

Outbreak of gastroenteritis due to *Salmonella* Typhimurium phage type 135a following consumption of raw egg

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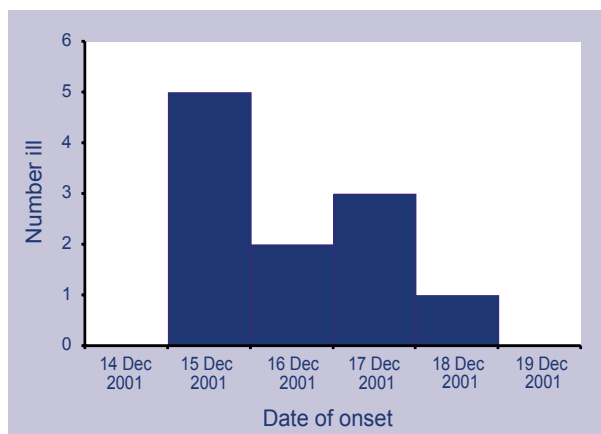
On 19 and 20 December 2001, 3 notifications of infection with *Salmonella* sp. were received by the Communicable Disease Control Branch for persons who had attended the same Christmas function on 14 December. On 21 December 2001 a voluntary service organisation reported that 4 of about 14 people attending a Christmas function had reported illness with gastrointestinal disease. The function was for staff of the organisation and was self-catered in a private home, with each of the guests contributing food and drink items. Interview of the hostess on 21 December 2001 established that 20 people (17 adults and 3 children), including the 2 notified cases, had attended the function. A list of persons attending the function was obtained from the voluntary organisation and 6 were interviewed to compile a list of menu items. On 24 December 2001 an additional case was notified. This case had also attended the function. Organisms from all cases were subsequently typed as *Salmonella* Typhimurium phage type 135a.

A questionnaire was developed inquiring after symptoms before and after the function and foods and drinks consumed at the function. A case was defined as a person attending the function who had reported diarrhoea after 14 December 2001.

Nineteen persons were available for interview. Responses to the questionnaire were entered into a database constructed in EpiData 2.0b and analyzed using Stata 7 and Excel 2000.

Eleven of the 19 persons attending were ill, 4 were admitted to hospital. The epidemic curve is presented in the Figure.

Figure. Cases of *Salmonella* Typhimurium phage type 135a, 14 to 19 December 2001, by date of onset.



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Table 1. Foods consumed and risk ratios for developing gastroenteritis

Food	Risk ratio	95% Confidence interval
Chicken wings	0.89	0.21, 3.80
Lasagna	1.88	0.36, 9.71
Salmon roulade	0.75	0.35, 1.62
Party pies	1.65	0.77, 3.53
Sausage rolls	undefined	-, -
Cocktail frankfurts	2.00	0.60, 6.64
Quiche	0.97	0.41, 2.32
Cherries	1.18	0.28, 4.97
Tiramisu	undefined	-, -
Hazelnut torte	1.48	0.57, 3.90
Rum balls	0.00	-, -
Chocolate slice	1.80	1.19, 2.72
Apricot slice	0.00	-, -
Almond bread	1.24	0.58, 2.64
Toffeed almonds	1.25	0.55, 2.84
Nibbles	1.81	0.91, 3.59
Nuts	0.98	0.44, 2.18

Foods consumed at the function and risk ratios for diarrhoea are presented in Table 1.

These results indicate a risk due to sausage rolls, tiramisu and chocolate slice. The sausage rolls were of 2 types: home-made and store-bought. Eighteen persons reported eating sausage rolls, and 11 became ill. Fourteen persons reported eating the tiramisu and 10 became ill. Only 1 person reported eating the chocolate slice.

Some leftover foods were available for sampling and these were cultured at the Food Laboratory of the Institute of Medical and Veterinary Sciences. Culture results are presented in Table 2.

The microbiology results support the hypothesis that the primary vehicle for infection was the tiramisu, with cross-contamination of some of the other foods. It is possible that the other foods may have been contaminated after the function, since all the foods available for culture were stored in the same fridge after the function.

The tiramisu was made by one of the guests, who denied illness before or after the party. It was made from Italian sponge biscuits, percolated coffee, port, free-range eggs, cream, sugar and cocoa. The port came from a flagon won in a raffle at a pub, the eggs were obtained from either a family friend or a relative (who kept layer chickens) and the other ingredients were commercial products obtained from supermarkets. The tiramisu was made by soaking the biscuits in the coffee and port, and whipping the cream and eggs together. Cocoa was added as a topping. It was set in the fridge and there was no cooking step. No eggs were available for culture.

These results indicate that it is likely that the eggs used in preparing the tiramisu were the original source of this outbreak. Outbreaks of *Salmonella* gastroenteritis where raw eggs have been implicated as the original source are not uncommon. In the United Kingdom and United States of America *Salmonella* Enteritidis phage type 4

Table 2. Microbiology of foods available for culture

Food	Result	Colony count
Fruit and nut slice	<i>Salmonella</i> Typhimurium PT 135a	<3cfu/g
Hazelnut torte	<i>Salmonella</i> Typhimurium PT 135a	<3cfu/g
Mixed nuts	<i>Salmonella</i> Typhimurium PT 135a	<3cfu/g
Tiramisu	<i>Salmonella</i> Typhimurium PT 135a	>1,000 cfu/g
Chocolate slice	<i>Salmonella</i> Typhimurium PT 135a	<3cfu/g
Toffeed almonds	Negative	
Almond bread	Negative	
Apricot/marshmallow roll	Negative	

has been associated with consumption of raw egg.^{1,2} In South Australia, an unrelated outbreak of gastroenteritis due to *Salmonella* Typhimurium phage type 135a due to the consumption of a pie glazed with raw egg and rice pudding made with raw egg was reported in 2001.³ An outbreak associated with raw egg due to contamination of mock ice cream containing raw egg with *Salmonella* Typhimurium phage type 135 was reported in Western Australia in 2001.⁴ In 2001,⁴ outbreaks of *Salmonella* (of different serovars) infection related to eggs were reported to OzFoodNet, including the South Australia and Western Australia outbreaks noted above (Martyn Kirk, OzFoodNet, personal communication). Between 1995 and 2000, 9 outbreaks of *Salmonella* infection have been identified where there has been exposure to eggs. Four of these have involved *Salmonella* Typhimurium phage type 135 (Craig Dalton, Hunter Public Health Unit, personal communication). These reports, and the present report, indicate a potential risk of *Salmonella* infection from raw egg and that foods containing raw egg should not be consumed by vulnerable groups such as the elderly and the immunocompromised.

References

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