

DETECTION AND CHARACTERIZATION OF VEROCYTOTOXIN - PRODUCING *ESCHERICHIA COLI* (VTEC) O157 AND NON-O157 IN CATTLE AT SLAUGHTER

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SUMMARY

Between September 2001 to June 2002, 145 samples of bovine caecal content were collected at slaughter for verocytotoxin-producing *Escherichia coli* (VTEC) serogroups O157 and non-O157 detection. For *E. coli* O157 the immunomagnetic-separation technique was performed. The enterohaemolytic phenotype was the target for non-O157 VTEC identification. The vero cell assay (VCA) was performed for toxic activity detection. The genomic sequence for VT1, VT2 and intimin (*vt1*, *vt2*, *eae* genes) were identified by PCR analysis.

Eight VTEC O157 and eight non-O157 VTEC isolates were detected. VTEC O157, *eae*-positive strains were shed by 9.7% of feedlot cattle and by 2.5% of dairy cows. Non-O157 VTEC, *eae*-negative isolates were detected in the intestinal content of 12.5% dairy cows and of 2.1% feedlot cattle. VTEC-shedding cattle came from 18.1% of the farms included in the study. From cattle faeces, VTEC O91:H- (VT2-positive, *eae*-negative), responsible of human diarrhoeal disease in Europe, was recovered. Other VTEC serogroups identified in the present study were O74, O109, O110, O116, and O117.

KEY WORDS: *Escherichia coli*, VTEC O157, non-O157 VTEC, cattle, slaughter

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INTRODUCTION

Verocytotoxin-producing *Escherichia coli* (VTEC) are recognized as food-borne pathogens which can cause a wide spectrum of disease from mild diarrhoea to severe and potentially fatal illnesses, such as haemorrhagic colitis (HC) and haemolytic uraemic syndrome (HUS) (Doyle, 1997).

Diseases produced by VTEC are associated with a subset of serogroups with the O157 as the predominant one. VTEC O157 was first isolated in 1982 in the USA during outbreaks of HC in Oregon and Michigan and since then many out-

breaks or sporadic cases of HC and HUS have been identified in several countries (Mead and Griffin, 1998). Most research on human pathogenic VTEC O157 has been done on the serotype O157:H7, even if cases of HUS associated with VTEC O157:H- have been reported (Ammon *et al.*, 1999).

Other *E. coli* O-groups contain verocytotoxin-producing strains responsible for similar human diseases, the most common ones being O26, O103, O111 and O145. In Italy, as of 2000, the VTEC serogroup most commonly associated with HUS was O157, followed by O111, O26, O103 and O145. Infections with non-O157 serogroups, in