Quarterly reports

OzFoodNet quarterly report, 1 October to 31 December 2006

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 investigation of outbreaks of gastrointestinal illness and clusters of disease potentially related to food occurring in Australia from 1 October to 31 December 2006.

Data were received from OzFoodNet representatives in all Australian states and territories and a sentinel site in the Hunter/New England region of New South Wales. The data in this report are provisional and subject to change, as the results of outbreak investigations can take months to finalise.

During the fourth quarter of 2006, OzFoodNet sites reported 370 outbreaks of enteric illness, including those transmitted by contaminated food. Outbreaks of gastroenteritis are often not reported to health agencies or the reports are delayed, meaning that these figures significantly under-represent the true burden of these infections. In total, these outbreaks affected 7,955 people, of which 267 were hospitalised and 5 died. The majority (82%, n = 306) of outbreaks resulted from infections suspected to be spread by person-to-person transmission (Figure 1). Fifty-nine per cent of these outbreaks occurred in aged care facilities, 22% in hospitals, 10% in child-care centres and 8% in various other settings. Norovirus was identified as a cause of illness in 102 of the outbreaks in aged care facilities and was suspected in many more.

Foodborne disease outbreaks

There were 34 outbreaks during the fourth quarter of 2006 where consumption of contaminated food was suspected or confirmed as the primary mode of transmission (Table). These outbreaks affected 756 people and resulted in 75 people being admitted to hospital. There were no deaths. This compares with 36 outbreaks for the fourth quarter of 2005 and 23 outbreaks in the previous quarter of 2006.

Salmonella was responsible for 11 outbreaks during the quarter, with *Salmonella* Typhimurium being the most common serotype. *S.* Typhimurium 44 was responsible for 3 outbreaks, *S.* Typhimurium 170/108 and *S.* Typhimurium 197 were each responsible for 2 outbreaks, and 1 outbreak was caused by *S.* Typhimurium 9. Each of these *S.* Typhimurium outbreaks were either confirmed or suspected to be associated with eating eggs or dishes containing eggs. The other *Salmonella* serotypes causing outbreaks were *S.* Saintpaul, *S.* Bareilly, and *S.* Litchfield. Norovirus was responsible for 5 outbreaks, *Campylobacter* for 3 outbreaks and 1 outbreak was caused by *Vibrio cholerae* O1 Ogawa El Tor.

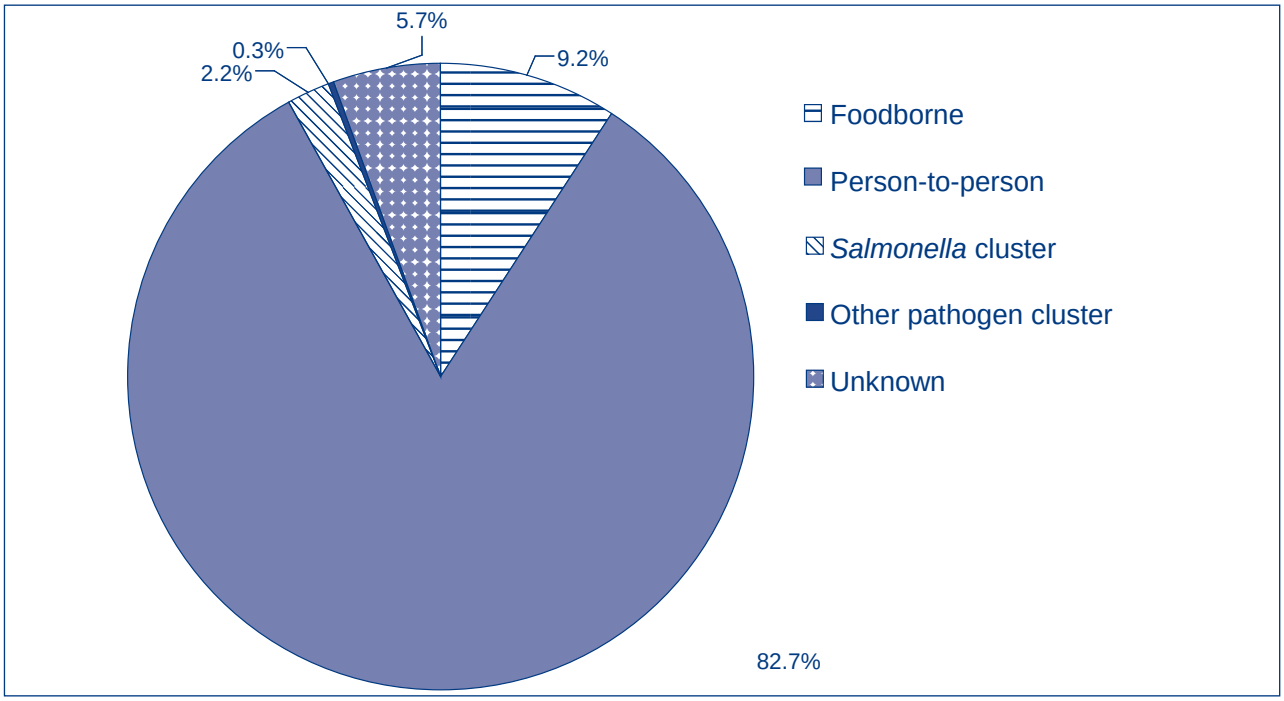
There were 5 toxin-related outbreaks during the quarter including *Clostridium perfringens* intoxication (2 outbreaks), ciguatera fish poisoning (2 outbreaks) and histamine poisoning (1 outbreak). One outbreak was suspected to be either *C. perfringens* or *Bacillus cereus* intoxication. The remaining 8 outbreaks were caused by unknown aetiological agents.

Sixteen outbreaks reported in the quarter were associated with food prepared by restaurants, 4 from contaminated primary produce, 3 with food prepared in private residences, 3 by commercial caterers, and 2 in aged care facilities. Single outbreaks were associated with food prepared by a bakery, institution, takeaway outlet, at a camp and a community-wide event. There was 1 outbreak where the food preparation setting was unknown, as multiple foods could have caused the outbreak.

To investigate these outbreaks, sites conducted 13 cohort studies and 6 case control studies, and collected descriptive data for 14 outbreaks. There was 1 outbreak where no individual patient data were available. Investigators obtained analytical epidemiological evidence in 6 outbreaks, microbiological with analytical epidemiological evidence in 7 outbreaks and microbiological evidence in 1 outbreak. For the remaining 20 outbreaks, investigators obtained descriptive epidemiological evidence implicating the food vehicle or suggesting foodborne transmission.

New South Wales reported 12 outbreaks of foodborne illness during the quarter. The aetiological agent was identified in 5 of the outbreaks, suspected in

Figure 1. Mode of transmission for outbreaks of gastrointestinal illness reported by OzFoodNet sites, 1 October to 31 December 2006



another and not identified in the remaining 6 outbreaks. *Clostridium perfringens* caused gastroenteritis in 80 people after a meal that included roast pork prepared by a takeaway outlet. *C. perfringens* (enterotoxin A) was isolated from stool samples and various leftover food but elevated results from samples of the roast pork suggested that it was the cause of the outbreak.

Vibrio cholerae O1 Ogawa El Tor was responsible for illness among 3 Italian women. The women ate raw whitebait fish imported from Indonesia while preparing a meal.

Campylobacter was responsible for illness among 3 residents of an aged care facility and thought to be due to undercooked chicken.

Salmonella Typhimurium 170/108 affected 47 people attending a hotel management training school. Laboratory and epidemiological evidence indicate that the use of raw egg in a white chocolate mousse was the cause of this outbreak.

The Australian Capital Territory reported 2 outbreaks of foodborne illness during the quarter. Eggs were identified as the cause of an outbreak of *Salmonella* Typhimurium 44 that affected 4 people. All cases ate free-range eggs purchased from a supermarket. One case was able to provide a brand name and these eggs came from a farm in New South Wales. The Australian Capital Territory also reported an outbreak of *S.* Typhimurium 170/108 that affected 13 people who had eaten meals dressed with a home-made mayonnaise containing raw egg. The farm that supplied the eggs was in New South Wales and an on-farm environmental sampling was positive for *S.* Typhimurium 170/108.

Victoria reported 7 outbreaks of foodborne illness during the quarter. Norovirus affected 57 patrons and staff during outbreaks associated with 3 restaurants where ill food handlers were the possible source.

Ten people were infected with *S.* Typhimurium 44 after eating a hazelnut gateau cake made with raw egg mousse filling. No other foods were consumed at the event and a sample of leftover cake was positive for *S.* Typhimurium 44.

During the quarter, Victoria experienced a community-wide outbreak of *S.* Typhimurium 44 suspected to be caused by contaminated eggs (Figure 2).

Clostridium perfringens was identified as the agent responsible for illness among 20 residents of an aged care facility but the source was unable to be identified.

Queensland reported 7 outbreaks of foodborne disease during the quarter. A cluster of 7 cases of *S.* Typhimurium 197 was identified in Queensland around December. All cases had eaten at a local restaurant but no common food vehicle could be identified from the epidemiological investigation. *Salmonella* was not detected in any of the food samples or environmental swabs taken at the restaurant. In a similar incident, another restaurant was linked to an outbreak of *S.* Typhimurium 197 among per-

Table. Outbreaks of foodborne disease reported by OzFoodNet sites,* October to December 2006

State	Month of outbreak	Setting prepared	Infection	Number affected	Evidence	Responsible vehicles
Multi-state	October	Contaminated primary produce	*Salmonella* Saintpaul	79	AM	Rockmelon
	November	Contaminated primary produce	*Salmonella* Litchfield	17	AM	Paw paw
ACT	November	Home	*Salmonella* Typhimurium 44	4	D	Eggs – free-range
	December	Restaurant	*Salmonella* Typhimurium 170/108	13	M	Eggs – free-range
NSW	October	Restaurant	Histamine poisoning	6	D	Yellowtail king fish fillets
		Restaurant	Unknown	5	D	Unknown
	November	Aged care facility	*Campylobacter*	3	AM	Undercooked chicken
		Institution	*Salmonella* Typhimurium 170/108	47	AM	Eggs – white chocolate mousse
		Commercial caterer	Suspected *Bacillus cereus* or *Clostridium perfringens*	14	A	Cooked chicken
		Restaurant	Unknown	15	D	Sandwiches
		Restaurant	Unknown	7	D	Banquet
		Home	*Vibrio cholerae* O1 Ogawa El Tor	3	D	Whitebait
	December	Takeaway	*Clostridium perfringens*	80	AM	Roast pork
		Restaurant	Unknown	24	D	Various Indian dishes – rice, beef madras, butter chicken, lamb rogan josh, veg curry
		Restaurant	Unknown	5	A	Unknown
		Commercial caterer	Unknown	25	D	Unknown
Qld	October	Contaminated primary produce	Ciguatoxin	4	D	Black kingfish
	November	Camp	*Campylobacter*	46	A	On-site water tank
	December	Restaurant	Norovirus	122	A	Chicken pesto & black forest stack
		Restaurant	*Salmonella* Bareilly	4	D	Unknown
		Restaurant	*Salmonella* Typhimurium 197	17	D	Eggs – suspected
		Restaurant	*Salmonella* Typhimurium 197	7	D	Eggs – suspected
		Restaurant	Unknown	9	D	Unknown
SA	December	Commercial caterer	*Campylobacter*	5	A	Chicken dish
		Bakery	*Salmonella* Typhimurium 9	15	AM	Eggs via a bakery product
Vic	October	Restaurant	Norovirus	15	D	Unknown
	November	Contaminated primary produce	Ciguatoxin	2	D	Coral perch or coral trout
		Restaurant	Norovirus	29	D	Unknown
		Restaurant	Norovirus	13	D	Unknown
		Home	*Salmonella* Typhimurium 44	10	AM	Eggs – hazelnut gateau cake made with raw egg mousse filling
	December	Aged care facility	*Clostridium perfringens*	20	D	Unknown
		Community	*Salmonella* Typhimurium 44	43	D	Eggs – suspected
WA	October	Unknown	Unknown	19	D	Unknown
	November	Restaurant	Norovirus	29	A	Salad

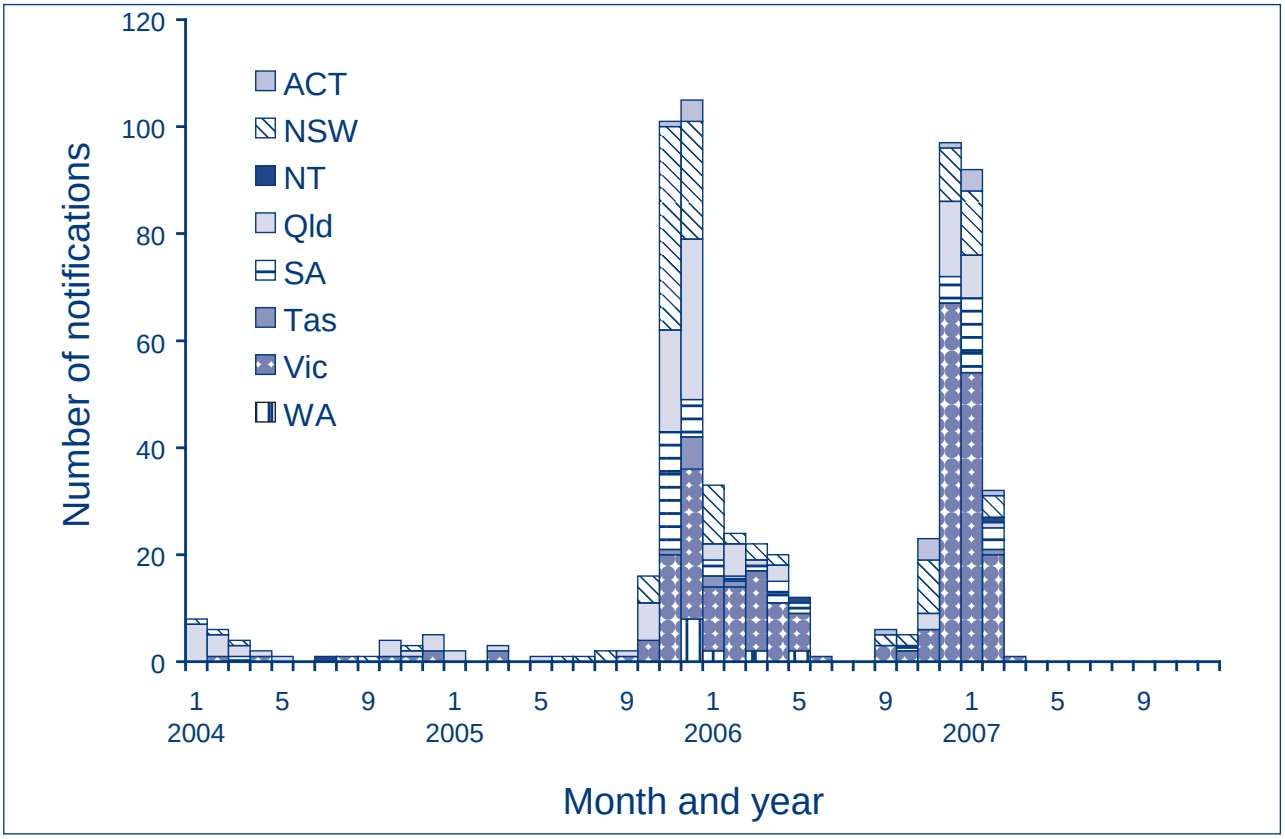
* No foodborne outbreaks were reported in the Northern Territory or Tasmania during the quarter.

D Descriptive evidence implicating the suspected vehicle or suggesting foodborne transmission.

A Analytical epidemiological association between illness and one or more foods.

M Microbiological confirmation of agent in the suspect vehicle and cases.

Figure 2. *Salmonella* Typhimurium 44 notifications to the National Notifiable Diseases Surveillance System, Australia, 2005 to date, by month of diagnosis and state or territory



Analysed as at 16 March 2007.

sons attending 3 separate work functions on different days during mid-December. In total, 17 cases of salmonellosis were related to this restaurant. Cohort studies were conducted on two of the three functions but no food items were significantly associated with illness. An environmental inspection identified very poor food hygiene standards within the restaurant and it was closed until correction of these deficiencies. Based on the ecology of this phage type in Queensland, a traceback investigation of chicken and egg sources was conducted. Consequently, a strain of *S.* Typhimurium 197, which was not indistinguishable from those infecting cases, was detected from environmental samples taken at the egg farm.

Approximately 31% (122/400) of guests at a function at a Queensland coastal resort were ill in early December. A retrospective cohort study indicated that consumption of the entrée chicken pesto fillets (OR = 14.9, 95%CI: 1.7 – 131.2, P = 0.002) and the black forest stack (OR = 2.9, 95%CI: 1.2 – 6.7, P = 0.01) were significantly associated with the illness. Stool samples from 71% (17/24) of those submitted were positive for norovirus.

Western Australia reported 2 outbreaks of foodborne illness during the quarter. An outbreak of gastrointestinal illness was investigated among a group of people (19 cases) who were searching for a missing person in the bush near Perth. It is likely that a component of the meal provided for lunch caused the outbreak, however samples of this food were negative for common disease causing bacteria and toxins.

In November, an outbreak of norovirus affected 29 people attending events at a farm on 2 consecutive days. The food vehicle was a lettuce salad prepared by the family who owned the venue, 5 of whom had gastroenteritis in the preceding week and 3 were confirmed with norovirus infection.

South Australia reported 2 outbreaks during the quarter. Fifteen people infected with *Salmonella* Typhimurium 9 were notified during December 2006. Initial investigation identified 5 people that had consumed products from a bakery. A case control study showed that illness was strongly associated with eating at a bakery (OR = 42 95%CI:3.9 – 1065.4, p = 0.00009). Microbiological investigations found *S.* Typhimurium 9 on the outside of the eggs stored in the bakery and on several on-farm environmental

samples (the water and feeder, other environmental swabs, and a number of eggs). Cross contamination of multiple bakery products with *S.* Typhimurium 9 from the surface of eggs was suspected as the cause of this outbreak.

Campylobacter affected 5 people who had attended a private party and eaten food provided by a commercial caterer. A cohort study showed that a chicken dish was associated with the illness. Four of the 5 cases had eaten this dish but none had been consumed by the other remaining well party goers.

The Northern Territory and Tasmania did not report any foodborne outbreaks occurring in the fourth quarter of 2006.

Multi-state investigations

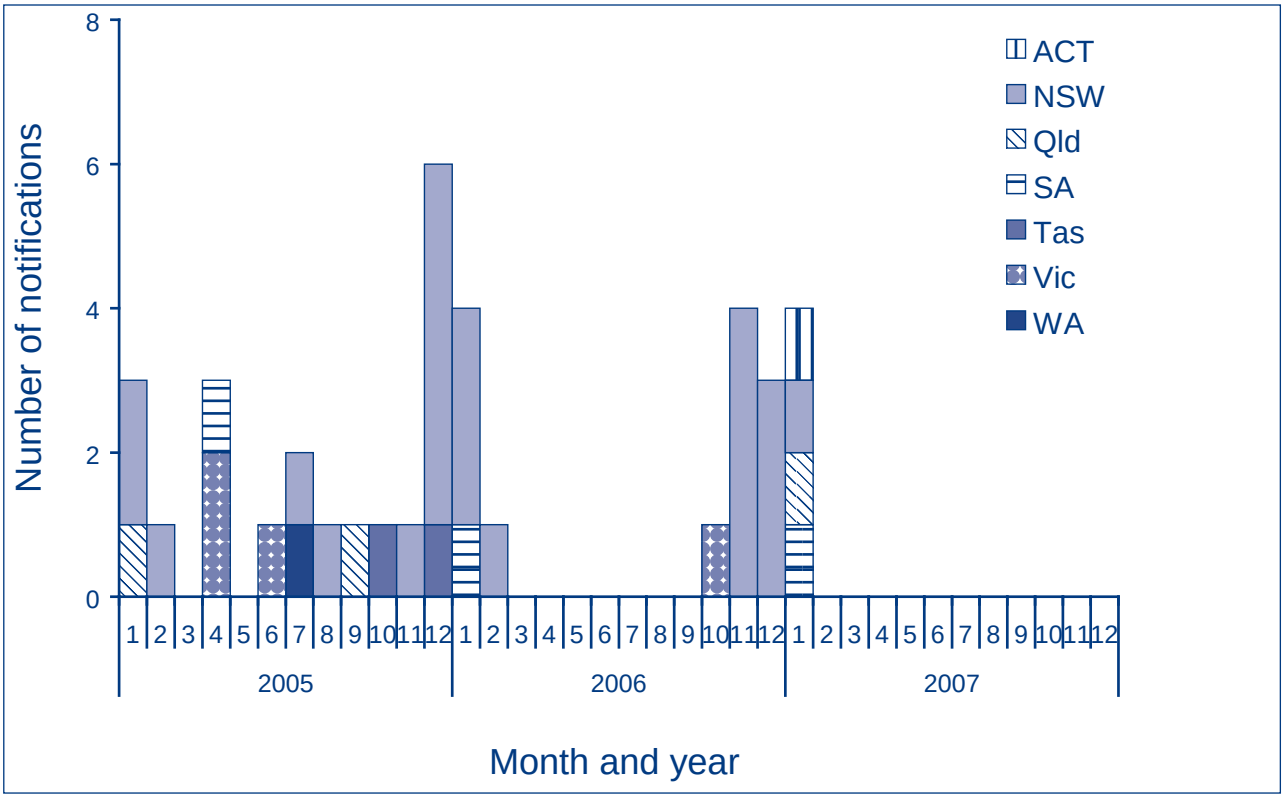
During the quarter there were 2 multi-state investigations of foodborne illness. OzFoodNet investigated a multi-state outbreak of *Salmonella* Saintpaul associated with contaminated rockmelon. Initial hypothesis generating interviews were conducted in New South Wales after routine surveillance detected an increase in notifications of *S.* Saintpaul infections. This process identified that 79% (11/14) of people had consumed rockmelon in the 7 days prior to onset of illness. Comparison data indicated that 28% of controls consumed rockmelon and watermelon in the 7 days prior to interview. The Australian Capital Territory and Victoria reported similar results from interviews with their cases. These findings prompted a case control study across the 3 jurisdictions which found that ill people were around 20 times more likely to have eaten rockmelon (OR 19.5, 95%CI:4.2 – 89.3, p value <0.001). *S.* Saintpaul was detected on rockmelon sold at retail and environmental sampling on farms detected a number of other *Salmonella* serotypes, though not *S.* Saintpaul.

Salmonella Litchfield was responsible for an outbreak in Western Australia and Queensland. A case-control study found an association between the consumption of paw paw and illness (OR = 32.8, 95%CI: 2.7–884, p value <0.01). Food sampling showed that paw paw sold in retail outlets in Perth was contaminated with *S.* Litchfield, however the source of the paw paw contamination on the farms was not found.

Cluster investigations

In late 2006, New South Wales reported an increase in haemolytic uraemic syndrome (HUS) and Shiga toxin-producing *E. coli* (STEC) notifications, with 7 HUS and 4 STEC notifications (Figure 3). Three HUS cases had STEC toxin detected in stool specimens collected after the initial clinical diagnosis.

Figure 3. Haemolytic uraemic syndrome notifications reported to the National Notifiable Diseases Surveillance System, Australia, 2003 to date, by month of diagnosis and state or territory



Two were *E. coli* O157 and one was *E. coli* O55. Causative pathogens were not identified for the other 5 cases, although each of the cases reported a history of bloody diarrhoea prior to onset of HUS symptoms. One case died, however the cause of death was attributed to their underlying medical condition. Cases were geographically dispersed throughout New South Wales. The median age of cases was 6 years (range 1–27 years), with males representing 56% of this cluster of cases. OzFoodNet staff in the Hunter/New England area conducted interviews of 8 HUS/STEC cases but the investigation was unable to identify specific food items, supermarkets or suppliers as the source of this outbreak.

New South Wales reported an increase in the number of notifications of patients with *Salmonella* Montevideo during November. The patients resided throughout the Sydney metropolitan area and the Hunter/New England Area. No clustering was identified among cases to date. The investigation is ongoing and new cases will be interviewed using a standard questionnaire in an attempt to identify common exposures.

Comments

Between October and December 2006, all outbreaks of *Salmonella* Typhimurium were suspected to be associated with dishes containing raw or undercooked eggs. This represented 24% (8/34) of all foodborne disease outbreaks during the quarter. Australia does not have S. Enteritidis in egg-laying flocks. S. Enteritidis can cause transovarian infections of chickens to eggs. However, *S.* Typhimurium has caused large outbreaks associated with eggs and the frequency of these outbreaks is a concern to public health agencies.[1,2] Food Standards Australia New Zealand has established a committee to develop a national primary production and processing standard for eggs (http://www.foodstandards.gov.au/thecode/primaryproductionprocessingstandards/).

The 2 multi-state outbreak investigations associated with contaminated primary produce highlight the role of fresh fruits and vegetables in causing foodborne disease outbreaks. Since fresh produce is often eaten without cooking, its outbreak potential is significant once it becomes contaminated. There are many potential points of contamination of fresh produce between the farm and the consumer's table. In the 2 outbreaks reported this quarter, investigations of farms producing rockmelons and paw paws revealed multiple *Salmonella* serotypes from a wide range of environmental samples. Of particular note, the water used to wash the produce during processing at each farm tested positive for various *Salmonella* serotypes. This highlights that any water used to wash or rinse fresh produce should be of potable quality. In each outbreak, the implicated fresh produce tested positive for the infectious agent causing the outbreak, although concentrations were thought to be low and contamination infrequent. This highlights the need for appropriate prevention messages for the public in order to render these products safe to consume. Recent outbreaks in the United States of America[3] further highlight the importance of fresh produce as a cause of human illness.

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