What do we do about *Listeria monocytogenes*?

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LISTERIA MONOCYTOGENES, A GRAM-POSITIVE COCCO-Bacillus, lived in microbiological obscurity until 1981, when an outbreak of 41 serious adult and perinatal listeriosis cases occurred in the Canadian Maritimes (1). The ecological niche of the organism as well as anecdotal case reports of infection with *L monocytogenes* had pointed to the possibility of foodborne transmission, but this outbreak provided the first solid evidence that epidemic and probably sporadic disease due to *L monocytogenes* was of foodborne origin. Since that time a number of even larger outbreaks of foodborne listeriosis have been described (2-4).

The recognition of epidemic foodborne listeriosis also fostered major advances in methodologies to detect *L monocytogenes* in food (5). Not surprisingly, but to the consternation of public health officials, *L monocytogenes* has been found to be a rather widespread – if low-level – contaminant of many fresh and processed food products (6). Agriculture Canada, Health and Welfare Canada, and the Food Safety and Inspection Service of the US Department of Agriculture (USDA) have undertaken food monitoring programs to detect listeria; these have led to the recall and condemnation of food products that are contaminated but unassociated with any clinical illness in the community. This so-called 'zero tolerance' has led to significant financial losses to the food industry as well as heightened and unnecessary public concern – so-called 'listeria hysteria'.

In this issue of the *Journal*, Farber et al (116-120) have reviewed the problem of foodborne listeriosis in Canada and have suggested methods to prevent this rare, but often fatal, infection. Their recommendations seem reasonable, but

total control of sporadic and epidemic listeriosis will require a multifaceted approach involving cooperation between industry regulators, health care providers and, ultimately, the general public.

In industry, steps are already being taken to institute a program entitled 'HACCP', or 'hazard analysis and critical control points' which will attempt to analyze and control foodborne pathogens at each stage of the food chain – from the farm to the intestinal tract of the consumer. Each food processing plant will have its own trained specialist in HACCP to seek out improvements at critical points in processing that will cut down on microbial growth including that of *Listeria* species. At the retail level, similar programs will seek to limit microbial growth by instituting better food handling practices – for example, the use of better cleaning agents to control biofilms that harbour *L monocytogenes* within the processing or serving environment.

Federal and local regulators will continue to sample the farm environment to assess levels of contamination and will also sample end products to ensure that HACCP programs are working properly.

Moving from 'zero tolerance' to a more benign regulatory stance will require further information on issues such as the infective dose and intrinsic virulence of *L monocytogenes* for humans (7), information that is not available at this time.

The health care provider will require education in the area of the compromised host, as suggested by Farber et al, particularly in educating compromised patients such as pregnant women or transplant patients in the daily hazards associated with nourishment. Physicians will also need to be aware of the clinical features of invasive

listeriosis, as outlined by Farber et al, in order to institute rapid and appropriate therapy for suspected or documented infection. It will be interesting to see whether medicolegal case law will ultimately make the provision of such physician-instituted education mandatory. Industry may also be required to label foods as to their potential hazard to compromised hosts in order to avoid lawsuits arising from cases of foodborne listeriosis.

Finally, the food-consuming public is now faced with another, albeit small, hazard of eating their favourite uncooked food products. Education in food handling is particularly needed for the com-

promised consumer. The US Food and Drug Administration has cooperated with the Centers for Disease Control in producing video materials for patients with the acquired immune deficiency syndrome, and the USDA has developed pamphlets that provide education specifically for compromised hosts, who are at the greatest risk for foodborne infection (8). Salmonellosis and campylobacteriosis will continue to dwarf listeriosis as a cause of foodborne infection in both healthy and compromised consumers, but the high mortality of listeriosis should provide some impetus for consumers to learn more about the proper handling of food.

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