OzFoodNet—Enhancing Foodborne Disease Surveillance Across Australia

Third Quarter Summary, 2011
Queensland

July – September 2011
Overview of Quarter

This is the third quarterly report for 2011 from the Queensland foodborne disease surveillance site, one of eight sentinel sites around Australia which comprise OzFoodNet. This report summarises the surveillance activities and outbreak/cluster investigations conducted in Queensland between July and September 2011. Surveillance data is summarised for the following twelve pathogens or conditions: *Salmonella* spp, *Listeria monocytogenes*, *Campylobacter* spp, *Shigella* spp, *Yersinia enterocolitica*, Typhoid Fever, Paratyphoid Fever, Shiga toxin-producing *E. coli* (STEC), Haemolytic Uraemic Syndrome (HUS), Hepatitis A, Ciguatera, and *Clostridium botulinum*. The number of notifications reported for each condition was extracted from the Queensland Health Notifiable Conditions database by date of onset or if this was unknown, the earliest date of specimen collection or notification date between 1 July 2011 and 30 September 2011. Notifications from overseas residents who were diagnosed in Queensland are included in the total counts.

The following are key points from this report:

- During the July - September 2011 reporting period 1,751 cases of illness due to the twelve foodborne pathogens or conditions under surveillance were notified to Queensland Health. This compares with 1,687 cases notified for the corresponding period in 2010.

- There were 1,304 *Campylobacter* notifications during the quarter, an increase of 7.0% in comparison to the same reporting period in 2010 and 22.8% higher than the 5-year mean for this quarter (2006-2010).

- The number of notifications (400) of *Salmonella* received during the third quarter 2011 was comparable to the same period in 2010 (395) and 25.8% higher than the 5-year mean. There was one outbreak of salmonellosis identified during the quarter.

- There were four cases of Shiga toxin-producing *E. coli* (STEC) infection reported during this quarter. This compares with two cases of STEC notified during the same period in 2010 and a 5-year mean of seven cases.

- There was one case of invasive listeriosis reported during the quarter. *Listeria monocytogenes* serotype 4b binary gene type 255 was identified. No source of infection was identified.

- Eight cases of hepatitis A were reported during the reporting period with overseas travel reported by six cases. Person to person transmission from a known case who had acquired their infection overseas is suspected in one of the locally acquired cases. No source of infection was identified in the remaining case.
• There were 56 documented outbreaks of gastrointestinal illness in Queensland during the third quarter 2011 affecting at least 1,030 people. Foodborne transmission was identified in five of these outbreaks.

• An increase in Campylobacter infection that was identified in the second quarter 2011 in the Cairns and Townsville Health Service Districts continued into the third quarter. Campylobacter notifications began to decline in both health districts in week 39 (end of September) following extensive investigations by Safe Food Production Queensland and Queensland Health into the North Queensland chicken meat industry.

Incidence of Foodborne Disease

During the July to September 2011 reporting period 1,751 cases of illness due to the twelve foodborne pathogens or conditions under surveillance were notified to Queensland Health (Appendix: Table 1). This compares with 1,687 cases notified for the corresponding period in 2010. Campylobacter was the most frequently notified foodborne pathogen followed by Salmonella. Campylobacter notifications (1,304) for this period were 7.0% higher than the same period in 2010 and 22.8% higher than the 5-year mean for this quarter (2006-2010). The number of notifications of Salmonella (400) received during the third quarter of 2011 were comparable to the same period in 2010 (395) and 25.8% higher than the 5-year mean for this quarter. Together, these two pathogens contributed to 97.3% of the total foodborne illness notifications received during the third quarter (Appendix: Table 1). There was one outbreak of Campylobacter infection comprising five cases investigated during the reporting period. The elevated incidence in notified Campylobacter infections from the Cairns and Hinterland Health Service District (HSD) and the Townsville HSD that was reported in the previous quarterly report continued into the third quarter. There was one Salmonella outbreak reported during the quarter affecting 34 primary school students (17 were laboratory confirmed) who attended the same afterschool care group. Person to person transmission was suspected in this outbreak. Details on these investigations are provided in further sections of this report.

One case of invasive Listeria monocytogenes infection was notified during the third quarter (Appendix: Table 2). This compares with two cases notified during the same period in 2010 and a 5-year mean of two cases. The case was a 66 year old male who was hospitalised with diarrhoea, abdominal pain and fever. Listeria monocytogenes serotype 4b, binary gene type 255 (MLVA 03-16-12-05-03-05-15-00-18; MLST 1; PFGE 86:46:37) was isolated from both blood cultures and cerebrospinal fluid. The patient had a 20-year history of ulcerative colitis and had recently undergone major bowel surgery. The patient deceased following a post-operative CVA. A food history was unable to be obtained. This is likely to be a sporadic case of infection. There have been five other cases of invasive listeriosis reported in Queensland.
Four cases of shiga toxin-producing *E. coli* (STEC) infection were reported during the quarter compared with two cases notified in the same period in 2010 and a 5-year mean of seven cases. Three cases were identified with *E. coli* O157 infections and were PCR positive for stx1, stx2 eaeA and ehxA genes. The fourth case was identified with an *E. coli* O26 infection and was PCR positive for stx1, eaeA and ehxA genes. No source of infection was identified among the cases. All case infections appeared to be sporadic in nature; one case was an overseas acquired infection. No cases of HUS were reported during the quarter.

The first STEC (*E. coli* O157) case was notified in a 78 year old male who developed gastrointestinal symptoms whilst holidaying in Bali. The case was hospitalised and diagnosed upon return to Australia. The other three cases appeared to be locally acquired. The second STEC (*E. coli* O157) case was reported in a 17 year old male whose symptoms included bloody diarrhoea, vomiting and abdominal cramps. No source of infection was identified, however, potential risk factors included camping, consuming beef (mince, burgers, lasagne) and sprouts. The third STEC (*E. coli* O157) case was notified in a 23 year old male whose symptoms included bloody diarrhoea and abdominal pain. The case had travelled to North Queensland during his incubation period and had consumed various high risk foods including meat pizzas, beef and lamb mince burgers and sprouts. The type of sprouts eaten by both cases was unknown. The fourth STEC (*E. coli* O26) case was notified in a 19 year old male whose symptoms included bloody diarrhoea, fever and abdominal pain. The case required hospitalisation for three days. Consumption of beef mince, bacon, meat pizza, deli meat, sausages and raw produce were reported.

Eight cases of hepatitis A were reported during the quarter including five males and three females aged 2 – 61 years (median 32.5 years). Overseas travel prior to illness was reported among six of the 8 cases with reported destinations including India, Pakistan, Indonesia, Papua New Guinea and Africa. Person to person transmission was likely to have occurred in one case (35 year old female) who acquired the illness from her husband who had travelled to Papua New Guinea during his exposure period. The final case of hepatitis A was notified in a 61 year old female with chronic renal failure. No potential risk factors were identified.

Two cases of Typhoid Fever were reported during the quarter from the Brisbane Southside PHU and Gold Coast PHU areas. The cases were both male aged 34 and 29 years and both had travelled to India prior to infection. No Paratyphoid Fever cases were reported during the reporting period.
There were six cases of ciguatera fish poisoning reported during the third quarter 2011 from two separate household outbreaks, each involving three cases. Both outbreaks were due the consumption of privately caught reef fish (see next section).

**Foodborne Disease Outbreaks**

Five outbreaks of foodborne illness were investigated during the third quarter of 2011 which affected at least 53 people and resulted in two hospitalisations. The outbreaks occurred in a variety of settings including two private residences (Ciguatera), a hospital (Campylobacter), a restaurant (Clostridium perfringens) and a catered wedding reception (Staphylococcus aureus, Bacillus cereus) [Appendix: Table 3].

**Outbreak 1**

Three cases of ciguatera fish poisoning were notified to the Townsville PHU following the consumption of an unknown species of reef fish at their private residence on 2/7/2011. Two adults (33M, 33F) and a 3 year old male became ill with symptoms including numbness / tingling of skin, reversed temperature sensation, diarrhoea, joint and muscle pain within 24 hours following the meal (median incubation period was 9 hours). A one year old child also consumed a portion of fish but remained well. The fish was a private catch that was caught a number of months prior from a reef off the Burdekin coast and stored at home in a freezer. No left-over fish was available for testing.

**Outbreak 2**

Brisbane Southside PHU received a foodborne illness complaint from a member of the public following the consumption of a chicken curry meal that was purchased from a local restaurant on 17/7/2011. Three people from the same household became ill 8 to 14 hours after the meal with diarrhoea and stomach cramps. No vomiting was reported. Microbiological testing of left-over curry identified the presence of enterotoxin Type A Clostridium perfringens (1.5 x 10^5 orgs/g) and coagulase positive staphylococci (1.7 x 10^3 orgs/g). One faecal specimen that was collected during the investigation was positive for Type A Clostridium perfringens (cpe gene positive). Food preparation involved placing the cooked curry into six large plastic tubs (approximately four litres capacity each), which were held at room temperature for 30 – 45 minutes before being placed into a freezer. It was suspected that when these containers were placed together in the freezer, the tubs would form a large mass of hot curry that would cool slowly, allowing the proliferation of bacteria over time. No temperature monitoring was in place at the restaurant. An improvement notice was served on the food business to ensure regular temperature monitoring and to cease the process of bulk cooking, cooling and reheating of food.
Outbreak 3
Three adults including two males and one female aged 31 – 57 years were notified to the Townsville PHU with suspected ciguatera fish poisoning in August. The cases were among a group of six who had consumed Coral Trout and Barracuda that was privately caught off Cape York. The onset of symptoms, which included diarrhoea, abdominal cramps, numbness and tingling of extremities, reversed temperature sensation and joint pain, began between 24 and 48 hours after consumption of the fish. Samples of fish (Coral Trout and Barracuda) were collected and submitted for ciguatera toxin analysis. The Coral Trout was positive for three Pacific ciguatoxins -P-CTX-1 (1.53 µg/kg), P-CTX-2 (4.16 µg /kg), P-CTX-3 (2.9 µg /kg). Barracuda samples were negative.

Outbreak 4
Brisbane Southside PHU was alerted to a suspected foodborne outbreak among 115 guests who attended a catered wedding function held on Saturday 24 September 2011. The wedding was held in the Moreton Bay PHU area with food served at the reception prepared at a takeaway venue in the Logan PHU area. A retrospective cohort study was conducted as part of the investigation where clinical and food history information was obtained on 94 attendees. Thirty eight of those interviewed had experienced either vomiting and/or diarrhoea following the consumption of food at the reception or left-over food from the reception on subsequent days. The cases were aged 2 – 63 years (median 27 years) and included 19 males and 19 females. Onset dates of illness ranged between 24/9/2011 and 26/9/2011 with a median incubation period of five hours (range 2 – 38 hours) and a median duration of illness of one day.

The cohort study identified multiple foods served at the reception (fried rice, egg yu fung, chicken and mussels) that were associated with an increased risk of illness (Relative Risks 1.9 to 2.1). Left-over food was sampled and tested for microbial pathogens. High levels of coagulase positive staphylococci (7 x 10^4 cfu/g to >2.5 x 10^7 cfu/g), emetic & diarrhoeal strains of Bacillus cereus (3.4 x 10^3 cfu/g to >2.5 x 10^7 cfu/g) were detected in mixed samples of prawns, pork, corned beef, mussels, noodles, curry, rice, chicken, egg fu yung, taro and seafood salad samples. The Bacillus cereus strains detected in these food samples were positive for the following virulence factors: haemolysin bl (hbl), non-haemolytic enterotoxin (nhe), enterotoxin FM, enterotoxin T and cytotoxin K. The hbl, nhe and cytK proteins are considered the primary virulence factors in B. cereus diarrhoea. Two food samples also had strains of B. cereus present that were positive for the emetic toxin gene (em gene) that is associated with the emetic type of food poisoning. High levels of Clostridium perfringens (3.7 x 10^3 cfu/g to 7.8 x 10^3 cfu/g) were reported in both samples of fried rice. Staphylococcal enterotoxin was detected in samples of fried rice and chicken. Both samples of corned meat contained high levels of E. coli (760 cfu/g and 720 cfu/g).
Coagulase positive staphylococci was also detected on a chopping board that was used by the caterer. Five faecal specimens and one vomitus specimen from persons reporting illness were collected for microbiological analysis. All samples submitted had light to moderate growth of coagulase positive *staphylococci*. Staphylococcal enterotoxin was not detected in any of the clinical specimens. *No Bacillus cereus* was detected in any of the clinical specimens.

An environmental audit was conducted at the takeaway venue where the reception food was catered. Inappropriate timing of food preparation resulting in long holding times, inadequate food storage, inappropriate defrosting of food and lack of knowledge in safe food handling practice were major contributing factors in this outbreak that resulted in the proliferation and survival of pathogens.

**Outbreak 5**

*Campylobacter* was identified in five of six patients who experienced gastrointestinal illness within the same surgical and rehabilitation wards of a Brisbane hospital in September. The cases included five males and one female aged 25 to 76 years (median 65 years) who became ill between 11/9/2011 and 15/9/2011. Investigations failed to identify a vehicle of infection for this outbreak. Food samples including sausage, chicken and roast lamb were negative for bacterial pathogens. An environmental audit did not identify any food hygiene concerns in relation to the preparation of food.

**Non-foodborne Investigations**

There were 51 non-foodborne outbreaks affecting a total of 977 people reported during the third quarter of 2011. Forty-one outbreaks were suspected to have been due to person-to-person transmission while the remaining ten outbreaks were of unknown transmission. The majority of outbreaks occurred in aged care facilities (28), child care facilities (16) and schools (3), while additional outbreaks were reported from a hospital, a correctional facility, a football team and a wedding function. Norovirus was the confirmed aetiological agent in 16 (31%) outbreaks which affected at least 381 people and resulted in three hospitalisations. Rotavirus was detected in five outbreaks (94 cases, 6 hospitalisations).

A propagated outbreak of *Salmonella* Typhimurium with MLVA profile 03-09-07-12-524 occurred among attendees of a Brisbane afterschool care group in August 2011. Thirty-two children aged 5 – 10 years (median 6 years; 12 males, 20 females) and two female adults aged 30 and 59 were affected among 186 children who had attended the afterschool care group on any day during the outbreak period. *Salmonella* Typhimurium was laboratory confirmed in 17 of the 34 cases. Reported onset dates among the cases ranged between 19/7/2011 and 16/8/2011 (Figure 1) with one hospitalisation reported in a 59 year old female.
Investigations identified no common food vehicle or potential exposures other than attendance within the afterschool care group. Environmental swabs taken from toilets, taps and toys as well as water samples were negative for *Salmonella*. This outbreak is suspected to have been propagated through close physical contact between young children (i.e. holding hands to and from the toilet, hugging, etc), with the majority of cases (72%) reported among children who were in grades prep to grade 2. The initial source of *Salmonella* was unable to be determined. Three additional laboratory confirmed cases (not included in above counts) were also identified. Two of these cases were three year old siblings of children who attended the afterschool care group, while the third case was a seven year old male who was a student at the school, but did not attend the afterschool care group. No further cases were reported from the school community.

![Epi-curve of Cases Linked to Afterschool Care 15/7/2011 – 20/8/2011 (N=34)](image)

**Figure 1. Epi-curve of Cases Linked to Afterschool Care 15/7/2011 – 20/8/2011 (N=34)**

Eight of 13 members of an U16 rugby team developed gastrointestinal symptoms within 48 hours of playing a rugby game together on 31 July. Eight faecal specimens were positive for Norovirus genotype II. The father of one of the boys in the rugby team was ill with V&D on 31 July while distributing water to the team throughout the game. The father is believed to be the index case and the norovirus was probably spread to various players through contact with water bottles and drinking from the mouthpiece of the water bottles. The father who did not provide a specimen for analysis was also known to have been drinking from the water bottles.
Cluster Investigations

Queensland conducted two cluster investigations during the quarter. The first cluster included five notified cases of Salmonella Typhimurium (MLVA profile 03-09-07-12-524) infection that were reported with specimen collection dates between 27/6/2011 and 5/7/2011. All cases were males aged between 20 and 77 years (median 30 years) who resided in the Brisbane Southside PHU area. Three cases were interviewed; however no common exposures were identified among the cases.

The second cluster investigated during the quarter included eight cases of Salmonella Typhimurium (MLVA profile 03-09-07-16-524) that were notified between 11/8/2011 and 17/8/2011. The cases were aged between 11 and 61 years (median 29.5 years); 7/8 cases were females. Case interviews were conducted on six cases. Of these, onset dates of illness were reported between 7/8/2011 and 11/8/2011 with four of the cases hospitalised for more than two nights. Five cases had attended the same shopping centre prior to illness, with four of these cases reporting the consumption of food from the food court located within. No other common exposures or food items were identified during the investigation.

Increase in Pathogen

An increase in notified cases of Campylobacter infection was identified in the Cairns and Townsville Health Service Districts in the second quarter 2011. Notifications began to increase in late February with the number of reported cases well above the expected background levels (Figures 2 & 3). The elevated numbers continued throughout the second quarter. In contrast, the number of notified cases of Campylobacter in other jurisdictions in Queensland were not above expected levels based on historical data. During the second quarter 2011, a total of 160 cases of campylobacteriosis were notified from the Cairns and Hinterland District and 167 cases from the Townsville District. This compares with a 5-year mean of 58 and 65 cases respectively. Two case series investigations were conducted in February and May, however no common potential risk factors or exposures were identified among the cases other than a strong history of chicken consumption during their week before onset of illness.

The increase in notified cases continued into the third quarter 2011 with 170 cases notified from the Cairns and Hinterland District and 188 cases from the Townsville District during this period. These counts compare with a 5-year mean of 46 and 52 cases respectively for the third quarter. Safe Food Production Queensland (SFPQ) and Queensland Health have been involved in extensive follow-up of the chicken meat industry since notifications began to increase, including the investigation of a North Queensland abattoir and secondary processors in the supply chain. Campylobacter notifications began to increase in week 7 of
2011 (11/2/2011 – 19/2/2011) and have remained elevated through to the end of September (week 39). In contrast, the number of notified cases of *Campylobacter* in other regions in Queensland (Central & Southern) did not show a similar increasing trend and were not above expected levels when compared with historical data. Queensland Health surveillance data to the end of the third quarter 2011 shows that *Campylobacter* notifications for Cairns (n=466 cases) and Townsville (n=502 cases) were 191% and 164% above the 5-year mean for the same period.

Microbiological testing (using *FlaA* typing) of *Campylobacter* isolates from raw chicken samples from the North Queensland abattoir and human isolates from notified cases in Cairns and Townsville Health Districts is currently being undertaken to enable comparison of genotypes between human and non-human isolates. Results from this investigation to date have shown a considerable overlap of *Campylobacter* genotypes between human strains and those of chicken isolates from North Queensland. A laboratory report dated 11 August showed:

- 133/160 (83%) human isolates collected between weeks 21 & 29 (21/5/11 to 22/7/11) were typed as *fla* 1 & 2
- 53/57 (93%) chicken isolates collected over the same period were typed as *fla* 1 & 2
- there were 13 other *fla* types among the other 27 human isolates that were not found in chicken and there were 4 other *fla* types among chicken isolates not found in human cases.

This investigation has now been extended to incorporate microbiological testing of *Campylobacter* isolates from raw chicken meat sold at retail level in South East Queensland. The purpose of this study is to extend data collection to South East Queensland which will provide baseline information on the different subtypes and genotypes of *Campylobacter jejuni* / *C. coli* that are currently present on fresh retail chicken meat from three major chicken producers in Queensland.

A number of outcomes from this investigation were identified as likely major contributing factors leading to the increase in *Campylobacter* infection in North Queensland. Deficiencies in training, supervision, equipment/machinery, hygiene and processes at the abattoir were identified. The investigation also identified that contaminated chicken product (bile stained and viscerally contaminated product) from the abattoir was being distributed to other businesses for further processing before distribution to the retail market for human consumption, and records that indicated chlorine solutions (used in spin chillers to reduce bacterial load) were intermittently below recommended levels. The practice of selling viscerally contaminated chicken meat for further processing is not permitted under the Primary Production & Processing Standard for Poultry Meat in Australia (FSANZ). A number
of interventions at the abattoir were implemented following these investigations in early September which included disposing of any viscerally contaminated product detected after processing, the requirement to maintain tighter process and product controls, attention to maintenance of plant equipment and training of staff. Campylobacter notifications had begun to decline in both health districts from week 39 (end of September) (Figures 2 & 3).

Figure 2. Cairns & Hinterland HSD Campylobacter counts by week, 2010 and 2011 *
* 3rd Quarter 2011 runs from weeks 27 to 39

Figure 3. Townsville HSD Campylobacter counts by week, 2010 and 2011

Queensland Quarterly Summary, 3rd Quarter 2011
Site Activities

During the third quarter 2011, site activities in Queensland included the following:

- Conducted enhanced surveillance for detecting outbreaks of foodborne and other enteric pathogens.
- Maintain the Queensland gastrointestinal outbreak register which contributes data to the national enteric outbreak register.
- Participated in a multi-jurisdictional (Australia-wide) case series investigation of *Salmonella* Typhimurium phage type 193 infections.
- Investigated the travel history of cases with *S. Enteritidis* infections, *Shigella* infections and other enteric pathogens of interest notified during the quarter.
- Maintained non-human food surveillance registers including the ‘Notification of pathogens in foods’ and ‘Food Recall’ pathogens list.
- Documented and submitted the OzfoodNet 2nd Quarter 2011 Summary Report for the Queensland OzFoodNet site.
- Continuation of the STEC working group in Queensland to provide guidance on the diagnostic testing and public health management of shiga-toxin producing *E.coli* infections in Queensland.
- Participated as a member of the National OzFoodNet STEC/HUS Working Group which during this quarter involved contributing information to a national paper prepared for CDNA titled “Outbreak of STEC/HUS in Germany/Europe 2011: lessons learned from an Australian perspective”.
- Coordination of the review and improvement of the national enteric outbreak register and data dictionary.
- Participated as a member of the National *Listeria* Surveillance Working Group and provided a report to the WG members on the inaugural national *Lm* MLVA typing workshop.
- Presented at the Queensland Public Health Medical Officers face-to-face meeting in August: *Outbreak of STEC/HUS in Germany/Europe 2011 – Update on the German outbreak and NSW ‘think tank’, outcomes for consideration in Queensland.*
- Presented at the joint Australian Institute of Medical Scientists and New Zealand Institute of Medical Laboratory Science South Pacific Congress in August: *Two waterborne outbreaks of salmonellosis in drinking water in rural Queensland.*
- Presented at the Inaugural National *Listeria monocytogenes* MLVA Typing Workshop in September: *The relevance of Listeria monocytogenes MLVA typing to OzFoodNet.*
APPENDIX

Table 1. Number of notified cases of foodborne pathogens in Queensland, third quarter 2011 by date of specimen collection.

<table>
<thead>
<tr>
<th>Pathogen / Condition</th>
<th>2011 Jul</th>
<th>2011 Aug</th>
<th>2011 Sep</th>
<th>2011 YTD†</th>
<th>2011 Jul - Sep</th>
<th>2010 Jul - Sep</th>
<th>5 Year Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella</td>
<td>122</td>
<td>155</td>
<td>123</td>
<td>2182</td>
<td>400</td>
<td>395</td>
<td>318</td>
</tr>
<tr>
<td>Listeria – materno-foetal</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Listeria – other</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Campylobacter</td>
<td>431</td>
<td>451</td>
<td>422</td>
<td>3941</td>
<td>1304</td>
<td>1219</td>
<td>1062</td>
</tr>
<tr>
<td>Typhoid Fever</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Paratyphoid Fever</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Yersinia</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>33</td>
<td>5</td>
<td>24</td>
<td>17</td>
</tr>
<tr>
<td>Shigella</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>55</td>
<td>21</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>STEC</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>4</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>17</td>
<td>8</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Ciguatera</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Botulism</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>569</td>
<td>623</td>
<td>559</td>
<td>6274</td>
<td>1751</td>
<td>1687</td>
<td>1451</td>
</tr>
</tbody>
</table>

* STEC: Shiga toxin-producing E. coli
** H.U.S: Haemolytic Uraemic Syndrome where STEC was not detected.
† YTD: Jan - Sep 2011

Table 2. Notified cases of invasive listeriosis reported in Queensland, third quarter 2011

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Onset Month</th>
<th>Serotype / Binary Gene Type</th>
<th>Site of Isolation</th>
<th>Underlying Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>M</td>
<td>August</td>
<td>4b / 255</td>
<td>Blood</td>
<td>Ulcerative colitis, bowel surgery</td>
</tr>
</tbody>
</table>

Table 3. Gastrointestinal illness outbreaks in Queensland, third quarter 2011, by aetiology

<table>
<thead>
<tr>
<th>Aetiology / agent</th>
<th>No. of Outbreaks</th>
<th>Cases</th>
<th>Hospitalised</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BACTERIAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campylobacter jejuni</td>
<td>1</td>
<td>6</td>
<td>Unknown</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Staphylococcus aureus and Bacillus cereus</td>
<td>1</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Salmonella Typhimurium (non-foodborne)</td>
<td>1</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td><strong>CHEMICAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciguatera poisoning</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td><strong>VIRAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norovirus</td>
<td>16</td>
<td>381</td>
<td>3</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>5</td>
<td>94</td>
<td>6</td>
</tr>
<tr>
<td><strong>UNKNOWN / OTHER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown – non-foodborne</td>
<td>29</td>
<td>468</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>56</td>
<td>1030</td>
<td>16</td>
</tr>
</tbody>
</table>