Quarterly reports

OzFoodNet quarterly report, 1 April to 30 June 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 April to 30 June 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 2nd quarter of 2009, OzFoodNet sites reported 244 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 4,166 people, of whom 140 were hospitalised. There were 20 deaths reported during these outbreaks. The majority of outbreaks (64%, n=157) were due to person-to-person transmission (Table 1).

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

Transmission mode	Number of outbreaks	Per cent of total
Foodborne	27	11
Person-to-person	157	64
Salmonella cluster	5	2
Unknown – other pathogen cluster	3	1
Unknown	52	21
Total	244	100

Foodborne disease outbreaks

There were 27 outbreaks during this quarter where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table 2). These outbreaks affected 419 people and resulted in 68 hospitalisations. There were 2 reported deaths during these outbreaks. This compares with 25 outbreaks for the 2nd quarter of 2008 and 43 foodborne outbreaks for the 1st quarter of 2009.

Salmonella was responsible for 12 outbreaks during this quarter, with *S*. Typhimurium being the most common serotype. There were 4 outbreaks due to *S*. Typhimurium phage type 170, and 1 each due to *S*. Typhimurium phage types 6, 29, 44, 135 and 135a. There was 1 outbreak of *S*. Typhimurium where phage typing was not reported and 1 outbreak each due to *S*. Litchfield and *S*. Virchow 34.

Of the remaining 15 outbreaks, two were due to foodborne toxins, including 1 *Clostridium perfringens* outbreak and 1 histamine poisoning outbreak associated with a fish meal. There were 3 outbreaks due to norovirus and 1 outbreak of hepatitis A infection. One outbreak was due to waxy esters in Escolar fish. The remaining 8 outbreaks were of unknown aetiology.

Ten outbreaks (37%) reported in this quarter were associated with food prepared in restaurants, four (15%) were associated with aged care facilities and two (7%) with bakeries and commercial caterers. Individual outbreaks were associated with primary produce, or food prepared at a fair or festival, a takeaway and a community event. Five outbreaks (21%) were associated with other settings.

To investigate these outbreaks, sites conducted 5 cohort studies, 2 case control studies, and collected descriptive case series data for 20 investigations. As evidence for the implicated food vehicle or foodborne transmission, investigators obtained microbiological evidence in 3 outbreaks, analytical epidemiological evidence in 2 outbreaks, and both analytical epidemiological and microbiological evidence in 2 outbreaks. Descriptive evidence only was obtained in 20 outbreaks.

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

State or territory	Month of outbreak	Setting prepared	Agent	Number affected	Hospitalised	Evidence	Responsible vehicles
ACT	May	Contaminated primary produce	Waxy esters	3	0	D	Escolar fish
NSW	April	Aged care facility	*C. perfringens*	16	2	M	Unknown
	April	Restaurant	Unknown	5	0	D	Possible lasagne, chicken Caesar salad
	April	Other	Unknown	7	0	D	Unknown
	April	Restaurant	Norovirus	16	1	D	Unknown
	April†	Fair, festival, other temporary/mobile service	*S.* Typhimurium 170	8	2	D	Raw egg sauces
	June	Restaurant	Unknown	15	2	D	Unknown
	March	Bakery	*S.* Virchow 34	10	3	M	Suspected pork rolls
	March	Bakery	*S.* Typhimurium 170	8	1	D	Suspected chicken/pork rolls
	May	Other	Unknown	15	0	D	Unknown
	May	Restaurant	*S.* Typhimurium 29	3	1	D	Unknown
	May	Other	Unknown	4	1	D	Mixed sandwiches
Qld	April†	Restaurant	*S.* Typhimurium 170	3	0	D	Unknown
	May	Other	Histamine poisoning	6	0	M	Tuna
	May	Takeaway	Unknown	2	0	D	Prawn roll
	May	Restaurant	Norovirus	17	1	D	Unknown
SA	April	Commercial caterer	*S.* Typhimurium 44	8	0	AM	Aioli
	May	Restaurant	*S.* Typhimurium 135	10	0	A	Fried ice cream
Vic	April	Aged care facility	*S.* Typhimurium 170	12	0	D	Unknown
	April	Restaurant	Unknown	6	0	D	Unknown
	May	Aged care facility	Unknown	7	0	D	Unknown
	May	Aged care facility	Norovirus	17	1	D	Unknown
WA	June	Restaurant	*S.* Typhimurium 135a	7	1	D	Unknown
	May	Restaurant	*S.* Typhimurium	8	2	D	Unknown
	May	Commercial caterer	*S.* Typhimurium 6	5	0	D	Unknown
Multi-jurisdictional	April	Contaminated primary produce	Hepatitis A	125	50	AM	Semi-dried tomatoes
	June	Other	*S.* Litchfield	76	0	A	Suspected barramundi

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.

* No foodborne outbreaks were reported by Tasmania during the quarter.

† These outbreaks were part of the multi-jurisdictional investigation into *S.* Typhimurium 170/108.

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

Australian Capital Territory

There was 1 small outbreak of escolar-induced keriorrhoea (oily diarrhoea due to consumption of waxy esters) in the Australian Capital Territory during the quarter. Eighteen hours after eating a home prepared fish meal, 2 adults and an infant experienced keriorrhoea, abdominal pain and nausea that lasted for 3 days. The fish was being sold as 'deep sea cod/escolar', which a local fishmonger had purchased from the Sydney fish markets.

New South Wales

New South Wales reported 11 foodborne or suspected foodborne disease outbreaks in the 2nd quarter of 2009, with four of these being due to *Salmonella*.

In the first of the *Salmonella* outbreaks, there were 4 notifications of *S*. Typhimurium multi-locus variable number of tandem repeats analysis (MLVA) 3-11-10-8-523, three of whom were employees at the same restaurant and 1 restaurant patron. Cases onsets occurred over 3 weeks. Person-to-person transmission was suspected as the cause of the 3 restaurant workers becoming ill.

An outbreak of *S*. Typhimurium 170, MLVA 3-9-7-13-532 affected 8 cases that were linked to a single Vietnamese bakery. Chicken and pork rolls were identified as the likely source of infection, but ingredients and environmental swabs tested negative for *Salmonella*. In a 2nd outbreak associated with a Vietnamese bakery, 11 cases of *S*. Virchow were reported through routine surveillance. The age of cases ranged between seven and 82 years. The suspected vehicle was raw egg in the egg butter used in the pork rolls. The New South Wales Food Authority inspected the premises and collected food and environmental samples, all of which tested negative except for the swab of the sink, which was positive for *S*. Virchow 34. A trace back of eggs used at the bakery was conducted and eggs collected at the commercial supplier were tested, but no *Salmonella* was detected.

During a multi-jurisdictional outbreak investigation of *S*. Typhimurium 170/108, OzFoodNet Hunter New England interviewed 18 cases (MLVA type 3-9-7-12-523). Eight of these cases were associated with a point source outbreak. This investigation is detailed further in the section on multi-jurisdictional outbreak investigations.

The other foodborne investigations included an investigation of *C. perfringens* at an aged care facility with 16 residents affected, two of whom subsequently died, and an outbreak of norovirus that affected 20 out of 64 guests at a wedding reception, one of whom was hospitalised.

Northern Territory

During June, the Northern Territory was notified of cases of gastroenteritis occurring among participants of a charity car rally. Six cases were notified with *S*. Litchfield infection, which is a common serotype in northern parts of Australia. OzFoodNet coordinated an investigation into the outbreak, which is detailed in the section on multi-jurisdictional outbreaks.

Queensland

Four outbreaks of foodborne or suspected foodborne illness were investigated in Queensland during the 2nd quarter of 2009.

During a multi-jurisdictional outbreak investigation of *Salmonella* Typhimurium 170, 4 cases of *S*. Typhimurium 170 with the same MLVA profile (1-13-3-21-3) were interviewed. Three of these cases were associated with a point source outbreak detailed further in the section on multi-jurisdictional outbreak investigations.

Queensland Health investigated 6 cases of histamine poisoning among 3 families in May 2009. Each had consumed fish from the same 35 kg tuna caught in waters off the Sunshine Coast. Reported symptoms included diarrhoea, fever and headaches. Five thousand milligrams per kilo of histamine was detected in a 2 kg sample taken from the implicated fish, which was approximately 10 times that which is known to cause illness (500 mg/kg). The fish was subsequently removed from sale.

An outbreak of gastroenteritis due to norovirus affected 17 patrons and staff members of a Brisbane hotel following a lunch meal in May. Several food handlers were ill with gastroenteritis prior to the event and a cohort investigation was unable to identify a specific food vehicle.

Two people who consumed prawn sushi rolls from a Brisbane store in May became ill with vomiting, diarrhoea and stomach cramps 2 hours after consuming the meal. No specimens were tested and the aetiology was unknown.

South Australia

South Australia reported 3 outbreaks of foodborne or suspected foodborne disease in the second quarter of 2009, including one that was part of a multi-jurisdictional outbreak of hepatitis A.

The Communicable Disease Control Branch (CDCB) investigated an outbreak of 37 cases of locally acquired hepatitis A identified in South Australia between March and June 2009. A case control study found semi-dried tomatoes were significantly associated with illness. See further detail under the section on multi-jurisdictional outbreak investigations.

In April 2009, CDCB investigated a report of gastrointestinal illness among attendees at a catered event in Adelaide. Thirty out of approximately 200 attendees reported illness of which nine were confirmed as being infected with *S*. Typhimurium phage type 44. A cohort study found a significant association between consumption of aioli, made from raw eggs, and illness among attendees (RR 5.4 95% CI: 1.6,18.1). An environmental investigation detected *S*. Typhimurium 44 in the aioli, but all other samples tested (including eggs) were negative.

An outbreak of *S*. Typhimurium phage type 135 was investigated in May 2009 with eight of 9 cases interviewed eating fried ice cream at the same restaurant. An environmental investigation was undertaken and samples collected. All samples were negative for *Salmonella*. Fried ice cream was removed from the menu and advice provided regarding the use of pasteurised egg for fried ice cream batter.

Victoria

Victoria reported 5 outbreaks of foodborne or suspected foodborne disease during the quarter, including 1 outbreak that was part of the multi-jurisdictional outbreak of hepatitis A.

In April, 12 residents of an aged care facility became unwell with gastroenteritis. *S*. Typhimurium 170 was isolated from faecal specimens of 7 cases and *S*. Typhimurium 44 from 1 further case. The source of this outbreak was unclear, however case patients became ill over a 1 month period suggesting that there may have been low dose sporadic contamination of some foods due to inadequately cleaned kitchen surfaces and/or equipment.

The Communicable Diseases Control Unit (CDCU) was notified of an outbreak of vomiting and diarrhoea in a group of 8 people attending meetings in April. The chef at the hotel where the meetings were held reported leaving work early on the 2nd day of the meeting due to a diarrhoeal illness. The aetiology of the outbreak could not be confirmed as no stool specimens were collected.

Seven residents of an aged care facility became ill with diarrhoea on the same day in May. Roast beef prepared on the previous day was suspected as the cause of this outbreak. One faecal specimen was collected and *C. perfringens* enterotoxin was detected.

In May, an outbreak of gastroenteritis due to norovirus was reported in 2 staff members and 15 residents of an aged care facility. A food handler at the facility became ill and returned to work sooner than 48 hours after symptoms resolved. Following this, 8 residents and another staff member became ill on the same day, with a further 3 residents on the following day. This outbreak was likely to have commenced as a point source foodborne outbreak rather than person-to-person transmission. The 4 remaining cases were likely to have become ill through secondary person-to-person transmission.

Between early March and late May, 86 cases of hepatitis A were notified in Victorian residents. This investigation is detailed further in the section on multi-jurisdictional outbreak investigations.

Western Australia

There were 3 outbreaks of foodborne or suspected foodborne disease investigated in the 2nd quarter of 2009 in Western Australia.

In the 1st outbreak, 17 cases of *S*. Typhimurium pulsed field gel electrophoresis (PFGE) type 0003 cases (phage type 135) were notified from April to early June. Of these cases, eight reported eating or attending the same Chinese food outlet. The cases ate a range of food from the outlet including noodles, honey chicken, satay beef, chicken on a stick and omelettes. An environmental investigation found the premises to have satisfactory food preparation and hygiene practices. Food samples and swabs were negative for *Salmonella*. No common exposure could be identified for the 9 cases that had not eaten at the food outlet.

In the 2nd outbreak, 2 cases of *S*. Typhimurium PFGE type 0018 (phage type 6) were part of an extended family party of 10 who attended a catered mother's day lunch in May at a European community function centre. Three other members of this party were also ill. Food at the lunch was served as a buffet and included lamb, pasta, pork, chicken, salads and cakes. As there was no booking list other cases could not be identified. No further cases of this PFGE type were notified in June or July.

In the 3rd outbreak, 7 cases of *S*. Typhimurium PFGE 0200 notified between late May and late June were investigated. Five cases had attended a wedding reception in early May and 2 cases attended a christening in mid-May, all at the same function centre. An Italian buffet with similar foods was served at both functions. Foods eaten by cases at both functions included: prosciutto, pizza, ice cream, squid and food garnished with parsley and snow pea sprouts. An environmental investigation found that the premises had satisfactory food storage, preparation and hand hygiene practices. Food samples were negative for *Salmonella*.

Multi-jurisdictional outbreak investigations

Salmonella *Typhimurium 170/108*

A large increase in notifications of *S*. Typhimurium 170/108 in the first 3 months of 2009 triggered a multi-jurisdictional investigation in Queensland, New South Wales, Victoria and the Australian Capital Territory during April 2009. The Microbiological Diagnostic Unit at the University of Melbourne developed an outbreak case definition based on 3 main outbreak strains of interest, referred to as MLVA 1, MLVA 2 and MLVA 3. In total, there were in excess of 600 cases in this outbreak. During this investigation, 2 point source outbreaks were identified:

- OzFoodNet Hunter New England OzFoodNet investigators interviewed 18 cases with *S*. Typhimurium 170 MLVA 3, eight of whom attended a food festival in Sydney and consumed a common dessert. Raw eggs used in the dessert were suspected as a possible source, although no pathogens were detected during environmental investigations. The restaurant was warned about the use of raw eggs in ready-to-eat foods. A subsequent inspection found that the restaurant was using pasteurised eggs in all foods containing raw eggs.
- Queensland identified 4 cases of *S*. Typhimurium 170 MLVA 3 in April 2009. All of the cases were females from Brisbane aged between 26 and 49 years. Three of the 4 cases had consumed different meals from the same Brisbane hotel during the same week. An environmental health inspection was undertaken, which identified the use of raw eggs during the preparation of large quantities of mayonnaise (10 litre containers). This was subsequently used as a base for a variety of other sauces and recipes which had no further cooking steps. Trace back identified that eggs used within the hotel were sourced both from Queensland and New South Wales companies. Visibly dirty eggs were observed in the hotel kitchen. The hotel managers were advised to cease using soiled eggs during the preparation of meals. Egg and mayonnaise samples collected from the premises tested negative for bacterial pathogens.

Locally-acquired hepatitis A

State and territory health departments participated in a multi-jurisdictional outbreak investigation of hepatitis A associated with semi-dried tomatoes during the 2nd quarter of 2009. All jurisdictions were asked to interview all cases of hepatitis A to determine if they had travelled and to administer hypothesis generating questionnaires. Increases in locally acquired hepatitis A cases were identified in Victoria, Queensland, South Australia and Western Australia.

Between 1 March and 27 May, 86 cases of hepatitis A were notified in Victorian residents. The majority of these cases (n=74) reported none of the usual risk factors for hepatitis A. In Queensland, a total of 72% (13/18) of cases notified between April and June 2009 were locally-acquired. Seven Queensland cases recalled consuming loose semi-dried tomatoes purchased from various delicatessens prior to illness. South Australia reported 37 locally-acquired cases between March and June 2009.

South Australia, conducted a case control study examining various risk factors for locally-acquired disease, which found semi-dried tomatoes were significantly associated with illness (OR 5.7, 95% CI: 1.5, 21.9). Trace back investigations conducted by South Australia identified a single company distributing the majority of product within the State. The distributor conducted a voluntary recall of potentially affected semi-dried tomatoes.

A multi-state case control study of cases from Victoria (34), Queensland (8) and New South Wales (2) confirmed the association between hepatitis A and semi-dried tomatoes (OR=3.6, 95% CI 1.6,8.3). The 2 New South Wales cases had exposures in Victoria during their incubation period. Trace back for semi-dried tomatoes was complicated and no specific source could be identified. Genotyping of hepatitis A confirmed that locally-acquired infections were part of an outbreak. Samples of semi-dried tomatoes were sent to an overseas laboratory for testing for hepatitis A by polymerase chain reaction-based tests. Hepatitis A genomic material was detected in some samples, but results were difficult to interpret. As a further precaution the South Australia and Victorian Health Departments issued a public health warning advising the public to avoid eating specified semi-dried tomatoes.

As part of the multi-state investigation, Western Australia investigated a cluster of 7 locally-acquired cases of hepatitis A. One of the cases was found to

have the outbreak genotype strain associated with the multi-state outbreak linked to semi-dried tomatoes. Five of the other cases were from 1 regional area of Western Australia, and genetic sequencing of hepatitis A virus from three of these cases showed that they had the same genetic strain as each other, which was different from the outbreak strain associated with semi-dried tomatoes. Four of the 5 cases reported that they had eaten frozen berries during the incubation period. Frozen raspberries were sampled from the home of 1 case and were positive for hepatitis A genomic material. Trace back could not identify a common supplier for frozen berries consumed by the cases.

Cases of hepatitis A declined nationally in June 2009 leading to the national investigation being closed. Since that time, case numbers increased markedly in the State of Victoria with some cases occurring in other jurisdictions, resulting in a re-opening of the investigation.

Salmonella Litchfield outbreak associated with a car rally

In June, the Northern Territory was informed of illness occurring during a charity car rally travelling through Queensland and the Northern Territory. OzFoodNet coordinated a multi-jurisdictional investigation to identify the cause of the outbreak. The investigation team contacted 286 participants by email inviting them to fill in an online survey. In total, 43% (76/176) of responses were ill with gastroenteritis, including 6 people who were notified with *S*. Litchfield. A variety of foods and meals were associated with illness, with barramundi having the highest relative risk for illness, although a source of illness was not definitively identified.

Cluster investigations

During the 2nd quarter of 2009, 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 of infection is not obvious. The majority of these investigations involved *Salmonella* serotypes, including Singapore, Wangata, Typhimurium phage type 170 and Typhimurium PFGE type 0039 (not phage typed).

Comments

During the quarter, there were 3 multi-jurisdictional investigations of foodborne disease. The investigation of *S*. Typhimurium 170/108 was carried over from the previous quarter and was suspected to be largely due to eggs, which are a consistent cause of *Salmonella* outbreaks in Australia.[1]

During this quarter, OzFoodNet coordinated a multi-jurisdictional investigation into an outbreak of hepatitis A infection linked to consumption of semi-dried tomatoes. The investigation relied on cooperation between the jurisdictions in the investigation of cases and provision of public warnings, however trace back was complex and a recall of affected food could only be enacted in one jurisdiction where the supply chain was clear. The source of contamination for the affected products remains unclear. Produce items are frequently implicated as vehicles of gastroenteritis outbreaks in Australia.[1] This is the first hepatitis A outbreak associated with fruits and vegetables in Australia, although these foods have been associated with outbreaks overseas.[2,3] The investigation was complex due to the long incubation period for hepatitis A making it difficult for cases to recall specific exposures.

The 2 outbreaks of salmonellosis associated with pork and chicken rolls from Vietnamese bakeries are a concern. Bakeries producing these foods use several ingredients, including raw eggs, chicken, pork and liver, which may be high risk for *Salmonella*. Vietnamese rolls have been responsible for some of Australia's largest and most severe foodborne outbreaks.[4] Health departments and food authorities have developed specific programs to improve food safety in these food premises over the last 10 years. The regular occurrence of these outbreaks highlights the need for continued work with bakery proprietors.

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