

Science Interpretive Summary

Typing of Meat Isolates of *Escherichia coli* O157:H7 in New Zealand by Pulsed Field Gel Electrophoresis (PFGE)

The United States has recently intensified monitoring requirements for *E. coli* O157:H7 in imported beef, including veal from very young calves and has specified modified procedures for detection of this pathogen. The procedures now specify molecular typing of any isolates of *E. coli* O157:H7 detected on beef and veal in New Zealand and provision of typing profiles to US regulators.

NZFSANZ contracted ESR to type a large number of *E. coli* O157:H7 strains isolated from adult cattle, young calves, beef, veal and human cases from 1998 until mid 2008. A total of 557 isolates were typed by pulsed field gel electrophoresis (PFGE) using both *Xba*I and *Bln*I *PulseNet USA* specified restriction enzymes. The study provides a library of New Zealand isolate profiles (listed by *PulseNet Aotearoa New Zealand*) that will facilitate future outbreak investigations and source attribution studies and also enable a direct comparison of isolate profiles with those listed by *PulseNet USA*.

Outbreak attribution studies generally begin with comparison of the *Xba*I profiles. While the most prevalent New Zealand *Xba*I type, and the fourth and fifth most prevalent, have not been reported in the US, the two most prevalent *Xba*I types in the US are commonly found in New Zealand.

However, these similarities all but disappear when further focused in combination with the *Bln*I profile. Almost all (99.6%) NZ isolates had *Xba*I:*Bln*I profiles different to US patterns. Only one NZ *Xba*I:*Bln*I combination has been reported in *PulseNet USA*. The two NZ isolates with this profile were isolated in 2004; the two USA types, which are uncommon in *PulseNet USA*, were associated with outbreaks (no source identified) in 2007. The prevalence of this *Xba*I:*Bln*I combination in other countries that export meat, and other foods, to the US could not be determined.

It is highly unlikely that *E. coli* O157:H7 strains isolated from New Zealand beef and veal have been the cause of any historic cases of human gastroenteritis reported in the US.