Quarterly reports

OzFoodNet quarterly report, 1 April to 30 June 2010

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health and Ageing established OzFoodNet in 2000 to collaborate nationally to investigate foodborne disease. OzFoodNet conducts studies on the burden of illness, coordinates national investigations into outbreaks of foodborne disease, develops nationally standardised protocols and tools for surveillance, identifies foods or commodities that may cause human illness and trains people to investigate foodborne illness. This quarterly report documents investigation of outbreaks of gastrointestinal illness and clusters of disease potentially related to food, occurring in Australia from 1 April to 30 June 2010.

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 2nd quarter of 2010, OzFoodNet sites reported 391 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 illness. In total, these outbreaks affected 7,275 people, of whom 154 were hospitalised. There were 24 deaths reported during these outbreaks. The majority of outbreaks (84%, n=327) were due to person-to-person transmission (Table 1).

Foodborne and suspected foodborne disease outbreaks

There were 35 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 771 people and resulted in 58 hospitalisations. There were 8 deaths reported during these outbreaks. This compares with 27 foodborne outbreaks for the 2nd quarter in 2009[1] and the 5-year average of 27 between 2005 and 2009, and 45 foodborne outbreaks during the 1st quarter of 2010.[2]

Salmonella was the aetiological agent for 10 outbreaks during this quarter, with *S.* Typhimurium being the most common serotype (n=8). Of the remaining 25 outbreaks, four were due to norovirus, two each due to *Clostridium perfringens*, *Listeria monocytogenes* and *Campylobacter*, and one due to *Cyclospora*. For 14 outbreaks, the aetiological agent was unknown or not specified.

Sixteen outbreaks (46%) reported in this quarter were associated with food prepared in restaurants, six (17%) with aged care facilities, five (14%) with takeaway food outlets, and two (6%) from within the community. Single outbreaks (3%) were associated with a bakery, a camp, a cruise, a national franchised fast food outlet, a training facility and a commercial caterer.

To investigate these outbreaks, sites conducted 7 cohort studies, 2 case control studies and collected descriptive case series data for 23 investigations. Individual patient data were not collected for 3 outbreaks. As evidence for the implicated food vehicle, investigators obtained both microbiological and analytic evidence for 3 outbreaks, relied on microbiological evidence in 5 outbreaks and analytical evidence alone for 1 outbreak. Descriptive evidence alone was obtained in 26 outbreaks.

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

Table 1: Mode of transmission for outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 April to 30 June 2010

Transmission mode	Number of outbreaks	Percentage of total
Foodborne and suspected foodborne	35	9
Person-to-person	327	84
Unknown (*Salmonella* cluster)	8	2
Unknown	21	5
Total	391	100

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 April to 30 June 2010 (n=35)

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
NSW	March	Restaurant	*S.* Typhimurium 170	6	3	M	Tartare sauce, prepared with raw egg
	April	Aged care facility	*S.* Infantis	26	5	D	Suspected fluid thickener contaminated by raw chicken mince
	April	Takeaway	*S.* Typhimurium 170	9	0	M	Mayonnaise made with raw egg
	April	National franchised fast food	*S.* Typhimurium 9	4	1	D	Unknown
	April	Restaurant	*S.* Typhimurium 170	19	0	D	Suspected peanut/cashew mix
	April	Takeaway	Norovirus	13	0	D	Suspected variety of ready to eat foods: sandwiches, salads, wraps
	May	Restaurant	Unknown	7	0	D	Unknown
	May	Takeaway	Unknown	2	0	D	Suspect Mongolian lamb/fried rice
	May	Commercial caterer	*S.* Saintpaul	7	3	D	Unknown
	May	Restaurant	*Campylobacter jejuni*	10	0	AM	Raw chicken
	May	Restaurant	Unknown	32	1	D	Unknown
	June	Restaurant	Unknown	4	0	D	Unknown
	June	National franchised fast food	Unknown	9	0	D	Unknown
	June	Restaurant	Unknown	3	0	D	Unknown
	June	Restaurant	Unknown	12	0	D	Unknown
	June	Restaurant	Unknown	7	0	D	Unknown
	June	Restaurant	*S.* Typhimurium 170	16	9	D	Suspected fried rice
	June	Restaurant	Unknown	11	0	D	Unknown
	June	Takeaway	*S.* Typhimurium 170	45	8	M	Chicken, hummus, tabouli
NT	June	Restaurant	Norovirus	19	0	D	Unknown
Qld	May	Bakery	*S.* Typhimurium	19	2	AM	Cheesecake, meat pies
	May	Restaurant	Norovirus	11	0	D	Unknown
	May	Restaurant	Norovirus	12	0	D	Unknown
	June	Restaurant	*S.* Typhimurium	34	1	AM	Citrus aioli
	June	Restaurant	*Clostridium perfringens*	4	0	M	Roti curry lamb
SA	April	Camp	Unknown	43	0	D	Unknown
	June	Other	Unknown	10	10	D	Unknown

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 April to 30 June 2010, *continued*

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic	February	Community	*Listeria monocytogenes*	6	6	D	Still under investigation
	April	Aged care facility	Unknown	6	0	D	Unknown
	May	Aged care facility	Unknown	9	0	D	Unknown
	June	Aged care facility	Unknown	8	0	D	Unknown
	June	Aged care facility	*C. jejuni* and *C. coli*	15	1	D	Unknown
WA	May	Cruise/airline	Cyclospora	314	0	A	Cantaloupe, mint, lettuce
	June	Aged care facility	*C. perfringens*	10	0	D	Unknown
Multi-jurisdictional	February to current	Community	*L. monocytogenes*	9	8	M	Melons and/or melons contained within fruit salads

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.

The month of outbreak represents the month of onset of outbreak.

* No foodborne outbreaks were reported by the Australian Capital Territory or Tasmania.

Australian Capital Territory

There were no reported outbreaks of foodborne or suspected foodborne illness during the quarter. However, a confirmed case of *S.* Typhimurium phage type 170 infection was linked to fried ice cream served at a Vietnamese restaurant in Sydney where five of 6 family members reported gastroenteritis following a lunch in April. Investigation and liaison with the NSW Department of Health and the New South Wales Food Authority were undertaken.

New South Wales

There were 19 reported outbreaks of foodborne or suspected foodborne illness during the quarter, with eight of these being due to *Salmonella*.

- Six cases of *S.* Typhimurium phage type 170, multi-locus variable number of tandem repeats analysis (MLVA) profile* 3-9-7-12-523 were identified through a cluster investigation. The same strain was also isolated from a tartare sauce prepared with raw egg and consumed by four of the 6 cases. Two of the cases were children of one of the food handlers at the café. They had not consumed any food from the café, suggesting some person-to-person transmission.

- A group of 7 work colleagues all developed abdominal cramps and diarrhoea after consuming chicken rolls that contained raw egg mayonnaise from a Vietnamese hot bread bakery. There were two other separate complaints about the same store around the same time. Three stool samples (one from the group of work colleagues and two from the separate complainants) were positive for *S.* Typhimurium phage type 170, MLVA type 3-9-7-13-523. A sample of the raw egg mayonnaise was positive for *S.* Typhimurium with the same MLVA profile.

- An outbreak of 31 confirmed cases of *S.* Typhimurium phage type 170, with one of 3 different MLVA profiles (3-9-7-13-523 (n=1), 3-9-7-14-523 (n=16), and 3-9-7-15-523 (n=14)) was identified through enhanced surveillance following 2 separate complaints. Cases had all consumed kebabs, mainly those filled with chicken, hummus, tabouli, lettuce, and tomato, or crepes from a food outlet in a shopping centre. A further 14 probable cases were also identified during the investigation. Samples of cooked chicken kebab, hummus and tabouli and several environmental samples were positive for *S.* Typhimurium MLVA profile 3-9-7-13-523. One environmental swab was positive for both *S.* Typhimurium phage type 170 and *S.* Typhimurium phage type 193. A sample of marinated raw chicken was positive for *S.* Infantis.

- A cluster of 9 cases of *S.* Typhimurium phage type 170, MLVA profile 3-9-7-12-523 was identified through follow-up of routine surveillance. Six cases had become unwell after dining at the same Thai restaurant. A further 10 cases reported being ill after dining with confirmed cases. A sample of a peanut/cashew mixture tested positive for *S.* Typhimurium MLVA profile 3-9-8-15-523. The MLVA profiles for the human isolates and the peanut/cashew mixture would be considered too different to be a match. However, both MLVA profiles are associated with phage type 170 and there is a clear epidemiological link to the restaurant and the peanut/cashew mixture, which is sprinkled on many of the dishes.

- Five people from a cluster of 16 cases of *S.* Typhimurium phage type 170, MLVA profile 3-9-7-13-523 had eaten fried rice at the same Chinese food outlet in a shopping mall. Two other cases had eaten at other establishments in the same shopping mall, and 2 cases had eaten food in another restaurant in the area. No link between these premises could be established. Food samples and environmental swabs were all negative for *Salmonella*.

- A cluster of salmonellosis among 3 members of one household, and a friend who was often at the home was investigated. Stool samples for all 4 cases were positive for *S.* Typhimurium phage type 9, MLVA profile 3-10-13-12-496. The only food shared by all was chicken pieces, purchased from a large fried chicken franchise outlet, and consumed at the home.

- An outbreak of salmonellosis in an aged care facility affected 26 people. Twenty-two residents and 1 staff member (not the index case) tested positive for *S.* Infantis and a further 3 residents had symptoms consistent with salmonellosis. Raw chicken mince sampled at the facility was also positive for *S.* Infantis. Epidemiological analysis found a strong association with the consumption of thickened fluids, which are drinking fluids to which a thickening agent is added to aid consumption by people with swallowing difficulties. However, a sample of the batch of powder used to thicken fluids at the time of the outbreak tested nega-

* Australian nomenclature used in New South Wales.

tive for any pathogens. Cross contamination from the chicken mince to the thickened fluid powder is suspected.

- Seven cases of *S*. Saintpaul were associated with consumption of salmon steak and pumpkin couscous salad served with a lemon aioli prepared with a commercially manufactured mayonnaise at a winery during a food and wine festival in the Hunter vineyards. Investigations were unable to identify how the contamination occurred or what ingredient was the cause of the outbreak. No environmental or food samples were taken.

The other foodborne investigations included an investigation of *Campylobacter jejuni* associated with the consumption of chicken affecting 10 people from a group of 16 who shared a buffet meal at a restaurant. The only 2 submitted stool specimens were both positive for *Campylobacter*, which was also detected in a sample of raw chicken. Epidemiological analysis showed a significant association between illness and consumption of the chicken curry (attack rate of 91%, relative risk undefined, $P = 0.004$). Further typing to establish a genetic similarity between the human and food isolates was not possible as the human specimens had been discarded.

A norovirus outbreak affecting 13 people in a workplace was found to be associated with commercially pre-prepared ready-to-eat foods. The symptoms profile was consistent with norovirus, with the pathogen detected in 1 stool specimen. The New South Wales Food Authority conducted an environmental investigation of the premises and identified at least 1 food handler who was symptomatic with gastroenteritis whilst working during the exposure period. The New South Wales Food Authority is considering further action.

There were a further 9 reports of suspected foodborne outbreaks during the quarter that were of unknown aetiology. One outbreak affected 26 of 60 people attending a wedding, and a further 6 secondary cases who became ill one incubation period (24–48 hours) later. It is suspected that the outbreak was caused by a viral pathogen, most likely norovirus, but it was not possible to ascertain the type of food that was the likely source, nor whether the outbreak was a result of the consumption of food contaminated by a food handler or by an environmental source. Another 6 outbreaks occurred in restaurant settings affecting 44 people, 1 outbreak was associated with a takeaway outlet affecting 2 people, and 1 outbreak was associated with a national fast food outlet affecting 9 people.

Northern Territory

There was 1 reported outbreak of foodborne or suspected foodborne illness during the quarter. This outbreak occurred amongst 2 different groups of attendees at a hotel restaurant who had eaten from a common menu on the same day. Food was prepared at the hotel. A cohort study was performed but did not identify a particular food vehicle. Of the 19 people affected, 1 faecal specimen was tested and was positive for norovirus. It is thought that wide-spread contamination of food or the environment at the functions could have occurred from a food handler, a staff member or an attendee of the function.

Queensland

There were 5 reported outbreaks of foodborne or suspected foodborne illness during the quarter. Four females aged between 27 and 41 years became ill with diarrhoea and abdominal cramps following the consumption of lamb curry at a restaurant in June. *C. perfringens* was cultured in a sample of lamb curry and in 2 faecal specimens. Cooking large volumes in conjunction with temperature abuse of food were identified as major contributing factors following the environmental health inspection.

An outbreak of 19 cases of *S.* Typhimurium was identified among residents in South East Queensland in May. Eighteen of the 19 cases of *S.* Typhimurium had the same MLVA profile† (1-1-8-2-9) and 1 case had a closely related MLVA profile (1-1-9-2-9). A large proportion of cases had reported consuming pies and/or cheesecake from the same bakery franchise within 5 days prior to illness. Extensive environmental sampling was conducted at both the individual franchise store level and a central manufacturing facility but the outbreak strain was not detected in any samples. However, another strain of *S.* Typhimurium (MLVA profile: 1-13-19-2-3) was detected from an egg wash sample. Egg wash, used for glazing pies, was supplied to franchises by the central manufacturing facility. It was concluded that multiple food vehicles were associated with the outbreak and that eggs were the likely source of infection.

A public health unit was alerted to a suspected foodborne outbreak among guests who had attended a wedding function in early June. A retrospective cohort study was conducted with 34 cases of gastroenteritis identified among 77 guests interviewed. Twelve of the 34 cases had faecal samples positive for *S.* Typhimurium

† Lindstedt nomenclature used in Queensland.

(MLVA profile 1-5-5-2-3). The epidemiological study found that guests who had consumed a barramundi meal served with a citrus aioli sauce were significantly more likely to develop illness compared with persons who had not eaten this meal (RR 4.1, 95% confidence interval (CI) 1.9 to 8.8). The same strain of *S.* Typhimurium was isolated from a sample of citrus aioli taken from the restaurant kitchen and whole egg samples were positive for *S.* Anatum, *S.* Mbandaka and *S.* Montevideo. The investigation identified that there was no heat treatment of the aioli sauce after the addition of raw egg yolk to the mixture. A traceback investigation sourced the eggs to a single egg producer, where several serotypes of *Salmonella* were detected from sheds and whole cage eggs, including the outbreak strain. A consumer level recall of cage eggs produced by the implicated farm was conducted based on these findings and the detection of multiple cartons of cage eggs at the farm and at retail level that contained eggs that appeared visibly contaminated with faecal matter. The function venue changed to using a commercially produced aioli. The egg producer, with the guidance of Safe Food Production Queensland, undertook reforms to their processes to enable the business to meet the Queensland Food Safety Scheme for Eggs and Egg Products.

Following the outbreak described above, community-acquired cases of the outbreak strain (*S.* Typhimurium MLVA profile 1-5-5-2-3) and cases of *S.* Montevideo, *S.* Anatum, *S.* Mbandaka and *S.* Tennessee notified prior to the consumer level recall date were investigated for possible exposure to eggs from the implicated farm. Eleven cases of *S.* Typhimurium MLVA profile 1-5-5-2-3 who did not attend the wedding, 2 cases of *S.* Montevideo and 1 case of *S.* Tennessee were notified from 1 June 2010. Of these, 4 cases of *S.* Typhimurium and 1 *S.* Montevideo case were epidemiologically linked to food businesses known to have been supplied eggs from the implicated farm.

Two outbreaks of norovirus genotype II were investigated. The 1st affected 11 people among 2 separate groups that consumed a meal at a café on different nights in the same week in May. Staff, including 2 waitresses and a chef, also fell ill but their onsets were reportedly on the same night as the patrons. The 2nd outbreak affected 8 patrons who attended a restaurant in May and 4 staff members. Both outbreaks were suspected viral foodborne outbreaks with person-to-food-to-person transmission, with 1 faecal specimen collected in each outbreak, both of which were positive for norovirus genotype II.

South Australia

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

In the 1st outbreak, 43 of 90 attendees reported illness during a church camp held on the Anzac Day long weekend. A cohort study was conducted using an on-line study tool to investigate the cause of the illness. The investigation identified rice as the likely food vehicle due to biological plausibility and high attack rate (68.2%). However, an odds ratio could not be calculated as all attendees consumed this food. No left over food was available for testing.

In the 2nd outbreak, 10 of 40 trainers experienced vomiting illness within a very short time frame (20 minutes) after consuming food at a training facility. In addition to 40 trainers, there were 100 trainees at the training facility, however no trainees reported illness. Trainers and trainees did not consume the same foods. A case series was conducted to investigate the illness. The epidemiological and laboratory investigations did not identify an infectious cause of the illness.

Tasmania

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

Victoria

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

Four outbreaks occurred in aged care facilities, three of which had no food source identified:

- Six residents all had an onset of diarrhoea on the same day. Two faecal specimens were collected and one had *C. perfringens* enterotoxin isolated.
- Eight residents all had an onset of diarrhoea or abdominal pain on the same day, and 1 staff member had an onset the following day. Duration of illness and symptoms were consistent with *C. perfringens* infection but all 3 faecal specimens collected were negative for bacterial and viral pathogens.
- Five residents and 3 staff members all had onsets of diarrhoea on the same day. Two faecal specimens were collected and were negative for

bacterial and viral pathogens, but clustered onsets, symptoms and duration were consistent with *C. perfringens*.

- Thirteen residents and 2 staff members had onsets of diarrhoea occurring over a 5-day period. Ten residents submitted faecal specimens and 3 residents were confirmed with *C. jejuni* and three were confirmed with *C. coli*. The cause of this outbreak was unable to be determined however, it was suspected that the outbreak was either caused by under-cooking of roast meats or through cross contamination of ready-to-eat foods during preparation.

One outbreak of listeriosis was reported with 6 cases with ages ranging from 55 to 86 years. All case isolates shared the same molecular serogroup, binary gene type (BT) and pulsed field gel electrophoresis (PFGE) pattern (molecular serogroup: 1a, BT: 155 and University of Melbourne Microbiological Diagnostic Unit (MDU) designated PFGE: 6:6:6A). Five of the cases spent part of their incubation period as inpatients or outpatients at the same hospital. Potential sources for this cluster are still under investigation at the time of writing this report.

Western Australia

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

An outbreak caused by *Cyclospora* affected passengers and crew on 2 successive cruises of the same ship that departed from and returned to Western Australia in May and June 2010, and visited South East Asian destinations. Follow-up of laboratory confirmed cases and passenger enquiries identified 34 ill passengers associated with the 1st cruise, with 26 of these cases laboratory confirmed. From the 2nd cruise, 232 passengers and 48 crew members were reported to be affected, with 46 passengers and 1 crew member laboratory confirmed cases. The duration of illness ranged from 1 to 33 days, with a median of 6.5 days. The most common symptom for confirmed cases was diarrhoea, which was reported by 45 of the 47 cases for whom symptom information was recorded.

A case-control study was conducted among crew members, with questions focusing on fresh produce and water consumed on board, and on shore visits. There were 31 cases and 97 controls recruited into the study. Of the 117 exposure variables included in univariate analysis, nine were significant at a P value of < 0.01, with lettuce having the strongest association with illness (OR = 5.49, 95% CI 1.73–14.1, $P = 0.0005$). Drinking water on board was not associated with illness. Variables with P values < 0.1 (25 variables) were included in a backward stepwise logistic regression analysis. Eating in a speciality dining area, eating cantaloupe, mint and lettuce were significant in the logistic regression model ($P < 0.05$). It was concluded that illness was most likely related to eating fresh produce items taken on board during the 1st cruise, but the case-control study did not provide enough evidence to definitively determine which fresh produce item was the likely cause of illness.

In June, nine of 135 residents and 1 staff member of an aged care facility became ill with diarrhoea, with onset of illness over a 4-day period. The duration of diarrhoea for most cases was 2 days or less. The staff member was also ill with vomiting. Of the 9 ill residents, six consumed vitamised food. Two of 5 stool specimens tested positive for *C. perfringens*, with indistinguishable PFGE profiles, suggesting that infection had come from a common source, suspected to be a common food. Food was prepared on site. There were no remaining food samples from the period prior to onset of illness, and more recent food samples were negative for common bacterial pathogens and *C. perfringens*. An environmental investigation found satisfactory food handling practices and hand hygiene standards.

Multi-jurisdictional outbreak investigation

Listeriosis

OzFoodNet commenced a multi-jurisdictional outbreak investigation of listeriosis in May 2010 after notifications exceeded expected levels in the 1st quarter of 2010, with 12 cases per month compared with a 3-year average of 5.8 notifications per month. Increases were most apparent in New South Wales and Victoria (Figure).

Jurisdictions requested characterisation of all human isolates from cases notified in 2010. Nine cases met the outbreak case definition for a confirmed case: four from Victoria, two from Queensland and three from New South Wales. Seven of these were infected with a particular subtype (molecular serogroup: 1/2b, BT: 158, MDU designated PFGE: 121:119:1 with indistinguishable ribotype and multilocus sequence typing (MLST)), and two with a 2nd outbreak strain (molecular serogroup: not established, BT: 158 and MDU designated PFGE: 122:4N:1). Dates of onset were between 2 February and 23 May 2010 (n = 7), while the onset dates for the other 2 cases were unknown, but specimen dates for these cases were in April and May. These strains have not previously been known to have been isolated from human cases in Australia.

Outbreak cases were aged between 53 and 95 years of age and all would be considered immunocompromised. Fifty-six per cent 56% (5/9) were female and 88% (8/9) were hospitalised.

Preliminary investigations to identify a possible food vehicle showed a possible link to fruits and prepared fruit salads, with these foods having been consumed by more cases than expected when compared with data from the general community, and from similar vulnerable/immunocompromised people.[3] Of the outbreak strain cases, 44% (4/9) had eaten rockmelon (expected frequency 37.7%) and 33% (3/9) prepared fruit salad (expected frequency 12.9%) in the 4 weeks prior to onset.[3] Food exposure history has been difficult to ascertain for some recent cases due to the seriousness of their illness.

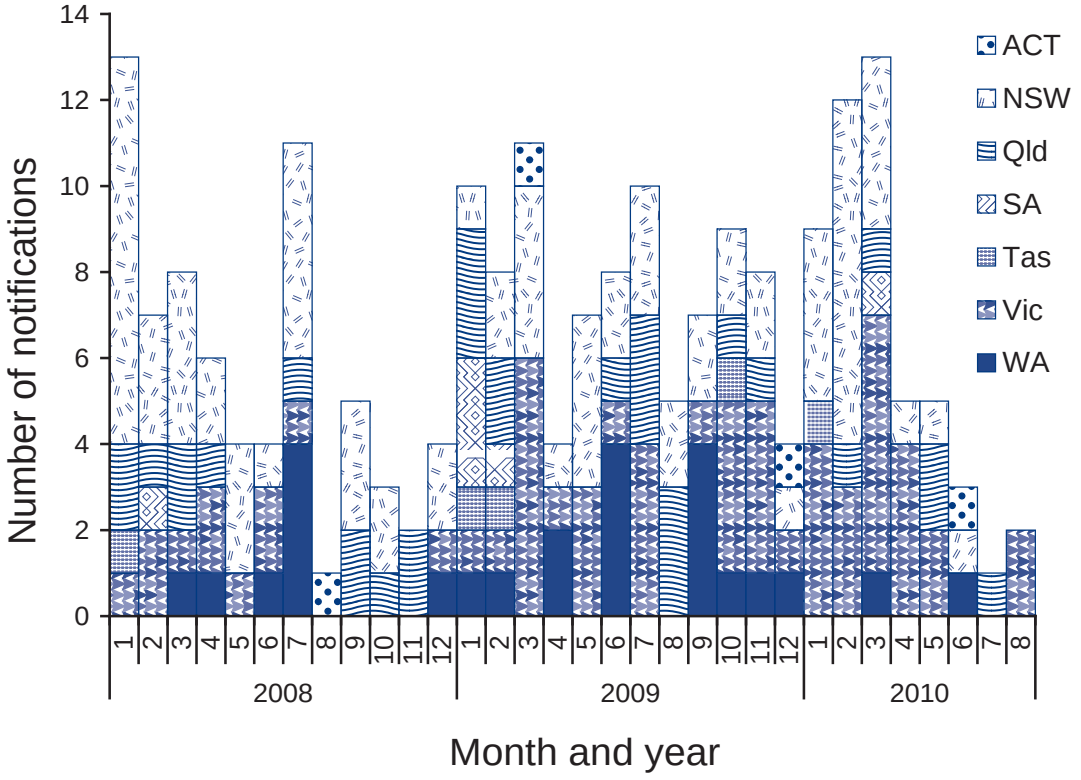
Hospital exposures were considered possible, with 33% (4/9) of outbreak cases hospitalised or with day visits for other underlying conditions during some of the period when they were likely to have been exposed.

There was a co-incidental finding of the outbreak strains of *Listeria* in samples obtained from a premises that manufactures fruit salad. These samples were taken as part of an investigation of a different cluster of *Listeria* cases in Victoria with a different serotype and BT. The outbreak strains of *Listeria monocytogenes* were isolated from by-products of manufacturing (waste juice from a stainless steel tub and fruit rinse water), and from a wash taken from the surface of a honeydew melon. There is no known interstate distribution from this manufacturer.

Separately, the outbreak strain (molecular serogroup: 1/2b, BT: 158, MDU designated PFGE: 121:119:1) was isolated from a sample of fruit salad taken by a local council at a delicatessen in Victoria, while a 2nd sample of fruit salad taken from a different delicatessen yielded the 2nd outbreak strain (molecular serogroup: not established, BT: 158 and MDU designated PFGE: 122:4N:1). These fruit salads were both prepared at the premises using whole fresh fruit. The Victorian Department of Health has also tested a range of other food samples, and none yielded the outbreak strain.

While the number of cases in this outbreak remains small, and there is no direct link between the positive environmental samples and the outbreak cases, there is a temporal association between outbreak cases and findings in a food reported as being consumed by many of the cases. The outbreak strain is rare, providing further evidence for the source being rockmelon and/or honeydew melon, eaten fresh or used in the preparation of fruit salads.

Figure: Notifications of listeriosis, Nationally Notifiable Diseases Surveillance System, Australia, 1 January 2008 to 6 September 2010, by month and year of diagnosis



Trace-back conducted in Victoria, New South Wales and Queensland indicated a common source for some of the melons, in south central New South Wales. Onset dates for cases were between February and May, and the supply of melons from growing districts is known to be seasonal, suggesting that the source of infection was likely to be a supplier from southern regions of Australia that ceased production after this time. If there are no further outbreak cases this year this would further support this theory.

This multi-jurisdictional outbreak investigation triggered the National Food Incident Response Protocol on 16 July 2010. The New South Wales Food Authority and New South Wales Department of Primary Industries have liaised with Horticulture Australia and are working to develop quality assurance education tools. Food Standards Australia New Zealand (FSANZ), in liaison with respective jurisdictions, is planning to meet with industry representatives to discuss issues at wholesale and retail levels, and will also consider including melons and prepared fruit salad in the Food Regulation Standing Committee's Implementation Sub-Committee's coordinated survey of *L. monocytogenes* in ready-to-eat foods. FSANZ will also coordinate the development of a discussion paper that identifies possible control measures and future preventative measures. This outbreak investigation has highlighted that detailed national level genotyping is critical for the detection of listeriosis clusters especially those involving cases across multiple jurisdictions.

Cluster investigations

During the 2nd quarter of 2010, OzFoodNet sites investigated several clusters. A cluster is defined as an increase in a specific infection in terms of time, place, or person where a source and mode of transmission remains unknown. The majority of these investigations involved *Salmonella* serotypes for which no common food vehicle or source of infection could be identified: *S.* Infantis, *S.* Poona, *S.* Virchow phage type 8 and *S.* Typhimurium (phage types 9, 135a and 170). However, in New South Wales, a cluster of *S.* Singapore cases was associated with the consumption of eggs but no common exposure or source of eggs could be identified.

Following a case series analysis in Tasmania, a large cluster of cryptosporidiosis was found to be associated with a public swimming pool and 2 smaller clusters associated with private swimming schools. After remedial intervention, *Cryptosporidium* infections in the area have returned to baseline levels.

Comments

The number of foodborne outbreaks reported during the quarter (n = 35) exceeded the average number during the same quarter over the past 5 years (n = 27). This increase in the number of foodborne outbreaks coincided with a general increase in the number of notifications of salmonellosis to the National Notifiable Diseases Surveillance System (NNDSS), with 2,893 notifications of salmonellosis during the quarter compared with a mean of 2,071 notifications for the same period over the past 5 years (National Notifiable Diseases Surveillance System, unpublished data).

In December 2009, the Public Health Microbiology Reference Laboratory in Queensland modified its screening procedures for detecting Shiga toxin-producing *Escherichia coli* (STEC) infections. All faecal samples that are submitted to the Public Health Microbiology Laboratory for STEC testing are now screened for the presence of Shiga toxin using an enzyme immunoassay (EIA – Premier EHEC, Meridian BioScience) method in conjunction with a polymerase chain reaction (PCR) technique for detecting Shiga toxin-producing genes. EIA only does not meet the national case definition for STEC.[4] Prior to December 2009, all stool specimens submitted for STEC testing were initially screened using the PCR method and EIA was performed on those specimens that were PCR positive. If the PCR was negative, there was no further testing conducted. Probable cases (EIA positive only; PCR and/or culture negative) are not being notified to the NNDSS. A study protocol is being developed in Queensland to evaluate the EIA test in terms of its specificity and level of agreement with the cytotoxicity assay and PCR.

Outbreaks of foodborne disease associated with eggs are of continuing concern in Australia. During the quarter, four of the 15 (27%) foodborne outbreaks for which sources could be determined, were associated with the consumption of egg-based sauces or egg wash used for glazing. Tartare sauce, aioli and mayonnaise continue to be a source of foodborne *Salmonella* infection.

During the quarter, OzFoodNet held an Advanced Disease Outbreak Investigation Workshop in Adelaide, South Australia, which was organised on behalf of the network by the OzFoodNet site and Communicable Disease Control Branch staff in South Australia. The workshop included

presentations by invited speakers from the Centers for Disease Control and Prevention, United States of America and Taranaki Public Health Service, New Zealand. The 2-day workshop covered the early stages of an outbreak investigation, descriptive analysis, analytical studies, risk assessment, environmental factors, novel vehicles of infection, laboratory issues including pathogen typing to improve outbreak detection and investigation, communication and media issues, and multi-jurisdictional outbreak investigations.

A limitation of the outbreak data provided by OzFoodNet sites for this report was the potential for variation in categorisation of the features of outbreaks depending on circumstances and investigator interpretation. Changes in the number of foodborne outbreaks reported should be interpreted with caution due to the small number each quarter.

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References

1. OzFoodNet Working Group. OzFoodNet quarterly report, 1 April to 30 June 2009. *Commun Dis Intell* 2009;33(3)341–347.

2. OzFoodNet Working Group. OzFoodNet quarterly report, 1 January to 31 March 2010. *Commun Dis Intell* 2010;34(2)127–136.

3. Dalton CB, Merritt TD, Unicomb LE, Kirk MD, Stafford RJ, Lalor K and the OzFoodNet Working Group. A national case-control study of risk factors for listeriosis in Australia. *Epidemiol Infect* 2010;30:1–9. [Epub ahead of print]

4. Communicable Diseases Network Australia. Shiga toxin-producing/vero toxin-producing ***Escherichia coli***—STEC/VTEC case definition Accessed on 18 August 2010. Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-nndss-casedefs-cd_stec.htm