RISK ANALYSES BASED CONTROL OF *SALMONELLA* ON PORK CUTS ON THE ISLAND OF IRELAND

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Introduction

Salmonella spp. are the second most common cause of bacterial food borne illness and pork is now recognised as one of the most important food borne sources of *Salmonella* (Berends *et al.*, 1998; Beloeil *et al.*, 2004). In the Republic of Ireland, every pig herd is tested on an on-going basis. Twenty four pigs from each herd are tested three times a year and herds are assigned a category (1-3) based on a calculated weighted average of the three most recent tests. A certificate is issued grading the herd as Category 1 (≤ 10% positive), category 2 (> 10% ; ≤ 50% positive) or category 3 (> 50% positive). At slaughter, pigs from category 3 herds are slaughtered separately from other pigs and in a manner that minimises the risk of contamination. While there is a considerable amount of information available on the occurrence of *Salmonella* in pork on the island of Ireland this has not been amalgamated and there are many gaps in knowledge. This study is employing a quantitative risk assessment approach to determine the contribution of processing to pork contamination during slaughter. This will involve a quantitative assessment of the contamination levels, types of *Salmonella* and risk factors contributing to its transmission via pork leading to an assessment of how well current controls are operating. To fill in key gaps in data needed for the exposure assessment, microbiological studies on *Salmonella* in pork will be conducted at pork plants and at retail level in the Republic of Ireland and Northern Ireland to investigate the prevalence, numbers and types of *Salmonella* on pork cuts. This will allow a direct comparison of *Salmonella* contamination on pork cuts in both jurisdictions to be fed into a quantitative risk assessment model. This study reports the findings of the prevalence of *Salmonella* spp. in three commercial pork abattoirs in the Republic of Ireland.

Materials and Methods

Samples were collected in the boning halls of three commercial pork abattoirs during two visits between October 2005 and March 2006. To ensure that samples were representative of the factory throughput, the day on which sampling was carried out was altered during each sampling visit. A total of sixty samples from each oyster cut (primal leg cut) were taken over the entire working day, thirty in the morning and thirty in the afternoon. Sampling took place 2 hrs after work commenced. A 25-50g sample was excised from the oyster cut using a sterile scalpel and tweezers and transferred to sterile stomacher bags. Samples were transferred to a coolbox with ice packs and transported to the laboratory under chilled conditions 0-4°C. The method employed for the isolation and enumeration of *Salmonella* spp. is described in Figure 1.

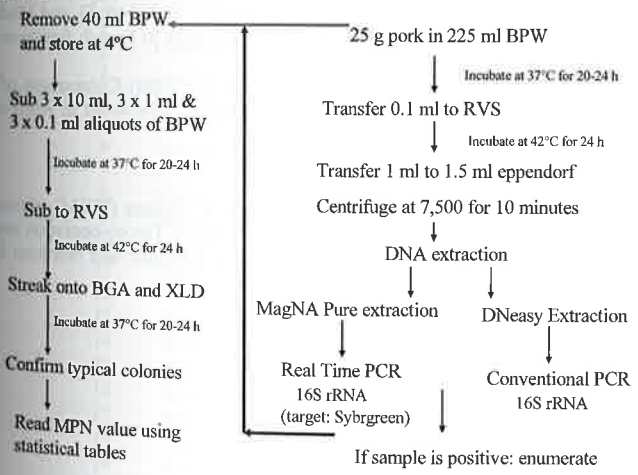

Figure 1: Schematic diagram of the method used to detect and enumerate *Salmonella* spp. in pork pieces

Information on the product that passed through the boning hall on the day of sampling i.e., slaughter date, number of animals slaughtered, number of suppliers and category of herd was obtained from each abattoir after each visit.

Results and Discussion

The number of samples positive for *Salmonella* spp. over two visits in each abattoir is shown in Table 1. In total, 360 samples were examined for the presence of *Salmonella* and 1.11% of these samples were found to be positive. *Salmonella* was not recovered in Abattoirs A or C. In abattoir A, the category of herd that passed through the boning hall on each sampling day was 1 and 2 only. In abattoir C, the category of herd that passed through the boning hall was 1, 2 and 3. However, further information revealed herds were classified as category 3 as the supplier did not have any certificate for these animals and therefore it is unknown if these animals were category 3. In abattoir B, 4 of the 120 samples were positive for *Salmonella* spp. These positive samples were all obtained from samples taken during the second visit. The category of herd that passed through the boning hall on the two sampling days was 1, 2 and 3. The percentage of category 3 animals on the first and second sampling days was 17.0 and 9.0% respectively.

Table 1: Incidence of *Salmonella* spp. on pork cuts (oyster) in the boning halls of Abattoirs A, B and C.

Abattoir	Time of sampling		No. positive		% positive		MPN g^{-1} (log_{10} cfu g^{-1})	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
A	60	60	0	0	0	0	-	-
B	60	60	1	3	1.70	5.00	<0.30 (-0.52)	<0.30 (-0.52)
C	60	60	0	0	0	0	-	-

Conclusions

In this present study, the incidence of *Salmonella* on pork cuts in the boning halls of the three abattoirs was 1.11%. It has been reported that the prevalence of *Salmonella* on raw pork in the Republic of Ireland has decreased from 9% in 2000 to 2% in 2003 (Anon, 2004; 2005) and the results of this present study are in keeping with this trend. Future work will increase the number of visits in each abattoir from two to five bringing the total number of samples analysed from 360 up to 900.

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