Quarterly report

OzFoodNet quarterly report, 1 October to 31 December 2012

The OzFoodNet Working Group

Introduction

The Australian Government Department of Health established the OzFoodNet network in 2000 to collaborate nationally to investigate foodborne disease. In each Australian state and territory, OzFoodNet epidemiologists investigate outbreaks of enteric infection. 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, which occurred in Australia between 1 October and 31 December 2012.

Data were received from OzFoodNet epidemiologists in all Australian states and territories. The data in this report are provisional and subject to change.

During the 4th quarter of 2012, OzFoodNet sites reported 647 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 13,058 people, of whom 297 were hospitalised. There were 48 deaths reported during these outbreaks. The majority of outbreaks (86%, n=559) were due to person-to-person transmission (Table 1), with 60% (335/559) of these occurring in residential aged care facilities.

Table 1: Outbreaks and clusters of gastrointestinal illness reported by OzFoodNet, 1 October to 31 December 2012 by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total
Foodborne and suspected foodborne	37	6
Waterborne and suspected waterborne	1	<1
Person-to-person	559	86
Unknown (*Salmonella* cluster)	5	<1
Unknown (other pathogen cluster)	1	<1
Unknown	44	7
Total	647	100*

* Percentages do not add up due to rounding.

Foodborne and suspected foodborne disease outbreaks

There were 37 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Table 2). These outbreaks affected 815 people and resulted in 59 hospitalisations. There were 6 deaths and 1 miscarriage reported during these outbreaks. This compares with 31 outbreaks in the 3rd quarter of 2012[1] and a 5-year mean of 35 outbreaks for the 4th quarter between 2007 and 2011. A limitation of the outbreak data provided by OzFoodNet sites for this report was the potential for variation in the categorisation of the features of outbreaks depending on circumstances and investigator interpretation. Changes in the number of foodborne outbreaks should be interpreted with caution due to the small number each quarter.

Salmonella Typhimurium was identified as the aetiological agent in 10 (27%) foodborne or suspected foodborne outbreaks during this quarter. The aetiological agent in the remaining outbreaks included 8 (22%) norovirus, 2 (5%) *Clostridium perfringens*, 2 (5%) histamine fish poisoning (previously referred to as scombroid poisoning), and one each (3%) due to *S.* Singapore, *Listeria monocytogenes* and a suspected bacterial toxin. In 12 outbreaks (32%), the aetiological agent was unknown.

Twenty-one outbreaks (57% of foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 3).

To investigate these outbreaks, sites conducted 4 cohort studies, 4 case control studies, 2 case-case analyses and collected descriptive case series data for 26 investigations, while for 2 outbreaks, no individual patient data were collected. The evidence

Table 2. Outbreaks of foodborne or suspected foodborne disease reported, 1 October to 31 December 2012, by OzFoodNet site* (n=37)

State	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Multi-jurisdictional	October	Primary production	*Salmonella* Typhimurium PT 3	43	7	M	Raw almonds
Multi-jurisdictional	December	Commercially manufactured	*Listeria monocytogenes* PFGE type 119A:44A:1	34	34	A	Brie and/or camembert cheese
Multi-jurisdictional	December	Commercially manufactured	*S.* Typhimurium MLVA profile 03-16-09-12-523 & 03-17-09-12-523 (historically PT 135)	391	Unknown	A	Suspected fresh pre-cut chicken pieces
ACT	November	Takeaway	Suspected bacterial toxin	3	0	D	Sashimi
NSW	October	Restaurant	*Clostridium perfringens*	5	0	M	Chicken burrito
NSW	October	Community	Norovirus genotype II.4 New Orleans 2009	8	0	M	Raw oysters
NSW	October	Restaurant	Unknown	20	0	D	Unknown
NSW	November	Restaurant	*S.* Singapore	7	3	D	Unknown
NSW	November	Restaurant	*S.* Typhimurium MLVA profile 03-09-08-13-523 (historically PT 170)	3	1	D	Unknown
NSW	November	Restaurant	Unknown	9	0	D	Unknown
NSW	December	Restaurant	*S.* Typhimurium MLVA profile 03-09-08-13-523 (historically PT 170)	4	0	D	Unknown
NSW	December	Restaurant	Unknown	16	0	D	Unknown
NSW	December	Restaurant	Unknown	12	0	D	Unknown
NSW	December	Restaurant	Unknown	8	0	D	Unknown
NSW	December	Restaurant	Unknown	7	0	D	Unknown
NSW	December	Restaurant	*C. perfringens*	13	0	D	Roast beef
Qld	October	Restaurant	Unknown	12	0	D	Unknown
Qld	November	Restaurant	Norovirus genotype II.4 New Orleans 2009	4	0	D	Raw oysters
Qld	November	Private residence	Histamine fish poisoning	3	0	M	Mahi Mahi
Qld	December	Hospital	*S.* Typhimurium MLVA profile 03-09-07-12-524	6	3	D	Unknown
Qld	December	Restaurant	*S.* Typhimurium MLVA profile 03-09-07-15-524 (PT 170)	11	3	D	Sushi
Qld	December	Restaurant	Histamine fish poisoning	3	0	D	Mahi Mahi
SA	October	Aged care facility	Unknown	20	0	D	Unknown
Vic.	October	Restaurant	Norovirus	17	1	D	Salads prepared by an ill food handler
Vic.	October	Private residence	*S.* Typhimurium PT 12a	7	1	D	Noodles with chicken and egg
Vic.	November	Private residence	Norovirus	10	0	A	Cake

Table 2 *continued*. Outbreaks of foodborne or suspected foodborne disease reported, 1 October to 31 December 2012, by OzFoodNet site,* (n=37)

State	Month†	Setting prepared	Agent responsible	Number affected	Hospitalised	Evidence	Responsible vehicles
Vic.	November	Restaurant	Norovirus	13	0	D	Multiple foods contaminated by infectious food handler/s
Vic.	November	Private residence	*S.* Typhimurium PT 135a	5	1	D	Suspected chocolate mousse made with raw eggs
Vic.	December	Restaurant	Norovirus	32	1	D	Suspected salad
Vic.	December	Restaurant	Norovirus	35	0	D	Unknown
Vic.	December	Unknown	*S.* Typhimurium PT 170	3	1	D	Scrambled eggs or chicken teriyaki
Vic.	December	Private residence	*S.* Typhimurium PT 170	3	3	D	Raw egg drink
Vic.	December	Aged care facility	Unknown	10	0	D	Unknown
WA	October	Restaurant	Unknown	9	0	A	Pork belly meal
WA	November	Restaurant	Norovirus	13	0	A	Pickled octopus, prawns, asparagus
WA	December	Commercial caterer	Unknown	9	0	A	Unknown
WA	December	Bakery	Unknown	7	0	D	Assorted sandwiches/rolls
Total				815	59		

* No foodborne or suspected foodborne outbreaks were reported by the Northern Territory and Tasmania.

† Month of outbreak is the month of onset of first case or month of notification/investigation of the outbreak

A Analytical epidemiological association between illness and 1 or more foods

BT Binary type

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 tandem repeat analysis

PFGE Pulsed-field gel electrophoresis

PT Phage type

ST Serotype

Table 3: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet, 1 October to 31 December 2012 by food preparation setting

Food preparation setting	Outbreaks
Restaurant	21
Private residence	5
Aged care	2
Commercially manufactured	2
Bakery	1
Commercial caterer	1
Community	1
Hospital	1
Primary production	1
Takeaway	1
Unknown	1
Total	37

used to implicate food vehicles included analytical evidence in 6 outbreaks and microbiological evidence in 4 outbreaks. Descriptive evidence alone was obtained for 27 outbreak investigations.

The following jurisdictional summaries describe key outbreaks and public health actions that occurred during the quarter.

Australian Capital Territory

There was 1 reported outbreak of foodborne or suspected foodborne illness during the quarter. A bacterial toxin was the suspected cause of the outbreak, which was associated with the consumption of salmon and tuna sashimi.

New South Wales

There were 12 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in six of these outbreaks: two each were due to *S.* Typhimurium and *C. perfringens*; and one each due to *S.* Singapore and norovirus.

Description of key outbreaks

Five people from a group of seven developed diarrhoea and abdominal cramps 12–15 hours after eating a meal at a Mexican restaurant. The 5 ill people had all consumed a chicken burrito, which included shredded chicken, cheese, rice and beans. Left-over and newly cooked food samples were taken from the restaurant and an inspection indicated poor temperature control may have been a contributing factor. Samples of the cooked chicken were positive for *C. perfringens*. New South Wales Food Authority (NSWFA) issued the restaurant with an improvement notice.

Six people from a group of 30 developed symptoms of diarrhoea, vomiting and stomach cramps after participating in a 5 day social event. A husband and wife who were not a part of the group of six were also ill. All 8 cases consumed oysters from the local area. One stool sample was collected, which was positive for norovirus genotype II.4 New Orleans 2009 variant.[2] An environmental investigation identified a damaged sewerage pipe that had been leaking into the waterway where the local oysters were harvested. Oyster samples from this waterway subsequently tested positive for norovirus genogroup II. The waterway was temporarily closed to oyster harvesting and the broken pipe was repaired.[3]

A complaint of illness was made to the NSWFA following a meal at a restaurant. Thirteen people from a group of 16 developed diarrhoea 12 hours after eating various dishes from a buffet. All interviewed cases reported eating roast beef. Stool samples were submitted for 3 cases and *C. perfringens* enterotoxin type A was identified in one sample. The NSWFA inspected the premises and issued improvement notices for storage and holding temperatures of food. The lack of temperature controls suggests the possibility of *C. perfringens* being able to proliferate to sufficient levels to cause illness.

Eight people from a group of 17 who had eaten at a restaurant reported symptoms of fever, nausea, vomiting, diarrhoea and abdominal cramps. Foods consumed by all 8 cases were tiramisu and panna cotta, though it was not known if the people who were not unwell also consumed these items. No clinical specimens were provided. While the symptoms and onsets could be representative of a salmonellosis outbreak, no positive samples were found from sampling of left-over foods to confirm this as the cause of illness. The cases did eat a raw egg tiramisu and whilst the use of raw eggs in the making of the tiramisu may have been a vehicle for *Salmonella*, in the absence of any further information, the cause of the illness for these cases could not be determined.

Northern Territory

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

Queensland

There were 6 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified in five of these

outbreaks: two each were due to *S.* Typhimurium and histamine fish poisoning; and one due to norovirus.

Description of key outbreaks

Four cases of suspected foodborne illness were reported following the consumption of a seafood buffet meal at a sports club. The cases became ill approximately 30 to 41 hours following the meal with symptoms including diarrhoea, vomiting and abdominal cramps. The consumption of raw oysters was common to all cases. Norovirus genotype II.4 2010 variant (also referred to as genotype II.4 New Orleans 2009 variant)[2] was detected in 2 faecal specimens, a strain that was genetically identical (by genome sequencing) to a human case from a New South Wales outbreak that was also associated with oyster consumption (reported above and in Table 2), suggesting that the source of the virus for these cases was likely to be the same.

Two outbreaks of histamine fish poisoning associated with the same fish species, Mahi Mahi, were investigated. The first outbreak involved 3 cases who consumed Mahi Mahi fish fillets purchased from a seafood vendor. The cases became ill within 1 hour of consuming the fish fillets with symptoms including vomiting, diarrhoea, fever, breathing difficulty, rash and headaches. High levels of histamine (1,600–2,050 mg per kg) were detected on samples of fillets collected from the retailer who sold the fish to the cases. The wholesaler and supplier of the Mahi Mahi were also investigated to ensure food handlers were aware of risks associated with poorly handled fish and inappropriate storage and transport of seafood. The second outbreak involved 3 cases who consumed Mahi Mahi fish at a restaurant. The cases became ill within 1 hour of consuming the fish. All 3 cases presented with symptoms including red rash and tachycardia. Environmental investigations of the restaurant and supplier of the Mahi Mahi were conducted and advice provided on the importance of correct food handling techniques for seafood. No leftover fish fillets were available for laboratory testing.

Twenty-six cases of *S.* Typhimurium multi-locus variable number tandem repeat analysis (MLVA) profile* 03-09-07-15-524 (phage type 170 [PT 170]) were investigated. Seventeen of the 26 cases were interviewed with 11 reporting the consumption of sushi meals from the same sushi restaurant prior to illness. Three of the cases were hospitalised. No specific sushi meal was common among the cases. The investigation identified numerous food hygiene and handling issues at the sushi restaurant including poor temperature control of ready to eat food and the potential for cross contamination. Extensive environmental sampling was conducted on-site including environmental swabs of food preparation surfaces and the collection of sushi, chicken, eggs, mayonnaise and cleaning cloths for microbiological analysis. The same strain of *Salmonella* as that found in cases was cultured from two cleaning cloths, however, all other environmental samples tested negative for bacterial pathogens. The investigation was still ongoing at the time of this report as further cases with this particular strain of *Salmonella* were found to be associated with this same sushi venue. No single vehicle or source of infection has been identified.

South Australia

There was 1 reported outbreak of foodborne or suspected foodborne illness during the quarter. No aetiological agent was identified.

Nineteen residents from an aged care facility reported diarrhoea. Twelve of the 19 cases were reportedly on a vitamised diet and two on a minced diet (these diets include the same foods). The illness was short-lived and no cases were hospitalised. Ten faecal samples were submitted, and no common viral or bacterial pathogens were detected. Due to the short duration of symptoms and only one person reporting vomiting, a bacterial toxin was suspected as the cause. Four faecal samples were submitted to an interstate laboratory for *C. perfringens* and *Bacillus cereus* testing. *C. perfringens* was detected in all faecal samples, but was below the diagnostic level for *C. perfringens* food poisoning (>10^6 cfu/g). No *B. cereus* was detected in any of the faecal samples. An environmental investigation identified that the dishwasher was not working prior to residents becoming unwell, and food reheating practices were of concern to investigators. *C. perfringens* and *Bacillus* species (not able to be further classified) were detected in food samples. Actions undertaken by the facility included fixing the dishwasher, and kitchen staff at the facility underwent food safety training.

Tasmania

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

Victoria

There were 10 reported outbreaks of foodborne or suspected foodborne illness during the quarter. The aetiological agent was identified for nine of these outbreaks with four due to *S.* Typhimurium and five due to norovirus.

* MLVA profiles are reported using the Australian coding convention agreed at a MLVA typing harmonisation meeting in Sydney in November 2011.[4]

An outbreak of salmonellosis affecting 3 of 5 teachers and 4 of 7 students who shared a meal at a secondary school was investigated. A meal consisting of spring rolls and a chicken and egg noodle dish was prepared at home by one of the students and brought to school to share with teachers and classmates. The noodle dish was suspected as the source as only the 3 cases consumed this food item. All 3 cases were confirmed with *S.* Typhimurium PT 12a.

Five family members were affected by an outbreak of *S.* Typhimurium PT 135a. The group had shared a meal of slow-cooked chicken curry and chocolate mousse made with raw eggs. Chocolate mousse was considered to be the most likely source based on information about how the food was prepared.

An outbreak of gastroenteritis affecting a group of people who had eaten dinner together at a restaurant was investigated. Twenty people from the group of 36 were interviewed and 10 reported an onset of vomiting and/or diarrhoea between 24 and 48 hours after eating. The group ate a variety of different meals. During the investigation it was revealed that one of the attendees had prepared a cake at home and brought this to share for dessert. This person, who subsequently became unwell approximately 24 hours after the dinner, had a child at home who had been ill with diarrhoea during the period when the cake was made. Analysis of this exposure (eating cake) for those interviewed suggested that the cake may have been the source (odds ratio [OR] 8.0; 95% confidence interval [CI] 0.8 to 235.5; $P=0.04$). Four cases were confirmed with norovirus including the person who made the cake.

An outbreak of salmonellosis affecting 3 children in a family was investigated. Two days prior to their illness onset, the children had shared scrambled eggs for breakfast. This meal was eaten at a hotel buffet. That same day the children also shared a chicken teriyaki and rice meal from a noodle bar. Neither of these meals was eaten by the children's parents who remained well. The children were all confirmed with *S.* Typhimurium PT 170. No other cases linked to either premise were identified.

Another outbreak of *S.* Typhimurium PT 170 affecting 3 family members was investigated. All 3 family members shared a raw egg milk drink the day prior to onset. The eggs were obtained from their own backyard chickens.

An outbreak of gastroenteritis affecting 2 separate groups of people who dined at a restaurant on the same evening was investigated. An analytical study was conducted for the larger group of 45 people (28 cases) who ate the set menu. A statistically significant association between illness and consumption of food from one of three platters was observed (OR 4.7; 95% CI 1.0 to 25.8; $P=0.026$). There were no common food items consumed by those who became unwell in the second smaller group of 20 attendees (7 cases). None of the 23 staff interviewed reported illness in the week prior to the groups dining at the restaurant. Seven cases (cases from both groups) were confirmed with norovirus. As two separate groups were affected, and the median incubation period for both groups was consistent with a point source exposure at the hotel, the source was suspected to be norovirus contaminated food. However, the investigation was unable to determine how the food became contaminated.

Thirty-two people reported vomiting and/or diarrhoea after attending a restaurant for a function. Over 70 people dined at the restaurant that night. Detailed questionnaires were not completed for the majority of attendees, but some data were collected for 44 attendees. Analysis of food exposures suggested that consumption of salad with the main meal was associated with illness (OR 5.6; 95% CI 1.2 to 27.4; $P=0.02$). Although this was one large work function, 3 separate groups reported illness and the median incubation period for 12 cases and their onset dates and times were indicative of a point source exposure at the restaurant suspected to be norovirus contaminated food. Seven cases were confirmed with norovirus.

Western Australia

There were 4 reported outbreaks of foodborne or suspected foodborne illness during the quarter. Norovirus was identified as the aetiological agent for one of these outbreaks.

Investigators were notified that people within a group became ill after attending a lunch at a restaurant. There were at least 24 people in the group and information on illness and food exposures was obtained from 21 people using a structured questionnaire. Of these, 13 were ill with diarrhoea (n=11), vomiting (n=8), and fever (n=9), with a median illness duration of 24 hours. One person submitted a faecal specimen that was positive for norovirus. None of the people reported diarrhoea and/or vomiting prior to, or during, the meal. The incubation period was 31 hours. A univariate analysis found an association between illness and eating either marinated octopus (risk ratio [RR] and CI not defined; $P<0.01$), prawns (RR 7.3; 95% CI 1.2–46.2; $P<0.01$) and asparagus (RR 2.4; 95% CI 1.1–5.5; $P=0.04$). The environmental investigation identified no immediate or critical risks to food safety at the time of assessment. The marinated octopus was prepared by a Western Australia company using local octopus. There were no reports of illness among restaurant staff

prior to the meal. Whilst the source of norovirus contamination was not identified, the outbreak was suspected to be foodborne, with a number of foods possibly contaminated.

At least 9 of the 110 people who attended a wedding became ill following the reception, with a median incubation period of 7 hours and a duration of one day. An analytical study found a statistical association between illness and eating the pork belly meal (OR: not defined; CI: not defined; $P=0.002$), and two of the individual components of the pork belly meal – pork belly (OR not defined; CI not defined; $P=0.013$) and polenta (OR 13.3; 95% CI 1.4 to 124; $P=0.017$). The shallot tart, which was also part of the pork belly meal, had an elevated OR of 5.8, but this was not statistically significant (95% CI 1.0 to 34.4, $P=0.057$). A logistic regression model was unable to identify a source of infection. While the environmental health investigation identified a potential food safety risk from an inadequate cooking-cooling process, there was insufficient evidence to determine an environmental cause of the outbreak. The symptoms experienced by cases, together with the incubation period and the duration of illness, were suggestive of toxin mediated bacterial food poisoning. However, without a positive faecal specimen or food samples, the aetiological agent could not be confirmed.

Multi-jurisdictional investigations

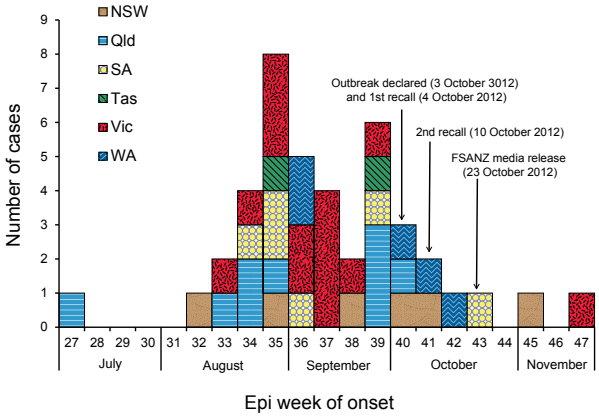
Salmonella Typhimurium PT 3 associated with the consumption of raw almonds

OzFoodNet commenced a multi-jurisdictional outbreak investigation on 3 October 2012 upon identifying *S.* Typhimurium PT 3 infection among cases from 3 jurisdictions. A confirmed outbreak case was defined as any person with a specimen collection date from 1 July 2012 with an isolate that had been confirmed as PT 3 and either MLVA profile 03-13-08-11-523/524 or 03-13-10-11/12-523/524, or pulsed-field gel electrophoresis (PFGE) type 0434. Of 39 interviewed cases, 37 (95%) reported consuming raw almonds in the week before onset of illness, either as a single food or part of a mixed nut product. Thirty-two of 37 (87%) cases who reported consuming almonds had purchased them from a retailer known to have been supplied with almonds from a single Victorian producer. The Victorian health department had received 3 separate notifications of *S.* Typhimurium PT 3 in raw almonds from this producer in July 2012. In total, 116 samples of implicated almond products were collected for microbiological testing including 13 samples from the homes of cases. Fourteen of 116 (12%) samples tested positive for *Salmonella* spp. of which 7 (6%) were confirmed with the outbreak strain *S.* Typhimurium PT 3.

An extensive environmental investigation was unable to determine the exact source of contamination of the almonds. However, it is known that the harvesting method for almonds exposes them to a risk of environmental contamination, especially from orchard soils that may be contaminated with bacteria including *Salmonella*. Almond trees are shaken during harvesting and the almonds lie on the ground for several days/weeks prior to being mechanically picked up for processing. It is known that the almond orchards in northern Victoria and southern New South Wales were subject to heavy rainfall during the 2012 harvest season. Under moist conditions there is potential for the growth of *Salmonella*.[5] Media releases and consumer level recalls of the implicated brands of almonds were conducted during the course of this investigation. As a result of this outbreak investigation all batches of raw almonds processed by this company now undergo pasteurisation prior to sale.

By the close of the investigation on 29 November 2012, 40 confirmed and 3 suspected cases were reported from 6 jurisdictions. For the 43 cases, the median age was 33 years (age range: 1 to 78 years), and there were approximately equal numbers of males and females. Seven cases were hospitalised with their illness, and there were no deaths. Onset of illness was from 2 July 2012 to 26 November 2012 (Figure).

Figure: Epidemic curve of Salmonella Typhimurium PT 3 infections, Australia, July to November 2012, by week of onset and jurisdiction



Listeria monocytogenes associated with the consumption of brie and/or camembert cheese

OzFoodNet, food safety officers and public health laboratories collaborated on a multi-jurisdictional outbreak investigation of listeriosis commencing on 10 December 2012. The outbreak involved 34 con-

firmed cases of infection with the same strain of *L. monocytogenes*: serotype 4b, 4d, 4e; binary type 254/255 and PFGE type 119A:44A:1.† Cases were reported from 6 jurisdictions, and had onset of illness between 18 August 2012 and 19 April 2013. There were 6 deaths and 1 miscarriage reported during the outbreak. Brie and camembert cheeses produced by a Victorian manufacturer were implicated, and 2 recalls of a range of soft cheese products from this manufacturer were conducted in December 2012 and January 2013. The outbreak strain of *L. monocytogenes* was detected in brie and camembert produced by the implicated manufacturer, and from product sampled from retailers in Victoria, New South Wales, Queensland and South Australia. Dairy Food Safety Victoria worked closely with the cheese manufacturer to improve processes, and more stringent routine test and hold protocols were implemented, as well as an extensive environmental testing protocol. The investigation closed on 22 August 2013.

Salmonella Typhimurium PT 135 associated with an unknown source

Two novel strains of *S.* Typhimurium PT 135 (MLVA profile 03-16-09-12-523 and 03-17-09-12-523) emerged in New South Wales and Queensland in significant numbers from July 2012. OzFoodNet commenced a multi-jurisdictional outbreak investigation on 10 December 2012 and declared the investigation closed on 10 January 2013. Nationally, 391 cases were identified between May and December 2012, with cases reported from 6 jurisdictions. The same *S.* Typhimurium MLVA profiles were identified in raw chicken meat sampled from the same chicken producer in both New South Wales and Queensland. A joint case control study in New South Wales and Queensland was conducted in December 2012 which included 22 cases and 45 controls; however the results of the study failed to identify any significant association with chicken consumption and illness.

Based on the laboratory evidence, food safety regulators and industry representatives implemented control measures at the farm and processing levels with the aim of reducing the prevalence of carcass contamination. Control measures included culling of chicken flocks from the implicated supplier, the inclusion of *S.* Typhimurium PT 135 organisms into vaccines for day old chickens and breeders, maintaining recommended chlorine levels in spin chillers at the processing plants, enhancing surveillance on-farm and diverting contaminated chickens to cooked product such as nuggets or schnitzels. Nationally, notifications peaked in October 2012 and began to decrease following the implementation of control measures.

Cluster investigations

During the quarter, OzFoodNet sites conducted investigations into a number of clusters of infection for which no common food vehicle or source of infection could be identified. Aetiological agents identified during the investigations included *S.* Typhimurium (PT 135, PT 8 and PFGE type 1), *S.* Chester and *Shigella sonnei* biotype a.

Comments

The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission, and in this quarter, 86% of outbreaks (n=559) were transmitted via this route. The number of foodborne outbreaks this quarter (n=37) was similar to the previous quarter (n=31) and was consistent with the 5-year mean (n=35, 2007–2011). Of the 21 foodborne outbreaks for which a source of the outbreak was identified, 7 (63.6%) were associated with the consumption of dishes containing seafood including oysters, Mahi Mahi, sashimi and sushi.

Salmonella species were identified as the aetiological agent in 11 (29.7%) of the 37 foodborne or suspected foodborne outbreaks during this quarter (Table 2), with 10 of 11 outbreaks being due to *S.* Typhimurium. Of the 11 outbreaks where *Salmonella* was implicated as the responsible agent, 45% (5/11) were associated with dishes containing eggs and/or chicken. To reduce the incidence of salmonellosis, Australian states and territories commenced implementation of the Primary Production and Processing Standard for Eggs and Egg Products[7] in November 2012, and continue to implement the Primary Production and Processing Standard for Poultry Meat[8] since May 2012.

OzFoodNet provided evidence to the Food Safety Information Council to inform the Council's annual Australian Food Safety Week, held in November. The theme of Food Safety Week 2012 was cross-contamination; with a specific focus on practices that increase the risk of cross-contamination from raw chicken.[9]

Acknowledgements

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† PFGE patterns were interpreted with reference to the guidelines proposed by Tenover et al,[6] the 3 restriction enzymes used for *L. monocytogenes* PFGE typing were: *Apa*1 : *Sma*1 : *Not*1 and a discrete PFGE type was assigned using a nomenclature defined by the Microbiological Diagnostic Unit Public Health Laboratory.

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