

Infections related to the ingestion of seafood

In their review of infections related to the ingestion of seafood,¹ Adeel A Butt and colleagues classify trematodes of the genus *Echinostoma* as liverflukes. They are, however, intestinal flukes. Adult worms are attached to the mucosa of the small intestine. Liver and biliary problems are not typical for infections with *Echinostoma* spp.² The eggs of these small worms, especially those of *Echinostoma ilocanum*, resemble those of *Fasciola hepatica* and *Fasciola gigantica* (liverflukes), as well as those of *Fasciolopsis buski* and *Gastrodiscoides hominis* (intestinal flukes). The eggs are rather difficult to differentiate from each other, appearing almost identical.³ Because of the overlap in size range, exact species identification cannot

be made from the eggs. The size difference of adults is, however, very pronounced.

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- 1 Butt AA, Aldridge KE, Sanders CV. Infections related to the ingestion of seafood. Part II: parasitic infections and food safety. *Lancet Infect Dis* 2004; **4**: 294–300.
- 2 Graczyk TK, Fried B. Echinostomiasis: a common but forgotten food-borne disease. *Am J Trop Med Hyg* 1998; **58**: 501–4.
- 3 Garcia LS. Diagnostic medical parasitology, 4th edn. Washington, DC, USA: American Society for Microbiology Press, 2001.

Street-vended seafood: a risk for foodborne diseases in Mexico

The comprehensive reviews of Adeel A Butt and colleagues^{1,2} clearly emphasise the risk of infection related to seafood consumption in industrialised countries, but little is mentioned about developing countries. In these countries, seafood consumption has been shown to be an important risk factor for infection, at least for cholera.^{3,4} Furthermore, although practically absent in industrialised countries, street-vended seafood must be considered when assessing or planning to reduce the impact of seafood as a vehicle of infection in developing countries, as has been suggested for cholera.⁵

In most developing countries, the street-vended food industry is a major source of fast, ready-to-eat meals for a large proportion of the population, mostly the poor and middle class, while providing jobs for otherwise unemployed people. Furthermore, it was estimated that, in Mexico alone, during 1993–1998, this “informal economy” employed 28.5% of the national labour force, generating 12.7% of the gross national product, and accounted for 30.8% of Mexico’s commercial activity.⁶

Street-sold food and beverages have been associated with cholera⁷ and travellers’ diarrhoea,⁸ found to be contaminated with sufficient quantities of human pathogens to cause disease,⁹ and shown to be contaminated with faeces.⁹ Unfortunately, there is no information available regarding the microbiological status of street-vended seafood worldwide. Therefore, we evaluated the prevalence of *Escherichia coli*, *Salmonella* spp, *Vibrio* spp, and *Aeromonas* spp in street-vended seafood from three stalls in the northern suburbs of Mexico City during May 2004. May is the warmest month of the year, with, on average, a temperature in the range of 12°C to 26°C. Each stall was visited six times and 48 samples were collected, including 18 of raw oysters, 12 of fish “ceviche” (raw fish marinated in lemon or lime juice for varying amounts of time), and 18

shrimp cocktails (slightly boiled shrimps are prepared with catsup, onion, and chilli sauce). As shown in the table, eight oysters, two ceviche, and two of the shrimp cocktail samples were faecally contaminated, and one sample contained as high as 1.1×10^7 colony-forming units/g. Furthermore, we isolated *Vibrio cholerae* non-O1 non-O139 from nine samples, *Aeromonas hydrophila* from five samples, and *Vibrio parahaemolyticus* from one sample. Thus 77.7% (14/18) of oyster samples, 33.3% (4/14) of ceviche, and 16.6% (3/18) of shrimp cocktails were microbiologically contaminated, revealing the poor sanitary conditions of street-sold seafood in Mexico City, the consumption of which poses a clear health risk.

Seafood, such as shellfish, can be contaminated either in the aquatic environment¹ (primary contamination) or subsequently during preparation (secondary contamination). Street-vended seafood has a high risk of being secondarily contaminated, due to street-trading conditions. We have shown the poor general sanitary conditions of food handling and trading of street-vended food in Mexico City.⁵ For example, food items are exposed at the street environment for about 8 h without refrigeration or protection, providing highly favourable conditions for microbial growth. In Singapore, two cholera outbreaks were associated with secondary contamination of seafood due to food-handlers.^{4,10} Therefore, to improve public health in developing countries, health authorities should take basic steps to improve the safety of seafood from the seabed to the street-sellers’ stalls—aiming to reduce the risks posed by street-vended seafood, rather than penalise their sale, which impinges only upon the street-vendors’ meagre income. In addition to the accessibility of potable water and toilet facilities to the street vendors, several measures are urgently required. For instance, educational campaigns for seafood-handlers should focus on the notion that after