

Hard to swallow—emerging and re-emerging issues in foodborne infection

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This issue's theme section was inspired by, and based on, the homonymous Symposium, proposed by the ESCMID Food- and Water-borne Infections Study Group (<http://www.escmid.org/efwisg>), and presented at the 19th ECCMID in Helsinki in May 2009.

Contrary to popular opinion, occasionally fuelled by irresponsible journalism (or even expert opinion), we do not live in a risk-free world, have never done so, and should never expect to do so. (The popularity of this illusion is manifest in the level of outcry at preventable incidents, in which the possibility for prevention is confused with a Utopian certainty of non-occurrence.)

As old infection-related risks fade away because of scientific and medical advances—the most impressive, of course, being vaccination of humans and their animal food sources—new risks emerge, or re-emerge. The reasons for the emergence of new pathogens or resurgence of established ones are complex and frequently ill-understood, but are often related to human activities that create ecological disturbance or outright environmental destruction.

Moreover, changes in the way in which our food is produced—introduced for reasons such as increasing production—have affected, and will continue to affect in an unfavourable way, the epidemiology of foodborne infection.

It is also true that, at least in the so-called 'developed world', our expectations of protecting individuals rendered more vulnerable to infection, either as a result of underlying medical conditions or because of iatrogenic immunosuppression, are continuously increasing. Therefore, when pathogens capable of causing severe disease in other settings, such as healthcare, are found in such an essential commodity as food, concern naturally grows.

Currently, one of the most infamous pathogens associated with healthcare-associated infection is *Clostridium difficile*. This bacterium had been the cause of mounting concern, as a result of the increasing incidence of infection reported from many countries, but, in the last few years, it has achieved even greater infamy, with the emergence of a hitherto

uncommon hypervirulent strain, implicated in several high-profile outbreaks. Traditionally, efforts to prevent and control *C. difficile* infection have focused on prudent prescribing of antibiotics, isolation of infected patients, and environmental cleanliness in the hospital. Now, however, both the new hypervirulent strain and other strains of *C. difficile* are being isolated not only from food animals, but also from their meat products. But how widespread is such contamination and, more importantly, how might it contribute to the epidemiology of *C. difficile* infection in humans?

In terms of notoriety, methicillin-resistant *Staphylococcus aureus* has been longer established than *C. difficile*. However, since the late 1990s, its epidemiology has been changing, with, for example, the emergence and spread in the community of strains differing genotypically, as well as in terms of antibiotic susceptibility, from their hospital-associated counterparts. And now yet other strains have been isolated from food animals, from those who rear them, and from meat and other food products. The questions raised above for *C. difficile* are also pertinent here.

The incidence of infections associated with a more traditional food-associated pathogen, *Listeria monocytogenes*, had remained low in the last decades of the previous century, most likely as a result of improved hygiene measures during the production, distribution and retailing of those products most implicated in foodborne listeriosis. However, since the first years of the current decade, it has increased again in several countries. What are the reasons for this resurgence? Could it be due to changes in the host population, or are other factors involved?

Emerging and re-emerging foodborne infections are not exclusively associated with bacterial pathogens, however. Foodborne hepatitis caused by hepatitis A virus has, of course, long been recognized, but, more recently, evidence to suggest that hepatitis E virus infection is acquired through consumption of contaminated food products is accumulating—but which foods represent the greatest risk for consumers?

These and other questions are addressed in the four reviews that this issue of the journal has the honour and pleasure to present. However, although biomedical research and clinical advances have improved our understanding and management of foodborne infections, and food producers and retailers have put in place measures to reduce or elimi-

nate pathogens from their products, consumers must also acknowledge their roles and responsibilities (e.g. in food storage, preparation, and eating), which are also of key importance in preventing both established and emerging foodborne infections. But that merits an altogether different discussion.