Foodborne Pathogens in Cattle, Sheep and Pigs at Slaughter in GB in 2003.

Milnes AS.[1], Stewart I.[2], Smith RP.[2], Sayers AR.[2], Paiba GA.[3]

[1]Veterinary Laboratories Agency, Langford; [2]Centre for Epidemiology and Risk Analysis, Veterinary Laboratories Agency, Weybridge; [3]Veterinary Surveillance Division, Defra, London (formerly at The Veterinary Laboratories Agency)

INTRODUCTION

- The food chain acts as a major method of transmission of animal disease to humans with an estimated 16% of cases of infectious intestinal disease (IID) related to the consumption of red meat[1]. The Pennington Report was commissioned following a severe outbreak of verocytotoxin-producing *Escherichia coli* (VTEC) O157 in 1995 and this highlighted the need for livestock prevalence data. Following this, abattoir surveys were undertaken in 1999/2000 by The Veterinary Laboratories Agency (VLA) to investigate foodborne pathogens in 1999/2000 [2,3].
- Since then, The Food Standards Agency has set targets to reduce foodborne illness by 20% by 2006 and European Union legislation has been revised.
- A 12 month study was undertaken by VLA in 2003 to investigate prevalence of carriage of VTEC O157, *E. coli* O157, *Salmonella, Campylobacter* and *Yersinia enterocolitica* in cattle, sheep and pigs (Table 1).

Table 1. Organisms of Interest

	Ruminants	Pigs
VTEC O157	All samples tested	
E. coli O157	All samples tested	
Salmonella	100%	25%
Campylobacter	25%	
Yersinia enterocolitica	25%	100%

METHODOLOGY

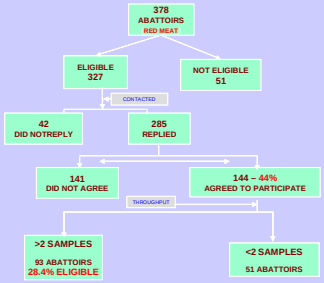
Sample size calculations

- Calculations were based on detecting differences in prevalence from the previous abattoir surveys [2,3] taking into account empty rectal samples. The total number of samples was 7616, comprising 2736 cattle, 2820 sheep and 2060 pigs.

Abattoir recruitment & sampling schedule

- By voluntary participation where throughput was sufficient to ensure that at least two samples would be collected during study period (Figure 1).
- Number of samples per abattoir proportional to throughput.

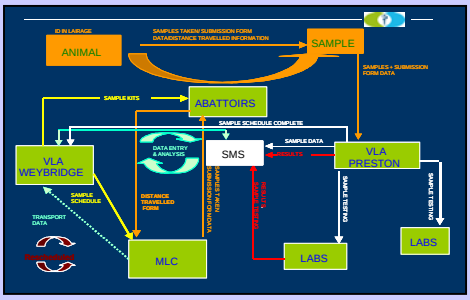
Figure 1. Abattoir recruitment



Sample collection protocol

- Aim to prevent clustering by farm and to collect data about sampled animal.
- A maximum of 4 samples collected on one occasion.
- Random or systematic random sampling.
- Identification of animal in lairage and follow through to slaughter.
- Ruminants – rectum.
- Pigs – caecum.

Figure 2. Survey management and protocol



Sample handling & testing

- Laboratory testing undertaken by VLA using standard protocols.
- *Yersinia enterocolitica* serotyping and VTEC O157 phage typing undertaken by the Health Protection Agency, Colindale.
- Sample management summarised by figure 2.

RESULTS

- Results summarised by tables 2 & 3.

Table 2. Prevalence of intestinal carriage of foodborne pathogens in 2003 abattoir survey

ORGANISM	CATTLE		SHEEP		PIG	
	%	95% CI	%	95% CI	%	95% CI
VTEC O157	4.7	3.9 - 5.6	0.7	0.5 - 1.1	0.3	0.1 - 0.5
E. coli O157	5.2	4.4 - 6.2	1.3	1.0 - 1.8	0.6	0.3 - 1.0
Salmonella sp	1.4	1.0 - 1.9	1.1	0.7 - 1.5	23.4	19.9 - 27.3
Campylobacter sp	54.6	50.7 - 58.4	43.8	40.1 - 47.5	69.3	65.2 - 73.2
Y. enterocolitica	4.5	3.0 - 6.3	8.0	6.1 - 10.2	10.2	8.9 - 11.5
Cryptosporidium	0.4	0.1 - 1.3	0.8	0.3 - 1.8		

Table 3. Comparison of prevalence between 1999/2000 and 2003 abattoir surveys

ORGANISM	CATTLE		SHEEP		PIG	
	%	95% CI	%	95% CI	%	95% CI
VTEC O157	4.7	3.9 - 5.6	0.7	0.5 - 1.1	0.3	0.1 - 0.5
	4.7	4.1 - 5.4	1.7	1.3 - 2.1	0.3	0.1 - 0.6
E. coli O157	5.2	4.4 - 6.2	1.3	1.0 - 1.8	0.6	0.3 - 1.0
	5.4	4.7 - 6.2	2.0	1.6 - 2.5	1.2	0.8 - 1.7
Salmonella sp	1.4	1.0 - 1.9	1.1	0.7 - 1.5	23.4	19.9 - 27.3
	0.2	0.0 - 0.5	0.1	0.1 - 0.3	23.0	21.4 - 24.7
Campylobacter sp	54.6	50.7 - 58.4	43.8	40.1 - 47.5	69.3	65.2 - 73.2
	24.5	21.7 - 27.4	17.0	14.7 - 19.5	94.5	92.8 - 96.0
Y. enterocolitica	4.5	3.0 - 6.3	8.0	6.1 - 10.2	10.2	8.9 - 11.5
	6.6	5.1 - 8.5	13.7	11.6 - 16.0	26.1	24.4 - 27.9
Cryptosporidium	0.4	0.1 - 1.3	0.8	0.3 - 1.8		

- VTEC O157 unchanged in cattle & pigs with decrease in sheep.
- *Salmonella* increased slightly in ruminants.
- *Campylobacter* was detected in more cattle and sheep, which was likely due to an increased sensitivity of the methods.

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References: 1. Adak, G.K. , S.M.Long & O'Brien. "Trends in Indigenous Foodborne Diseases and Deaths, England and Wales:1992-2000. "*Gut* 6 (2002):832-41.

2. VLA Project Report "Prevalence of Faecal Carriage of Foodborne Pathogens in Pigs at Slaughter in GB".(2002).

3. VLA Project Report "Prevalence of Faecal Carriage of VTEC O157 and other Foodborne Pathogens by cattle and sheep at slaughter in GB".(2001).

For further information contact: a.milnes@vla.defra.gsi.gov.uk.

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Centre for Epidemiology and Risk Analysis, Veterinary Laboratories Agency, Weybridge, New Haw, Addlestone, Surrey KT15 3NB

Executive Agency of the Department for Environment, Food & Rural Affairs.

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