



Just when you thought it was safe to eat a burger . . .

Escherichia coli O157 (EC O157) produces a vero cytotoxin that causes gastroenteritis. Although large-scale outbreaks receive the most publicity, most cases (as many as 90%) are sporadic.¹ For these common, sporadic cases, the source of infection remains obscure.

A population-based study in the United Kingdom, published recently in *The Lancet*,¹ provides information about the causes of sporadic cases. Over a 2-year period (1994–1996) staff at public health laboratories interviewed 85 people who had stool samples positive for EC O157. Control subjects were chosen from among patients consulting the same physicians as the case subjects, at about the same time. Both groups were asked about foods eaten in the 7 days before the illness (for case subjects) or before presentation (for controls).

The most interesting finding was that eating “beef-burgers” from establishments other than “fast food chain A” was strongly associated with risk of illness (odds ratio [OR] 4.63, 95% confidence interval [CI] 1.33–30.14).

In a parallel environmental study, the authors visited some of the establishments identified by the case subjects and examined the procedures for cooking burgers. Only fast food chain A used appropriate procedures to ensure thorough cooking. Outlets of this chain had automatic timing devices on the grill. The timers were set to fixed, predetermined times matched to the thickness of the 2 types of burgers available. Fast food chain A also cooked the burgers from the bottom and the top simultaneously. The other establishments did not use automatic timing devices, leaving it to employees to time the cooking. The investigators cooked a burger to “well done” according to company regulations for a restaurant chain included in the environmental study. After the specified cooking time, the core temperature of the burger had reached 72°C, but the burger was still pink in the centre.

Although the article did not reveal the names of the establishments investigated, fast food aficionados in the UK were able to identify chain A and, by default, the others.

In Canada 1039 cases of EC O157:H7 were reported in 1996.² An inquiry about 4 local outlets of fast food chains in Canada revealed that only 1 had cooking procedures that closely resembled those of fast food chain A in the *Lancet* paper. For the other chains, either the cooking procedures were not automated or the burgers were cooked from one side only (Peter Moccio, manager, Environmental Health, Kingston, Frontenac and Lennox and Addington Health Unit, Ont.: personal communication, 1998). Thus, it is possible that eating burgers from fast food chains in this country, other than those from fast food chain A, may be associated with many of the reported cases of EC O157 infection.

Other risk factors for EC O157 infection identified by Parry and colleagues¹ were eating cooked, sliced meats from a caterer (OR 3.36, 95% CI 1.04–12.74), household contact with another person with a previous diarrheal illness (OR 6.83, 95% CI 1.69–36.35) and household contact with a person whose occupation involved farm animals (OR 2.71, 95% CI 1.03–8.62).

As we approach the height of the burger season, physicians should remain alert to this illness. The incubation period is usually 24 to 48 hours, and the illness begins with mid-abdominal cramps and watery diarrhea. In mild cases the illness lasts about a week. In severe cases there may be invasion of the intestinal mucosa along with fever and more systemic symptoms. The diarrhea can also be bloody, as in infections with *Shigella*, which produces a similar toxin. Children and elderly people often have more severe illness. Treatment with trimethoprim or trimethoprim-sulfamethoxazole is helpful. Strain EC O157:H7.78 is the cause of most cases of hemolytic uremic syndrome.

References

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2. Spika JS, Khakhria R, Michel P, Milley D, Wilson J, Waters J. Shiga-toxin producing *Escherichia coli* infections in Canada. In: Kaper JB, O'Brien AD, editors. *Escherichia coli O157:H7 and other Shiga toxin-producing E. coli strains*. Washington (DC): American Society of Microbiology. In press.