Quarterly reports

OzFoodNet quarterly report, 1 July to 30 September 2009

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 July to 30 September 2009.

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 3rd quarter of 2009, OzFoodNet sites reported 606 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 13,608 people, of whom 446 were hospitalised. There were 43* deaths reported during these outbreaks. The majority of outbreaks (67.5%, n = 409) were due to person-to-person transmission (Table 1).

Foodborne disease outbreaks

There were 28 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 445 people and resulted in 26 hospitalisations. There were 3* reported deaths during these outbreaks. This compares with 17 outbreaks for the 3rd quarter of 2008[1] and 27 foodborne outbreaks for the 2nd quarter of 2009.[2]

Salmonella was responsible for 3 outbreaks during this quarter, with *Salmonella* Typhimurium being the most common serotype (n = 2). There was 1 outbreak due to *S.* Typhimurium phage type 193 var 1 and 1 outbreak of *S.* Typhimurium where phage typing was not reported. There was 1 outbreak due to *S.* Saintpaul.

Of the remaining 25 outbreaks, four were due to foodborne toxins, including 2 *Clostridium perfringens* outbreaks and 2 ciguatera fish poisoning outbreaks. There were 7 outbreaks due to norovirus and 2 outbreaks due to *Campylobacter* infection. One outbreak was each due to *Yersinia enterocolitica,* and *Listeria monocytogenes*. Ten outbreaks were of unknown aetiology.

Thirteen outbreaks (46%) reported in this quarter were associated with food prepared in restaurants, four (14%) each associated with aged care facilities and primary produce, three (11%) associated with commercial caterers, and two (6%) with takeaway establishments. An individual outbreak was associated with food prepared at a bakery. In 1 outbreak the setting in which the food was prepared was unknown.

To investigate these outbreaks, sites conducted 8 cohort studies, 1 case control study, 1 case–case analysis and collected descriptive case series data for 15 investigations. As evidence for the implicated food vehicle, investigators collected microbiological evidence in 2 outbreaks, analytical epidemiological evidence in 4 outbreaks, and both analytical epide-

Table 1: Mode of transmission for outbreaks of gastrointestinal illness reported by OzFoodNet, 1 July to 30 September 2009

Transmission mode	Number of outbreaks	Percent of total
Foodborne	28	4.6
Person-to-person	409	67.5
Salmonella cluster	10	1.7
Suspected waterborne	1	0.2
Unknown – other pathogen cluster	1	0.2
Unknown	157	25.9
Total	606	100

* Includes 3 foetal deaths associated with a multi-jurisdictional outbreak of *Listeria* infection. See section on multi-jurisdictional outbreaks.

Table 2: Outbreaks of foodborne disease reported by OzFoodNet sites,* 1 July to 30 September 2009 (n = 28)

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
ACT	July	Takeaway	*Yersinia enterocolitica*	3	0	D	Roast pork, BBQ pork
	July	Aged care facility	*Clostridium perfringens*	50	0	A	Sweet and sour pork
NSW	August	Commercial caterer	Norovirus	31	0	D	Unknown
	September	Restaurant	Norovirus	13	0	D	Unknown
	September	Restaurant	Unknown	8	0	D	Unknown
	July	Restaurant	Unknown	6	Unknown	D	Unknown
	July	Unknown	Unknown	2	0	D	Unknown
	September	Restaurant	Unknown	3	0	D	Unknown
	September	Aged care facility	*Salmonella* Typhimurium	9	2	D	Unknown
	August	Restaurant	Unknown	2	0	D	Unknown
Qld	August	Primary produce	Ciguatera	2	2	D	King snapper
	August	Restaurant	*C. perfringens*	4	0	D	Unknown
	July	Restaurant	Unknown	2	0	D	Unknown
	July	Bakery	Norovirus	24	Unknown	D	Sandwiches (various fillings)
	September	Restaurant	Unknown	4	0	D	Unknown
	July	Primary produce	Ciguatera	2	0	D	Reef cod
SA	August	Commercial caterer	Norovirus	22	0	D	Sandwiches and baguettes
Tas	September	Restaurant	*Campylobacter*	35	0	A	Chicken liver parfait
	September	Restaurant	*Campylobacter*	9	0	A	Chicken liver parfait
Vic	July	Aged care facility	Unknown	4	0	D	Unknown
	August	Restaurant	Norovirus	87	0	D	Unknown
	August	Restaurant	Unknown	3	0	D	Unknown
	September	Restaurant	Norovirus	10	0	D	Unknown
	September	Aged care facility	Unknown	7	0	D	Unknown
WA	July	Takeaway	*S.* Typhimurium 193 var 1	31	9	M	Vietnamese pork roll
	August	Primary produce	*S.* Saintpaul	17	3	M	Paw paw
	September	Commercial caterer	Norovirus	15	0	A	Rice paper rolls
Multi-jurisdictional	July†	Commercially manufactured	*Listeria monocytogenes*	40	10	AM	Chicken meat

* No foodborne outbreaks were reported by the Northern Territory during the quarter.

† Some cases associated with this outbreak had dates of onset prior to the 3rd quarter.

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.

miological and microbiological evidence in 1 outbreak. Descriptive evidence only was obtained in 21 outbreaks.

The following jurisdictional summaries describe key outbreaks and public health actions that occurred in this quarter. The Northern Territory did not report any foodborne outbreaks during the quarter.

Australian Capital Territory

The Australian Capital Territory reported 2 outbreaks of foodborne or suspected foodborne disease reported during the quarter.

In July, an outbreak occurred in a residential aged-care facility where *C. perfringens* enteritis affected 50 residents. A cohort study was undertaken, with a sweet and sour pork meal identified as the suspected food vehicle. No leftover food remained for microbiological testing.

The other was a cluster of yersiniosis that was investigated following a food complaint and confirmed infection in a 10-month-old child. Two other family members exhibited symptoms but returned negative stool samples. A takeaway meal including Asian style BBQ/roast pork and roast duck was nominated by the family as the suspected food vehicles, but no leftover food remained and samples of pork and duck collected from the restaurant tested negative for *Yersinia* and other bacterial pathogens.

New South Wales

New South Wales reported 8 foodborne or suspected foodborne disease outbreaks in the 3rd quarter of 2009.

An outbreak of *Salmonella* occurred in an aged care facility with four confirmed cases of salmonellosis amongst 9 people with symptoms of gastroenteritis. Two of the cases were confirmed as *S.* Typhimurium multi-locus variable number of tandem repeats analysis (MLVA) 3-9-8-13-523. All 4 patients were categorised as high dependency, and all were on a pureed/soft diet. Approximately 30 out of 61 residents of the facility were on a pureed/soft diet and no other cases of salmonellosis were reported. A thorough investigation of the premises was conducted, including the collection of food and environmental samples for microbiological testing. Results were all negative, and the New South Wales Food Authority found no obvious problems or possible source of infection.

An outbreak of norovirus associated with a birthday party was investigated through a cohort study. Thirty-three people were interviewed, with 31 people reporting illness consistent with norovirus infection. One specimen was positive for norovirus. No foods were significantly associated with illness. The source of the infection remains unknown.

In September, an outbreak affecting 3 different groups and associated with a single food premises was reported. Illness onset times were between 25–35 hours after consumption of meals. The symptom profile was consistent with a viral infection, and norovirus was isolated from 3 stool specimens. Food items common to the cases was a side salad. It is likely that norovirus was transmitted to cases through consumption of salads, served as meal or as a side salad. No common ingredients could be identified between the salad types. The source of the outbreak remains unknown.

New South Wales reported a further 5 outbreaks of gastroenteritis of suspected foodborne origin, all of them of unknown aetiology.

New South Wales reported 2 confirmed cases of *L. monocytogenes* as part of a multi-jurisdictional outbreak that is detailed further in the section on multi-jurisdictional outbreak investigations.

Queensland

Queensland investigated 6 outbreaks of foodborne or suspected foodborne illness during the 3rd quarter of 2009.

Two outbreaks of suspected ciguatera fish poisoning were reported during the quarter. In July, 2 cases consumed approximately 200 g of reef cod which was caught from a reef north east of Bundaberg (private catch). In August, 2 people consumed king snapper fillets that were purchased from a Brisbane seafood outlet. Traceback investigations identified that this fish was part of a 288 kg catch that was taken off Capel Bank (east of Brisbane).

In July, an outbreak of 24 cases of norovirus infection was reported among a cohort of 50 people. Illness was initially reported among staff members of an educational college following the consumption of sandwiches catered by a nearby café. The sandwiches were provided by the café during 2 separate events held in July. Onset of illness (with symptoms including vomiting, diarrhoea and stomach cramps) occurred between 12 and 36 hours after consuming the sandwiches. Environmental health investigations identified poor hygiene practices and food safety knowledge among café staff, and several staff had reported recent gastrointestinal illness. Norovirus was detected in one of 2 stool specimens from the college staff members.

In August, four people became ill with diarrhoea and stomach cramps after consuming a meal con-

sisting of roast beef and gravy at a Brisbane hotel restaurant. All 4 cases had incubation periods less than 11 hours and *C. perfringens* was detected at diagnostic levels in the stools of all 4 cases. No food samples were collected and no further cases of illness were reported.

Three cases of *L. monocytogenes* infection were reported by Queensland during this quarter, all were part of a multi-jurisdictional outbreak that occurred across 6 Australian states. All 3 cases were materno-foetal infections. Two cases had pre-term live births at 33 and 34 weeks gestation, while a foetal death occurred in the 3rd case at 20 weeks gestation. This investigation is detailed further in the section on multi-jurisdictional outbreak investigations.

South Australia

South Australia reported 1 outbreak of foodborne or suspected foodborne disease during the 3rd quarter of 2009. The Communicable Disease Control Branch investigated an outbreak of 22 cases of gastroenteritis in people from 2 catered events in Adelaide in August 2009. Both events were served lunch consisting of sandwiches and baguettes that were prepared by the same caterer. An environmental inspection of the caterer found that 1 food handler had been sick on the premises the day the food was prepared. A second food handler also became ill 24–48 hours after the first.

Two outbreaks of unknown aetiology were reported in which investigators were unable to identify a food vehicle.

One confirmed case of *L. monocytogenes* was reported by South Australia as part of the multi-jurisdictional outbreak. This investigation is detailed further in the section on multi-jurisdictional outbreak investigations.

Tasmania

There were 2 outbreaks of foodborne disease reported by Tasmania this quarter affecting 2 groups attending separate functions at the same hotel and consuming an identical set menu. In the 1st outbreak 35 of the 83 attendees interviewed reported gastroenteritis after eating at the function. *Campylobacter* was detected in the faecal specimens of 7 cases. In the 2nd cohort nine of 21 attendees reported gastroenteritis after eating at the function. A combined cohort investigation was undertaken and analysis of the questionnaire data revealed that consumption of a chicken liver parfait was significantly associated with gastroenteric illness. While water and food samples, including the chicken liver parfait, tested negative for *Campylobacter,* it is suspected that inadequate cooking of the chicken livers was the main contributing factor to the outbreaks.

Tasmania reported 1 confirmed case of *L. monocytogenes* linked to the multi-jurisdictional outbreak described in further detail in the section on multi-jurisdictional outbreak investigations.

Victoria

Victoria reported 5 outbreaks that were considered to be due to foodborne or suspected foodborne transmission this quarter. These outbreaks affected 111 people.

Norovirus was identified as the aetiology of two of the outbreaks. The 1st outbreak occurred in a hotel restaurant where a total of 87 people from 8 separate groups who dined on one of 3 consecutive days, reported illness. The food service was self-serve smorgasbord style and there was a selection of hot and cold foods. The 2nd outbreak affected 10 people in a group of 18 who dined at a café for lunch.

There were 2 suspected *C. perfringens*† outbreaks in aged care facilities, affecting four and 7 people respectively, during this quarter. A 3rd suspected *C. perfringens* outbreak was reported, which affected 3 people after sharing a meal at a restaurant. Investigators were unable to identify the vehicle responsible for infection in any of the outbreaks.

Thirty-two cases of hepatitis A were notified in Victoria this quarter and 21 cases of which were locally acquired. Fifteen of these locally-acquired cases had consumed semi-dried tomatoes within a likely window of exposure. Two cases were food handlers. The median age for these locally-acquired cases was 42 years (range 9–79 years) and there were approximately equal numbers of males and females. This increase in locally-acquired cases was considered to be related to the multi-jurisdictional outbreak between March and May,[2] not a new outbreak. A 2nd case control study to investigate this outbreak commenced in early October and cases were eligible for enrolment if they had an onset on or after 1 September 2009.

Victoria reported three cases of *Listeria* infection linked to the multi-jurisdictional outbreak, of which only one was notified in this quarter. Further information is provided in the section describing multi-jurisdictional outbreak investigations.

† The aetiology of these outbreaks was unable to be confirmed by investigators and is listed as unknown in Table 2.

Western Australia

Western Australia investigated 3 outbreaks of foodborne disease or suspected foodborne disease in the 3rd quarter of 2009.

In July, 28 cases of *S.* Typhimurium Pulsed Field Gel Electrophoresis (PFGE) type 0279 (phage type 193) were notified, plus an additional 3 cases with symptoms of gastroenteritis linked to these cases. This PFGE type had not previously been reported in Western Australia. Sixteen of the 31 cases reported eating Vietnamese pork rolls that were prepared by a lunch bar for distribution to other food outlets. One of the cases was a secondary case, 5 cases had poor recall of food eaten, 4 cases could not be followed up and 5 cases reported eating at a restaurant and had not eaten pork rolls. The pork rolls consisted of cooked pork, raw egg mayonnaise, cucumber, carrots and coriander. *S.* Typhimurium with an indistinguishable PFGE pattern from the human cases was isolated from pork rolls sampled from a retail outlet. The source of the *Salmonella* contamination of the pork rolls could not be identified. No link was found between the cases that ate the pork rolls and the 5 cases that ate at a restaurant. The pork rolls were removed from sale.

An investigation was commenced in September into an increase in the number of *S.* Saintpaul notifications. Four of 5 locally-acquired cases in August reported eating paw paw, which is above expected consumption frequencies. Paw paw from one Western Australian grower was found to be contaminated with *S.* Saintpaul and subsequently withdrawn from sale. Investigations revealed that the likely source of contamination was from the washing process used to treat the paw paw with fungicide. A total of 17 *S.* Saintpaul cases were associated with this foodborne outbreak and three of the cases were hospitalised.

In September, a suspected foodborne outbreak of norovirus was reported amongst guests of a wake at a private home, with the incubation period, symptoms and duration of illness consistent with norovirus infection. While norovirus was detected in 1 specimen from an affected person, a 2nd specimen collected from the same person was positive for norovirus and rotavirus. A case control study was conducted with 15 cases and 15 controls. Illness was found to be significantly associated with the consumption of rice paper rolls (odds ratio [OR] 12.0, 95% confidence intervals [CI]: 1.9, 76). Food was supplied by a catering company, and no staff illness was reported. Contamination of the rice paper rolls by an infected food handler was the suspected source of infection.

Western Australia also reported a single case of listeriosis linked to the multi-jurisdictional outbreak investigation described in the section on multi-jurisdictional outbreak investigations.

Multi-jurisdictional outbreak investigation

Listeria monocytogenes

In late July, Queensland reported a cluster of 4 cases of listeriosis who had been infected with the same strain of *L. monocytogenes* (serotype 1/2c, binary gene type 82), a strain not frequently detected in Queensland. However, this particular strain of *Listeria* had been detected in several food and environmental samples taken intermittently between January and July 2009 from a food manufacturer in Brisbane. Further investigation and case ascertainment identified additional cases in other jurisdictions.

During a multi-jurisdictional investigation into the outbreak, case ascertainment identified additional cases in other jurisdictions and a total of 13 laboratory confirmed cases with the outbreak strain were identified. Cases were from Queensland (5), Victoria (3), New South Wales (2), South Australia (1), Western Australia (1) and Tasmania (1). There were also 27 epidemiologically-linked cases associated with this outbreak, 26 with clinical symptoms of gastroenteritis only. Onset dates for all 40 cases ranged between January and July 2009. The median incubation period among the 26 clinical cases with gastroenteritis was 21 hours (range: 5–38 hours). Eight of the 13 laboratory-confirmed cases were perinatal infections with three foetal deaths at 15, 20 and 40 weeks gestation.

Eight of the 13 laboratory-confirmed cases and 21 of 27 clinical cases reported consuming chicken wraps on a particular domestic airline. Laboratory-confirmed cases infected with the outbreak strain ($n = 13$) were more likely to have flown on a domestic airline in the 3 months before onset of illness (OR 30.0, 95% CI: 2.3, 885.7, $P < 0.001$) and more likely to have consumed chicken wraps (OR 27.2, 95% CI: 2.2, 758.5, $P = 0.001$), when compared to sporadic cases of *Listeria monocytogenes* infected with other strains ($n = 40$).

Traceback investigation subsequently led to the isolation of the outbreak strain of *Listeria* from pre-packaged chicken sandwiches and wraps prepared by a food manufacturer in Queensland and from cooked chicken meat from a wholesaler in New South Wales that supplied chicken to the Queensland manufacturer. The Queensland food manufacturer supplied chicken wraps to the domestic airline and several other food businesses

in Queensland. An environmental investigation identified deficiencies in the food safety program for the production of chicken meat. The facility ceased the manufacture of the meat in response to the environmental investigation.

Cluster investigations

During the 3rd quarter of 2009, OzFoodNet sites investigated a number of clusters across 7 jurisdictions and the majority were due to *Salmonella*. The Australian Capital Territory investigated a cluster of 2 cases of *S.* Rubislaw during the period. Both cases were young children. This was the first time this serotype has been reported by the Australian Capital Territory. One child was hospitalised with bloody diarrhoea and a pet lizard was identified as a possible source of the child's infection, with environmental sampling including lizard faeces, a vacuum cleaner filter and swabs from the terrarium in which it was housed testing positive for *S.* Rubislaw. The other clusters investigated included *Listeria*, *Shigella sonnei* biotype A *Campylobacter*, *S.* Typhi *S.* Enteritidis 6A, *S.* Typhimurium phage types 141, 170/108, 60, 3, 9 and *S.* Havana and *S.* Anatum.

Comments

There was a higher number of foodborne outbreaks (n = 28) during the 3rd quarter of 2009 compared with the same quarter in 2008 (n = 17),[1] but a similar number to the previous quarter (2nd quarter 2009) (n = 27).[2] 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. Changes in the incidence of foodborne outbreaks should be interpreted with caution due to the small numbers each quarter.

Of particular interest this quarter was the multi-jurisdictional outbreak investigation into cases of listeriosis linked to the consumption of cooked chicken meat in pre-packaged sandwiches and wraps served during flights on a domestic airline. Cooperation between the jurisdictions and the companies involved in the supply chain in the investigation of these cases, facilitated traceback and appropriate public health actions, including recall of the affected food. Serotyping in combination with genotyping was critical for enhanced case-finding and source attribution in this investigation. This outbreak provides a timely reminder to public health investigators that foods containing high levels of *Listeria* are capable of causing outbreaks of both invasive and/or non-invasive (gastrointestinal) illness, occurring among both immunocompromised and healthy immunocompetent persons. Small outbreaks of *Listeria* infection have previously occurred in Australia,[3] including a cluster of cases in South Australia in 1996 linked to sandwiches prepared in a hospital with diced chicken meat from a commercial supplier.[4] The multi-jurisdictional outbreak described here is the first outbreak of listeriosis in Australia that has been linked to consumption of pre-packaged food on an airline and involved a higher than usual proportion of materno-foetal cases and foetal deaths. Communication of the risks to vulnerable populations, such as pregnant women and immunocompromised people is important for the prevention of cases. Food Standards Australia New Zealand (FSANZ) is planning an education campaign using OzFoodNet data.

Also of interest this quarter is the outbreak of *S.* Saintpaul in Western Australia associated with the consumption of paw paw. This is the 2nd outbreak of *Salmonella* linked to the consumption of paw paw/papaya produce. An outbreak of *S.* Litchfield infection in Queensland and Western Australia in late 2006 and early 2007 was shown to be associated with the consumption of papaya, with untreated water used to wash the fruit with fungicide being the likely source of contamination.[5] In addition, a multi-state outbreak of *S.* Saintpaul occurred in Australia in 2006 in which consumption of rockmelon was strongly associated with illness.[6] Together, these outbreaks show that there is a need for care in the preparation of fresh produce such as paw paw/papaya and rockmelon, with particular care to sourcing safe water for washing the fruit.

During this quarter, Victoria reported an increase in locally acquired cases of hepatitis A associated with consumption of semi-dried tomatoes, subsequent to the quarter, the multi-jurisdictional outbreak investigation was re-opened on 2 November 2009. All jurisdictions were asked to follow-up locally acquired cases and request genotyping on all isolates to determine whether they matched the strain linked to the multi-jurisdictional outbreak investigation conducted in the 2nd quarter. Between 1 July and 30 September, 14 locally acquired hepatitis A cases were reported by jurisdictions outside Victoria, including South Australia (7 cases), New South Wales (3 cases), Queensland (3 cases) and Western Australia (1 case). The investigation is continuing and outcomes of the investigation will be reported in the 4th quarterly report.

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OzFoodNet contributors to this report include *(in alphabetical order)*: Robert Bell (Qld), Barry Combs (WA), Robyn Gibbs (WA), Joy Gregory (Vic), Jenine Gunn (NT), Katina Kardamanidis (NSW), Martyn Kirk (DoHA), Katrina Knope (DoHA), Karin Lalor (Vic), Peter Markey (NT), Lisa McCallum (SA), Charlotte McKercher (Tas), Carol McWeeney (NSW), Cameron Moffatt (ACT), Sally Munoch (Hunter New England), Nevada Pingault (WA), Jane Raupach (SA), Anna Reynolds (DoHA), Katrina Roper (DoHA), Frances Sheehan (Qld), Russell Stafford (Qld) and Nicola Stephens (NSW).

Author details

Correspondence: Ms Anna Reynolds, Epidemiologist, OzFoodNet, Office of Health Protection, Australian Government Department of Health and Ageing, GPO Box 9848, MDP 14, CANBERRA ACT 2601. Telephone: +61 2 6289 2751. Facsimile: +61 2 6289 2500. Email: ozfoodnet@health.gov.au

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