

Quarterly report

OzFoodNet quarterly report, 1 July to 30 September 2015

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. In addition, 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 commenced in Australia between 1 July and 30 September 2015.

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 3rd quarter of 2015 (1 July to 30 September), OzFoodNet sites reported 474 outbreaks of enteric illness, including those transmitted by contaminated food or water. Outbreaks of gastroenteritis are often not reported to health authorities, which results in current figures under-representing the true burden of enteric disease outbreaks within Australia. There were 8,561 people affected in these outbreaks and 246 hospitalisations. There were 25 deaths reported during these outbreaks. This represents a decrease in the number of people affected compared with the 5-year average from 2010 to 2014 for the 3rd quarter (n=10,047). The majority of reported outbreaks of gastrointestinal illness in Australia are due to person-to-person transmission. In this quarter, 85% (402/474) of outbreaks were transmitted via this route (see Table 1). This percentage was higher compared to the same quarter in 2014 (71%, 242/342) but the total number is lower than the 5-year average (3rd quarter, 2010-2014) of 447 outbreaks transmitted person-to-person. Of the person-to-person outbreaks in the 3rd quarter of 2015, 40% (159/402) occurred in child care facilities and 45% (181/402) occurred in aged care facilities.

Table 1: Outbreaks and clusters of gastrointestinal illness and number ill reported by OzFoodNet, Australia, 1 July to 30 September 2015, by mode of transmission

Transmission mode	Number of outbreaks and clusters	Per cent of total outbreaks and clusters (%)*	Number ill
Foodborne and suspected foodborne	29	6%	659
Person-to-person	402	85%	7,520
<i>Salmonella</i> cluster	4	1%	66
Suspected waterborne	2	<1%	32
Unknown	37	8%	284
Total	474	100	8,561

* May not add up to 100% due to rounding.

Foodborne and suspected foodborne disease outbreaks

There were 29 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as being the primary mode of transmission (Appendix 1). These outbreaks affected 659 people, of which 195 were laboratory confirmed cases, and resulted in 78 hospitalisations. There was one death reported during these outbreaks. This was a decrease on the number of foodborne outbreaks that were reported in the 2nd quarter of 2015 (33 outbreaks), but the number in this quarter was similar to the 5-year average for the 3rd quarter between 2010 and 2014 (30 outbreaks). The data within this report, provided by OzFoodNet sites, have associated limitations, including the potential variation in categorisation of features of outbreaks, depending on varied circumstances and investigator interpretation. Changes in the number of foodborne disease outbreaks should be interpreted with caution due to the small number each quarter.

Salmonella Typhimurium was identified as the aetiological agent in 34% (11/29) of foodborne or suspected foodborne outbreaks during this quarter (Appendix 1); a lower proportion than for the same quarter in 2014 (40%, 10/25). The aetiological agents for the remaining out-

breaks included norovirus (for 4 outbreaks), *Campylobacter* (for 2 outbreaks), ciguatoxin, and *S. subsp 1:4,5,12:i-* (for 1 outbreak each). For 11 outbreaks the aetiological agent was unknown.

Twelve outbreaks (41% of all foodborne or suspected foodborne outbreaks) reported in this quarter were associated with food prepared in restaurants (Table 2). This is lower than the average number of foodborne or suspected foodborne outbreaks in restaurants in the 3rd quarter from 2010 to 2014 (13.4 outbreaks).

To investigate these outbreaks, sites conducted 3 cohort studies, 2 case control studies, 1 case series and cohort study, and collected descriptive case series data for 15 investigations. For 8 outbreaks no individual patient data were collected. The evidence used to implicate food vehicles included analytical evidence in 3 outbreaks, microbiological evidence in 5 outbreaks, both analytical and microbiological evidence in 1 outbreak, and descriptive evidence in 20 outbreaks.

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

Table 2: Outbreaks of foodborne or suspected foodborne disease and number ill reported by OzFoodNet, Australia, 1 July to 30 September 2015, by food preparation setting

Food preparation setting	Number of outbreaks	Per cent of foodborne outbreaks (%)*	Number ill	Number laboratory confirmed
Restaurant	12	41%	324	113
Aged care facility	3	10%	155	14
Take-away	3	10%	26	14
Private residence	3	10%	12	7
Commercial caterer	2	7%	54	3
Bakery	1	3%	18	1
Overseas (returning military personnel)	1	3%	19	19
Child care facility	1	3%	2	2
Fair, festival, other temporary/mobile service	1	3%	4	3
Hospital	1	3%	37	16
School	1	3%	8	3
Total	29	100%	659	195

* May not add up to 100% due to rounding.

Australian Capital Territory

There was 1 outbreak of foodborne or suspected foodborne illness reported in the Australian Capital Territory (ACT) in this quarter. The aetiological agent identified was *S. Typhimurium* phage type (PT) 9.

Description of outbreak

The outbreak occurred in a private residence. Three people were affected, with onsets within two hours of each other. One of the three cases was admitted to hospital. Two cases were laboratory confirmed *S. Typhimurium* PT 9. A possible food vehicle was identified through routine interviews. A smoothie containing raw eggs was consumed by all three cases. No other family members were exposed or ill. The suspected source of infection was the raw eggs used in the smoothies.

New South Wales

There were 11 outbreaks of foodborne or suspected foodborne illness reported in New South Wales (NSW) in this quarter. The aetiological agents were identified as *S. Typhimurium* (for 2 outbreaks), norovirus and ciguatera fish poisoning (for 1 outbreak each). In 7 outbreaks, the aetiological agents were unknown. In three of the outbreaks, a suspected food vehicle could be implicated.

Description of key outbreak

Three separate complaints of food poisoning from three separate groups dining at the same Chinese restaurant were received by the NSW Food Authority. An investigation was initiated. A retrospective cohort study was conducted. Forty-four of 59 diners were interviewed, 40 reporting illness following dinner at the restaurant. Eleven stool samples were positive for *S. Typhimurium* multi-locus variable number tandem repeat analysis (MLVA) profile 03-12-11-14-523. Univariate analysis identified a statistically significant association between illness and those that consumed fried ice cream (odds ratio [OR] 6.89, 95% confidence interval [CI] 1.2-39.0, $P \leq 0.05$)

NSW Food Authority, in conjunction with the local council, conducted an inspection of the premises. General hygiene and food handling practices were found to be good; however fried ice cream was made using raw egg. Food and environmental samples were taken during the inspection. Samples of uncooked fried ice cream balls and fried ice cream crumbs both tested positive for *S. Typhimurium* MLVA 03-12-11-14-523. The NSW Food Authority issued the restaurant with a prohibition order on serving fried ice cream (made using a raw egg component).

A traceback on the egg supplier was conducted. The egg supplier was associated with four other outbreaks during 2014 and 2015. The egg farms associated with the supplier were inspected by the NSW Food Authority. Various *Salmonella* serovars (including *S. Typhimurium* MLVA 03-09-08-13-523, *S. Agona*, *S. Bareilly*, and *S. Orion*) were detected on the farm. No deficits in hygiene or processing were observed. The farm reported some bird illness in the last 18 months as well as new flock populations. It is possible stress events such as these could exacerbate the presence of *Salmonella* on otherwise hygienic and well run egg farms.¹

Northern Territory

There were 3 outbreaks of foodborne or suspected foodborne illness investigated in the Northern Territory (NT) this quarter. The aetiological agents identified included *S. Typhimurium* and *Campylobacter* for 1 outbreak each, and for 1 outbreak the aetiological agent was unknown.

Description of key outbreak

An outbreak was investigated in Darwin after 4 reports of illness were made following a cultural festival. Of these reports, 3 were laboratory confirmed cases of *S. Typhimurium* (including 2 cases of *S. Typhimurium* PT 168a). Environmental health officers were notified but the festival was a one-night only event and no food remained for testing. A number of patrons who were interviewed as part of the outbreak investigation reported poor temperature control of cooked foods on the night in question.

Queensland

There were 2 outbreaks of foodborne or suspected foodborne illness reported in Queensland in this quarter. *S. Typhimurium* was identified as the aetiological agent for both outbreaks.

Description of key outbreak

An outbreak was investigated after gastrointestinal illness was reported in 2 separate groups that had consumed meals at the same Brisbane restaurant. A total of 76 reported cases had attended the restaurant during a one week period. Forty-two of the 76 cases were laboratory confirmed: 41 cases with *S. Typhimurium* MLVA 03-17-09-11-523 (1 had a co-infection with *S. Hvitvingfoss*); and 1 case with *S. Typhimurium* MLVA 03-16-09-11-523. A case series investigation of 57 ill attendees indicated the majority of cases had consumed foods containing various mayonnaise-based sauces including aioli and tartare sauce. The environmental health investigation determined that a base mayonnaise sauce was used to create various different flavoured sauces. The base mayonnaise sauce was prepared each week in a 25 litre bucket using whole eggs, into which oil, vinegar and mustard were also added and the mixture emulsified using a stick blender. Numerous environmental samples were collected. *S. Typhimurium* (MLVA 03-17-09-11-523) was isolated from samples of chilli, mustard, aioli and base mayonnaise. Additionally, *Escherichia coli* and *Staphylococcus aureus* were detected on a sauce bottle and kitchen tap handle. Eggs that were collected during the investigation for microbial analysis were negative for *Salmonella*. Following the investigation, the restaurant management removed all raw egg-based sauces from the menu (replaced with commercially made mayonnaises) and replaced all chopping boards, sauce bottles and the stick blender.

South Australia

There were 2 outbreaks of foodborne or suspected foodborne illness reported in South Australia (SA) in this quarter. *S. Typhimurium* PT 9 was identified as the aetiological agent for both outbreaks.

Description of key outbreak

An outbreak was investigated after a report was received from a hospital about two patients who had tested positive for *Salmonella*. A total of 37 people who had contact with the hospital were reported as unwell, with 16 testing positive for *S. Typhimurium* PT 9 (MLVA 03-24-12-10-523) and 2 people tested positive for *Aeromonas*. The hospital kitchen was inspected and a range of food and environmental samples were collected. Imported frozen fish samples were positive for *S. Matopeni* and *S. Weltevreden*. Samples of the uncooked imported fish that had been coated with an egg-based crumb were positive for *S. Typhimurium* PT 9 (MLVA 03-24-12-10-523). Internal components from a stab mixer were also positive for *S. Typhimurium* PT 9 (MLVA 03-24-12-10-523). Both items were suspected to have been contaminated by eggs.

Tasmania

There was one outbreak of foodborne or suspected foodborne illness reported in Tasmania in this quarter. The aetiological agent was identified as norovirus.

Description of outbreak

An outbreak was investigated in an aged care facility after 84 residents and 40 staff reported symptoms of gastroenteritis. The overall attack rate was estimated to be 37%. Six of 8 specimens collected had norovirus detected. Five people presented to a medical practitioner, and 1 person was hospitalised. The epidemiology suggested a point source outbreak with a large number of cases becoming ill on the same day and at around the same time. Foodborne transmission was suspected, but the vehicle for the outbreak could not be definitively determined.

Victoria

There were 8 outbreaks of foodborne or suspected foodborne illness reported in Victoria in this quarter. The aetiological agents identified were norovirus (for 2 outbreaks), *S. subsp.*

1:4,5,12:i:- *S. Typhimurium* and *Campylobacter* (for 1 outbreak each). In 3 outbreaks the aetiological agent was unknown.

Description of key outbreak

An outbreak associated with a catered work function was investigated. Symptoms of diarrhoea were reported in 14 of 200 attendees. Foods served included a variety of roasted meats, gravy, vegetables, dips, quiche and falafels. The workplace provided a list of attendees with details of who had been ill. A random sample of 25 attendees taken from both ill and well groups was interviewed and odds ratios were calculated for each of the food exposures. Illness was associated with consumption of 3 different types of roasted meats. Univariate analysis identified a statistically significant association between illness and those that consumed roast pork (OR 10.8, 95% CI 0.84 - 550.59, $P=0.026$) roast beef (OR undefined, 95% CI 1.2 - undefined, $p=0.037$), ham (OR undefined; Lower 95% CI 3.5 - undefined, $P=0.002$). The number of attendees interviewed was too small for stratified analysis to be conducted. Illness duration and symptom profile was consistent with *Clostridium perfringens* enterotoxin. Three faecal specimens were collected, albeit between 3 and 4 days after symptoms resolved. All three specimens tested negative for viral and bacterial pathogens, including *C. perfringens* enterotoxin.

Western Australia

There was 1 outbreak of foodborne or suspected foodborne illness reported in Western Australia (WA) in this quarter. The aetiological agent was identified as *S. Typhimurium*.

Description of outbreak

An outbreak was investigated in an after school care setting following notification of two cases of *S. Typhimurium* pulsed-field gel electrophoresis (PFGE) type 0001, MLVA 03-10-15-11-496. Both cases consumed raw cake mixture and became ill within 48 hours. No other food was shared between the cases. Eggs used in the cake mixture were from home hens. The manager of

the facility was advised not to use home hen eggs at the facility and not to offer students raw cake mixture to eat.

Multi-jurisdictional investigations

There were no multi-jurisdictional outbreak investigations in this quarter.

Cluster investigations

During this quarter, OzFoodNet sites conducted investigations into 7 clusters of infection for which no common food vehicle or source of infection could be identified. Aetiological agents that were able to be identified during the investigations included *S. Typhimurium* (for 4 clusters), and *S. Bovismorbificans*, *Salmonella* subsp I, and *S. Saintpaul* (for 1 cluster each).

Comments

OzFoodNet has performed enhanced surveillance on all notified cases of invasive listeriosis nationally since 2010 through its National Enhanced Listeriosis Surveillance System (NELSS). All *Listeria monocytogenes* isolates from these cases were subtyped using PFGE performed at the Microbiological Diagnostic Unit Public Health Laboratory (MDU) in Melbourne, Victoria. PFGE is a slow, technically demanding and resource intensive process,² so several less discriminatory but rapid subtyping methods (binary typing, molecular serotyping and MLVA) were performed at MDU and other enteric reference laboratories to assist with rapid cluster detection. At the start of this quarter, MDU and OzFoodNet began routinely performing whole genome sequencing in parallel with PFGE for subtyping and reporting of invasive listeriosis cases in Australia.

The Implementation Subcommittee for Food Regulation (ISFR) *Principles for the Inspection of Food Businesses* were endorsed by ISFR committee members this quarter. The document provides principles for the guidance of the inspection of food businesses. "Inspection of food premises is

an important activity to assess compliance with the *Australia New Zealand Food Standards Code* (the Code) and food act provisions.³

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OzFoodNet contributors to this report include (*in alphabetical order*): Brett Archer (NSW), Robert Bell (Qld), Barry Combs (WA), Jane de Garis (Central), Anthony Draper (NT), Marion Easton (Vic.), James Flint (NSW-Hunter New England), Laura Ford (ACT), Neil Franklin (NSW), Michelle Green (Tas.), Jodie Halliday (SA), Kirsty Hope (NSW), Joy Gregory (Vic.), Robyn Leader (Central), Megge Miller (SA), Cameron Moffatt (ACT), Nevada Pingault (WA), Ben Polkinghorne (Central), and Russell Stafford (Qld).

Correspondence

Dr Ben Polkinghorne, Office of Health Protection, Australian Government Department of Health, GPO Box 9848, MDP 14, CANBERRA ACT 2601. Telephone: +61 2 6289 1831. Email: ozfoodnet@health.gov.au.

Appendix 1: Outbreaks of foodborne or suspected foodborne disease reported by OzFoodNet sites, 1 July to 30 September 2015 (n=29)

State or Territory	Month*	Setting Prepared	Agent responsible	No. affected †	No. lab confirmed	No. hospitalised†	Evidence	Responsible vehicles
ACT	Jul	Private residence	S. Typhimurium PT 9	3	2	1	D	Smoothie containing raw egg
NSW	Jul	Restaurant	Unknown	10	0	0	D	Unknown
NSW	Jul	Take-away	Unknown	9	0	0	D	Unknown
NSW	Aug	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Aug	Restaurant	Unknown	3	0	0	D	Unknown
NSW	Aug	Restaurant	Unknown	3	0	0	D	Unknown
NSW	Sep	Restaurant	Unknown	29	0	0	D	Unknown
NSW	Sep	Take-away	S. Typhimurium MLVA 03-16-09-11-523	12	12	9	M	Vietnamese pork rolls
NSW	Sep	Private residence	Ciguatera fish poisoning	4	0	0	M	Red throat emperor and purple rock cod
NSW	Sep	Restaurant	Unknown	5	0	0	D	Unknown
NSW	Sep	Restaurant	S. Typhimurium MLVA 03-12-11-14-523	40	11	0	M	Fried ice cream
NSW	Aug	Bakery	Norovirus	18	1	1	D	Unknown
NT	Aug	Fair, festival, other temporary/mobile service	S. Typhimurium PT 168a	4	3	0	D	Unknown
NT	Aug	Restaurant	Unknown	3	0	0	D	Aioli
NT	Aug	Institution (overseas)	Campylobacter	19	19	19	D	Unknown
Qld	Aug	Aged Care Facility	S. Typhimurium MLVA 03-17-09-11-523	22	8	2	D	Unknown
Qld	Sep	Restaurant	S. Typhimurium MLVA 03-17-09-11-523 (41) & MLVA 03-16-09-11-523 (1)	76	42	16	M	Aioli and mayonnaise-based sauces
SA	Jul	Take-away	S. Typhimurium PT 9, MLVA 03-24-11-10-523	5	2	0	D	Egg based crêpes

State or Territory	Month*	Setting Prepared	Agent responsible	No. affected †	No. lab confirmed	No. hospitalised†	Evidence	Responsible vehicles
SA	Jul	Hospital	S. Typhimurium PT 9, MLVA 03-24-12-10-523	37	16	6	M	Egg based crumb and contaminated stab mixer
Tas.	Aug	Aged Care Facility	Norovirus	124	6	1	D	Unknown
Vic.	Jul	Restaurant	S. Typhimurium PT 170/108, MLVA 03-09-09-15-525	133	55	22	AM	Mayonnaise containing raw egg
Vic.	Jul	Aged Care Facility	Unknown	9	0	0	D	Unknown
Vic.	Jul	Commercial caterer	Unknown	14	0	0	A	Roast meats
Vic.	Sep	Restaurant	Unknown	8	3	0	D	Unknown
Vic.	Aug	School	Campylobacter	8	3	0	D	Unknown
Vic.	Sep	Commercial caterer	Norovirus	40	3	0	A	Any food from a platter
Vic.	Sep	Restaurant	Norovirus	9	2	0	A	Salad – young leaves with house dressing
Vic.	Sep	Private residence	Salmonella subsp. 1:4,5,12:i:- PT 9, MLVA 03-10-14-11-496	5	5	1	D	Raw chocolate chip cookie dough containing eggs
WA	Aug	Child care centre	S. Typhimurium PFGE 0001, MLVA 03-10-15-11-496	2	2	0	D	Cake mix containing raw eggs
Total				658	195	78		

* Month of outbreak is the month of onset of the first case or month of notification of the first case or month the investigation of the outbreak commenced

† The number of people affected and hospitalised relate to the findings of the outbreak investigation at the time of writing and not necessarily in the month specified or in this quarter. The number of people affected does not necessarily equal the number of laboratory-confirmed cases.

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 aetiological agent in the suspected vehicle and cases

MLVA Multi-locus variable number tandem repeat analysis

PFGE Pulsed-field gel electrophoresis

PT Phage type

References

1. Gole VC, Caraguel CG, Sexton M, Fowler C, Chousalkar KK. Shedding of Salmonella in single age caged commercial layer flock at an early stage of lay. *Int J Food Microbiol* 2014;189:61-66.
2. Kwong, J.C. *et al.* (2016) Prospective whole-genome sequencing enhances national surveillance of *Listeria monocytogenes*. *J. Clin. Microbiol.* 54, 333-342.
3. Implementation Subcommittee for Food Regulation (ISFR) (2015) *Principles for the inspection of food businesses*. Viewed online 23 June 2017 < <http://foodregulation.gov.au/internet/fr/publishing.nsf/Content/publication-Principles-for-Inspection-of-Food-Business>>

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