Quarterly reports

OzFoodNet quarterly report, 1 January to 31 March 2011

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health and Ageing established the OzFoodNet network in 2000 to collaborate nationally to investigate foodborne disease. OzFoodNet conducts studies on the burden of illness and coordinates national investigations into outbreaks of foodborne disease. This quarterly report documents investigations of outbreaks of gastrointestinal illness and clusters of disease potentially related to food, occurring in Australia from 1 January to 31 March 2011.

Data were received from OzFoodNet epidemiologists in all Australian states and territories. The data in this report are provisional and subject to change, as the results of outbreak investigations can take months to finalise.

During the 1st quarter of 2011, OzFoodNet sites reported 364 outbreaks of enteric illness, including those transmitted by contaminated food. Outbreaks of gastroenteritis are often not reported to health agencies or the reports may be delayed, meaning that these figures under-represent the true burden of enteric disease outbreaks. In total, these outbreaks affected 5,220 people, of whom 247 were hospitalised. There were 13 deaths reported during these outbreaks. The majority of outbreaks (70%, n = 255) were due to person-to-person transmission (Table 1).

Table 1: Mode of transmission for outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 January to 31 March 2011

Transmission mode	Number of outbreaks and clusters	Per cent of total
Foodborne and suspected foodborne	45	12
Person-to-person	255	70
Unknown (*Salmonella* cluster)	18	5
Unknown (other pathogen cluster)	3	1
Unknown	41	11
Waterborne	2	1
Total	364	100

Foodborne and suspected foodborne disease outbreaks

There were 45 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 785 people and resulted in 119 hospitalisations. There was 1 death reported during these outbreaks. This compares with 37 outbreaks for the last quarter for 2010[1] and a 5-year mean of 37 outbreaks for the 1st quarter between 2006 and 2010.

Salmonella was the aetiological agent for 24 outbreaks during this quarter, with *S.* Typhimurium being the most common serotype (n = 22). Of the remaining 21 outbreaks, six were due to foodborne toxins, including 1 ciguatera fish poisoning, and 5 outbreaks of *Clostridium perfringens*. There were 2 outbreaks due to *Campylobacter* infection and one due to norovirus. Twelve outbreaks were of unknown aetiology.

Thirteen outbreaks (29% of foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants, 9 outbreaks (20%) in aged care facilities, six each (13%) were associated with bakeries and takeaway food outlets, and two each (4%) with private residences, camps and grocery stores or delicatessens. Single outbreaks (2%) were associated with primary produce, a hospital, an institution, a school and an unknown setting.

To investigate these outbreaks, sites conducted three cohort studies, two case control studies and collected descriptive case series data for 39 investigations, while for 1 outbreak no individual patient data were collected. As evidence for the implicated food vehicle, investigators collected both microbiological and analytical evidence for 3 outbreaks, relied on microbiological evidence alone for 7 outbreaks and analytical evidence alone for 3 outbreaks. Descriptive evidence alone was obtained in 32 outbreak investigations.

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 January to 31 March 2011 (n = 45)

State	Month of outbreak	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
ACT	March	Takeaway	*S.* Typhimurium PT 197	9	1	D	Chicken kebab, lamb kebab
NSW	January	Bakery	*S.* Typhimurium PT 135	9	0	D	Unknown
	January	Grocery store/ delicatessen	*S.* Singapore	10	0	AM	Roast chicken pieces served cold
	January	Grocery store/ delicatessen	*S.* Singapore	46	2	AM	Roast chicken pieces served cold
	January	Restaurant	Unknown	5	0	D	Unknown
	January	Restaurant	Unknown	7	0	D	Unknown
	January	Restaurant	*S.* Typhimurium	11	1	M	Caesar salad dressing – raw egg†
	January	School	*S.* Typhimurium PT 170	17	1	A	Apple turnover
	January	Takeaway	*S.* Typhimurium PT 44	85	17	M	Vietnamese pork/chicken/salad rolls containing raw egg butter†
	February	Institution	*C. perfringens*	6	0	D	Unknown
	February	Restaurant	*Campylobacter*	11	0	A	Chicken liver pate on toast
	February	Restaurant	Unknown	36	0	D	Suspected dessert
	February	Restaurant	Unknown	3	0	D	Unknown
	February	Restaurant	*S.* Typhimurium	10	0	D	Dessert containing raw egg custard†
	February	Restaurant	*S.* Typhimurium PT 170	6	2	M	Fried ice cream†
	March	Restaurant	Norovirus	49	Unknown	D	Suspected person-person
	March	Restaurant	Unknown	7	0	D	Unknown
NT	January	Camp	Unknown	3	0	D	Unknown
	February	Camp	Unknown	3	1	D	Unknown
Qld	January	Unknown	*S.* Typhimurium MLVA profile 1-5-5-2-3	49	6	M	Eggs†
	March	Primary produce	Ciguatera fish poisoning	3	0	D	Red Bass
SA	January	Bakery	*S.* Typhimurium PT 9	15	3	AM	Bakery product– cannoli
	January	Bakery	*S.* Typhimurium PT 9	43	19	A	Bakery product– custard berliner
	February	Bakery	*S.* Typhimurium PT 44	8	0	D	Unknown
	March	Bakery	*S.* Typhimurium PT 135	6	2	M	Egg wash†
	March	Private residence	Unknown	16	1	D	Unknown

Table 2 *continued*: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 January to 31 March 2011 (n = 45)

State	Month of outbreak	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic	January	Aged care	Unknown	9	0	D	Unknown
	January	Aged care	*C. perfringens*	25	0	D	Unknown
	January	Takeaway	*S.* Typhimurium 9	3	1	D	Chicken sushi (hand rolls)
	February	Aged care	*C. perfringens*	7	0	D	Unknown
	February	Aged care	*C. perfringens*	22	0	D	Unknown
	February	Aged care	*C. jejuni*	15	2	D	Unknown
	February	Hospital	*S.* Typhimurium PT 135	7	0	D	Unknown
	February	Private residence	Unknown	5	0	D	Tiramisu made with raw eggs†
	February	Restaurant	*S.* Typhimurium PT 170	15	6	D	Salty fish, pork and eggs Vietnamese dish
	February	Takeaway	*S.* Typhimurium PT 170 and *S.* Typhimurium RDNC A066	26	6	D	Sushi made with raw egg mayonnaise†
	February	Takeaway	*S.* Typhimurium 9	84	19	M	Sushi made with raw egg mayonnaise†
	March	Aged care	Unknown	9	0	D	Unknown
	March	Aged care	*C. perfringens*	9	0	D	Unknown
	March	Aged care	*S.* Typhimurium PT 170	6	5	D	Unknown
	March	Bakery	*S.* Typhimurium PT 135	18	3	M	Chicken pate
WA	January	Restaurant	*S.* Typhimurium PT 170, PFGE 0011	4	1	D	Unknown
	January	Takeaway	*S.* Typhimurium PT 9, PFGE 0001	15	5	D	Vietnamese pork roll with raw egg butter†
	February	Restaurant	*S.* Typhimurium PT 135, PFGE 0003	24	15	D	Unknown

* No foodborne outbreaks were reported by Tasmania.

† Suspected/confirmed egg associated outbreaks

A Analytical epidemiological association between illness and one or more foods.

D Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission.

M Microbiological confirmation of agent in the suspected vehicle and cases.

MLVA Multi-locus variable number of tandem repeat analysis.

PFGE Pulsed-field gel electrophoresis.

PT Phage type

The following jurisdictional summaries describe key outbreaks and public health actions that occurred in this quarter.

Australian Capital Territory

There was 1 reported outbreak of foodborne or suspected foodborne disease reported during the quarter.

An investigation was commenced following an increase in notifications of *S.* Typhimurium phage type (PT) 197 multi-locus variable number of tandem repeats analysis (MLVA) profile 5-13-11-11-490.* Nine confirmed *S.* Typhimurium PT 197 infections were epidemiologically linked to the consumption of kebabs served at a Turkish takeaway, including 1 hospitalised case. Two further cases of *S.* Typhimurium PT 197 were identified, including an additional hospitalised case, but neither reported exposure to the implicated premises at initial interview. One *S.* Virchow PT 34 case was also linked to the premises. An environmental inspection identified issues with cleaning and sanitising and also a practice of allowing cut cooked meat to fall into the tray under the rotisserie where it could then be contaminated with juices collected during the thawing and heating processes. Food and environmental samples were negative for *Salmonella*.

New South Wales

There were 16 reported outbreaks of foodborne or suspected foodborne illness during the quarter.

An outbreak of *S.* Typhimurium PT 44 multi-locus variable number of tandem repeats analysis (MLVA) profile 3-10-8-9-523* was investigated in January following an increase in hospital emergency department presentations with gastrointestinal symptoms. Case data were suggestive of a point source of infection – pork/chicken/salad rolls with raw egg mayonnaise from a Vietnamese bakery in the area. Of 147 cases who presented to emergency departments and general practitioners, 58 were interviewed and provided information on a further 27 people who were ill. Forty-nine people submitted a stool sample and 47 were positive for *S.* Typhimurium PT 44 (MLVA profile 3-10-8-9-523). The bakery was inspected by the New South Wales Food Authority (NSWFA) and shut down for clean up and disinfection. Thirteen of 21 food samples including raw egg butter, pate, chicken, pork and salad items and 5 of 11 environmental swabs were positive for *S.* Typhimurium 44 (MLVA profile 3-10-8-9-523). Lack of records or supplier information prevented an egg trace back.

Five cases of salmonellosis were notified by a hospital emergency department. Two of the 5 cases had eaten fried ice cream at the same Chinese restaurant. Two additional clinical cases had also eaten fried ice cream, and the NSWFA received a complaint from two further cases (one hospitalised) who had both eaten fried ice cream at the same premises. Confirmed cases were infected with *S.* Typhimurium (MLVA profile 3-9-7-14-523). The NSWFA inspected the premises and issued a prohibition order on serving fried ice cream. Samples of uncooked and cooked fried ice cream balls and numerous environmental samples were positive for *S.* Typhimurium phage type 170 (MLVA profile 3-9-7-14-523). NSWFA traced the eggs back to a specific farm and collected approximately 30 samples. Chicken feed, faeces and environmental samples were positive for a mixture of *S.* Infantis, *S.* Havana and *S.* Saintpaul. One environmental sample from a walkway was positive for *S.* Typhimurium 170 (MLVA profile 3-9-7-13-523).

A geographic cluster of 23 cases of *S.* Typhimurium MLVA profile 3-12-9-10-550 (previously associated with PT 135) was identified and 19 were interviewed. Nine of the 19 cases had eaten a range of products from a bakery with common ingredients including cream, custard and icing. There were no reports of illness in staff. Two environmental samples taken by the NSWFA were positive for *S.* Typhimurium (MLVA profiles 3-12-9-10-550 and 3-12-9-9-550), but no food samples were positive for *Salmonella*. Environmental swabs were repeated following cleaning and *S.* Typhimurium (MLVA profiles 3-12-9-11-550) was again found on numerous pieces of kitchen equipment and surfaces. A prohibition order for full closure was issued. The bakery was re-opened following negative results on clearance swabs for *Salmonella* and a satisfactory assessment of food handling skills and knowledge.

Six cases of *S.* Typhimurium with a novel MLVA profile (3-11-11-10-523) and clustered in time were investigated. Cases were part of 5 groups who had eaten at the same restaurant over a 2-day period in late January, and 4 additional clinical cases were found through interviews. Nine of 10 cases had eaten a dessert containing berries (strawberries, raspberries and possibly others), meringue and sabayon containing raw egg. The final case ate a baked chocolate dessert. All food and environmental samples taken from the restaurant by the NSWFA were negative except for a swab from a hand wash basin, which was positive for *S.* Sofia.

Seventeen of 311 girls at a boarding school developed diarrhoea, vomiting, headache and fever in late

* Reported in the nomenclature used by the Institute for Clinical Pathology and Medical Research, New South Wales.

January. Five stool specimens were taken and three were positive for *S.* Typhimurium (MLVA profile 3-9-8-13-523). Web-based questionnaires were administered to 72 students (17 cases, 56 controls). The only food statistically significantly associated with illness was an apple turnover consumed one evening: odds ratio (OR) = 4.6 (95% confidence interval [CI]; 1.4–15.4) though this was consumed by only 11 cases and 18 controls. The apple turnover was not served with any high risk foods such as cream, custard or ice cream. The NSWFA inspected the premises and found no issues and took no samples. They received reports that 15 staff ate the same meals as the boarders and none were ill. It was also reported that approximately 50% of the boarders ate off-site one night, mostly with their own families before returning to school. Investigations could not determine a credible source of the infection.

Two separate outbreaks of gastroenteritis were investigated, each affecting four of five people who had eaten a meal at a local café on the same date in February. Investigations revealed a further 3 cases. In total, 11 people (6 with laboratory confirmed *Salmonella* infection) were symptomatic with a diarrhoeal illness after consuming a chicken Caesar salad from the café, over a 2-day period. All isolates were typed as *S.* Typhimurium with MLVA profiles 3-13-14-9-523 (5 cases) and 3-13-14-10-523 (1 case). NSWFA investigations revealed that raw egg was used in the chicken Caesar salad dressing, with the same batch of dressing used over a 2-day period. *S.* Typhimurium MLVA profile 3-13-14-9-523 (PT 3) was isolated from a sample of Caesar salad dressing 10 days after the exposure period. The NSWFA has issued an order prohibiting the use of raw egg in ready to eat foods.

Two outbreaks of *S.* Singapore were associated with buffet functions on a cruise boat in February. The first was an 80th birthday party, with 41 of 57 people reporting a *Salmonella*-like illness, *S.* Singapore was isolated from 5 stool specimens, and *Salmonella* spp detected from a 6th specimen. Roast chicken pieces (relative risk [RR] 5.70, 95% CI 0.93–35.19), silverside (RR 1.32, 95% CI 0.97–1.81) and potato salad (RR 1.60, 95% CI 1.08–2.36) were found to have an association with illness, but only roast chicken had a statistically significant association with illness (OR 26.4, 95% CI 2.85–244.43) in a multivariate analysis. The 2nd outbreak involved a function on the previous day, with 10 of 35 attendees becoming ill (one with laboratory confirmed *S.* Singapore infection). Similar foods were served at both functions. Five of 7 food handlers were also ill with a similar illness and all 5 cases reported consuming food at both functions. The chicken for both functions was purchased from a supermarket and then plated and stored for use. *S.* Virchow phage type 34 was isolated from a sample of chicken obtained from the supermarket; however other food samples and swabs taken from both the supermarket and the cruise owner's premises were negative for pathogens.

An outbreak of campylobacteriosis was investigated amongst guests who had attended an 80th birthday at a restaurant. Eleven of 34 people (2 laboratory confirmed *Campylobacter* spp) became unwell with a diarrhoeal illness after the meal. Chicken liver pate consumed as a canapé was the only food item that was found to have a statistically significant association with illness (RR 7, 95% CI 1.04–45.44 $P = 0.004$). NSWFA found that the chicken livers were undercooked. All food samples and environmental swabs were negative for pathogens. The NSWFA has advised the business to cease using raw eggs in aioli, and is currently reviewing the practice of pate preparation at the premises.

An outbreak in a long-term care facility for disabled men aged between 30 and 70 years was initially notified as a probable viral gastroenteritis outbreak, with 5 residents and 1 staff member reporting diarrhoea. Cases appeared in 3 clusters occurring 2 weeks apart. One stool specimen was positive for *C. perfringens* with a cell count of 6.5×10^7 (suggestive of food poisoning). The local council inspected the facility and reported that the kitchen was clean and well-organised. Residential facilities for developmentally disabled people are not covered by Food Safety Programs for Food Service to Vulnerable Persons. The NSWFA will discuss the inclusion of these facilities with the Food Standards Australia New Zealand.

Forty-nine of 82 people developed vomiting and diarrhoea after attending a christening. No-one from the venue was able to be interviewed regarding staff illness. The complainant's son was admitted to hospital. Three stool samples were submitted and all were positive for norovirus. There was not enough evidence available to indicate whether the norovirus outbreak was due to person-to-person spread or to food contamination.

In 5 suspected foodborne outbreaks, the aetiology remained unknown:

- All 7 people eating a range of dishes at a Thai restaurant, developed abdominal cramps, nausea, diarrhoea and vomiting 5–24 hours after eating. No stool specimens were submitted for testing. The NSWFA inspected the premises and took food samples but found no breaches and all samples were negative.
- Five of 6 members in one family became ill 12–15 hours after eating beef steaks and hamburgers from a restaurant. The adult who was not ill had a chicken Caesar salad. Analysis of the

menu items did not reveal any common foods to all 5 dishes and no stool samples were submitted for testing.

- Thirty-six of 100 attendees of an 80th birthday party developed diarrhoea and fever after eating at a Chinese restaurant. The people ate a set banquet menu and desserts that were brought in from a shop (coffee sponge cake) and homemade (sticky rice congee, biscuits and red bean balls). No illness was reported amongst a wedding party of 120 people who had the same banquet menu.
- All 3 of a group of people consuming chicken and salad wraps from a bistro became unwell with vomiting and diarrhoea 35–40 hours after eating. No illness was reported in the contacts of cases, and no specimens were obtained. It is suspected that this was a point source viral outbreak associated with the consumption of wraps.
- Seven people became unwell with vomiting 6 hours after attending a wedding reception. No contact details were available for attendees of the wedding. Although the epidemiology suggests a point source of infection associated with the wedding, there were a number of shared exposures between the cases prior to the reception.

Northern Territory

There were 2 reported outbreaks of foodborne or suspected foodborne illness during this quarter.

An investigation commenced after routine follow-up of a *S.* Typhimurium PT 9 notification revealed that 2 people with gastroenteritis symptoms had been on a camping trip together prior to and whilst ill. Almost all foods that were consumed were high risk (being mostly raw and prepared in a camping ground) and both gave a history of swimming in a remote creek. No food vehicle was identified and the investigation was closed.

Three of 21 tourists became ill on the same day whilst travelling on a commercial tour bus. Food histories were obtained for 2 of the 3 cases. No stool samples were obtained but the illness was suspected to be of a viral nature. The investigation was closed with no pathogens or source identified.

Queensland

There were 2 reported outbreaks of foodborne or suspected foodborne illness during this quarter.

Forty-nine cases of *S.* Typhimurium with MLVA profile 1-5-5-2-3[†] were notified and 34 of the 49 cases were interviewed. Six cases were hospitalised. A single sushi outlet located in a suburban shopping precinct was associated with 7 cases and several other retail outlets were common amongst some cases. Each of the premises was using eggs sourced from the same egg layer farm. No other common links were identified among the food establishments. Food preparation, handling and storage procedures in each of these premises were investigated and environmental sampling conducted. An extensive audit of the egg layer farm was undertaken by environmental health officers from Queensland Health in conjunction with regulatory officers from Queensland Primary Industries and Fisheries (Safe Food Queensland). Environmental swabs, drag swabs and eggs were collected at different sections of the production line. Eggs were also inspected and sampled from several retail outlets in South East Queensland that were supplied by the egg layer farm. *S.* Typhimurium with MLVA profile 1-5-5-2-3 (outbreak strain) was cultured from drag swabs collected at the farm and from cage eggs sampled at retail level. Other *Salmonella* serotypes identified from drag swabs collected from the farm included *S.* Montevideo, *S.* Anatum, *S.* Kottbus and *S.* Subsp 1. *S.* Montevideo was also detected in eggs sampled at the retail level. No *Salmonella* were detected in environmental samples taken from the sushi outlet that was epidemiologically linked to 7 cases.

Three family members became ill with suspected ciguatera fish poisoning following the consumption of Red Bass fish. The cases experienced symptoms including reversed temperature sensation, numbness and tingling of the mouth and muscle pain. The fish was approximately 6–7 kg and was taken as part of a private catch at a reef off Lucinda in North Queensland.

South Australia

There were 5 reported outbreaks of foodborne or suspected foodborne illness during this quarter.

Two outbreaks of *S.* Typhimurium PT 9 were investigated following a sharp increase in notifications in January. Through hypothesis-generating questionnaires, it was found that bakery products were frequently consumed food items. A case control study identified that 2 items were significantly associated with illness in a multi-variate analysis: custard berliners (OR 55.9; 95% CI 11.1–282.1) and cannoli (OR 16.8; 95% CI 1.8–157.2). Products were from 2 different bakeries. Bakery A made the custard berliners eaten by 43 cases (19 of them hospitalised). Samples of product, raw materials and environmental swabs collected from bakery A were all negative for *Salmonella*. Bakery B made the cannolis that were eaten by 15 cases (3 hospital-

† Reported in the European nomenclature used by Queensland Health Scientific Services.

ised). Products, raw materials and environmental swabs were collected from bakery B and product samples tested positive for *S.* Typhimurium PT 9. There appeared to be no common ingredients, processes, distribution chains or suppliers to either bakery, and no staff worked at both bakeries.

In March, 8 cases of *S.* Typhimurium PT 135 were reported in a 1-week period. Interviews identified 6 people who reported eating products from the same bakery. An egg wash that was used to brush pies tested positive for *S.* Typhimurium phage type 135. The brush used to glaze the pies was old and not adequately sanitised, cross contamination of cooked products appeared to have been occurring. No further traceback on the eggs was conducted.

In February, an increase in the number of notifications of *S.* Typhimurium phage type 44 was detected. Eight cases reported eating sweet and savoury items from the same bakery franchise. The sweet and savoury products were made at different locations. None of the food or environmental samples collected tested positive for *Salmonella*. An improvement notice was issued at one of the bakery locations.

An outbreak of gastrointestinal illness was investigated amongst an extended family group in March. Cases had attended a family party at which pork, chicken and noodles were served. Leftover food was taken on a bus tour by some family members on the following day and eaten without adequate reheating. A total of 16 people were ill and seven provided faecal specimens. All specimens were negative for bacterial and viral pathogens.

Tasmania

There were no reported outbreaks of foodborne or suspected foodborne illness during this quarter.

Victoria

There were 16 reported outbreaks of foodborne or suspected foodborne illness during this quarter.

In January, an outbreak of *C. perfringens* occurred in an aged care facility. Twenty-one residents and 4 staff members developed diarrhoea and 2 residents had a 2nd episode of diarrhoea a few days later. Seven faecal specimens were collected and five were positive for *C. perfringens* enterotoxin. This outbreak was atypical for a *C. perfringens* outbreak as onsets were spread out over a 10-day period. However, the predominance of diarrhoea and a median duration of 1 day were consistent with the aetiology.

In January, an outbreak of *C. perfringens* affecting 9 residents of an aged care facility was investigated. Onsets for cases ranged over an 18-hour period and symptoms and duration of illness were consistent with *C. perfringens*. One faecal specimen was collected, which was negative for bacterial and viral pathogens. A food source was unable to be identified in this outbreak.

During routine surveillance in January, a cluster of 7 cases of *S.* Typhimurium PT 9 was detected in residents of a regional Victorian town. Five cases were interviewed and three of these cases, who had onsets of illness in December, had recalled eating chicken sushi hand rolls from the same premises. It is possible that one batch of chicken was cross-contaminated after cooking as an investigation at the premises by the local environmental health officer revealed that cooking procedures for the chicken appeared to be adequate.

In February, an outbreak of salmonellosis was detected through routine surveillance. A number of cases were notified from the same pathology service located at a metropolitan hospital and 4 inpatients with salmonellosis at the hospital, mentioned eating sushi from the same premises prior to becoming ill. Further cases linked to the same premises were found through council food poisoning complaints. Environmental health officers from council and the Department's regional office conducted an on-site investigation at the takeaway premises, which was temporarily closed by the council. A total of 84 cases (59 confirmed with *S.* Typhimurium PT 9) were found to have eaten sushi from these premises between 27 January and 7 February and 19 cases were hospitalised with their illness. Two of the confirmed cases were food handlers at the premises. Twenty-five of 59 food samples and five of 17 environmental swabs taken at the premises were positive for *S.* Typhimurium PT 9, including a mayonnaise used in the sushi hand rolls and environmental swabs of the blender used to make the mayonnaise. The mayonnaise was made using raw eggs. The eggs were traced back to farm level but samples (both eggs and environmental samples) taken on the farm were negative.

Salmonella surveillance in early February identified a family of 4 cases who had reported consuming a Vietnamese dish containing salty fish, eggs and pork mince from a restaurant/ takeaway food premises. Further cases were identified through active surveillance of notified *Salmonella* cases living in the same geographical area. A further 3 groups who had eaten the same food item from this premises were identified. In total, 15 cases (9 confirmed with *S.* Typhimurium phage type 170) who had consumed the food in a 2-day period were associated with the outbreak. A review of the preparation and cooking methods for this food item revealed that it is probable that the batch eaten by the cases was undercooked.

Two outbreaks of *C. perfringens* in aged care facilities in February were investigated:

- Seven residents were ill with diarrhoea. Onsets for cases ranged over a 9-hour period and symptoms and duration of illness were consistent with *C. perfringens*. Three faecal specimens were collected and two were positive for *C. perfringens* enterotoxin. A food source could not be identified.
- Sixteen residents and 6 staff members were ill. Onsets for cases ranged over a 4-day period and the duration of illness was consistent with *C. perfringens*. Atypically, vomiting was experienced by 74% of cases. Three faecal specimens were collected and two were positive for *C. perfringens* enterotoxin. Staff also ate food at the facility. A food source could not be identified.

In February, an outbreak of *Salmonella* affecting 4 residents and 1 staff member of an aged care facility located in a rural Victorian town, was investigated. Three residents were subsequently notified with *S.* Typhimurium PT 135. Food for the aged care facility and a community meals-on-wheels service was prepared by the local hospital. Active surveillance for cases in the hospital and community found a further 2 confirmed *Salmonella* cases linked to the outbreak, one was a patient in the hospital and the other was a health care worker at the hospital. No cases were identified in community residents who received meals-on-wheels. Onsets for the 7 cases ranged over a 9-day period. A food source for this outbreak could not be identified.

A small family outbreak of gastroenteritis, suspected to have been caused by *S.* Typhimurium PT 44 (1 confirmed case), was identified during the follow-up of a *Salmonella* case thought to be associated with the point source outbreak linked to the Vietnamese restaurant. The case attended a family barbeque with 5 others. Foods served included roasted meat, salads and a Tiramisu for dessert. Five family members became unwell with diarrhoea and a further case (a child) had abdominal pain but no diarrhoea. The outbreak was suspected to have been caused by consumption of Tiramisu, which contained raw eggs.

An outbreak of *C. jejuni* affecting 15 residents of an aged care facility was investigated in February. Onsets ranged over a 4-day period. Three of 6 faecal specimens were positive for *C. jejuni*. No particular food source could be identified, but it is possible that cross contamination of some foods may have caused the outbreak.

In early March, 3 cases of salmonellosis were notified in cases who had eaten sushi from the same food premises. The premises closed voluntarily for cleaning, and sampling and disposal of foods was undertaken. Active surveillance was conducted for notified cases of *Salmonella* residing in the geographical area surrounding the food premises. In total, 26 cases were found to have consumed sushi hand rolls from this premises and subsequently developed diarrhoea within a median incubation period of 24 hours. Cases had a median duration of illness of 8 days and 6 cases were admitted to hospital. There were 25 cases confirmed with either *S.* Typhimurium PT 170 or *S.* Typhimurium RDNC A066. The Microbiological Diagnostic Unit, University of Melbourne reported that *S.* Typhimurium RDNC A066 does not exhibit the full characteristics of *S.* Typhimurium PT 170, but in those characteristics expressed, they resemble *S.* Typhimurium PT 170. It is suspected that the raw egg mayonnaise (an ingredient of the hand rolls) was the source of this outbreak.

In March, an outbreak affecting 9 residents of an aged care facility was investigated. Onsets for cases ranged over a 24-hour period and symptoms and duration of illness were consistent with *C. perfringens*. Three faecal specimens were collected, which were negative for bacterial and viral pathogens. A food source could not be identified.

In March, an outbreak of *C. perfringens* affecting 7 residents and 2 staff members of an aged care facility was notified. Onsets for cases ranged over a 10-day period but the majority of cases had onsets over a 3-day period. Four cases also had a second episode but were not counted twice in the case numbers. Three faecal specimens were collected and two were positive for *C. perfringens* enterotoxin. Symptoms and duration of illness were consistent with this aetiology. Staff also ate food at the facility. A food source was unable to be identified in this outbreak.

In March, an outbreak of *C. perfringens* affecting 9 residents of an aged care facility was investigated. Five faecal specimens were collected and one was positive for *C. perfringens* enterotoxin. Symptoms, duration of illness and clustered onsets over a 24-hour period were consistent with this aetiology. A food source was unable to be identified in this outbreak.

An outbreak of *S.* Typhimurium PT 135 was investigated in which 5 family members developed acute gastroenteritis symptoms approximately 24 hours after consuming Vietnamese chicken rolls from a bakery. Faecal specimens collected from two of these cases were confirmed positive for *Salmonella* and subsequently typed as *S.* Typhimurium 135. Active case finding amongst confirmed *Salmonella* cases residing in this geographical area was commenced and a total of 17 cases (13 confirmed *S.* Typhimurium PT 135) had eaten either chicken or pork rolls from this premises during their incubation period.

An additional case, an asymptomatic food handler working at the premises, also had a faecal specimen positive for *S.* Typhimurium PT 135. Council environmental health officers undertook an investigation at the implicated premises, which included supervised cleaning and sanitising, and sampling and disposal of high risk foods. Of the 21 food samples submitted for analysis, 2 samples of chicken liver pate were positive for *S.* Typhimurium PT 135. The rolls also contained raw egg butter but samples taken for analysis were negative for *Salmonella*. A review of the process for making the chicken liver pate was unable to determine any food safety issues.

In late March, an outbreak of gastroenteritis affecting 5 residents and 1 staff member of an aged care facility was investigated. *S.* Typhimurium PT 170 was subsequently identified as the aetiology of this outbreak with all 5 residents having positive faecal specimens. Onsets for cases ranged over an 11-day period and symptoms lasted for a median of 12 days. A review of the menus and food process information revealed that the likely cause of this outbreak was low dose sporadic contamination of a ready-to-eat food such as cream, which had been processed (beaten) in a blender that had not been adequately cleaned and sanitised after being used to process raw foods.

Western Australia

There were 3 reported outbreaks of foodborne or suspected foodborne illness during this quarter, all due to *S.* Typhimurium.

In January, 4 cases of *S.* Typhimurium pulsed-field gel electrophoresis (PFGE) type 0011 (PT 170) were notified. These cases had separately eaten at an Asian restaurant on one of two consecutive days. Cases ate different meals, but all meals consumed contained chicken. An environmental investigation was conducted. Swabs and food samples were not collected during the initial investigation. Deficiencies were found with food handling practices, particularly temperature control. The source of contamination was not found.

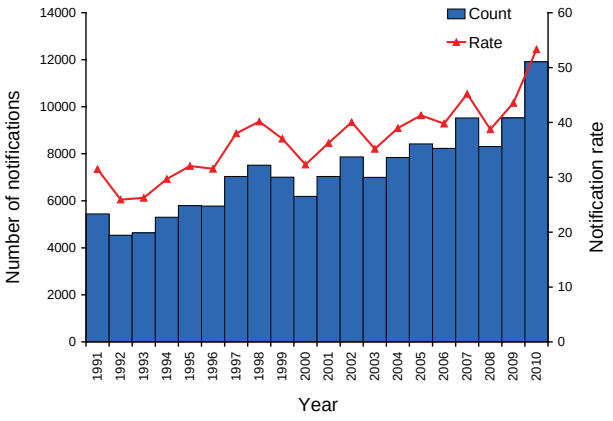
An outbreak of *S.* Typhimurium infection PFGE type 0001 (PT 9) was investigated in January. Fifteen cases (10 laboratory-confirmed) reported eating Vietnamese pork rolls over a 9-day period, with a median incubation period of 20 hours. The pork rolls were produced at one food business and distributed to at least 3 retail food premises. No product or swabs tested positive. The roll ingredients included cooked pork, pickled vegetables, a chicken liver pate, and a raw egg 'butter' spread. The rolls were not refrigerated during transport to retail shops, or during storage at these shops, which is likely to have contributed to proliferation of bacteria.

Between January and March, 24 cases of *S.* Typhimurium PFGE type 0003 were associated with an Asian restaurant. Six isolates tested were confirmed as *S.* Typhimurium PT 135. The median incubation period was 5 days. This strain appeared to be associated with unusually severe illness, with 15 of the 24 cases hospitalised. A variety of foods were eaten by cases. Investigation of the premises identified deficiencies that may have resulted in cross-contamination. A variety of food samples and swabs were collected, all were negative for *Salmonella*. Stool samples collected from 10 staff were negative for *Salmonella*. The Asian restaurant associated with this outbreak and the Asian restaurant associated with the outbreak due to *S.* Typhimurium PFGE type 0011 (PT 170) are part of the same restaurant franchise. *Salmonella* outbreaks associated with restaurants from this franchise were also investigated in 2007 and 2009.

Multi-jurisdictional outbreak investigations

In Australia in 2010, the number of notified cases of salmonellosis was the highest on record, with 11,900 notifications (54.4 notifications per 100,000 population) nationally, compared with an average of 8,807 cases per year (41.8 notifications per 100,000 population) between 2005 and 2009 (Figure 1). Notifications continued to increase in 2011. On 17 March 2011, OzFoodNet commenced 2 multi-jurisdictional outbreak investigations: into *S.* Virchow PT 34 and *S.* Typhimurium PT 170/108. The *S.* Virchow PT 34 multi-jurisdictional outbreak investigation was commenced after Victoria was notified of 13 cases in 2011 (Victorian 5-year average for the same time period was 2 cases). Cases were also notified in South Australia, Tasmania, Queensland, New South Wales and the Australian Capital Territory. The *S.* Typhimurium PT 170/108 investigation was commenced because this phage

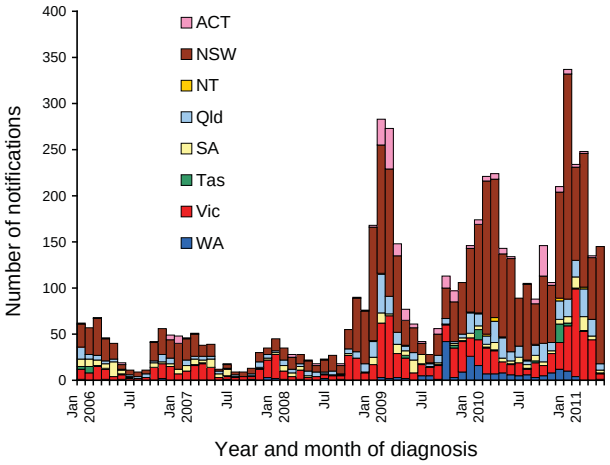
Figure 1: Notifications of salmonellosis, Australia, 1991 to 2010*



Source: National Notifiable Diseases Surveillance System, 1 February 2011.

type was the largest single contributor to the increase in *Salmonella* notifications nationally. Notifications peaked in January 2011, which is consistent with the historical seasonal peak for salmonellosis in Australia (Figure 2).

Figure 2: Notifications of *Salmonella* Typhimurium 170/108, Australia, 1 January 2006 to 31 May 2011, by state or territory



Jurisdictions conducted hypothesis-generating questionnaires with notified cases of *S.* Virchow PT 34 using a standardised *Salmonella* questionnaire developed in Victoria. Data from questionnaires completed during interviews were entered onto a national database and analysed for common exposures, and for food frequencies. Victoria also undertook to conduct sampling from possible food sources identified through interviews with cases. Forty-nine cases of *S.* Virchow PT 34 were interviewed by jurisdictions during the investigation (26 from Victoria); two of these were considered to have been secondary cases. The median age of cases was 11 years (range 4 months to 90 years). While a range of foods such as eggs were consumed by the majority of cases, the products were from a range of retailers and were different brands, and no source of infection could be identified. For 1 case from Victoria, investigators were able to collect a sample of eggs from the place of purchase, and to trace back these eggs to a particular farm where an on-farm investigation was conducted by the Victorian Department of Primary Industries. While S. Virchow PT 34 was isolated from a wash of the eggs from the retail outlet, no on-farm samples were positive for the organism.

From January 2009 to May 2011, there were 1,099 notifications of S. Typhimurium PT 170/108 nationally. Whilst no single point source could be identified, associations with eggs and egg-based foods were frequently identified amongst smaller outbreaks within the larger increase, with 25 of 36 outbreaks during the time period with a known food vehicle suspected to have been due to eggs.

From January to May 2011, OzFoodNet epidemiologists investigated 13 *S.* Typhimurium 170/108 outbreaks that affected at least 124 people (accounting for only 12% of notified cases), with 35 hospitalisations (hospitalisation rate 28.2%) and 1 death (case fatality rate, CFR 0.8%). A food vehicle was identified for nine of the 13 foodborne outbreaks. In the other 4 outbreaks the food vehicle remained unknown. Seven of the 9 (77%) outbreaks with a known food vehicle were suspected to be due to eggs, or a food containing raw or lightly cooked eggs. Investigations into the increase in notified cases of STm 170/108 during this period did not provide any additional evidence of the source/s of infection. In the absence of a sufficient number of point source outbreaks, epidemiologists relied on interviews with sporadic cases. These interviews were hampered by poor recall of food histories by the cases. Associations between illness and the consumption of specific food items were difficult to establish, particularly because food items such as egg and chicken are commonly consumed. With the exception of the identified outbreaks there were no further associations found with specific food items.

Both investigations were stood down on 1 June 2011 with declining notifications.

Cluster investigations

During the 1st quarter of 2011, OzFoodNet sites investigated a number of clusters with 12 due to *S.* Typhimurium, six to other *Salmonella* serotypes, and one each due to *Campylobacter*, *Shigella* and non-toxigenic *Vibrio cholerae*. In the clusters, no particular source or transmission mode could be identified.

Comments

The number of foodborne outbreaks reported during the quarter (n = 45) was the same as the number reported in the 1st quarter 2010 (n = 45)[2] but exceeded the average number during the same quarter over the past 5 years (n = 37) and the number reported during the previous quarter (n = 37).[1] This increase in the number of foodborne outbreaks coincided with a increase in notifications of salmonellosis to the National Notifiable Diseases Surveillance System (NNDSS), with 4,756 notifications of salmonellosis during the quarter compared with a mean of 3,383 notifications for the same period over the past 5 years.‡

‡ National Notifiable Diseases Surveillance System, 12 January 2012.

During the quarter, 9 of 45 outbreaks investigated were confirmed or suspected to have been due to the consumption of foods containing raw or undercooked eggs (Table 1). This highlights the continued importance of eggs as a source of salmonellosis in Australia. Analyses of outbreak data during the multi-jurisdictional outbreak investigation into *S.* Typhimurium 170/108 also showed that a high proportion of smaller outbreaks within the larger increase were related to the consumption of eggs. Egg associated outbreaks can be difficult to investigate for a number of reasons. Eggs are a commonly consumed food and consumers often do not know if they have eaten foods containing raw eggs such as chocolate mousse. Trace back of eggs is often hampered by poor documentation of batch details and a complex supply chain. Even where eggs are traced back to a particular brand or farm, the outbreaks strain(s) are often not isolated from environmental swabs, drag swabs or samples of eggs. Health departments and food safety regulators in Australia need to work with the egg industry to decrease the incidence of salmonellosis associated with the consumption of eggs. A recent investigation in Queensland (see foodborne outbreaks investigated) provides a good example of what might be achieved. Following the investigation, a consumer level recall of cage eggs laid on a single day was undertaken in March 2011. Based on the microbiological test results, the egg farm also conducted a voluntary trade level recall of a different batch of eggs considered to be a potential risk to the public. Longer-term sustainable control measures were also introduced as a result of this investigation. In conjunction with Safe Food Queensland and Queensland Health, a veterinary consultancy group was engaged to review and update egg washing procedures and on-farm biosecurity and control measures. The consultancy group will also assist the egg farm to develop an ongoing monitoring and prevention program aimed at minimising the level of *Salmonella* found in layers and the layer environment. The prevention program includes adding specific feed additives and vaccination of flocks to reduce the levels of *Salmonella* in the birds and in the environment. The rearing and production sheds will also be cleaned and sanitised on a regular basis. *Salmonella* levels will be monitored by ongoing environmental sampling.

The outbreak of *C. perfringens* amongst developmentally disabled men highlights the need to ensure that food standards are adequate in this setting. Residential facilities for developmentally disabled people are not currently covered by *Food Safety Programs for Food Service to Vulnerable Persons.*

Since 2008, OzFoodNet investigated 6 outbreaks of *Campylobacter* associated with liver pate or liver parfait containing undercooked poultry livers, including one during this quarter.[2] This analysis did not include mixed foods such as Vietnamese rolls, which may include a pate (as in the outbreaks this quarter in Victoria and Western Australia).

A limitation of the outbreak data provided by OzFoodNet sites for this report is the potential for variation in categorisation of the features of outbreaks depending on investigator interpretation and circumstances. OzFoodNet continues to standardise and improve practices through its Outbreak Register Working Group. Changes in the incidence of foodborne outbreaks should be interpreted with caution due to the small numbers each quarter.

Acknowledgements

OzFoodNet thanks the investigators in the public health units and state and territory departments of health, as well as public health laboratories, local government environmental health officers and food safety agencies who provided data used in this report. We would particularly like to thank reference laboratories that conduct sub-typing of *Salmonella, Listeria* and other enteric pathogens for their continuing work and advice during the quarter.

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