Selected Summaries

Salmonella Outbreak from Ice Cream

[Hennessy TW, Hedberg ON, Slustsker L, et al. A national outbreak of Salmonella enteritidis infections from ice cream. N Engl] Med 1996, 334:1281-1286.]

In September 1994, the Minnesota Department of Health detected an increase in the number of reports of *Salmonella enteritidis* infections. After a case-control study implicated a nationally distributed brand of ice cream (Schwan's) in the outbreak, the product was recalled and further epidemiologic and microbiologic investigations were conducted. An outbreak associated case of *S. enteritidis* infections was defined as one in which *S. enteritidis* was cultured from a person who became ill in September or October 1994.

Authors estimated that *S. enteritidis* gastroenteritis developed in 224,000 persons in the United States after they ate Schwan's ice cream. The attack rate for consumers was 6.6%. Ice cream associated with infection contained a higher percentage of premix that had been transported by tanker trailers that had carried non-pasteurized eggs immediately before (p=0.02). *S. enteritidis* was isolated from 8 of 266 ice cream products (3%) but not from environmental samples obtained from the ice cream plant (n=157) or tanker trailers (n=204).

This nationwide outbreak of salmonellosis was most likely the result of contamination of pasteurized ice cream premix during transport in tanker trailers that had previously carried nonpasteurized liquid eggs containing *S. enteritidis.* To prevent further outbreaks, it was recommended that food products not destined for re-pasteurization should be transported in dedicated containers.

Comments

Salmonellosis with the notable exception of typhoid fever, is a disease of civilization. The animals used for food production frequently carry salmonella, thus contaminating meat, dairy products and eggs(l). Salmonellosis is rare in developing countries, where sanitation is poor and diarrheal diseases are endemic, but where food production and consumption are local.

Conclusions of the authors are supported by several findings. First, a case-control study demonstrated that *S. enteritidis* infections were associated only with the consumption of Schwan's ice cream. Second, a study of Schwan's customers showed an increased risk of gastrointestinal illness after consumption of Schwan's ice cream. Third, the outbreak ended after sales of contaminated ice cream stopped. Fourth, S. *enteritidis* was isolated from unopened ice cream products. Finally, a dose-response relation was demonstrated between the proportion of a product's premix that had been carried in tanker trailers immediately after an egg load and the likelihood of that product's being associated with illness. Ice cream premix was not re-pasteurized after transportation; thus, any contamination that occurred during transport would not have been eliminated at the ice cream plant.

Manifestations of food-borne disease are not restricted to the gastrointestinal tract, as illustrated by the etiologic role of *Escherichia coli* 0157: H7 in the hemolytic-uremic syndrome, C. *jejuni* in Guillain-Barre syndrome and Listeria

moncytogenes in fetal morbidity, nor are the ramifications always obvious. The most pernicious threat may be the spread of antibiotic resistance by foodborne organisms, because of the promiscuous case of sub-therapeutic doses of antibiotics as food supplements for farm animals(2).

An interesting scientific question is when should the Public Health Department make a public announcement about the association of a particular food with an outbreak? Public health officials should not require confirmation of microbial contamination of a product before taking action when sufficient epidemiolgoic evidence implicates that product. This is evidenced by the following: When the Minnesota Department of Health announced the association between the consumption of Schwan's ice cream and *S enteritidis* infection on October 7, 1994, the evidence implicating this product was limited to a single case-control study of 15 matched pairs. Laboratory isolation of *S enteritidis* in samples of ice cream was not reported until 10 days later. Had the announcement been delayed until the receipt of this confirmation, many more people would have become ill after eating this product.

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REFERENCES

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