An outbreak of *Salmonella* Typhimurium phage type 99 linked to a hotel buffet

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Salmonella Typhimurium phage type 99 is a relatively rare serovar in Australia. The National Enteric Pathogen Surveillance Scheme reported only 16 cases Australia-wide in 2000, and 19, 4, 3,1 and 1 for the 5 preceding years. Victoria contributed 4, 7, 1, 0, 0 and 0 cases for these years respectively. From 15 to 28 June 2001 the Victorian Department of Human Services was notified of 4 cases of *S.* Typhimurium 99; all 4 resided in the same rural region of Victoria. Earlier in the year there was a notification of *S.* Typhimurium 99 in a man who lived in the same region and who had become ill after burying 6 sheep that had recently died with *S.* Typhimurium 99 infections at his workplace, a feedlot.

The Department initiated an investigation into the cluster of *S.* Typhimurium 99 cases. During interviews it was found that one case had eaten at a local hotel buffet in the 3 days before illness onset. A number of others who had eaten from the hotel buffet on the same evening, 6 June 2001, had also subsequently become ill with gastrointestinal symptoms. Lamb's fry was the suspected source of illness. Further investigation revealed that 6 out of 10 people contacted had eaten lamb's fry. All of the six who consumed lambs's fry were subsequently ill with diarrhoea.

A study was undertaken of patrons eating from the hotel buffet on the evening of 6 June. A standard questionnaire was administered by phone, seeking information on illness history, consumption of buffet foods according to the list provided by the hotel, and any other meals bought and/or eaten away from home in the first 2 weeks of June. A suspected case was defined as a person who ate at the hotel on the evening of 6 June 2001 and became ill with gastrointestinal illness (vomiting and/or diarrhoea i.e. three or more loose bowel motions in a 24 hour period) in the 5 days following. A case was confirmed if *S.* Typhimurium 99 was isolated from a faecal specimen. Both suspected and confirmed cases were included in the analysis.

The exact number of patrons who attended the hotel on the evening of 6 June 2001 could not be established, but the regular buffet caters for approximately 80 and there were 7 bookings for a total of 92 people listed for 6 June. Six of the booking groups totalling 83 people were contacted. Interviews were conducted with 78 patrons, revealing 18 suspected cases in addition to the confirmed index case. As there was a delay in identifying suspected cases no further faecal samples were obtained. However, it was determined that one of the 18 suspected cases was actually a confirmed case because he was part of the June cluster of 4 *S.* Typhimurium 99 cases. Therefore the overall attack rate of suspected and confirmed cases was 24 per cent. All cases reported diarrhoea, followed by nausea (79%), and lethargy (63%). Vomiting was not common (21%). Over half of the cases visited a doctor (53%), and two were admitted to hospital (10%). The median incubation period was 25 hours (range 16-68). The median age of cases was 45 years (range 7-72) and 58 per cent were male.

Of 31 food or beverage items from the hotel buffet or menu, there was a strong association between illness and consumption of the lamb's fry with bacon and onion in gravy (RR 8.44; 95% CI 3.13 – 22.77; p value < 0.001). There was no statistical association between illness and consuming food from any other local establishment.

The hotel was inspected for general food handling techniques, food storage, and cooking procedures for the lamb's fry dish. No hotel staff were ill either before or after the buffet dinner. The inspection revealed inadequate recording of coolroom, freezer, delivery, cooking and reheating temperatures. Potential problems during the preparation of the lamb's fry dish included: possible lack of refrigeration after frying; addition of meat juices to gravy during preparation; unknown temperature of combined dish of lamb's fry with bacon and onion in gravy after reheating; unknown holding temperature of the dish in a Bain Marie during self service.

The supply chain of the lamb's fry was followed as far as possible through hotel suppliers and meat processors. The meat processor buys animals from all over Australia, but occasionally obtains animals from the feedlot where the *S.* Typhimurium 99 case notified in February worked. There was no way to determine when animals were traded between these two companies, so a link between the source of infection for the earlier case and the current cohort is only speculative. All of the lamb's fry was consumed on 6 June, so liver samples from the same batch could not be tested. Lamb meat and offal samples from the hotel, its direct supplier, and the meat processing company two steps further back in the supply line were all negative on microbiological culture tests. Powdered gravy mix from the hotel also tested negative.

It was not possible to determine whether the lamb liver was contaminated with *S.* Typhimurium 99 before reaching the hotel. *Salmonella* contaminated raw meat or offal will not pose a health risk if adequately handled, stored and cooked. Education has been provided at the premises encompassing storage, cooking, post-cooking temperature control, physical handling of products, cross contamination, and personal hygiene.

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