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### Food Poisoning Outbreak Caused by *Salmonella* Enteritidis in Box Lunches Distributed by a Restaurant

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This paper describes a food poisoning outbreak caused by box lunches distributed by a restaurant. The outbreak was concluded to be associated with hens' eggs contaminated by a *Salmonella* Enteritidis phage type 14b strain.

On 16th November 2005, the health center of Kyoto City was informed of an outbreak of food poisoning at a business office. About 10 employees among those who consumed lunch boxes distributed by a restaurant had developed diarrhea and fever. Further investigation by the health center responsible for the region revealed that a total of 30 employees at eight businesses had developed diarrhea, abdominal pain, fever and other food poisoning symptoms.

The first person affected developed symptoms at 5 o'clock in the evening of 14th November. A total of 30 persons among those who ate the same lunch developed symptoms by the

night of 15th November. The main symptoms were diarrhea and fever; in addition, some patients developed chill, abdominal pain, malaise, headache, and nausea. The average time of incubation was 18 h, and the shortest interval was about 3 h. No persons who did not take the box lunch developed the symptoms.

Twenty-three stool specimens of patients, one stool specimen from a cook of the restaurant, one finger swab of the cook, and nine swab specimens from the chopping boards and other surfaces of the restaurant's kitchen were inoculated on SS plates (Eikenkagaku, Co., Ltd., Tokyo, Japan). At the same time, some patients' stool specimens were submitted to the Multiplex PCR Screening (QIAGEN Multiplex PCR kit; Qiagen, Tokyo, Japan) for *Salmonella* spp., *Campylobacter jejuni* and *Campylobacter coli*. Bands specific for *Salmonella* spp. were observed in most of the specimens tested (Fig. 1).

The bacterial culture revealed that 21 specimens among the 23 patient stool specimens were positive for *S. Enteritidis*. No bacteria were detected either from the cook's stool specimens or from swabs of the cook's fingers or the kitchen surfaces.

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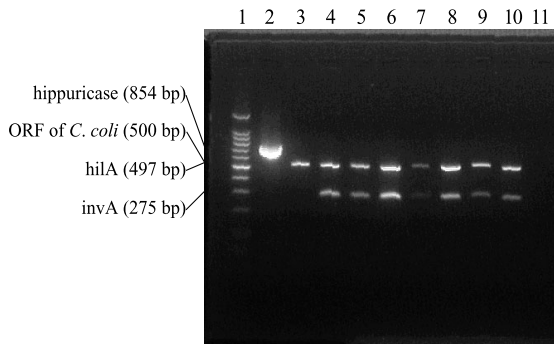


Fig. 1. Direct detection of *Salmonella* genome from the specimens. Lane 1, 100 bp DNA ladder marker (Promega 100 bp DNA Ladder; Promega, Tokyo, Japan); lane 2, *C. jejuni*; lane 3, *C. coli*; lane 4, *S. Enteritidis*; lanes 5-11, patients' stool specimens.

The pulsed-field gel electrophoresis (PFGE) patterns of all the *S. Enteritidis* isolates were identical (Fig. 2). Phage typing conducted at the National Institute of Infectious Diseases (NIID), Tokyo revealed that the isolates were phage type PT14b. The isolates were positive for lysine decarboxylase, and were sensitive to all the antibiotics tested (amikacin, ampicillin, aztreonam, cefazolin, cefmetazol, cefotaxime, cefpirome, ceftazidin, chloramphenicol, ciprofloxacin, fosfomycin, imipenem, minocycline, piperacillin, trimethoprim-sulfamethoxazole).

The above data strongly indicated that the box lunches distributed by the restaurant were responsible for the outbreak, and the restaurant was ordered to stop its service for 3 days. As no box lunches were saved, a bacterial investigation of

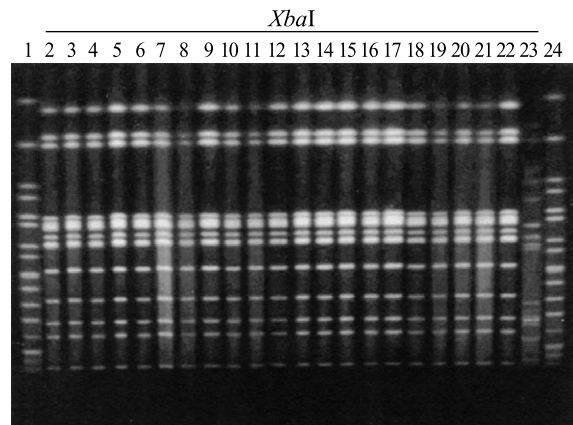


Fig. 2. PFGE of *Salmonella* Enteritidis isolates. Lanes 1 and 24, *S. Breanderup* H9812; lane 2-22, isolates from patients' stool specimens; lane 23, a *S. Typhimurium* isolate.

the box lunch itself could not be conducted. However, as the responsible pathogen was *S. Enteritidis*, and as the crab omelet was not well cooked (noted by the cook), it was very probable that the source food was the crab omelet. It was also revealed that the restaurant stored the eggs at room temperature, which could have allowed for the growth of the bacteria.

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