

Enumeration of Bacterial Pathogens on Commercial Pork

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Today's consumer expects that the fresh meat they purchase is safe to eat. Substantial resources are dedicated to reducing bacterial levels at various stages of meat processing. However, meat is still implicated in the majority of Canada's more than 1 million cases of food-borne illness. Clearly some pathogenic bacteria are deposited on meat during processing and remain on meat destined for the consumer. Most microbiological methods only detect pathogenic bacteria and give no indication of their numbers. Also, since sample sizes are usually small, pathogens which may be unevenly distributed and present in low numbers may not be reliably detected.

A miniaturized most probable number procedure followed by confirmation of positive samples by polymerase chain reaction was designed and used to enumerate pathogenic bacteria on commercial pork. A method was devised to use large samples of meat so small numbers of unevenly distributed bacteria could be detected. The possible presence of *E. coli* 0157:H7, *Campylobacter* spp., *Listeria* spp., *Listeria monocytogenes*, *Salmonella* spp. and *Yersinia* spp. and the numbers of these organisms were determined.

Listeria spp. was indicated on 32% of the samples and almost 70% of these samples had genetic determinants of *Listeria monocytogenes*. Cell numbers ranged from 200 to >1,000 per kg. *Yersinia* spp., an indicator of the possible presence of the pathogen *Yersinia enterocolitica*, was present on 82% of the samples with numbers ranging from <10 to >1,000 per kg. These bacteria are psychrotrophic and may grow at refrigeration temperatures. DNA from the other organisms was present on less than 3 samples and their numbers were very low.

Implications: Although the numbers of pathogens are very low, there are some pathogenic bacteria on product destined for the consumer. The industry must pay careful attention to processing hygiene, cold chain management and consumer awareness to reduce the risk of illness associated with handling and consumption of fresh pork.