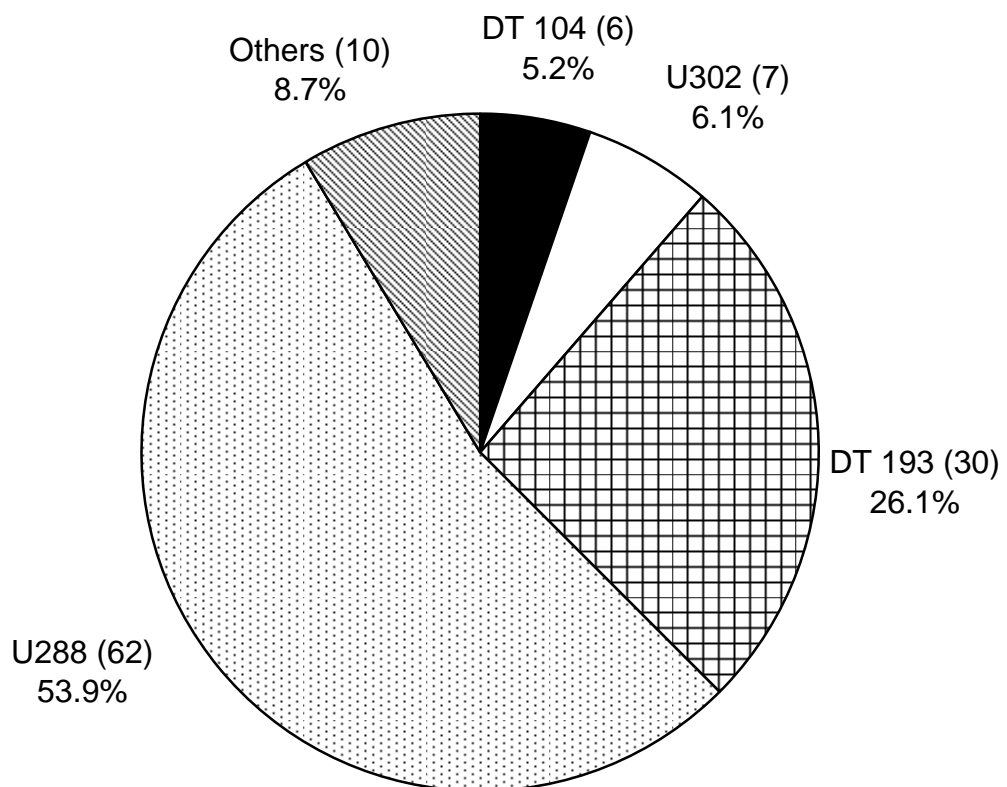


Fig 29: Incidents of *Salmonella* Typhimurium definitive types in pigs (2003 - 2007)

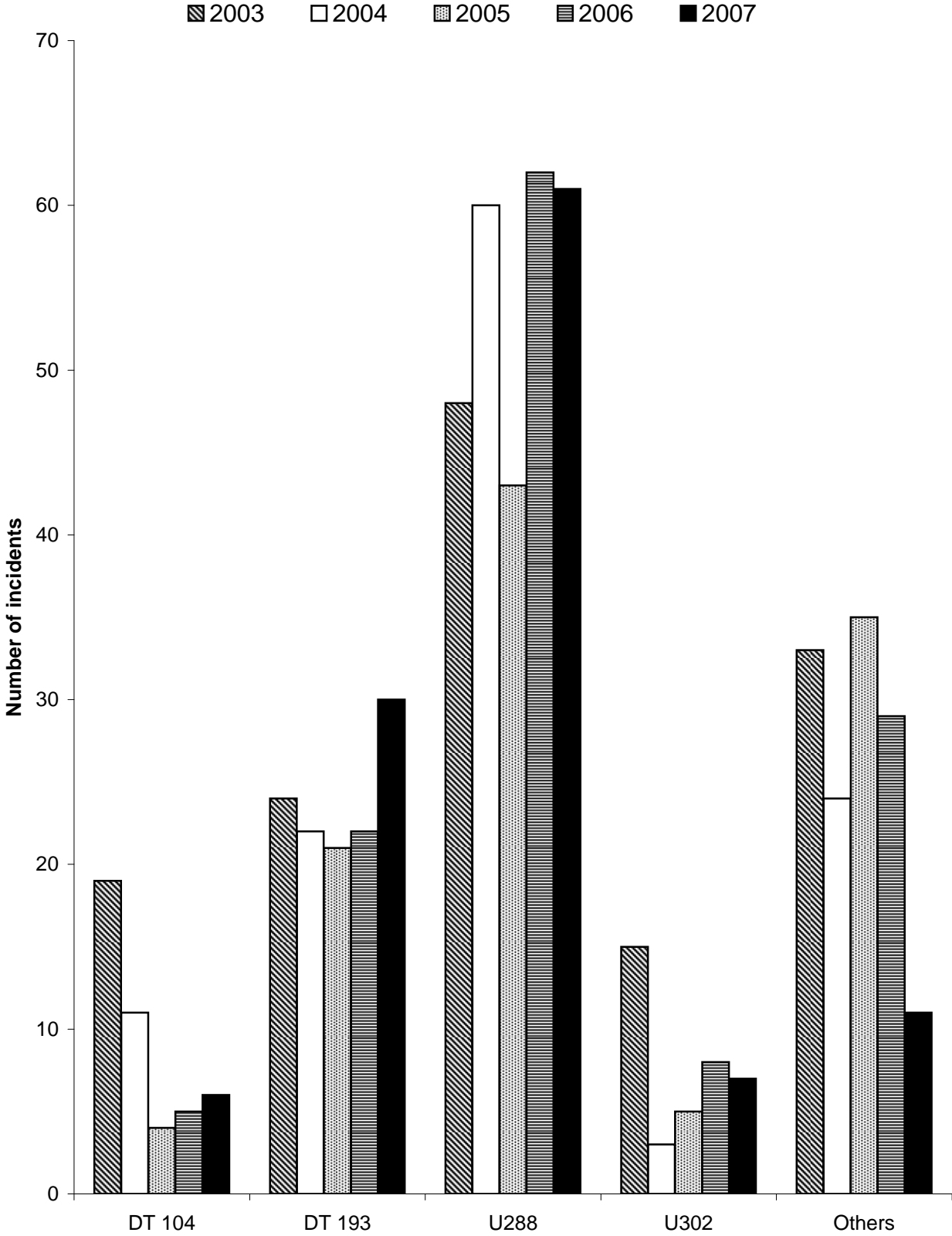


Table 32: S. Enteritidis in pigs on all premises

Phage Types Incidents (Isolations)	2003	2004	2005	2006	2007
4	- (1)	- (-)	- (-)	- (-)	- (-)
35	- (1)	- (-)	- (-)	- (-)	- (-)
TOTAL	- (2)	- (-)	- (-)	- (-)	- (-)

Fig 30: *S. Enteritidis*, *S. Typhimurium* and *S. Derby* as a proportion of all incident reports in pigs (1987- 2007)

