An outbreak of *Salmonella* Typhimurium phage type 135 infection linked to the consumption of raw shell eggs in an aged care facility

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In March 2001, the Communicable Diseases Control Branch and local government investigated an outbreak of gastroenteritis in an aged-care facility in rural South Australia. Initial reports indicated 12 residents and 1 staff member had experienced gastrointestinal illness; 3 residents had been hospitalised. An epidemiological and environmental investigation sought details of illness, food consumption, food purchasing practices and social activities for the 3 day period prior to the onset of illness in the first case. In total, 18 (16 residents, 2 nursing staff) were ultimately linked to this outbreak (Figure). The predominant symptoms were diarrhoea in 18 cases (100%) and vomiting in 10 cases (55.5%). Of the 15 cases for whom the time of onset was available, the median incubation period was 45.5 hours (range: 12 to 94 hours). Thirteen stool specimens provided by residents and staff yielded *Salmonella* Typhimurium phage type 135. One secondary case in a health care worker was identified. This case is believed to have acquired the infection by person-to-person transmission. There were no reports of gastrointestinal illness in kitchen food handlers.

Attack rates (AR) for food items served at the nursing home in the 3 days prior to the outbreak were calculated. A rice pudding (AR=42%) and meat-based potato pie (AR=48.5%) were identified as possible sources for the infections. The environmental investigation established that 8 raw shell eggs had been whisked into the cooked rice pudding immediately prior to serving. In addition, raw egg had been incorporated into the potato topping of a meat pie and lightly browned. Indeed, the incorporation of raw shell eggs into dishes that received minimal or no further cooking was a plausible explanation for the outbreak. Microbiological sampling of both the leftover meat-based potato pie and a frozen serve of the rice pudding confirmed the presence of *Salmonella* Typhimurium phage type 135.

The first staff member to become ill did not consume the potato pie or rice pudding. Nonetheless, the staff member reported handling and cracking the raw eggs included in the rice pudding. The staff member reported that the exterior surfaces of the shell eggs were visibly contaminated, however, there were no reported breaks in the integrity of the eggshells.

A trace-back investigation identified the producer that supplied the nursing home with shell eggs. An environmental investigation identified that whole and crushed grains used to feed the chickens were securely stored, however, an intermediate step, the chicken feed crusher, provided rats with access to crushed grain. Rat faeces were observed in the chicken feed crusher and crushed grain stored in sealed bins. Microbiological sampling of the chicken feed, chicken feed crusher and the exterior surface and interior contents of shell eggs collected after the outbreak were negative for *Salmonella* spp. However, microbiological sampling of chicken manure from the farm yielded *Salmonella* Typhimurium phage type 135.

This outbreak illustrates the dangers associated with eating inadequately cooked shell eggs. The elderly and immunocompromised persons are particularly susceptible to infection with small numbers of *Salmonellae* and in turn are more likely to suffer more severe disease than healthy adults. In nursing homes, pasteurised egg products should be used in dishes that are not thoroughly cooked. Hands, cooking utensils and food preparation surfaces should be washed thoroughly after contact with shell eggs to prevent cross contamination. The economic impact of this outbreak was considerable. Three residents were hospitalised and the need for additional staff resources presented an overwhelming burden for the local community.

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With the cooperation of the nursing home, local government implemented changes to food handling procedures. Consequently, no further cases of *Salmonella* Typhimurium phage type 135 infections have been reported from this aged-care facility.

Editor's note: This outbreak was briefly reported in the OzFoodNet January to March 2001 quarterly report published in *Commun Dis Intell* 2001;25:105.

Figure **Outbreak of *Salmonella* Typhimurium phage type 135 in an aged care facility in South Australia**