

Exposure assessment of *Salmonella* in animal foods in Belgium

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Introduction

Salmonella is among the most important meat pathogen worldwide. The prevalence and the level of contamination are essential for an efficient risk assessment program but all the different serovars do not have the same virulence potentiality.

Material and Methods

Since 1997, the Belgian zoonosis surveillance program has assessed the contamination with *Salmonella* in cattle, pig, poultry, rabbit and fish. The number of samples was approximately 120 in 1997, 150 in 1998 and 1999 and 310 in 2000 and 2001 for each matrix. Between 1997 and 1999, the analysed sample amount has been adjusted to obtain semi-quantitative results and determine the appropriate amount to investigate for each matrix. The matrixes investigated and the sample size investigated are shown in table 1.

The detection of *Salmonella* has been carried out with the official method from the Ministry of Public Health (SP-VG M002). Briefly, this method consist of a pre-enrichment into buffered peptone water (16-18h at 37°C) followed by a culture of 100µl onto a semisolid selective enrichment media (Diassalm incubated for 24h at 42°C). From typical migration zones, a loopful was streaked onto xylose lysine desoxycholate agar (XLD incubated for 24h at 37°C). Suspicious-looking colonies were confirmed by biochemical tests. The isolates were serotyped, lysotyped, and the antibiotic resistance assessed (results not shown).

Results and discussion

The semi-quantitative study of 1997 to 1999 has determined that the contamination level was low in pork and higher in poultry (Figures 1&2 : example). In calf, rabbit and fish, the study has been stopped after one year of investigation due to the very low prevalence. The following results are presented for the years 2000 and 2001 (Figures 3 - 6).

The study of beef showed a low prevalence of *Salmonella* in minced meat (3-6%) and carcasses (3%), with Typhimurium (44%) and Enteritidis (25%) as major serotypes.

In pork, prevalence seems to be at a constant level, except for cutting meat (carcasses: 18-21%; Retail cuts: 18-32%; minced meat: 10-17% and salami: 0,7%). The isolated strains belong to the following serotypes : Typhimurium (43%), Derby (14,7%), Brandenburg (11%) and Infantis (5,1%). In poultry, the prevalence is also at a constant but higher level in accordance with the amount of matrixes assayed (broilers: carcasses: 7-11% and breasts: 13-15%; layer carcasses: 22-27%). Enteritidis is the major serotype in layers (86%). For chicken, the major serotypes are Bredeney (18%), paratyphi B (15%), Virchow (13%), Enteritidis (12%), Hadar (9%) and Typhimurium (6%).

Fig. 1 : Semi-quantitative evaluation of pork carcasses contamination (1997-1999)

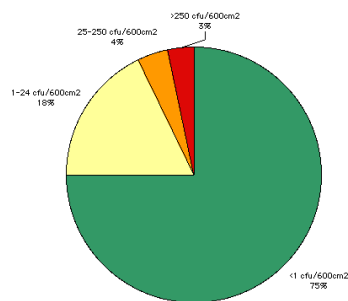


Fig. 2 : Semi-quantitative evaluation of chicken carcasses contamination (1997-1999)

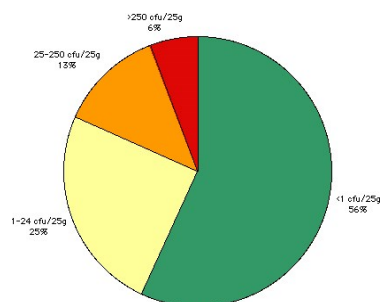


Fig. 3 : Prevalence in pork and beef (2000-2001)

Salmonella in carcasses and meat of pork and beef in Belgium (2000-2001)

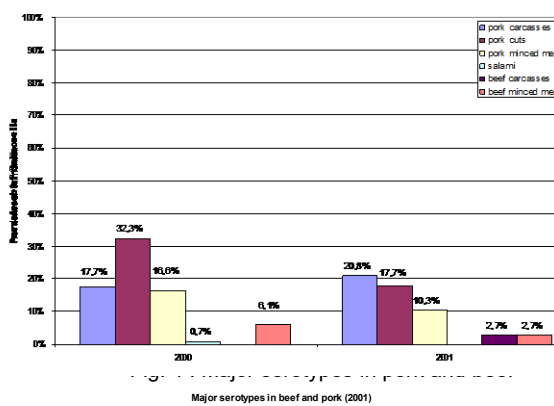


Table 1: Matrixes and sample sizes since 1997.

		1997	1998	1998	1999	1999	2000	2001
		Sample	Sample	Dilution	Sample	Dilution		
Cattle	Carcasses	400cm ²						1600cm ²
	Retail cuts	25g						
	Livers	400cm ²						
	Minced meat	25g					25g	25g
Calf	Carcasses	400cm ²						
	Livers	400cm ²						
	Minced meat	25g						
Pork	Carcasses	600cm ²	600cm ²	24cm ²	600cm ²	2.4 cm ²	600cm ²	600cm ²
	Retail cuts	25g	25g	1g	25g	0.1g	25g	25g
	Livers	700cm ²	700cm ²	27cm ²				
	Minced meat	25g	25g	1g	25g	0.1g	25g	25g
Broiler	Carcasses	25g	25g	1g	25g	0.1g	25g	25g
	Livers	25g	25g	1g				
	Breasts	25g	25g	1g	25g	0.1g	25g	25g
Layer	Carcasses	25g	25g	1g	25g	0.1g	0.1g	0.1g
Turkey	Carcasses	25g	25g	1g	25g	0.1g		
Rabbit	Carcasses	600cm ²						
Fish	Fresh				25g			
Pork butchery	Salami						25g	

Fig. 5 : Prevalence in poultry (2000-2001)

Salmonella in carcasses and meat of poultry in Belgium (2000-2001)

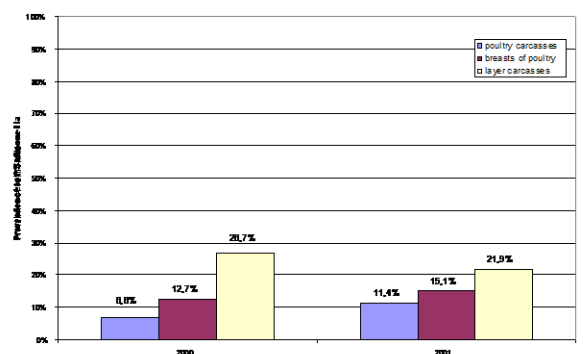
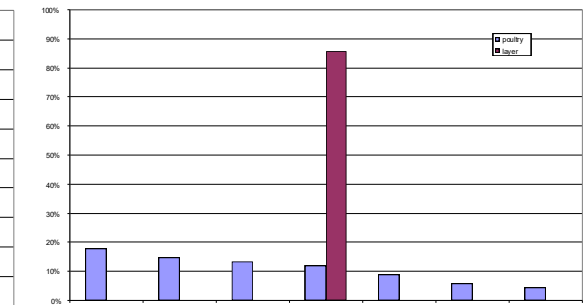


Fig. 6 : Major serotypes in poultry

Major serotypes in poultry (2001)



Conclusion

Salmonella is a common pathogen found in pork and poultry.

Isolated strains belong to same serotypes and lysotypes isolated in human and animals.

An advanced analyze of results is needed in order to precise the sources of human salmonellosis.

The rate and the level, and thus the risk, is very higher in poultry than in pork.

These results should be used to take preventive measures in order to lower the contamination rate of *Salmonella*.

These results should be compared with those of others European countries.