MINNESOTA DEPARTMENT OF HEALTH 2012 FOODBORNE, WATERBORNE, AND ANIMAL CONTACT OUTBREAKS AND GASTROINTESTINAL OUTBREAKS DUE TO OTHER TRANSMISSION ROUTES

Compiled by:

Minnesota Department of Health
Infectious Disease Epidemiology, Prevention and Control Division
Foodborne, Waterborne, Vectorborne, and Zoonotic Diseases Section

Internet: www.health.state.mn.us/divs/idepc/dtopics/foodborne

P.O. Box 64975
Saint Paul, Minnesota 55164-0975
Phone: 651-201-5414
Fax: 651-201-5743

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MINNESOTA DEPARTMENT OF HEALTH
2012 GASTROENTERITIS OUTBREAK SUMMARY

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Preface

In 2011, the format of the Minnesota Department of Health's annual gastroenteritis outbreak summary was expanded to include waterborne outbreaks of any disease syndrome (i.e., not just gastroenteritis). Additionally, the category "Outbreaks with Other or Unknown Routes of Transmission" was divided into "Animal Contact Outbreaks," "Gastroenteritis Outbreaks due to Person-to-Person Transmission," and "Gastroenteritis Outbreaks with Unknown Transmission Routes."

Definitions

Confirmed Foodborne Outbreaks

A confirmed foodborne disease outbreak is defined as an incident in which two or more persons experience a similar illness after ingestion of a common food or meal and epidemiologic evaluation implicates the meal or food as the source of illness. Confirmed outbreaks may or may not be laboratory-confirmed.

Confirmed outbreaks may be classified as:

1. Laboratory-Confirmed Agent: Outbreaks in which laboratory evidence of a specific etiologic agent is obtained.

2. Epidemiologically Defined Agent: Outbreaks in which the clinical and epidemiologic evidence defines a likely agent, but laboratory confirmation is not obtained.

3. Outbreak of Undetermined Etiology: Outbreaks in which laboratory confirmation is not obtained and clinical and epidemiologic evidence cannot define a likely agent.

Probable Foodborne Outbreaks

A probable foodborne disease outbreak is defined as an incident in which two or more persons experience a similar illness after ingestion of a common food or meal, and a specific food or meal is suspected, but person-to-person transmission or other exposures cannot be ruled out.

Confirmed and Probable Waterborne Outbreaks

These are similar to foodborne outbreaks, except epidemiologic evaluation implicates water as the source of illness. Waterborne outbreaks may be associated with drinking water or with recreational water.

Animal Contact and Environmental Outbreaks

Outbreaks are considered to be due to animal contact if two or more persons experience a similar illness after exposure to an animal or animal environment. Other outbreaks with environmental sources (e.g., blastomycosis, histoplasmosis) are also included in this category.

Gastroenteritis Outbreaks due to Person-to-Person Transmission

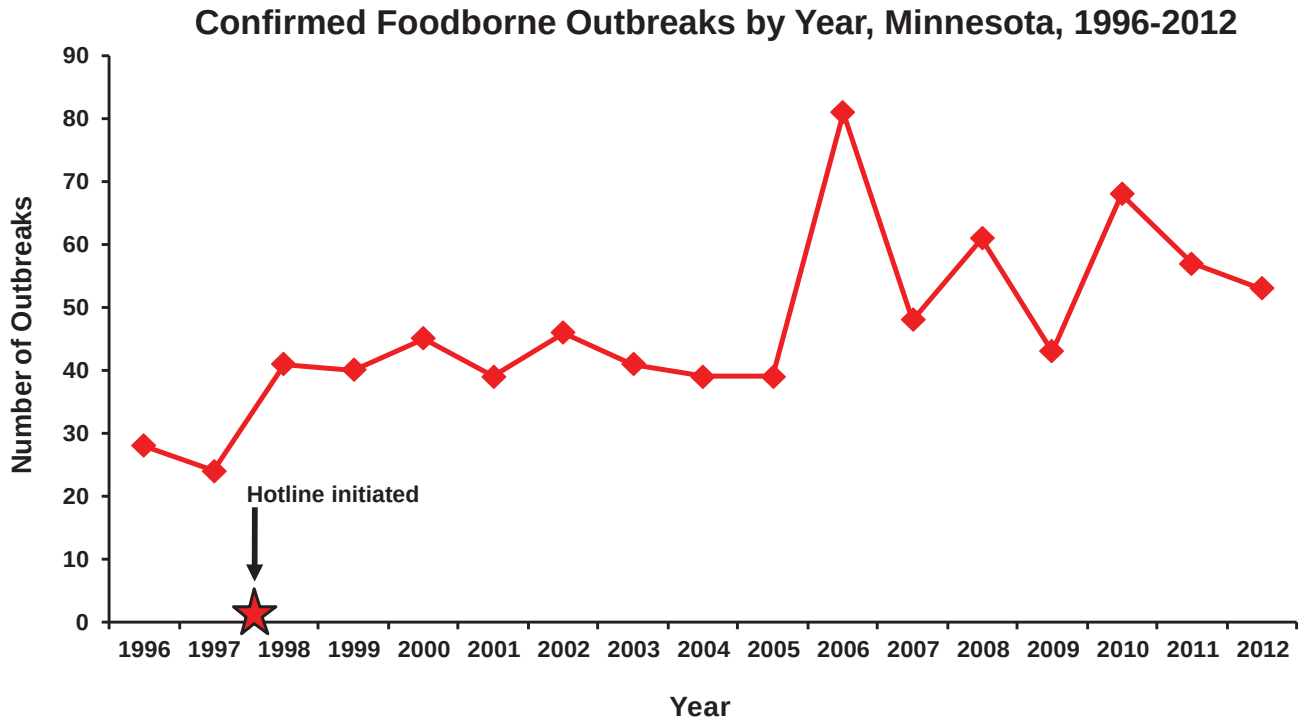
These outbreaks are defined as two or more cases of gastrointestinal illness related by time and place in which an epidemiologic evaluation suggests either person-to-person transmission occurred.

Gastroenteritis Outbreaks with Unknown Transmission Routes

This category includes gastroenteritis outbreaks for which the route of transmission could not be determined.

Summary

In 2012, the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section identified a total of 196 outbreaks that were due to foodborne, waterborne, or animal contact transmission, or that were gastroenteritis outbreaks due to person-to-person or unknown route of transmission; these outbreaks involved at least 3,600 cases of illness. The 196 outbreaks were classified as follows: 53 confirmed foodborne outbreaks, 5 probable foodborne outbreaks, 11 confirmed waterborne outbreaks, 11 animal contact outbreaks, 104 person-to-person gastroenteritis outbreaks, and 12 gastroenteritis outbreaks with unknown route of transmission (see page 1 for definitions). The median annual number of confirmed foodborne outbreaks from 1996-2012 was 43 (range, 24 to 81). The median number of cases identified per confirmed foodborne outbreak in 2012 was 8 (range, 1 to 50).



In 2012, 36 (68%) of the 53 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via phone calls from the public. Fifteen (28%) outbreaks were identified through routine laboratory-based surveillance of reportable bacterial pathogens, and two (4%) were identified through a report from a physician.

Of the 53 confirmed foodborne outbreaks, 26 (49%) were either laboratory-confirmed (n=24) or epidemiologically defined (n=2) outbreaks of norovirus gastroenteritis. There were 14 (26%) confirmed foodborne outbreaks caused by *Salmonella*, 3 (6%) by *Campylobacter jejuni*, 3 (6%) by *Clostridium perfringens*, 2 (4%) by sapovirus, and 1 (2%) each by Group A *Streptococcus*, *Listeria monocytogenes*, and scombroid toxin. The remaining 2 (4%) confirmed foodborne outbreaks were classified as suspected bacterial intoxications (caused by *Clostridium perfringens*, *Bacillus cereus*, or *Staphylococcus aureus*).

The predominance of norovirus as a cause of foodborne disease outbreaks in 2012 continues a pattern that has been observed for over three decades in Minnesota. During 1981-2012, 524 (53%) of 997 confirmed outbreaks of foodborne disease were due to norovirus, while 239 (24%) confirmed

foodborne outbreaks were cause by infectious bacterial pathogens such as *Salmonella*, *E. coli* O157, or *Campylobacter*.

Many outbreaks of norovirus are due to ill food workers handling ready-to-eat food items such as salads and sandwiches in restaurant or catering settings. In other foodborne norovirus outbreaks, ill or convalescent individuals contaminate shared food (e.g., self-serve food items in a wedding reception buffet, or school cafeteria). Prevention of further disease transmission during norovirus outbreaks is accomplished by emphasizing good handwashing procedures, minimizing bare-hand contact with ready-to-eat foods items, minimizing environmental contamination, and excluding ill employees from work until 72 hours after recovery.

There were 14 confirmed foodborne outbreaks caused by *Salmonella* in 2012. Four salmonellosis outbreaks were associated with commercially distributed products including cantaloupe (n=2), turkey jerky, and peanut butter. Six outbreaks were associated with restaurants, and an additional four outbreaks were associated with private events including a wedding reception and a graduation party.

Three confirmed foodborne outbreaks of *Campylobacter jejuni* infections were identified in 2012. One outbreak was associated with raw milk consumption on a school field trip, one was associated with a restaurant, and one was associated with a private party.

Two outbreaks of sapovirus gastroenteritis were detected in 2012; one was associated with a restaurant and the other with a catered event.

An outbreak of Group A *Streptococcus* infections was associated with pasta served at a banquet.

One outbreak of listeriosis was associated with consumption of imported ricotta salata cheese.

One outbreak of scombroid poisoning was reported in 2012. The likely vehicle was temperature-abused tuna.

Five of the confirmed foodborne outbreaks identified in Minnesota in 2012 were due to laboratory-confirmed or suspected bacterial intoxications caused by pathogens such as *Clostridium perfringens*, *Bacillus cereus,* or *Staphylococcus aureus*. These outbreaks often lack laboratory confirmation, as the resulting illnesses typically are of short duration. A recurring theme in outbreaks of bacterial intoxications is improper time and temperature control of potentially hazardous food items such as meats, rice and sauces, which allows for the proliferation of organisms that produce these enterotoxins.

There were eleven waterborne outbreaks identified by MDH in 2012. Nine outbreaks of cryptosporidiosis were associated with recreational water including pools, splash pads, water parks, and a swim pond. One outbreak of Pontiac Fever was associated with a private hot tub, and one outbreak of suspected *Pseudomonas aeruginosa* infections was associated with a hotel pool and hot tub.

Eleven outbreaks in 2012 were associated with contact with animals or animal environments. Four outbreaks of salmonellosis and one campylobacteriosis outbreak were associated with contact with live poultry including chicks. Calves were the vehicle of transmission for two outbreaks of cryptosporidiosis. Two multi-state outbreaks of salmonellosis were associated with contact with pets (one with bearded dragons and one with hedgehogs). An outbreak of *Cryptosporidium parvum* and *E. coli* O111:NM

infections was associated with a Vet Skills summer camp. One outbreak of histoplasmosis was associated with restoration work on an old barn.

There were 104 outbreaks associated with person-to-person transmission of enteric pathogens, predominantly norovirus, in nursing homes, schools, daycares, and other facilities. An additional 12 outbreaks were investigated, but the route of transmission was not determined.

Confirmed Foodborne Outbreaks

(1)
Norovirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 5, 2012, managers at a restaurant in Edina, Minnesota contacted their local health department (City of Edina) to report two independent complaints of gastrointestinal illness among individuals who ate at the restaurant on January 1. The City of Edina Health Department interviewed the original complainants and notified the Minnesota Department of Health (MDH); an investigation was initiated immediately.

City of Edina sanitarians visited the restaurant on January 6 to evaluate food preparation and handling procedures. They obtained a reservation list from the establishment to obtain contact information for additional patrons. A case was defined as a person who ate at the restaurant on January 1 and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

During the site visit, a restaurant manager reported that he had a birthday party for his son at the establishment on January 1. The manager provided contact information for the guests who had attended the birthday party.

On January 9, MDH staff began interviewing guests who had attended the birthday party and patrons identified from the reservation list.

Sixty-seven patrons were interviewed; 21 (31%) met the case definition. Thirteen of 24 birthday party guests and 8 of 43 additional patrons (representing 5 separate parties) met the case definition. One of the cases (a toddler) had a diarrheal incident before the birthday party; the mother attributed this incident to teething and reported that the child's diarrhea became much more severe on January 2. Four additional patrons (three from the birthday party and one from the reservation list) reported illness that did not meet the case definition and were excluded from analysis.

The median incubation period for the cases was 33.5 hours (range, 29 to 66 hours). The median duration of illness was 54 hours (range, 17 to 132 hours). Eighteen (86%) cases reported vomiting, 12 (57%) reported diarrhea, 11 (52%) reported cramps, 8 (38%) reported fever, and none reported bloody stools. Three cases visited a medical provider but none were hospitalized.

Two stool specimens (from one birthday guest and one patron) were submitted to MDH; both tested positive for norovirus GII with identical nucleic acid sequences. The two stool specimens were negative for *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, *Shigella*, and *Yersinia.*

Food items served to the birthday party guests included salad, a variety of pizzas (cheese, margherita, autunno, morocain, fig and prosciutto, and pepperoni), ice cream served in cones with angel food cake, soda, water, coffee, apple juice, and alcoholic beverages. Most of the food items served to the birthday party guests were prepared by the restaurant. Exceptions included the ice cream and cones which were purchased from a grocery store and supplied by the parent party organizers, and the angel food cake which was prepared by the parent party organizers.

The eight patron cases who were identified from the reservation list reported eating a variety of different menu items, but all reported eating some type of ready-to-eat food item (e.g., mozzarella caprese, salami or mozzarella plates, salads).

A univariate analysis was conducted including all 67 interviewed patrons. No foods were significantly associated with illness in this analysis. However, consuming cheese pizza yielded an elevated odds ratio [OR] of 3.1 (9 of 15 cases vs. 11 of 34 controls; 95% confidence interval [CI], 0.86 to 11.5; p = 0.14).

A second analysis was conducted separating the birthday party guests from the reservation list patrons. No foods were significantly associated with illness in either group. In the reservation list patrons consuming fig and prosciutto pizza (6 of 15 cases vs. 6 of 34 controls; OR, 3.1; 95% CI, 0.75 to 12.5; p = 0.15) and soda (9 of 18 cases vs. 10 of 41 controls; OR, 3.1; CI, 0.93 to 10.2; p = 0.10) yielded elevated odds ratios. In the birthday party group consuming ice cream served in a cone containing angel food cake resulted in an increased odds ratio (10 of 13 cases vs. 3 of 8 controls; OR, 5.6; CI, 0.74 to 42.2; p = 0.16).

Illness histories and job duty information were obtained from 41 restaurant employees. No employees reported having had gastrointestinal illness previous to or on the implicated meal date. Two employees reported gastrointestinal illness after the implicated meal date, with onsets of January 2 and January 3.

When conducting an inspection of the restaurant, the City of Edina sanitarian viewed bare-hand contact with ready-to-eat foods. Education was provided to eliminate this process and to stress the importance of proper handling of food and beverages, the use of gloves or utensils when handling ready-to-eat foods, proper handwashing practices, and exclusion of ill food handlers.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Edina. No food item was statistically associated with illness. The source of contamination was not identified.

(2)
Norovirus Gastroenteritis Associated with a Restaurant

January Washington County

On January 11, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among four people in a party of nine who had eaten at a restaurant in Woodbury on January 6. The complainants had nothing else in common besides their meal at the restaurant. By January 12, MDH staff were able to interview two of the ill complainants. Both had symptoms consistent with viral gastroenteritis. Washington County Public Health and Environment (WCPHE) staff were notified, and an investigation was initiated.

WCPHE environmental health specialists visited the restaurant on January 12 to conduct a kitchen inspection, inquire about ill employees, determine if the restaurant had received other complaints, and obtain patron credit card receipts. MDH staff interviewed patrons regarding food consumption and illness history.

WCPHE and MDH staff maintained a daily presence at the restaurant from January 12 through January 18 to provide management and staff education, conduct employee interviews, and monitor food handling and preparation practices. Employees were interviewed regarding recent illness history and work duties at the restaurant.

Management staff were instructed to monitor for employee illness using employee health screening logs in order to prevent ongoing issues at the restaurant. WCPHE staff gave written orders to the restaurant on January 20 and conducted a follow-up inspection on January 30.

A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). Stool samples collected from two patrons were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 75 restaurant patrons were interviewed, including 7 from the original complainant group. Ten patrons met the case definition. Six patrons reported mild illness that did not meet the case definition and were excluded from further analyses. Of the 10 cases, 8 (80%) reported diarrhea, 7 (70%) reported cramps, 6 (60%) reported vomiting, and 3 (30%) reported fever. No cases reported bloody stools and none sought medical care. The median incubation period was 24.5 hours (range, 20.5 to 48 hours). The median duration of illness was 39 hours (range, 6 to 95 hours).

Two case stool specimens, both from the original complainant group, tested positive for norovirus GII.4 Sydney with identical region D nucleic acid sequences.

By univariate analysis, eating buffalo chicken pizza was statistically associated with illness (2 of 8 cases vs. 0 of 55 controls; odds ratio [OR], undefined; $p = 0.01$), though only a small number of cases could be explained by this exposure. Consumption of an entrée that contained fresh lettuce (5 of 10 cases vs. 10 of 52 controls; OR, 4.2; 95% confidence interval [CI], 1.02 to 17.4; $p = 0.05$) was also statistically associated with illness. Consuming the Works Burger (3 of 10 cases vs. 4 of 55 controls; OR, 5.5; 95% CI, 1.01 to 29.7; $p = 0.06$) approached significance. The Works Burger could be ordered with lettuce, and this was captured in the interviews. All three cases who had a Works Burger ordered it with lettuce. No other exposures were significantly associated with illness.

WCPHE staff began an on-site investigation at the restaurant on January 12, starting with review of employee illness logs at the restaurant. Ten employees had been ill between January 2 and 10; at least two of these reported symptoms of diarrhea and vomiting. Management staff at the restaurant indicated that employees were sent home after experiencing symptoms in the restaurant. Employee contact lists were not immediately available, and management staff started putting together lists of employees. All employees were to be screened for gastrointestinal illness by management upon arrival to work. Employees experiencing diarrhea and/or vomiting were to be excluded until 72 hours after their recovery.

A "no bare-hand contact" policy was in place at the restaurant according to management; however, bare-hand contact and improper glove use by employees was noted. Employees were observed not washing hands when changing gloves, and overall handwashing was limited. One handwashing sink was blocked by a large garbage can and kitchen equipment. There were not adequate handwashing stations for the number of employees. A strict no bare-hand contact requirement for all ready to eat (RTE) foods was immediately put into place.

WCPHE staff continued follow-up on January 13. Restaurant management was reluctant to have employee interviews conducted on-site because it would disrupt business operations. WCPHE staff informed management that interviews of all employees were required. Management staff had not been screening employees for illness as instructed on the previous day, and management staff had not been informed by the previous day's manager about requirements. Bare-hand contact with RTE foods was observed. The "no bare-hand contact" requirement was again discussed at length with management.

WCPHE interviewed employees on-site and by phone as contact information became available. Minnesota Department of Health staff discussed obtaining patron credit card receipts with the restaurant and arranged for pick up of the receipts. MDH staff emphasized the importance of timely availability of the receipts to continue the outbreak investigation and identify food items of concern, so that food preparatory changes could result in control of the outbreak. Management staff said they could have patron receipts ready the following day.

On Saturday, January 14, MDH staff arrived at the restaurant to collect credit card receipts. Receipts were not available. Numerous issues were identified by MDH staff, including an ill employee at work who was immediately sent home, bare-hand contact with RTE foods, a blocked handwashing sink in the kitchen, and lack of management knowledge regarding the outbreak investigation and person-in-charge requirements (including employee screening). One kitchen worker put on gloves when MDH staff were watching, but once the staff person left discarded the gloves and was not wearing them when she returned minutes later. This employee was handling RTE foods. Employees were also rolling silverware into napkins with bare hands. After lengthy discussion with the restaurant employees and managers about the importance of handwashing, another handwashing sink was found blocked in the kitchen. Extensive discussion about viral gastroenteritis, handwashing, and the current outbreak took place with management staff and employees prior to MDH staff leaving the restaurant.

On Sunday, January 15, WCPHE staff were at the facility to continue follow-up. Improper glove use and cross-contamination issues with raw chicken and raw eggs were observed, but other issues had been addressed. Employee screening was taking place, and management was informing employees about the need to stay home if they have been ill. Handwashing was more frequent, and addition of another handwashing sink in the server area was discussed with management.

On January 16, MDH staff picked up credit card receipts and noted no-bare hand contact among employees. Handwashing was also more frequent. WCPHE staff were at the restaurant on January 17 and 18 to continue the investigation and finish employee interviews. Restaurant management was directed to continue employee screening through January 24 unless additional employee illnesses were identified (in which case screening would be extended).

On January 20, a letter from WCPHE management with written orders was provided to the restaurant. The letter included "no bare-hand contact" requirements, information on maintaining access and supplies for hand sinks, employee training materials, person-in-charge requirements, employee screening requirements, and addition of another handwashing sink. A walk-through of the establishment was conducted, and orders in the letter were discussed on-site.

On January 30, WCPHE staff conducted a follow-up inspection at the restaurant. Bare-hand contact was again discussed in detail. Employee screening forms had been discontinued, and there had been no

additional illnesses. Use of the employee illness log and tracking and posting employee illness policies were discussed with management.

A total of 102 active employees were identified at the restaurant. Interviews were conducted with 100 of those employees. Of those, 15 had been ill since December 26 with symptoms of vomiting and diarrhea. Four additional employees had been mildly ill with symptoms of nausea and cramps.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Woodbury. Eating lettuce and eating the buffalo chicken pizza at the restaurant were significantly associated with illness. Substantial numbers of ill employees were reported. Improper use of gloves, improper handwashing, and poor management practices contributed to the outbreak.

(3)
Norovirus Gastroenteritis Associated with a Restaurant

January Ramsey County

On January 10, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of five individuals from two households who ate lunch at a restaurant in Arden Hills on January 8. Ramsey County Environmental Health (RCEH) was contacted, and an investigation was initiated immediately.

RCEH sanitarians visited the restaurant on January 10 to evaluate food preparation and handling procedures, and to interview food workers. Credit card receipts were not collected as they did not contain patron signatures. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Five restaurant patrons were interviewed, and three (60%) met the case definition. The median incubation period for the cases was 29 hours (range, 24 to 33 hours). Duration of illness information was only available for one case, whose symptoms lasted 13 hours. All three cases reported diarrhea and vomiting, two (67%) reported cramps, and none reported bloody stools or fever. Stool samples submitted by two ill patrons tested positive for norovirus GII.

The limited number of cases and controls prevented a meaningful statistical analysis of specific food exposures. Two cases reported sharing a cheddar and beef sandwich with fries and the third case consumed a chicken sandwich with lettuce, fries, and pop.

RCEH sanitarians interviewed 18 restaurant employees, and 3 reported recent gastrointestinal illness. These employees reported becoming ill on January 4, 7, and 9, respectively. However, none of these employees reported working on January 8. The sanitarian observed good hand hygiene and use of gloves when handling ready-to-eat foods. The restaurant had an employee illness log, but it had not been updated since February of 2011. The sanitarian discussed the importance of handwashing for the prevention of norovirus transmission, and all employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Arden Hills. A specific food vehicle was not identified. The source of the contamination was likely an infected food worker.

(4)
Salmonella Enteritidis Infections Associated with a Restaurant

January Ramsey County

On January 26, 2012, Minnesota Department of Health (MDH) Public Health Laboratory (PHL) notified MDH epidemiology staff of a *Salmonella* Enteritidis isolate with pulsed-field gel electrophoresis (PFGE) pattern SE1B173; this was the same pattern observed in a fall 2011 outbreak associated with organic eggs from a farm in Owatonna, Minnesota. Routine interview of the case revealed that he had attended a private event at a restaurant in St. Paul, Minnesota on January 12. The case reported knowing of at least two individuals who also had become ill with similar symptoms following the event. The Minnesota Department of Agriculture (MDA) and sanitarians from the City of St. Paul were notified on January 27, and an investigation was initiated.

All *Salmonella* cases reported to MDH are interviewed about exposures and food consumption as part of foodborne disease surveillance in Minnesota. An epidemiologist reviewed the information gathered during the interviews of *S*. Enteritidis cases to identify other potential cases associated with eating at the restaurant. A list of individuals who attended private events at the restaurant was requested from event organizers. MDH staff interviewed guests from private events held at the restaurant.

Confirmed cases were defined as persons who reported eating at the restaurant since January 1 and who subsequently had *S.* Enteritidis SE1B173 isolated from a clinical specimen. Probable cases were defined as persons who reported eating at the restaurant since January 1 and became ill with diarrhea (≥3 loose stools in a 24-hour period) lasting 3 or more days.

A case-control study was conducted to evaluate particular food items that may have been associated with illness served at the January 12 private event.

On January 27, City of St. Paul sanitarians conducted an inspection of the restaurant and began interviewing employees. Stool samples were required from all food workers who reported recent illness.

On February 3, a routine surveillance interview of a second *S*. Enteritidis SE1B173 case revealed that he had attended a separate private event held at the restaurant on January 21.

Illness histories and exposure information were obtained from 71 restaurant patrons, including 26 from the January 12 event and 45 from the January 21 event. Four confirmed and three probable cases were identified, including six (three confirmed) from the January 12 event and one (confirmed) from the January 21 event. Six additional patrons reported illness that did not meet the case definition and were excluded from further analysis.

All seven cases were adult males. All cases reported diarrhea and cramps, three (60%) of five reported fever, one (17%) of six reported bloody stools, and none reported vomiting. The median incubation

period was 3 days (range, 2 to 4 days). The median duration of illness was 7 days (range, 4 to 8 days) for the six cases who had recovered at the time of interview.

Illness histories and job duty information were obtained from 31 employees. Two employees reported recent symptoms of gastrointestinal illness, with onset dates of January 14 and 20. Neither of the employees who reported illness worked on January 12, nor did any of the food preparation for the January 12 event. Both employees reporting recent illness tested negative for *Salmonella*.

Food for the January 12 event was served buffet style, with multiple food items displayed on the same platters. Multiple food items from the January 12 event were significantly associated with illness, including brie cheese (5 of 6 cases vs. 3 of 17 controls; odds ratio [OR], 23.3; 95% confidence interval [CI], 2 to 279; $p = 0.005$), pickled garlic (4 of 6 cases vs. 3 of 17 controls; OR, 9.3; 95% CI, 1.1 to 76.7; $p = 0.03$), oyster mushroom mousse (4 of 5 cases vs. 0 of 15 controls; OR, undefined; $p < 0.001$), wild boar liver pate (6 of 6 cases vs. 5 of 19 controls; OR, undefined; $p = 0.002$), mangalitsa lardo (3 of 5 cases vs. 1 of 16 controls; OR, 22.5; 95% CI, 1.5 to 335; $p = 0.009$), and vanilla chiffon cake (6 of 6 cases vs. 10 of 19 controls; OR, undefined; $p = 0.04$).

The January 21 event was a plated meal in which guests had a limited choice of options for each of the courses. No food items were statistically associated with illness.

The restaurant used unpasteurized shell eggs in a variety of food items at the restaurant, including aioli, béarnaise sauce, and desserts. However, the chef stated that the only foods containing raw eggs served at the two events were a vanilla chiffon cake served on January 12 in which eggs were used in the Swiss merengue, and tiramisu served on January 21 where eggs were used in the mascarpone; no temperatures were taken to ensure that the desserts were fully cooked. Eggs were purchased from an organic farm in Owatonna, Minnesota.

On February 2, staff from MDA, MDH, and the United States Food and Drug Administration met with owners of the Owatonna farm to review records. Following the 2011 outbreak, the Owatonna farm was depopulated and cleaned. Egg production at the Owatonna farm had not resumed prior to the January 12 meal date at the restaurant. However, eggs produced at multiple other farms that had been subject to the fall 2011 recall did not undergo depopulation and cleaning and were continuing to be sold under the Owatonna farm's brand name.

On February 8, MDA inspectors visited a farm that sells eggs under the Owatonna farm's brand name that was determined the farm most likely to have supplied the eggs to the restaurant to perform environmental sampling. The team collected 15 samples: 3 controls, 8 drag swabs, and 4 surface swabs of the egg belt; all samples were negative for *Salmonella*.

This was an outbreak of *Salmonella* Enteritidis infections associated with a restaurant. Consumption of desserts containing undercooked egg was associated with illness. The same unique outbreak strain that was isolated from cases was found on a farm owned by the egg supplier in an outbreak 3 months prior. While *Salmonella* was not isolated on the February 8 farm visit, it is possible that the hens may have been experiencing intermittent shedding or that the contaminated eggs originated from one of the other farms selling eggs under the farm's brand name. MDA is continuing to work with the farmer to identify the source of the *Salmonella*. As a result of the outbreak, the restaurant discontinued the use of unpasteurized shell eggs in uncooked foods.

(5)
Norovirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 24, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a party of five co-workers who had eaten together at a restaurant in Minneapolis on January 20. MDH notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units, and an investigation was initiated.

In addition to a list of the original complainant's co-workers, a list of customers from January 20 was obtained from the restaurant, and HSPHD interviewed patrons about food consumption and illness history. A case was defined as an individual who ate food from the restaurant and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). A stool sample collected from a consenting complainant group member was submitted to the MDH Public Health Laboratory for bacterial and viral testing.

MDEH sanitarians visited the restaurant on January 24 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

There were no other shared meals identified among the original complainant group. A total of 16 individuals were interviewed, and 8 (50%) met the case definition. All eight cases reported diarrhea and vomiting, six (75%) reported cramps, four (50%) reported nausea, three (38%) reported fever, one (13%) reported headache, and none reported bloody stools. The median incubation period was 38 hours (range, 22 to 72 hours). The median duration of illness was 26 hours (range, 3 to 33 hours) for the seven individuals who had recovered at the time of interview. A stool specimen collected from a case tested positive for norovirus GII.

Cases reported eating a variety of foods including several types of hoagie sandwiches, a spinach salad, a calzone, cheese bread, and sodas. The hoagie sandwiches are topped with tomato, onion, lettuce, mayonnaise, and dressing, unless otherwise specified by the patron. While no topping was found to be statistically significant by univariate analysis, tomatoes approached statistical significance (5 of 8 cases vs. 1 of 8 controls; odds ratio 11.67; 95% confidence interval, 0.9 to 147.6; $p = 0.06$).

Illness histories and job duty information were obtained from 32 restaurant employees. One employee reported having an episode of vomiting late in their shift on the implicated meal date. The employee left work after the episode and reported ongoing vomiting and diarrhea. The employee had a child in the home that had been ill with gastrointestinal symptoms in the days prior. While at work on January 20, the employee had prepared hoagies and topped them with fresh vegetables after baking. A stool specimen from the employee tested positive for norovirus GII. Nucleic acid sequencing was conducted on the patron and employee specimens; the sequences were identical.

MDEH sanitarians noted one critical violation when conducting an inspection of the restaurant. Food workers were observed having bare-hand contact with ready-to-eat foods. Salads, hoagies, and hoagie toppings were handled with bare hands. A temporary glove order was instituted and sanitarians

provided recommendations to minimize the risk when handling ready-to-eat foods. The facility was also instructed to sanitize common areas. No additional patron complaints were received.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating food from a restaurant. The source was an infected food worker. Although a single food item was not identified as being associated with illness, it is likely that the infected food worker contaminated fresh vegetable toppings when placing them on hoagie sandwiches.

(6)
Clostridium perfringens Intoxications Associated with a Restaurant

February Hennepin County

On February 7, 2012, the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit received a complaint of gastrointestinal illness among two patrons from different households who had eaten the lunch buffet at a restaurant in Brooklyn Center on February 6. HSPHD notified the HSPHD environmental health unit and the Minnesota Department of Health (MDH) and an investigation was initiated.

A list of patrons identified from restaurant credit card receipts was provided to HSPHD. HSPHD epidemiologists interviewed the original complainants about food consumption and illness history. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. A stool sample collected from one complainant was submitted to the MDH Public Health Laboratory for bacterial, viral, and toxin testing.

HSPHD sanitarians visited the restaurant on February 8 to evaluate food preparation and handling procedures.

The two original complainants were interviewed by HSPHD epidemiologists. While the restaurant provided a list of names from 15 credit card receipts, only two matching telephone numbers were found, and neither patron at those telephone numbers returned multiple phone calls.

Both complainants met the case definition. Both cases reported cramps and diarrhea, one (50%) reported bloody stools, and none reported vomiting or fever. Incubation periods were 11 and 14 hours, respectively, and both cases were still experiencing symptoms at the time of interview (12 and 15 hours after their respective illness onset). A stool specimen collected from one case tested positive for *Clostridium perfringens* enterotoxin.

The cases reported consuming West African foods from the lunch buffet. However, neither case was familiar with this cuisine, so recall of specific food items was minimal. The cases reported eating rice, okra, and various unidentified meats; one recalled eating cassava leaves. Both drank ice water. The lack of non-ill controls prevented a statistical analysis of specific food items.

HSPHD sanitarians noted several critical violations when conducting an inspection of the restaurant. Violations included having an unapproved buffet; having food items from an unlicensed meat processor; improper cooling, cold/hot holding, and heating of buffet food items; and, adequate cooking temperatures not known by cooking staff. Sanitarians noted large containers of rice, meat, and other

potentially hazardous foods that were unlikely to be cooled in the required amount of time. Education was provided to improve these processes, and environmental health staff continued to work with the restaurant to remedy these issues and improve the flow of food.

A representative from the Minnesota Department of Agriculture (MDA) accompanied the Hennepin County sanitarian during a follow-up restaurant visit on February 15 to further investigate the unapproved food items from an unlicensed meat processor. The MDA representative also followed-up with the restaurant to deliver a written description of the violation and to follow-up with verification of proper meat sources.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with eating food at a restaurant in Brooklyn Center. The vehicle of transmission was not identified. The outbreak most likely resulted from improper cooling procedures and improper hot- and cold-holding temperatures, which created an environment in which *C. perfringens* proliferated and survived in one or more of the buffet food items.

(7)
Norovirus Gastroenteritis Associated with a Restaurant

February Winona County

On February 29, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a party of four individuals who had eaten at a restaurant in Elba, Minnesota on February 24. The complainant reported that three ill individuals from two different households had become ill. The complainant knew of additional patrons who had eaten at the restaurant on the same date; he did not know if they had become ill but said he would give the additional patrons the MDH hotline number. Winona County Community Services was notified on February 29, and an investigation was initiated.

MDH interviewed the original complainants, and Winona County sanitarians obtained credit card receipts from the establishment for additional patron contact information. A case was defined as a person who ate at the restaurant on February 24 and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On February 29, Winona County sanitarians visited the restaurant to evaluate food preparation and handling procedures and to interview employees regarding illness history and job duties. On February 30, MDH staff began interviewing patrons identified from the credit card receipts.

Twenty-nine patrons were interviewed, and eight (28%) met the case definition; cases represented five different households. Two patrons reported illness that did not meet the case definition and were excluded from analyses. The median incubation period for cases was 34.5 hours (range, 28.5 to 40.5 hours). The median duration of illness was 29 hours (range, 26.5 to 32 hours). Seven cases reported diarrhea (88%), five (63%) reported vomiting, five (63%) reported cramps, one (13%) reported fever, and none reported bloody stools. One case visited a medical provider and was hospitalized for a day.

Seven stool specimens (from four patrons and three employees) were submitted to MDH; all tested positive for norovirus GII. The seven stool specimens were negative for *Campylobacter*, *Salmonella*,

Shiga toxin-producing *E. coli*, *Shigella*, and *Yersinia.* Four specimens (two from patrons and two from employees) were sequenced, and all specimens had identical nucleic acid sequences.

The patrons reported eating a variety of different menu items. In a univariate analysis, consuming fillet of haddock (3 of 8 cases vs. 0 of 19 controls; odds ratio [OR], undefined; 95% confidence interval [CI], undefined; p = 0.02), tossed side salad (4 of 7 cases vs. 0 of 19 controls; OR, undefined; 95% CI, undefined; p = 0.02), and garlic toast (6 of 7 cases vs. 5 of 19 controls; OR, 16.8; 95% CI, 1.6 to 176.2; p = 0.02) were significantly associated with illness. No other foods were associated with illness; however, consuming baked potato approached significance (5 of 7 cases vs. 5 of 19 controls; OR of 7.0; 95% CI, 1.0 to 48.3; p = 0.07).

Illness histories and job duty information were obtained from 15 restaurant employees. Seven employees reported having had gastrointestinal illness previous to or on the implicated meal date, (including three employees who worked while ill on the implicated meal date). One employee became ill after the implicated meal date, with onset of vomiting and diarrhea on February 26.

During the establishment visit, the Winona County sanitarians viewed bare-hand contact with all foods, including ready-to-eat foods, and the manager reported that they had not been excluding ill food workers. The sanitarians stressed the importance of proper handling of food and beverages, use of gloves or utensils when handling ready-to-eat foods, good handwashing, and exclusion of ill food handlers to the restaurant employees.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at restaurant in Elba, Minnesota. Multiple food items were associated with illness. The source of contamination was one or more infected food workers.

(8)
Norovirus Gastroenteritis Associated with a Bowling Alley

March Olmsted County

On March 9, 2012, the Minnesota Department of Health (MDH) was notified by Olmsted County Public Health Services (OCPHS) that they were investigating two independent complaints of illness from group events held at a bowling alley in Rochester, Minnesota on March 3. OCPHS received the first complaint of vomiting and diarrhea among eight of nine birthday party guests on March 7. They received a second complaint the next day of illness among 34 of 56 co-workers from a work bowling event. A joint investigation was initiated.

OCPHS sanitarians visited the bowling alley on March 8 to evaluate food preparation and handling procedures, and gather contact information for other bowling alley patrons (including large group reservations and credit card receipts) from March 3 and March 4. Employees were interviewed by OCPHS to determine their food handling duties and to elicit an illness history.

OCPHS obtained contact information for party attendees from each party host. MDH and OCPHS staff interviewed party attendees to obtain information on food/beverage consumption and illness history. The organizer for the March 3 work-related event forwarded an email and interview form from OCPHS to

her co-workers, who were asked to return the completed form to OCPHS. Credit card receipts did not have printed names and were not used to contact patrons.

A case was defined as a bowling alley patron who subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). A secondary case was defined as either a bowling alley patron who lived or worked with a primary case and developed vomiting and/or diarrhea >48 hours after visiting the bowling alley, or an ill individual who did not go to the bowling alley but lived in the same household as a primary case.

Stool samples from consenting patrons and employees were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 99 patrons were interviewed about food/beverage consumption and bowling activities. Of these, 24 were excluded from further analyses due to incomplete symptom or exposure histories, illness that did not meet the case definition, illness with an indeterminate incubation period (could not differentiate between primary and secondary cases) or the questionnaire was received after completion of data analyses. Among the remaining 75 interviewed patrons, 31 primary cases were identified. In addition, 15 secondary cases were identified and were excluded from further analyses. The median incubation period for cases was 36 hours (range, 13 to 47.5 hours). Among the 31 cases, 30 (97%) reported vomiting, 28 (90%) reported diarrhea, 25 (42%) reported cramps, 19 (68%) reported fever, and none reported bloody stools. The median duration of illness was 47.5 hours (range, 10.5 to 104 hours). Four patron stool samples were submitted to the MDH PHL; two tested positive for norovirus GI.6A with identical region D nucleic acid sequences. The positive stools were from individuals who attended two different March 3 birthday parties. The two negative stools were collected 10 days after illness onset.

In a univariate analysis, consuming a “first frame starter” appetizer (10 of 31 cases vs. 1 of 24 controls; odds ratio, 11.0; 95% confidence interval, 1.3 to 93.0; $p = 0.02$) was significantly associated with illness. Individual appetizers, eating any food item (17 of 31 cases vs. 9 of 15 controls), and bowling activities were not significantly associated with illness.

All 11 bowling alley employees were interviewed. One employee reported gastrointestinal illness onset on March 6. This employee worked at the alley primarily as a bartender on March 2 through March 4. A stool sample from the employee tested positive for norovirus GI.6A with an identical region D nucleic acid sequence to the patron specimens.

The facility is a 20-lane bowling alley with lobby seating and an additional bar area. On March 8, OCPHS sanitarians asked the alley to institute interventions to prevent further transmission, including mandatory glove use when handling ready-to-eat foods, management review of employee illness and handwashing policies with all staff, daily screening of employees for illness, a 72-hour exclusion for ill employees, discarding prepared ready-to-eat foods, and a cleaning/sanitizing of the entire facility including bowling balls. The alley voluntarily closed their kitchen at 6:00 p.m. for the reminder of the day to accomplish the cleaning. As a result of the outbreak, the alley switched to norovirus-effective sanitizer for non-food contact surfaces and reinforced staff illness and hygiene practices. OCPHS sanitarians recommended more frequent cleaning of restrooms and surfaces throughout the facility.

This was a foodborne outbreak of norovirus gastroenteritis associated with a bowling alley. Appetizers were identified as the outbreak vehicle; however, 45% of cases did not consume any food items at the alley, suggesting that contamination of the alley environment (e.g., bowling balls, surfaces, utensils) likely also played a role in transmission.

(9)
Norovirus Gastroenteritis Associated with a Restaurant

March Wilkin County

On March 12, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among four of six meal companions from three households who had eaten at a restaurant Rothsay, Minnesota on March 9. Incubation periods ranged from 20 to 53 hours. The complainants from separate households claimed they did not have any other common meals in the 5 days prior to illness onset. An investigation was initiated.

MDH sanitarians visited the restaurant on March 12 to evaluate food preparation and handling procedures, interview employees, and obtain credit card receipts from March 9. MDH staff interviewed restaurant patrons to obtain information on food/beverage consumption and illness history using contact information from the credit card receipts.

A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). A secondary case was defined as an individual who lived in the same household as a primary case and developed vomiting and/or diarrhea (≥3 stools in a 24-hour period) at least 24 hours after the primary case. Stool samples were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 18 patrons were interviewed: 12 identified from credit card receipts, and 6 from the original complaint. Three (17%) primary cases were identified, all from the original complaint, and represented three households. In addition, one secondary case was identified, also a person from the original complaint, and was excluded from further analyses. The median incubation for cases was 29 hours (range, 20 to 34 hours). One case had recovered at the time of interview and had an illness duration of 40 hours. All three cases reported stomach cramps, two (67%) each reported diarrhea, vomiting, and fever (maximum temperatures measured were 102° F and 100.4° F), and none reported bloody stools. No cases sought medical attention. The median age of cases was 31 years (range, 27 to 58 years), and two (67%) were female. Three stool samples tested positive for norovirus GII.4 New Orleans with identical nucleic acid sequences at the MDH PHL. Two of the specimens were from primary cases from different households, and the third specimen was from the secondary case who lived in the same household as a norovirus-positive primary case.

The three primary cases all reported consuming different menu items, which included: seafood alfredo; beef nachos; pasta with shrimp, sausage, pepper, and white sauce; and a burger with lettuce, onion, cheese, tomato, and onion rings. The 14 controls reported eating a variety of menu items. The small number of cases precluded a meaningful statistical analysis.

Twelve (92%) of the restaurant's 13 employees were interviewed. All denied recent gastrointestinal illness in themselves and their household members.

During the March 12 visit, sanitarians noted that the restaurant was in general need of cleaning. Hand sinks were stocked with soap and paper towels, but no handwashing was observed during the inspection. Food preparation was not observed as the restaurant had just opened for the day at the time of the inspection, but it was noted that employees do not use gloves to handle food; all food contact is with bare hands. The restaurant did not maintain an employee illness log. Sanitarians instructed the restaurant to clean and sanitize, and use gloves when handling ready-to-eat foods. Management staff was given an employee illness log and instructed to use it.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Rothsay, Minnesota. The source and vehicle of the outbreak were not identified. No ill employees were identified; however, bare-hand contact with ready-to-eat foods at the restaurant may have contributed to the outbreak as employees never wore gloves when handling food.

(10)
Norovirus Gastroenteritis Associated with a Restaurant

March Washington County

On March 12, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in one of two individuals who had eaten at a restaurant in Woodbury on March 10.

On March 13, Washington County Public Health and Environment (WCPHE) received and notified MDH of a second independent complaint of illness among three of five individuals from two households who had also eaten at the restaurant on March 10. All four ill individuals had onset of diarrhea and vomiting 26 to 34 hours after eating at the restaurant. The same restaurant was the cause of a norovirus outbreak in January 2012 that resulted in extensive employee and staff education. An investigation was initiated.

WCPHE environmental health specialists visited the restaurant on March 13 to conduct a kitchen inspection, and inquire about ill employees and complaints. At that time, restaurant management reported that they had not received any patron complaints, and environmental health staff provided the restaurant with a complaint log. Patron credit card receipts from March 10 were obtained from the restaurant. MDH staff interviewed patrons regarding food/beverage consumption and illness history.

Environmental health staff from WCPHE maintained a daily presence at the restaurant during weekdays from March 13 through March 20 to provide management and staff education, conduct employee interviews, and monitor food handling and preparation practices. Employees were interviewed regarding recent illness history and work duties at the restaurant. WCPHE staff provided written norovirus fact sheets and hand hygiene information to employees interviewed at the restaurant. Restaurant management staff were instructed to prospectively monitor employee illness using employee health screening logs.

A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). Stool samples collected from consenting patrons were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

On March 14, two additional complaints were identified by on-site WCPHE environmental health staff who called the restaurant on March 12 and March 13 but had not been reported to WCPHE or MDH previously. The complaints were retroactively added to the complaint log given to the restaurant on March 13. The March 12 complaint was of gastrointestinal illness in three individuals who had eaten at the restaurant on March 9. The recorded telephone number for the March 13 complainant was incorrect, and no further follow-up was possible. The complainant had reported eating chicken nachos at the restaurant and developing "flu symptoms."

A total of 32 restaurant patrons were interviewed: 8 from the 3 complaint calls and 24 from credit card receipts. Nine patrons met the case definition, including three cases from separate households identified using the March 10 credit card receipts. Four patrons reported mild illness that did not meet the case definition and were excluded from further analyses. Of the nine cases, all reported diarrhea, seven (78%) reported vomiting, seven (78%) reported abdominal cramps, three (75%) of four reported fever (75%), and none reported bloody stools. The median incubation period was 28.5 hours (range, 20 to 50 hours). The median duration of illness for the three cases who had recovered at the time of interview was 44 hours (range, 11 to 58 hours). No cases sought medical care.

Four case stool specimens tested positive for norovirus at the MDH PHL. Three stool samples (two from one complainant household who ate at the restaurant on March 9, and one identified using the March 10 credit card receipts) tested positive for norovirus GII.1 with identical region D nucleic acid sequences. The fourth specimen, from an individual from a separate household identified using the March 10 credit card receipts, tested positive for norovirus GII.4 New Orleans. The region D sequence for this norovirus was five base pairs different from the GII.4 Sydney norovirus that was found in specimens during the January outbreak at this restaurant.

By univariate analysis, eating an entrée that contained fresh lettuce (7 of 9 cases vs. 4 of 19 controls; odds ratio, 13.1; 95% confidence interval, 1.9 to 89.5; $p = 0.01$) was significantly associated with illness. Menu items eaten by cases that contained fresh lettuce included: chicken quesadilla, beef nachos, southwest pizza, salad, burger, chicken wrap, and southwest taco salad. No other exposures were significantly associated with illness.

All employees were interviewed; none reported recent gastrointestinal illness or illness in their households. An incomplete and inaccurate employee contact list hindered the employee interview process. No ill employees were identified during prospective employee health screening. The restaurant's employee illness log showed no illness since February 10.

During the March 13 inspection, bare-hand contact was not observed; employees were observed wearing gloves and washing their hands. However, employees were observed wearing gloves during non-food activities (e.g., sweeping and mopping), indicating lack of understanding of appropriate glove use. The restaurant used three kinds of lettuce: iceberg lettuce that was shredded on-site with a slicer, chopped head lettuce, and pre-washed, pre-cut, bagged romaine lettuce (this lettuce was used for chicken Caesar salad and Caesar wraps only). The lettuce station also had several other items (e.g., green onions, jalapeños, tomatoes, and shredded cheese) and was usually staffed by one person. The person at the station on March 10 reported no illness. Lettuce for burger orders was typically prepared by the grill or expo employee. A three-compartment sink at the restaurant used to wash produce and cool various items was dirty. The sink and the entire salad station were washed and sanitized.

This was an outbreak of norovirus gastroenteritis associated with a restaurant. Eating lettuce at the restaurant was significantly associated with illness. No illness in employees or employee family members was reported. Improper use of gloves by employees may have contributed to the outbreak.

(11)

Group A *Streptococcus* Pharyngitis Associated with a High School Dance Team Banquet

March St. Louis County

On March 20, 2012, the Minnesota Department of Health (MDH) received a complaint regarding a suspected outbreak of streptococcal pharyngitis among attendees of an all-female high school dance team banquet. The complainant, a parent of a child on the dance team, reported that according to postings on the team Facebook page at least 17 banquet attendees became ill with "strep throat" within 3 days following the banquet. This included herself and her daughter, who were tested at an urgent care clinic. An investigation was conducted to determine whether the reported illnesses were caused by foodborne transmission of group A *Streptococcus* (GAS) infection.

A menu of items served at the banquet and a list of attendees was obtained from a parent coordinator. All attendees and their household contacts were interviewed by telephone regarding illness and foods and beverages consumed at the banquet. During the course of interviewing, a potluck held the night prior to the banquet was identified as a second possible exposure event. Banquet attendees and household contacts were therefore re-contacted to determine potluck attendance. Male high school classmates who were invited to the potluck by the dancers (but who did not attend the banquet) were also interviewed. Because the potluck was subsequently deemed unlikely to be the cause of the outbreak, we conducted a retrospective cohort study among banquet attendees only, to assess the relative risk of illness associated with specific food items. A case of GAS pharyngitis was defined as an illness with onset between March 16 and March 21 consisting of sore throat and a positive GAS rapid test or throat culture, or sore throat and fever in the absence of cough or coryza. Primary cases were defined as persons with GAS illness onset occurring within 1 day of the earliest illness onset within the household. Secondary cases were defined as persons with GAS illness onset occurring >1 day after the earliest illness onset within the household. The secondary attack rate was calculated using a denominator of all banquet attendees and household contacts, minus persons presumed to be infected at or prior to the banquet.

Throat swabs were performed on attendees, household contacts, symptomatic male classmates, and food workers involved in preparation of the food items purchased from a local restaurant. MDH staff performed swabs only on persons not already taking antibiotics. GAS isolates cultured from case specimens by clinical laboratories were sent to the MDH Public Health Laboratory (PHL). Leftover food items from the banquet were collected. Patient and food specimens were cultured for GAS at the MDH PHL. GAS isolates were further characterized by pulsed-field gel electrophoresis (PFGE) using *Sma*I. PFGE pattern names were assigned by the MDH PHL.

A total of 80 persons were initially interviewed, of whom 58 attended the banquet, 5 did not attend but ate leftovers from the banquet, and 17 did not attend the banquet or eat leftovers. Among 71 persons re-contacted, 45 reported eating at the potluck the night prior. An additional 20 male classmates were interviewed, and all reported eating at the potluck but not the banquet. Two male classmates reported sore throat, with onset dates of March 21 and March 22, but both tested negative for GAS on throat culture. Among all 100 persons interviewed, eating food from the banquet was associated with illness

(relative risk [RR], 2.0; 95% confidence interval [CI], 1.6–2.5; $p < 0.001$), whereas eating at the potluck was not associated with illness (RR, 1.0; CI, 0.7 to 1.4, $p = 1.00$). All cases ate food from the banquet, and five cases did not eat at the potluck. Thus, the potluck was deemed unlikely to be the source of illness. The remainder of the investigation was focused on the banquet event.

Items served at the banquet included pasta, sauces, salad, breadsticks, cake, lemonade, soda and water. Marinara sauce, tomato sauce, alfredo sauce, salad, and breadsticks were purchased from a chain restaurant. The pasta was prepared at home by a parent of a dance team member. Multiple parents were involved in set-up at the hotel banquet hall where the event was held. Hotel staff provided water pitchers, plates, and silverware.

Among 63 persons who consumed food from the banquet, 18 primary cases occurred, yielding an attack rate of 29%. All primary cases were confirmed by GAS rapid test or culture. Four throat isolates from primary cases were received by the MDH PHL, all of which yielded GAS indistinguishable by PFGE (pattern GA-3). Three attendees met the case definition but had onset dates >1 day after the first illness onset in the household; therefore, they were classified as secondary cases. In addition, one attendee did not report symptoms, but did have a positive throat culture for GAS with PFGE pattern indistinguishable from the outbreak strain. This attendee lived in a household where all other residents had negative throat cultures. Another attendee with atypical symptoms had a positive culture for GAS which differed from the outbreak strain by one band. The outbreak strain was isolated from throat cultures of other household members of this attendee. The overall infection rate was therefore estimated to be 37% (23 of 63), and the secondary attack rate 5% (3 of 60). One attendee was first diagnosed with GAS by rapid test on March 19, but did not meet the case definition because symptom onset occurred on March 8, preceding the banquet event. Neither this individual nor her household members were involved in food preparation.

Among primary cases, the median age was 16.5 years (range, 8 to 53 years), and 16 of 18 (89%) were female. The median incubation period was 39 hours (range, 5 to 68 hours) and median duration of illness was 62 hours (range, 43 to 102 hours). Symptoms reported included sore throat in 18 of 18 (100%), swollen glands in 14 of 17 (82%), and fever in 11 of 17 (65%). When asked about symptoms typically considered to be negative indicators of GAS pharyngitis, 5 of 17 (29%) case-patients reported cough and 5 of 18 (28%) reported runny nose. Including both primary and secondary cases, 9 of 21 (43%) case-patients sought care in an emergency department, and 12 of 21 (57%) sought care in an urgent care or office setting. A total of 30 rapid strep screens were performed during the outbreak. No suppurative or non-suppurative sequelae were reported.

No food or beverage items were significantly associated with illness. However, all case-patients consumed pasta, and pasta consumption yielded the highest relative risk of all the items assessed (RR, 3.6; CI 0.3 to 50.6; $p = 0.29$). GAS with PFGE pattern GA-3 was isolated from 1 of 2 samples of leftover pasta collected from a household in which all but one resident had negative throat cultures. The household member with GAS pharyngitis did not attend the banquet, but ate leftover pasta and marinara sauce. GAS was not found in leftover marinara sauce collected from this household, or in tomato sauce collected from a second household (Alfredo sauce was not available for testing). Throat swabs collected from the two food workers that prepared food purchased from the restaurant were negative for GAS, as was a swab from a hand abrasion on one of the workers.

The parent who prepared the pasta reported that both she and her daughter had been ill with GAS pharyngitis 3 to 4 weeks prior to the banquet date and had been treated with antibiotics. They both reported a second onset of symptoms following the banquet and again tested positive for GAS by rapid test. The parent reported that she used gloves throughout cooking and cooling the pasta, and changed gloves frequently between batches. She cooked the pasta 2 days prior to the banquet and stored it in gallon size resealable bags in her refrigerator. She emptied the bags into two large roasting pans and rewarmed the pasta just prior to the event. The warmed pasta was transported in the same roasting pans to the hotel.

This was a foodborne outbreak of GAS pharyngitis. Pasta was identified as the vehicle. Findings in support of foodborne transmission of GAS pharyngitis as the cause of this outbreak include isolation of GAS of indistinguishable PFGE type from the pasta and from cases associated with the outbreak, an epidemic curve suggestive of a point source, and probable transmission through leftover food. We suspect that the pasta was contaminated during preparation, with recent GAS infection in the preparer providing a plausible mechanism for contamination, as nasopharyngeal carriage of GAS is common following treatment. Although the food preparer did report glove use, it is unclear whether gloves provide adequate protection against a respiratory pathogen, for which inoculation might occur as easily by airborne droplets as by hand contact. There may have been opportunities for inoculation and incubation during cooling, storage, or rewarming of the pasta. However, contamination at the event by another attendee cannot be ruled out given the buffet-style setup and the possibility of undiagnosed GAS infection among other attendees prior to the event. We reviewed proper food handling techniques with parents who prepared food, and event organizers. In order to prevent complications of GAS infection and further respiratory spread of infection, we confirmed that all symptomatic individuals had been treated with antibiotics. Asymptomatic carriers identified by positive throat culture were contacted and advised to seek antibiotic prophylaxis through their medical provider.

(12)
Listeriosis Associated with Imported Ricotta Salata Cheese

March — Hennepin County/Multiple states

On July 20, 2012, the Centers for Disease Control and Prevention (CDC) notified the Minnesota Department of Health (MDH) of a cluster of five cases of *Listeria monocytogenes* infection and two food isolates in five states/areas that were indistinguishable by pulsed-field gel electrophoresis (PFGE) (CDC two enzyme pattern designation GX6A16.0408/GX6A12.0096). The pattern was new to the national PulseNet database. Two opened cheeses, a raw milk blue cheese from Oregon and a soft cheese imported from France, both collected from a Pennsylvania case's refrigerator, were positive for the outbreak strain of *L. monocytogenes.*

One Minnesota case isolate submitted through routine surveillance matched the outbreak strain (Minnesota pattern LAS162LAP159); the case's family had been interviewed on April 9 using a CDC-developed standardized "*Listeria* Initiative" questionnaire. Cheese exposures reported during initial interview included brie, camembert, goat cheese, and raw cheese (camembert). The case's family reported several restaurants and grocery stores from which the case could have consumed food prior to the *L. monocytogenes* diagnosis. A multi-state outbreak investigation was initiated.

CDC and state health departments conducted a case-case comparison analysis to identify exposures associated with outbreak-related illness. Initial case interviews were unable to identify a particular cheese eaten by a majority of cases, though many reported consuming store-packaged, gourmet cheeses; cross-contamination of multiple cheeses by a single contaminated cheese during cutting and re-packaging was suspected. The cheese inventories of various retail and distribution facilities associated with the outbreak were compared to identify a list of cheeses of interest based on inventory commonalities. The United States Food and Drug Administration (FDA) conducted sampling of intact cheeses working from this cheese list.

Family members of the Minnesota case were re-interviewed with supplemental questionnaires to collect additional details on cheese exposures and locations where food, particularly cheese, for the case had been purchased. A list of establishments for follow-up was prioritized based on where the case's family recalled purchasing cheese for the case and where the case had done most of her grocery shopping. The Minnesota Department of Agriculture (MDA) conducted investigations at these locations, including targeted inquires about the initial cheeses of interest, collection of cheese inventories, and acquisition of member purchase records. Cheese inventories from two grocery stores, a supplemental questionnaire, and other exposure information for the Minnesota case were provided to CDC.

MDA used distribution information from FDA to trace-forward the implicated Frescolina Marte brand ricotta salata cheese from the importer to retail establishments in Minnesota that received the cheese. The case's family accessed the case's credit card records to identify dates the case ate at the restaurant that received the ricotta salata cheese.

Twenty-two cases from 13 states and the District of Columbia were identified in this outbreak: California (3), Colorado (1), District of Columbia (1), Maryland (3), Massachusetts (1), Minnesota (1), Nebraska (1), New Jersey (3), New Mexico (1), New York (1), Ohio (1), Pennsylvania (2), Virginia (2), and Washington (1). Specimen collection dates ranged from March 28, 2012 to October 6, 2012. Twenty cases were hospitalized and four died. Two of the deaths were related to listeriosis. Nine cases were related to pregnancy; three were diagnosed in newborns. One fetal loss was reported. The other 13 ill had a median age of 77 years (range, 30 to 87 years); 54% were female.

The Minnesota case was a female over 80 years of age from the Twin Cities metropolitan area. *L. monocytogenes* was isolated from a blood sample collected on March 28, 2012. The case's family reported that she did not experience any symptoms related to the *L. monocytogenes* infection. The Minnesota case was hospitalized and died after collection of the specimen that yielded the *L. monocytogenes*; however, the case had an underlying condition and listeriosis was not a cause of death listed on the death certificate.

Nationally, 12 of 15 (80%) cases reported consumption of soft cheese on the *Listeria* Initiative questionnaire. Ten of 11 (91%) cases reported consumption of cut and re-packaged cheese from a retail location. Seven cases were linked directly to consumption of Frescolina Marte brand ricotta salata cheese (including cases identified in infants whose mothers consumed the cheese).

Several food recalls were associated with this outbreak. On August 8, a cheese distributor recalled partial wheels of two cheeses that had been cut and re-packaged at the distributor and were sold in June and July, after California Department of Agriculture sampling identified the outbreak strain of

L. monocytogenes in cut samples of both cheeses. This recall did not include cheese distributed to Minnesota.

FDA targeted sampling of suspect cheeses identified the outbreak strain of *L. monocytogenes* in an unopened/intact wheel of Frescolina Marte brand ricotta salata cheese that was distributed by the sole U.S. importer. The ricotta salata was imported from Manufacturer A in Italy and sold without further cutting or processing.

On September 14, the importer expanded a September 10 recall to include all imported Manufacturer A products and announced its intention to permanently cease import/sale of Manufacturer A products. The importer released a list of states that received the Frescolina Marte ricotta salata sold between September 2011 and August 31, 2012 that was part of the expanded recall. Minnesota was listed as a state that received the cheese in the expanded recall.

MDA and MDH requested Minnesota distribution information for the ricotta salata cheese and received the information from FDA on October 15. A single Minnesota distributor received two shipments (March 14 and June 20, 2012) of the recalled ricotta salata cheese, one of which was shipped prior to the case's specimen collection date. The March 14 shipment (approximately 66 pounds) was received by the Minnesota distributor on March 19 – cheese from this shipment was sent without further cutting or processing to a small grocery store in the metropolitan area, a restaurant, and a secondary distributor. The secondary distributor did not receive the cheese until May 2012, after the case's specimen collection date. A restaurant in Minneapolis received 8 pounds of the recalled ricotta salata cheese on March 20. The cheese was used during that week in menu items, including a pasta with fried cheese on top, and greens with crumbled cheese and white balsamic vinaigrette dressing. The rest of the cheese was used in the bakery in a chicken salad in April. The case's family had reported this restaurant during the initial interview as one frequented by the case and a location where food for the case was purchased. The case's credit card records indicated that she ate at the restuaurant on March 21 and March 22 (among other dates prior to delivery of the recalled ricotta salata to the restaurant). Specific information on food items purchased/eaten was not available. The case had no known exposure to the metropolitan area grocery store that was the only other Minnesota retail location that may have received the cheese prior to the case's specimen collection date. The incubation period for the Minnesota case calculated from the restaurant meal dates to specimen collection date was 6 or 7 days.

This was a multi-state outbreak of listeriosis involving one Minnesota case. Frescolina Marte brand pasteurized ricotta salata cheese imported from Italy was implicated as the source of the outbreak. Cross-contamination of other cheeses during cutting and repackaging at distribution and/or retail locations complicated the outbreak investigation. The Minnesota case was exposed to the implicated cheese at a Minneapolis restaurant; it is unknown if the case consumed this cheese or another cross-contaminated menu item.

Reference

1. Multistate Outbreak of Listeriosis Linked to Imported Frescolina Marte Brand Ricotta Salata Cheese (Final Update). www.cdc.gov/listeria/outbreaks/cheese-09-12/
2. FDA Investigates a Multistate Outbreak of Listeria monocytogenes Infections Linked to Imported Frescolina Marte Brand Ricotta Salata Cheese www.FDA.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm319197.htm

(13)
Clostridium perfringens Intoxications Associated with a Restaurant

March Washington County

On March 26, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of seven individuals from two households who ate at a restaurant in Woodbury on March 24. The group reported no other recent meals in common. Washington County Public Health and Environment (WCPHE) was contacted and an investigation was initiated immediately.

WCPHE sanitarians visited the restaurant on March 26 to evaluate food preparation and handling procedures and collect credit card receipts for additional patrons who had dined there from March 23 - 25. MDH staff interviewed patrons identified from credit card receipts about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-nine restaurant patrons were interviewed; seven (18%) met the case definition (three from the original complainant group and four identified through credit card receipts). All seven cases reported eating at the restaurant on March 24. The median incubation period for the cases was 7 hours (range, 3 to 16.5 hours). The median duration of illness was 16 hours (range, 9 to 21 hours). All seven cases reported diarrhea, six (86%) reported cramps, and none reported vomiting, fever, or bloody stools. A stool specimen submitted by one ill patron tested positive for *Clostridium perfringens* enterotoxin type A.

No food items were significantly associated with illness. The majority of cases reported consuming chips (n=7), salsa (n=6), chicken (n=6), rice (n=5), and beans (n=4).

WCPHE sanitarians conducted an environmental assessment at the restaurant on March 26. The sanitarians identified several issues regarding cooling of food. Beans and ground beef were being cooled improperly. Additionally, the restaurant had no functioning thermometer and was not keeping cooling logs. Restaurant employees were educated on safe cooling procedures.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with a restaurant in Woodbury. While no vehicle was implicated, the environmental health assessment documented time-temperature abuse of multiple food items.

(14)
Salmonella Enteritidis Infections Associated with a Restaurant

April Wabasha County

On April 24, 2012, the Minnesota Department of Health (MDH) identified a case of *Salmonella* Enteritidis infection with MDH pulsed-field gel electrophoresis pattern designation SE1B1 who, during a routine surveillance interview, reported onset of illness 5 days after eating eggs Benedict with hollandaise sauce, a poached egg, and biscuits at a restaurant in Lake City on April 8. Due to this suspect

exposure, other recent SE1B1 cases who had been interviewed were called back and asked specifically about the restaurant and several other restaurants. During the call-back interview, a case with illness onset on April 9 recalled eating crab cake Benedict with hollandaise sauce, lamb, and an egg frittata at the restaurant April 8. This case had initially reported two other restaurants during routine interview on April 24. Wabasha County Public Health Environmental Health (EH) and the Minnesota Department of Agriculture (MDA) were notified, and an investigation was initiated.

Subsequently, during a call-back interview, a case who had been interviewed on April 19 (and reported no restaurant exposures) remembered eating at the restaurant on April 8 with a family member from a different household who had also tested positive for *Salmonella*.

Wabasha County EH specialists visited the restaurant on April 25 to evaluate food preparation and handling procedures, gather information on egg-containing items and egg sources, obtain a complete menu for April 8, and interview food workers. Food workers who reported diarrhea since April 1 were excluded from work pending a stool test for *Salmonella*. *Salmonella*-positive food workers were excluded from work until two stool samples collected at least 24 hours apart tested negative for *Salmonella.*

Reservations and credit card receipts from April 8 were obtained from the restaurant. MDH staff interviewed restaurant patrons about food/beverage consumption at the restaurant and illness history. MDA staff visited the restaurant's egg supplier on May 3 to conduct a site inspection. A case was defined as a restaurant patron who subsequently either had *Salmonella* Enteritidis SE1B1 isolated from a clinical specimen or developed diarrhea (≥3 loose stools in 24 hours) that either lasted ≥3 days or was accompanied by fever. Stool samples were submitted to the MDH Public Health Laboratory (PHL) for *Salmonella* testing.

A total of 26 patrons were interviewed; four met the case definition. All four had tested positive for *S.* Enteritidis SE1B1 and were identified through routine disease surveillance. No additional cases were identified through credit card and reservation list calling. The median incubation period for cases was 4 days (range, 30 hours to 12 days). The case with 12 day incubation was a family member and meal companion of another case, but the cases did not live in the same household and claimed that they had no other meals in common; therefore, both were classified as primary cases. The one case who had recovered at the time of interview had illness duration of 7 days. All four cases reported diarrhea and abdominal cramps, two (50%) reported vomiting, two (50%) reported bloody stools, and one (33%) reported a 105° F fever. All four cases visited a healthcare provider, but none were hospitalized. The median age of cases was 52 years (range, 20 to 58 years), and two (50%) were female. Multiple locus variable-number tandem repeat analysis (MLVA) was used to further differentiate isolates with this common PFGE pattern; all four case isolates had MLVA pattern MSE146.

In a univariate analysis, consuming crab cake Benedict (4 of 4 cases vs. 5 of 22 controls; $p = 0.008$), and consuming egg frittata (3 of 3 cases vs. 1 of 21 controls; $p = 0.002$) were significantly associated with illness.

On April 8, the restaurant offered a special Easter brunch menu in addition to their regular lunch and dinner menu. A crab cake Benedict dish that was part of the Easter menu included a poached egg and hollandaise sauce. Hollandaise sauce was used only for the crab cake Benedict dish and was prepared in a single batch on April 8 using nine egg yolks with butter in a double-boiler. After preparation, the

sauce was held at room temperature for the remainder of the day (10:30 a.m. to 2:00 p.m.) as it was used to fill orders. An egg frittata was also part of the Easter menu; ingredients were mixed, baked in the oven (doneness was measured by time), and stored in the walk-in cooler on April 7, and then slices were reheated in the microwave and oven-finished on April 8. Eggs were used in some other Easter and regular dishes, including poached eggs served with several menu items.

All 15 employees were interviewed; one employee reported diarrhea since April 1 and was sent home during the April 25 inspection. The employee had eaten crab cake Benedict with hollandaise, steak and eggs, and potato hash at the restaurant on April 8, and had experienced diarrhea, abdominal cramps, chills, and aches from April 11 through April 15. Other employees had also eaten at the restaurant on April 8 and were not ill. A stool sample from the ill employee tested positive for *S.* Enteritidis SE1B1 (MLVA pattern MSE146) at the MDH PHL, and the employee was excluded from work until two stool samples tested negative for *Salmonella*. The employee shed *Salmonella* in stool for 70 days.

The restaurant's only egg supplier was located in Mantorville, Minnesota. A receipt indicated that the restaurant received 12 dozen X-large eggs from supplier on April 11 and on April 25; the restaurant also received a delivery of eggs on April 8. The supplier provided wholesale eggs to the restaurant and a bakery next door. All other egg sales were direct to consumers. The supplier maintained a flock of 150-250 hens and was registered with MDA's egg program. Hens had outdoor access during nice weather. No formal pest control was used. Hen suppliers included an Iowa supplier, private sources, "rescue" hens, and home-raised hens. Nesting boxes were used in the pens, but the farm did report having a little trouble with hens laying eggs on the floor. Roll-out boxes were placed under the nesting boxes so eggs rolled into a covered area after they were laid. Hens were fed home-grown corn mixed with soy protein from a local elevator. Eggs were graded and packed and placed in a walk-in cooler before delivery. Plastic egg flats were sanitized once a week.

Wabasha EH specialists directed the restaurant to develop an employee illness policy, and instructed the chef to monitor if foods were done by temperature. EH specialists discussed with the restaurant the need for a consumer advisory on the menu, and the use of pasteurized eggs.

This was a foodborne outbreak of *Salmonella* Enteritidis associated with egg dishes, including hollandaise sauce, served at a restaurant; the dishes were made using locally produced shell eggs from a small farm.

(15)
Sapovirus Gastroenteritis Associated with a Restaurant

April Kandiyohi County

On April 12, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of 13 individuals from 5 households who ate at a restaurant in Willmar on April 8. Kandiyohi County Environmental Health Services (KCEHS) was contacted, and an investigation was initiated immediately.

A KCEHS sanitarian visited the restaurant on April 13 to evaluate food preparation and handling procedures, interview food workers, and collect credit card receipts for additional patrons from April 8. MDH staff interviewed patrons identified from credit card receipts about food consumption and illness

history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) or with laboratory-confirmed sapovirus infection after eating at the restaurant. Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Sixty-five restaurant patrons were interviewed; 22 (34%) met the case definition. Six additional patrons reported illness that did not met the case definition and were excluded from analysis. The median incubation period for the cases was 52.5 hours (range, 20.5 to 77 hours). The median duration of illness was 3 days (range, 1 to 5 days). Twenty-one (95%) cases reported diarrhea, 16 (73%) cramps, 13 (59%) fever, 5 (23%) vomiting, and one (5%) bloody stools. Stool samples were submitted by five cases; three were positive for sapovirus.

By univariate analysis, consuming baked ham (16 of 21 cases vs. 11 of 34 controls; odds ratio [OR], 6.7; 95% confidence interval [CI], 1.9 to 23.0; p = 0.002) and Swedish meatballs (15 of 21 cases vs. 11 of 34 controls; OR, 5.2; 95% CI, 1.6 to 17.2; p = 0.006) were significantly associated with illness. Both baked ham (adjusted OR [aOR], 6.8; 95% CI, 1.7 to 26.5; p = 0.006) and Swedish meatballs (aOR, 4.62; 95% CI, 1.2 to 17.7; p = 0.03) remained independently associated with illness in a multivariable logistic regression model. Cases were more likely than controls to have reported a meal time at or before 11:00 a.m. (17 of 21 cases vs. 10 of 31 controls; OR, 8.9; 95% CI, 2.1 to 44.3; p = 0.006). Among patrons who reported a meal time at or prior to 11:00 a.m., only consuming baked ham was significantly associated with illness (13 of 17 cases vs. 3 of 13 controls; OR, 10.8; 95% CI, 2.0 to 59.8; p = 0.009). All of the foods served, including the baked ham and Swedish meatballs, were served buffet style.

A KCEHS sanitarian interviewed all 36 restaurant employees, and two reported recent gastrointestinal illness. A hostess reported becoming ill with diarrhea on April 9, and a server developed diarrhea on April 10. No employees reported illness prior to or on the implicated meal date of April 8. The server had worked on April 8 and reported consuming both Swedish meatballs and ham. However, the hostess had not worked since April 6 and did not consume food from the April 8 buffet. All employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms. A stool specimen collected from the ill hostess was negative for sapovirus and all other viral and bacterial pathogens.

This was a foodborne outbreak of sapovirus gastroenteritis associated with a restaurant in Willmar. Baked ham and Swedish meatballs were statistically associated with illness. The source of the contamination was not identified. However, the most plausible source of the contamination was either an unidentified infected food worker or an infected patron who contaminated the baked ham and Swedish meatballs and/or utensils used to serve those food items.

(16)

Clostridium perfringens Intoxications Associated with a Restaurant

April Dakota County

On April 16, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received two separate complaints of gastrointestinal illness among groups that had dined at a restaurant in Mendota Heights on April 14; the first complaint involved a party of two and the second a party of five. In

addition, a third complaint from a party of two who had eaten at the restaurant on April 15 was reported by the restaurant to MDH. An investigation was initiated immediately.

MDH Environmental Health Services (EHS) sanitarians visited the restaurant on April 16 to evaluate food preparation and handling procedures and collect credit card receipts for additional patrons who had dined there on April 14. MDH staff interviewed patrons identified from credit card receipts about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Stool samples collected from consenting patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Twelve restaurant patrons were interviewed; eight (67%) met the case definition. The median incubation period for the cases was 15.5 hours (range, 13.5 to 17.5 hours). The median duration of illness was 15 hours (range, 11 to 31 hours). All eight cases reported diarrhea, seven (88%) reported cramps, and none reported vomiting, fever, or bloody stools. Three stool specimens were submitted by ill patrons and all tested positive for *Clostridium perfringens* enterotoxin Type A.

Due to the limited number of non-ill controls, the case control study lacked power to detect significant associations and no food items were significantly associated with illness. However, the consumption of refried beans (7 of 8 cases vs. 2 of 4 controls; odds ratio [OR], 7.0; 95% confidence interval [CI], 0.4 to 123.4; $p = 0.24$) and shredded chicken (6 of 8 cases vs. 2 of 4 controls; OR, 3.0; CI, 0.2 to 37.7; $p = 0.55$) yielded elevated odds ratios in the analysis.

MDH EHS sanitarians conducted an environmental assessment on April 16. Shredded chicken was found cooling at room temperature on the counter and measured at 97° F, and shredded chicken was being hot-held on a steam table and measured at 124° F. All out of temperature chicken was reheated to 165° F. The previous inspection (January 9, 2012) reported that refried beans had not been cooled properly (49° F in the walk-in cooler) and were being hot held on a steam table at 134° F and 65° F. Employees were educated on safe holding and cooling procedures.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with a restaurant in Mendota Heights. Time-temperature abused refried beans and/or shredded chicken was the likely vehicle.

(17)
Norovirus Gastroenteritis Associated with a Restaurant

April Ramsey County

On April 26, 2012, a restaurant in Roseville received a complaint of gastrointestinal illness among a group of 14 meal companions who ate dinner at the restaurant in Roseville on April 22. The restaurant forwarded the complaint to the Ramsey County Environmental Health (RCEH) sanitarian, who notified the Minnesota Department of Health (MDH). MDH staff interviewed the complainants and determined that the group had other recent common meals in addition to the meal at the restaurant.

On May 3, the restaurant received a second, independent complaint of illness in all four meal companions who also ate dinner at the restaurant in Roseville on April 22. Ramsey County Environmental Health was notified, and an investigation was initiated.

RCEH sanitarians visited the restaurant on April 27 to evaluate food preparation and handling procedures. RCEH sanitarians interviewed restaurant food workers after the second complaint on May 3. MDH staff interviewed the complainants about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Eleven restaurant patrons were interviewed; 10 met the case definition, including 9 from the first complaint and 1 from the second complaint (repeated attempts to reach the other 3 members of the second complainant group were unsuccessful). The median incubation period for the cases was 41 hours (range, 14 to 105 hours). The median duration of illness was 3.5 days (range, 1 to 5 days). Nine (90%) cases reported diarrhea, eight (80%) vomiting, eight (80%) fever, four (40%) fever, and two (20%) bloody stools. Stool samples submitted by two ill patrons from the first complaint tested positive for norovirus GII. Two cases were likely due to secondary person-to-person transmission of norovirus from an ill household member and were excluded from further analysis.

The limited number of non-ill controls precluded a meaningful statistical analysis of food exposures. Five (63%) cases reported consuming ribs, five (63%) corn bread, four (50%) salad, two (25%) coleslaw, two (25%) onion strings, and one each (9%) chicken wings, French fries, and beans.

RCEH sanitarians interviewed 21 restaurant employees. One reported an onset of vomiting and diarrhea on April 23. This employee worked as a cashier and server on Sunday, April 22 but could not recall if they prepared foods. Following the initial complaint on April 26, sanitarians and restaurant management established a screening protocol for employee illness. All employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms. The sanitarian also discussed the importance of handwashing for the prevention of norovirus transmission.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Roseville. No vehicle was identified. The source of the contamination was not identified.

(18)
Sapovirus Gastroenteritis Associated with Catered Banquet

May — Ramsey County

On May 2, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in people who attended a banquet in St. Paul on April 27. The banquet was catered by Caterer X in Maplewood. Approximately 80 persons attended the banquet. The City of Maplewood Environmental Health program was notified on May 2, and an investigation was initiated.

MDH interviewed the original complainants, and obtained a list of banquet attendees from event organizers. A case was defined as a person who ate at the banquet on April 27 or ate leftovers from the banquet and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On May 2, a sanitarian from the City of Maplewood contacted the caterer to evaluate food preparation and handling procedures and to interview employees regarding illness history and job duties. On May 3, MDH staff began interviewing attendees from the contact list that had been provided. On May 7, a sanitarian visited the licensed kitchen where the caterer prepares food and conducted an environmental assessment.

Forty-three attendees were interviewed, and 25 (58%) met the case definition. Five attendees reported illness that did not meet the case definition and were excluded from analyses. The median incubation period for cases was 39 hours (range, 2 to 111 hours). Three cases had an incubation of 2 hours. The median duration of illness was 25 hours (range, 20 to 62 hours). Twenty-four (96%) cases reported diarrhea, 14 (56%) reported cramps, 11 (44%) reported fever, 8 (32%) reported vomiting, and none reported bloody stools. One case visited a medical provider.

Four stool specimens from banquet attendees were submitted to MDH; all tested positive for sapovirus genotype GI and all specimens had identical nucleic acid sequences. The four stool specimens were negative for norovirus, *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, *Shigella*, and *Yersinia.*

Food items prepared for the banquet by the caterer included roast beef, baked chicken, au gratin potatoes, Italian pasta salad, a vegetable tray (homemade veggie dip, carrots, broccoli, cucumber, cherry tomatoes, cauliflower), cheese tray (provolone and colby jack slices), buns, chocolate-covered strawberries, coffee, and cream. The banquet organizers purchased a cake from a bakery in St. Paul and supplied bottled water and canned soda in coolers filled with ice. All the foods were self-serve on a buffet line. All dishes, silverware, and linens were provided by the caterer.

No food items were significantly associated with illness in a univariate analysis. However, consuming baked chicken yielded an elevated odds ratio [OR] of 3.3 (19 of 24 cases vs. 7 of 13 controls; 95% confidence interval [CI], 0.8 to 14.2; $p = 0.14$) and taking home leftover food approached significance (11 of 24 cases vs. 2 of 13 controls; OR, 4.7; 95% CI, 0.8 to 25.7; $p = 0.08$). Two cases did not attend the banquet but consumed leftovers; one case had au gratin potatoes and roast beef, and one case had au gratin potatoes and baked chicken.

Illness histories and job duty information were obtained from three catering employees. No employees reported having had gastrointestinal illness previous to or on the implicated meal date. One employee reported becoming ill (fever, headache, cramps, nausea) on April 30 (after the implicated meal date) and had consumed roast beef, au gratin potatoes, and cake at the banquet.

During the establishment visit, the sanitarian stressed the importance of proper handling of food and beverages, use of gloves or utensils when handling ready-to-eat foods, good handwashing, and exclusion of ill food handlers.

This was a foodborne outbreak of sapovirus gastroenteritis associated with eating at a banquet in St. Paul, Minnesota. No food item was statistically associated with illness. The source of contamination was

not identified. The occurrence of very short reported incubations among attendees suggests that one or more infectious attendee could have contaminated buffet items.

(19)

Campylobacter jejuni Infections Associated with Raw Milk Consumption Among a 5th Grade Class

May Hennepin County

On May 23, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint from a Hennepin County resident who reported that her child and six or seven other students became ill after drinking raw milk during a 5th grade field trip to Wisconsin. During May 9-11, 2012, approximately 60 students from a Hennepin County grade school, their teachers, and adult chaperones participated in an annual 5th grade capstone experience at a farm school near Glenwood City, Wisconsin. On May 24, MDH notified the Hennepin County Public Health Department (HCPHD) epidemiology unit and Wisconsin Division of Public Health (WDPH), and an investigation was initiated.

The complainant reported that a 5th grade teacher had purchased raw milk and distributed it to students in the class. This teacher was contacted and interviewed about the raw milk sale and his illness history. On May 10, the students and their chaperones took a trip to a nearby dairy farm and petting zoo in Dunn County. Before returning to the farm school campus, the teacher purchased a gallon of raw milk and shared it with the teachers and the students in his class. He later brought the remaining milk home and served it to his 6-year-old son, who became ill 9 days later. On May 11, another teacher returned to the same farm to purchase another gallon before returning home to Minnesota.

A list of adult chaperones, teachers, and students present on the trip was obtained from the school's principal. It was estimated that 60 students and adults attended the trip; two of the four 5th grade classes in attendance visited the nearby farm during the field trip and had an individual in their party purchase raw milk. Interviews focused on individuals associated with these two classes. The Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) conducted an investigation on the dairy farm and collected bulk tank milk samples for testing. A case was defined as any individual who attended the field trip in Wisconsin or consumed a food item purchased during the field trip, and subsequently developed diarrhea (≥3 loose stools in a 24-hour period). All cases were asked if they were willing to submit a stool sample to the MDH Public Health Laboratory for culture.

Illness histories and exposure information were obtained from 21 individuals, and seven (33%) met the case definition. Of the seven cases, all reported diarrhea and cramps, five (71%) reported fever (maximum temperature range, 102-103° F), two (29%) reported vomiting, and two (29%) reported blood in their stool. One case sought medical care for their illness and no cases were hospitalized.

Consuming raw milk was significantly associated with illness (6 of 7 cases vs. 4 of 18 controls; odds ratio, 21.0; 95% confidence interval, 1.9 to 229.4; $p = 0.004$). The median incubation period was 6 days (range, 3 to 10 days).

The index case was confirmed to have *Campylobacter jejuni* via stool culture. Stool kits were sent to the remaining six cases. Only one of the kits was returned for testing. This specimen also was culture-positive for *C. jejuni.* Raw milk samples collected at the farm by the WDATCP also tested positive for

C. jejuni. Isolates of *C. jejuni* from both cases and the raw milk were indistinguishable by pulsed-field gel electrophoresis (Minnesota subtype designation CMP31).

This was an outbreak of campylobacteriosis associated with consumption of raw milk obtained from a Wisconsin farm. Raw milk is a well-known vehicle for *Campylobacter* in humans.

(20)
Salmonella Newport Infections Associated with a Graduation Party

May Hennepin County

On May 22, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that three clinical *Salmonella* Newport isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (NEW122). All three were interviewed by MDH staff as part of routine surveillance and reported attending the same graduation party held at a private residence in Brooklyn Park on May 12. An investigation was initiated immediately.

From May 23 through July 3, eight additional *S.* Newport cases with matching PFGE patterns were identified through routine surveillance. However, no common food vehicle was identified among the additional cases and no cases reported consuming food items that were served at the graduation party.

All *S*. Newport cases in Minnesota are routinely interviewed about potential exposures, including foods consumed at home and at restaurants, as part of routine surveillance. Interviews of *S*. Newport cases that are indistinguishable by PFGE are compared to identify potential common exposures. Information gathered during routine interviews is reviewed by an MDH epidemiologist.

After the initial cases reported attending the same graduation party, the party host was contacted. He provided information on what foods were served at the party and where those foods were purchased. He also initially agreed to provide contact information for additional graduation party attendees. However subsequent repeated attempts to re-contact him were unsuccessful. A case was defined as an individual from whom *S*. Newport NEW122 was isolated after attending the graduation party on May 12.

Five graduation party attendees were interviewed. One additional case could not be reached for interview and was lost to follow-up. Case illness onsets ranged from May 13 to 15. Among the five cases interviewed, all five reported diarrhea, four (80%) fever, three (60%) cramping, and one (20%) bloody diarrhea and vomiting each. The median incubation period was 1.5 days (range, 1 to 3 days). The median duration of illness was 7 days (range, 5 to 11 days). Two cases were hospitalized, each for two days.

Graduation party attendees reported consuming a variety of foods at the event including goat (n=2), chicken (n=2), rice (n=2), salad (n=1), goat tripe (n=1), meat pie (n=1), fish (n=1), soup (n=1), and chips (n=1). Several cases had difficulty identifying the dishes that were served and reported consuming "African foods." The lack of non-ill controls precluded a meaningful analysis of food exposures.

The party host reported that chicken, meat pies, salads, goat meat, goat tripe, goat intestines, salad, and rice were served at the event. The goat and chicken were purchased from a live animal market in St. Paul and all of the foods were prepared in the same kitchen prior to the event.

This was an outbreak of *S*. Newport NEW122 infections associated with a graduation party and identified through routine disease surveillance. The tightly grouped illness onsets suggest a food vehicle at the event as the most likely source of illness. However, the lack of cooperation from the event host prevented the identification of a vehicle.

(21)
Norovirus Gastroenteritis Associated with a Private Party

June Washington County

On June 19, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of 18 of 20 people becoming ill after attending a party held at a private home in White Bear Lake on June 16. Foods served at the party included three types of sandwiches ordered from a restaurant, chips, strawberries, watermelon, pasta salad, and cake. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on June 19, and an outbreak investigation was initiated.

A list of party attendees was obtained from the host. Party attendees were interviewed by MDH staff about food consumption and illness history. A case was defined as a party attendee who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were obtained from party attendees and submitted to MDH for bacterial and viral testing.

A sanitarian from MDH FPLS contacted the restaurant to inquire about any recent employee illness or customer illness complaints.

Illness histories and exposure information were obtained from 12 attendees. Seven (67%) cases were identified. Four additional individuals reported illness; however, three of their illness onsets were during the week prior to the party, and one illness onset was more than 72 hours after the party, most likely representing a secondary case.

All seven cases reported diarrhea, six (86%) reported vomiting, six (86%) reported cramps, and five (83%) of six reported fever. The median incubation period was 31 hours (range, 28 to 39 hours). The median duration of illness was 38 hours (range, 18 to 47 hours) for the four cases who had recovered at the time of interview.

The three individuals who were ill prior to the party all resided at the home where the party took place. One of the individuals helped prepare food for the party, including slicing the fruit and cutting the cake.

Three stool samples were received: one from a primary case, one from a secondary case, and one from the individual who was ill prior to the party and who helped prepare food. All three stool samples tested positive for norovirus GI. Nucleic acid sequencing was conducted on all three of the positive norovirus samples; the nucleic acid sequences were identical.

Due to the limited menu and the identification of only one non-ill controls, a meaningful statistical analysis could not be performed. However, all of the cases did report eating strawberries or watermelon.

No employees at the restaurant reported being recently ill with diarrhea or vomiting. Neither the restaurant nor MDH received any additional complaints of illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with a birthday party. The same norovirus sequence was identified in samples submitted from a party guest and a previously ill individual who prepared food for the party. While a specific vehicle was not identified, one or more of the food items handled by the previously ill individual was the most plausible vehicle.

(22)
Salmonella Montevideo Infections Associated with a Restaurant

June-July Olmsted County

On July 10, 2012, the Mayo Clinic Infection Prevention Department notified an Olmsted County Public Health Services (OCPHS) epidemiologist that they had an unusually high number of patients test positive for *Salmonella* within a few days. The Minnesota Department of Health (MDH) was then notified. All the cases were reported to MDH by Mayo Clinic staff. All of the *Salmonella* isolates were sent to the MDH Public Health Laboratory (PHL) for confirmation, but none had serotype or pulsed-field gel electrophoresis (PFGE) subtype results yet. Initial interviews of two cases revealed that they had eaten at the same restaurant in Rochester, in the week prior to illness onset. Based on that information, OCPHS and MDH initiated an investigation of the restaurant on July 11.

A case was defined as a Minnesota resident with laboratory-confirmed infection with *S.* Montevideo PFGE subtype SMON93SMB4, or as a person who ate at Restaurant A in Rochester and subsequently developed diarrhea (≥3 loose stools in a 24-hour period) and fever or duration of diarrhea > 2 days in the 7 days after the meal.

All *S.* Montevideo cases identified during routine surveillance activities are interviewed using a standard questionnaire about exposures and food consumption at home and at restaurants. A supplemental questionnaire that included multiple restaurants and other eating venues was used early in the investigation. A second supplemental questionnaire listing Restaurant A menu items was used to interview cases after the restaurant was identified as the source of the outbreak, and also was used to interview additional restaurant patrons.

Patrons who ate at Restaurant A from June 28 to July 2 were identified using credit card receipts, and were contacted and interviewed about food consumption and illness history by MDH. Stool samples collected from consenting patrons were submitted to the MDH PHL for *Salmonella* testing.

OCPHS Environmental Health Specialists visited the restaurant on July 11 to evaluate food preparation and handling procedures. Restaurant employees were interviewed about recent history of gastrointestinal illness and work duties at the restaurant. All restaurant employees were asked to submit stool specimens to the MDH PHL until two consecutive specimens collected at least 24 hours apart tested negative for

Salmonella. Additionally, employees who reported gastrointestinal illness or who tested positive for *Salmonella* were excluded from work until testing was completed.

Restaurant management staff were asked to screen employees for gastrointestinal illness when they presented to work during the investigation. Additional interventions to prevent further transmission were also implemented.

Overall, 24 people were interviewed as part of the investigation. Eleven cases were identified (eight were identified through routine surveillance, two were identified from complaint calls to MDH, and one was a dining companion of a surveillance case). Of those, 10 were laboratory confirmed cases with *S.* Montevideo SMON93SMB4 isolates. Of all the cases, only one confirmed case did not report eating at Restaurant A prior to onset of illness. All 11 cases had diarrhea, 7 (64%) had fever, 3 (27%) had vomiting, 1 (9%) had blood in their stool, and 1 (9%) developed a urinary tract infection. Four (36%) of the patients were hospitalized. The median duration of hospitalization was 3 days (range, 1 to 6 days). None of the cases died. Illness onset dates for the confirmed cases ranged from June 29 to July 7. The median incubation period was 39 hours (range, 15.5 to 143 hours). Most of the cases were still ill at the time of the interview; duration of illness was available for only four cases. The median duration of illness was 144 hours (range, 31.5 to 191 hours). One secondary case was identified in a household member and dining companion of a confirmed case.

The cases' meal dates at Restaurant A ranged from June 23 through July 5. One case ate at the restaurant two times before the onset of illness (June 27 and July 2); however, the second meal was less than 3 hours before onset of illness. The cases ate a variety of foods including biscuits, chicken sandwich, eggs, fruit, gravy, hash browns, mashed potatoes, pancakes, pancake special (with blueberries, strawberries, and whipped cream), pork chops, salads, sausages, and other foods. Twelve patrons identified through credit card receipts and who ate at Restaurant A from June 28 to July 2 were interviewed about food consumption at the restaurant and gastrointestinal illness after their meal. None were ill. A case-control study was conducted. Foods were grouped into categories including any eggs, bacon, sausage, hamburger, steak, chicken, salad, lettuce, tomatoes, sandwich, strawberries, fruit drinks, syrup, and other food categories for analysis. No foods were statistically associated with illness.

OCPHS interviewed 50 employees. Seven employees reported experiencing diarrhea, with onsets ranging from June 30 through July 12. Forty eight employees submitted at least two stools for testing. Two tested positive for *Salmonella*, including one employee with onset of diarrhea on June 30 who worked while ill for 2 days, and one employee who was asymptomatic.

OCPHS worked with restaurant management to implement employee health screening by management during the investigation. Additional interventions included no bare-hand contact with ready-to-eat foods using a 100% glove use policy for food handling, and surface cleaning, especially of heavily soiled areas, to be followed by sanitizing.

Observations made on July 11 during the initial visit to the restaurant identified a potential for cross-contamination on the cook line due to inadequate glove changes and inadequate handwashing after handling raw meat and shell eggs. While task separation of the three cook line positions was attempted, the actual food-handling practices of staff working the "shell-egg" position and the middle "raw-meat" position increased the probability of cross-contamination.

This was an outbreak of *Salmonella* Montevideo infections associated with eating at a restaurant in Rochester. A specific food vehicle or source of contamination were not identified. Ill and infected food workers were identified, and it is possible that they served as a source of contamination for some patron cases; however, some patrons became ill ate at the restaurant before the earliest food worker illness, suggesting that an infected food worker was not the initial source of contamination. Cross-contamination of ready-to-eat foods from raw foods of animal origin could also explain some of the patron cases.

(23)
Salmonella Enteritidis Infections Associated with a Restaurant

July Hennepin County

On July 25, 2012, review of routine surveillance interviews of *Salmonella* Enteritidis pulsed-field gel electrophoresis (PFGE) subtype SE1B1 cases reported to the Minnesota Department of Health (MDH) revealed that one case had patronized a restaurant in Minneapolis on July 8, and a second case reported working as a server at the same restaurant. Review of previous SE1B1 cases identified an additional case that worked in food service at the restaurant with an illness onset in May. Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH) were contacted and an investigation was initiated.

S. Enteritidis cases are routinely interviewed about exposures and food consumption at home and at restaurants as part of routine surveillance. Interviews of *S*. Enteritidis cases with isolates that are indistinguishable by PFGE are compared to identify potential common exposures. Information gathered during routine interviews is reviewed by an MDH epidemiologist.

On July 25, MDEH sanitarians conducted an environmental assessment of the restaurant to interviewed restaurant employees, and collected credit card receipts for additional patrons from July 6 - 9 and July 18 - 22. The cases, their meal companions, and additional patrons identified through credit card receipts were interviewed by MDH and HSPHD staff about food consumption and illness history. All restaurant staff were required to submit at least two stool specimens to the MDH Public Health Laboratory.

A confirmed case was defined as a restaurant patron from whom *S*. Enteritidis SE1B1 was isolated after eating at the restaurant. Controls were restaurant patrons identified from credit card receipts who reported no gastrointestinal symptoms after eating at the restaurant.

A total of 98 restaurant patrons were interviewed. Of these, two culture-confirmed cases were identified through routine surveillance. No additional illnesses among patrons identified through credit card receipts were identified.

Both cases reported diarrhea, one reported fever, one reported cramping, and neither reported vomiting or bloody stools. Neither case was hospitalized. The meal dates for the two cases were July 8 and July 15. The cases reported incubation periods of 46.5 and 75 hours, and illness durations of 4 and 14 days.

One case reported consuming eggs benedict with corn sauce and potatoes. The other case ate yogurt with granola and a small amount of a meal companion’s CSA hash which includes eggs. The small number of cases precluded a meaningful statistical analysis of food exposures.

MDEH sanitarians interviewed all 57 restaurant employees. Fifteen employees reported gastrointestinal illness since May 1, and 10 tested positive for *S.* Enteritidis SE1B1, including three employees who did not report symptoms. Employees reported illness onsets over a 3 month period, including four in May, two in June, and nine in July. Upon environmental inspection, the sanitarian noted several violations. Unpasteurized shell eggs were being used to make mayonnaise and aioli, which was used in several menu items including egg salad and potato salad. The restaurant was ordered to discontinue using unpasteurized eggs in mayonnaise and aioli produced in the restaurant.

The majority of foods served at the restaurant, including all eggs, were produced on a single farm in Plato, Minnesota associated with the restaurant. The farm had approximately 1000 laying hens. Two employees reported visiting the farm and having direct contact with baby chicks within their incubation period. The Minnesota Department of Agriculture took 17 environmental swabs from the egg laying facility; all were negative for *Salmonella*.

This was an outbreak of *S*. Enteritidis SE1B1 infections associated with eating at a restaurant in Minneapolis. The outbreak was identified through routine disease surveillance. Documented transmission to patrons occurred on July 8 and July 15. While a vehicle was not confirmed, both cases reported consuming egg containing dishes, and this PFGE pattern of *S*. Enteritidis historically been associated with eggs. Therefore eggs from the farm in Plato are the most plausible initial source of the contamination in the restaurant. However, a large number of infected food workers were also identified, and it is possible that an infected food worker served as the source of contamination for patron cases.

(24)
Norovirus Gastroenteritis Associated with a Restaurant

July Olmsted County

On July 19, 2012, Olmsted County Public Health Services (OCPHS) notified the Minnesota Department of Health (MDH) that they had received a complaint of gastrointestinal illness among several attendees of a small two-company business meeting held on July 11 at an office building. The two companies were meeting about potential future work together and had no other common exposures. Box lunches for the meeting had been catered from a restaurant in Rochester. An investigation was initiated.

OCPHS sanitarians visited the restaurant on July 19 to evaluate food preparation and handling procedures, and interview employees regarding food handling duties and recent illness.
OCPHS requested a list of business meeting participants and their contact information from the original complainant. Additional patron information from July 11 could not be obtained; credit card receipts did not include a printed name, credit card signatures were not required for transactions less than $25, and there were no other catering or faxed orders that day. OCPHS staff interviewed meeting participants with a box lunch-specific interview form to obtain information on food/beverage consumption and illness history.

A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). Stool samples from consenting employees and patrons were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 12 box lunches were prepared on July 11 by employee X, who reportedly wore gloves during the process. Box lunch items included a turkey or ham sandwich with lettuce, tomato, and mayo or mustard, and chips, cookie, and beverage. Employee X also prepared an additional sandwich ordered off the regular menu for the courier (from another company) who picked up the sandwiches and delivered them to the business meeting. Ten of the box lunches were eaten at the business meeting, and two were taken home by a secretary who did not attend the meeting.

All 10 meeting participants who consumed a box lunch, and the sandwich courier, were interviewed; nine (82%) met the case definition, including the sandwich courier. All nine cases were male, with a median age of 46 years (range, 34 to 58 years). The median incubation period from the July 11 noon lunch was 34 hours (range, 22 to 46 hours), and the median duration of illness was 38.5 hours (range, 19.5 to 154 hours). All nine cases reported diarrhea, six (67%) reported vomiting, four of six (67%) reported fever, six of eight (75%) reported cramps, and none reported bloody stools. Three patron stool specimens were tested at the MDH PHL; two were positive for norovirus GI.6A with identical region D nucleic acid sequences. All stools were negative for *Salmonella*, *Shigella*, *Campylobacter*, and Shiga toxin-producing *E. coli*.

In a univariate analysis, no box lunch ingredients were significantly associated with illness, but the small number of controls precluded a meaningful statistical analysis.

All 15 restaurant employees were interviewed. Employee X and another employee reported recent gastrointestinal illness; both submitted stool samples to the MDH PHL. Employee X tested positive for norovirus GI.6A with an identical region D nucleic acid sequence to that of the patrons specimens. Employee X's illness onset date was unclear; he had reported stomach cramps without diarrhea and had been diagnosed with gastroesophageal reflux disease (GERD) by a physician on July 14. Other employees reported that employee X had been ill. The second employee's stool sample was negative for norovirus.

During the July 19 restaurant inspection, OCPHS sanitarians directed management to reinforce appropriate handwashing and glove or utensil use for handling ready-to-eat foods, screen employees for vomiting/diarrhea at the start of each shift, and review the employee illness and handwashing policies with staff. The restaurant already had a no bare-hand contact policy, and their illness policy required any ill employees, including those with vomiting and/or diarrhea, to have a doctor's note to return to work. At the time of the assessment, there were no ready-to-eat foods remaining from the July 11 preparation date. Sanitarians instructed the restaurant to perform a deep-clean of the facility and disinfect food contact surfaces with 1,000 ppm chlorine. Handwashing and glove use observed during the July 19 inspection was appropriate.

This was a foodborne outbreak of norovirus gastroenteritis associated with catered boxed lunches. A food worker who prepared the boxed lunches and tested positive for norovirus was the source of contamination.

(25)
Salmonella Typhimurium Infections Associated with Cantaloupe

July — Multiple states

On August 6, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that three clinical *Salmonella* Typhimurium isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Centers for Disease Control and Prevention [CDC] XbaI designation JPXX01.0324; MDH designation TM76). The cases were both interviewed using a standard questionnaire. A review of the national PulseNet database revealed 116 additional *S*. Typhimurium isolates with the outbreak PFGE pattern in 25 states. A multi-state investigation was subsequently initiated. The MDH PHL received two additional *S*. Typhimurium isolates with the outbreak PFGE pattern. However, subsequent subtyping by multiple loci variable-number of tandem repeats analysis (MLVA) indicated that only two Minnesota cases met the national outbreak case definition.

During the environmental investigation at the implicated farm, *Salmonella* Newport PFGE pattern JJPX01.0807 was also isolated; this pattern matched 33 clinical isolates from 8 states (none in Minnesota).

A case was defined as a person from whom *S*. Typhimurium with the outbreak PFGE pattern (JPXX01.0324) and MLVA pattern (A1) was isolated, and who had illness onset from July 6 to October 1, 2012. Minnesota cases were interviewed with a broad-based exposure questionnaire.

Overall, 272 cases from 26 states were identified in this outbreak, including 33 *S*. Newport cases from 8 states and 239 *S*. Typhimurium cases from 25 states (Alabama 24, Arkansas 6, Delaware 1, Florida 1, Georgia 13, Iowa 9, Illinois 28, Indiana 20, Kentucky 65, Maryland 1, Michigan 7, Minnesota 2, Missouri 10, Mississippi 13, Montana 1, North Carolina 6, New Jersey 2, Ohio 2, Oklahoma 1, Pennsylvania 3, South Carolina 5, Tennessee 10, Texas 2, and Wisconsin 7). The two cases from Minnesota were a 75 year-old male and 76 year-old female with illness onsets of July 18 and 19, respectively. Both reported diarrhea, cramps, and fever, one reported bloody stools, and neither reported vomiting. Neither case was hospitalized.

Upon initial interviews, both Minnesota cases reported purchasing and consuming whole cantaloupe in the week prior to illness onset. The first case purchased a whole cantaloupe from a grocery store in Coon Rapids on July 13. The second case reported consuming cantaloupe at a restaurant in Fargo, North Dakota and purchased a whole cantaloupe from a grocery store in Fargo.

On August 17, several states (including Minnesota) and CDC issued press releases warning consumers not to eat cantaloupe from southwestern Indiana. Cases in Kentucky had reported cantaloupe consumption, and testing of cantaloupe from a store where two cases had purchased cantaloupe yielded the outbreak strain of *S*. Typhimurium. This cantaloupe traced back to a producer in Owensville, Indiana. On August 22, the producer announced a recall of cantaloupe produced on the farm. On August 16, the United States Food and Drug Administration conducted an environmental investigation at the farm. Numerous poor sanitary practices were documented including carpet and wood food contact surfaces throughout the production line, rust and corrosion on multiple pieces of equipment throughout the production line, accumulation of black, green, and brown buildup on conveyor rollers and belts,

and an accumulation of debris beneath the conveyor belt. Environmental swabs of the packing shed and cantaloupes tested positive for the outbreak strains of *S*. Typhimurium and *S*. Newport, as well as *S*. Anatum[1]. Subsequently, watermelon produced on the farm also tested positive for a different PFGE pattern of *S*. Newport and was also recalled.

This was a multi-state outbreak of *S*. Typhimurium and *S*. Newport infections associated with consuming cantaloupe from a producer in Indiana. Two cases of *S*. Typhimurium related to this outbreak were identified in Minnesota. Multiple sanitation deficiencies were observed at the farm, and cantaloupe from the farm tested positive for the outbreak strain of *S*. Typhimurium as well as two other serotypes of *Salmonella*.

Reference

1. Multistate Outbreak of *Salmonella* Typhimurium and *Salmonella* Newport Infections Linked to Cantaloupe http://www.cdc.gov/salmonella/typhimurium-cantaloupe-08-12/index.html

(26)
Campylobacter Infections Associated with a Private Party

July Hennepin County

A routine surveillance interview of a *Campylobacter jejuni* case conducted by the Minnesota Department of Health (MDH) on August 10, 2012 revealed that the case had attended a private party in Plymouth, Minnesota on July 14. The case reported that approximately 11 of 30 people who attended the party subsequently became ill with diarrhea, including at least one other individual who also had a stool specimen test positive for *Campylobacter* spp. MDH confirmed the identity of the second case on August 13, and received contact information for the party organizer on August 14. On August 14, MDH notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit of the two *Campylobacter* cases. HSPHD epidemiology notified the HSPHD environmental health unit and an investigation was initiated.

A partial list of family members attending the private party was provided to HSPHD by the party host. MDH interviewed the *Campylobacter* cases identified through routine surveillance, and HSPHD epidemiologists interviewed the other family members about food consumption and illness history. A case was defined as an attendee of the private party who subsequently developed diarrhea (≥3 loose stools in a 24-hour period) for ≥48 hours. Three ill party attendees saw their healthcare providers and submitted stool samples; bacterial pathogen isolates were submitted to the MDH Public Health Laboratory as part of routine disease surveillance.

Illness histories and exposure information were obtained from 14 party attendees. Eight cases were identified. Three additional party attendees reported symptoms but did not meet the case definition, and thus were excluded from further analyses.

Of the eight cases, all reported diarrhea, five (62%) reported cramps, five (62%) reported fever (range, 102° to102.4° F), two (25%) reported bloody stools, and one (12%) reported vomiting. The median incubation period was 3.5 days (range, 1 to 7 days). The median duration of illness was 7 days (range, 5 to 19 days) for the six cases who had recovered at the time of interview. Two cases tested positive

for *Campylobacter jejuni* subtype CMPC5. Another case tested positive for nalidixic acid-resistant *Campylobacter coli*.

A wide variety of homemade and pre-packaged foods were served at the party, including shredded chicken, green salad, Italian pasta salad, Mexican hamburger pasta salad, cheese plate, beans, potato chips, cut-up fruit, cut-up vegetables, brownies, and bottled beverages. Pre-packaged pulled pork purchased from a meat packing vendor was also served, but the host declined to provide information for the vendor. Both cases and controls consumed a wide variety of foods. The small number of non-ill controls prevented a meaningful statistical analysis of specific food items.

In addition to the family potluck, the host has a swimming pool and reported that nearly half of party attendees swam in the pool. However, only one case reported swimming.

Since no commercial food establishments were involved in providing or catering food for the private party, HSPHD environmental health was not involved in the outbreak.

This was a foodborne outbreak of *Campylobacter* infections associated with a private party. The vehicle of transmission was not identified. The outbreak most likely resulted from improper cooking of or cross-contamination from a high risk food item, such as raw chicken.

(27)
Salmonella Newport Infections Associated with Cantaloupe

July-August — Multiple counties/Multiple states

On August 1, 2012, The Centers for Disease Control and Prevention (CDC) and several state health departments, including the Minnesota Department of Health (MDH) began an investigation of a cluster of *Salmonella* Newport cases with isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (MDH *Xba*I designation NEW403; CDC designation JJPX01.4014). There were 10 cases geographically clustered in 5 states: Illinois (2), Michigan (5), Minnesota (1), Ohio (1), and Wisconsin (1). Cases in Michigan, Wisconsin, and Minnesota all shopped at different Walmart locations.

A case was defined as a person from whom *S*. Newport with the outbreak PFGE pattern (JJPX01.4014) was isolated, and who had illness onset from July 1 to August 31, 2012. Minnesota cases were interviewed with the routine MDH broad-based exposure questionnaire.

Four *S*. Newport cases were identified in Minnesota. The median age of the Minnesota cases was 62 years (range, 57 to 79 years). All were female and had illness onsets from July 15 through August 10. Three (75%) cases reported diarrhea, cramps, and fever. One (25%) case also reported bloody stools and vomiting. One case had severe dementia and symptom history was unknown. This case was hospitalized for a foot amputation and had a blood culture done during hospitalization that was positive for the outbreak strain of *S*. Newport. This was the only hospitalized case.

In initial interviews, all Minnesota cases (including interview of a family member for the case with dementia) reported shopping at various locations of Grocery Chain A. Three of the cases had purchased

and consumed cantaloupe in the week prior to illness onset. Several other midwestern cases reported cantaloupe consumption.

Two cases in Minnesota, one case in Wisconsin, and one case in Michigan were able to provide purchase receipts for their cantaloupe. The Minnesota Department of Agriculture (MDA) worked with other state agriculture departments, the United States Food and Drug Administration (FDA), Grocery Chain A, and its regional distributor to look at sources for the cantaloupes. One problem identified with cantaloupe receipts was the price look up (plu) code. If a cashier at a specific Grocery Chain A location did not use the correct product code for the specific variety of cantaloupe, the traceback investigations could be subject to inaccuracies. Cantaloupes for three cases, two purchased at a single Grocery Chain A location in Wisconsin, and one from a Grocery Chain A location in Michigan were identified as Athena cantaloupes from Farm A in Poseyville, Indiana. The other Minnesota case receipt showed a western cantaloupe that would have been from one of two farms in California. It is unknown if the plu code on the receipt was correct for this cantaloupe or if other cantaloupes might have been purchased in this timeframe by that case. Additional receipts for other cases were not available.

An additional cantaloupe outbreak investigation involving *S.* Typhimurium and a different PFGE subtype of *S.* Newport was underway during this investigation (1). On August 17, several states (including Minnesota) and CDC issued press releases warning consumers not to eat cantaloupe from southwestern Indiana due to that *S.* Typhimurium/Newport outbreak. Farm A (implicated in this NEW403 outbreak) is in southwest Indiana, just 13 miles from Owensville, the location of Farm B where the cantaloupes implicated in the *S.* Typhimurium/Newport outbreak were grown.

In the traceback investigation, FDA did not find any positive environmental or product samples in the distribution chain for the NEW403 outbreak. FDA officials did not pursue an environmental assessment of Farm A because the team that assessed Farm B for the concurrent outbreak went to Farm A and found that they were no longer in cantaloupe production. As of September, 2012, FDA officials were considering a regional assessment at the beginning of the next growing season.

This was a multi-state outbreak of *S*. Newport infections likely associated with consuming cantaloupe from Farm A in Poseyville, Indiana. Four cases of *S*. Newport related to this outbreak were identified in Minnesota. Environmental assessment of the farm was not pursued since the growing season was complete, though an assessment was under consideration for the following year.

Reference

1. Multistate Outbreak of *Salmonella* Typhimurium and *Salmonella* Newport Infections Linked to Cantaloupe http://www.cdc.gov/salmonella/typhimurium-cantaloupe-08-12/index.html

(28)
Salmonella Newport Infections Associated with a Wedding

June Sherburne County

On July 11, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified a cluster of three *Salmonella* Newport isolates received through routine disease surveillance that were indistinguishable by two-enzyme pulsed-field gel electrophoresis (PFGE), with MDH pattern designation NEW390 (Centers for Disease Control and Prevention [CDC] pattern designation

JJPX01.0884). Specimen collection dates for the cases were June 30, July 2, and July 3. All three cases were interviewed on July 11, and all reported attending a June 23 wedding held at a private home in Corcoran, Minnesota. Foods for the wedding were reportedly prepared in a private home. The Hennepin County Human Services and Public Health Department was notified, and an investigation was initiated.

S. Newport cases are reported by hospitals and clinics and routinely interviewed by MDH staff using a standard questionnaire that includes questions about attendance at large events as part of routine disease surveillance. Interviews of *Salmonella* cases with isolates that are indistinguishable by PFGE are compared to identify potential common exposures. The bride and family of the couple provided information about foods served at the wedding, but the bride refused to provide contact information for wedding guests. Contact information for a limited number of guests was obtained from cases, controls, and family members of the bride and groom. MDH interviewed guests to obtain information on food/beverage consumption and illness history. Cases were defined as individuals who had *S.* Newport with the outbreak PFGE pattern isolated from a clinical specimen, and/or who attended the June 23 wedding and subsequently developed diarrhea (≥3 loose stools in 24 hours) that either lasted ≥3 days or was accompanied by fever. Stool kits from consenting cases were tested for *Salmonella* at the MDH PHL.

Approximately 250 attended the wedding reception. Fourteen guests were interviewed, and seven cases were identified. One attendee reported diarrhea that did not meet the case definition and was excluded from further analyses. The median incubation for cases from the wedding meal was 66 hours (range, 24 to 148.5 hours), and the median duration of illness was 12 days (range, 4 to 17 days). All seven cases reported diarrhea, six (86%) reported cramps, five (71%) reported fever, three (43%) reported bloody stools, and one (14%) reported vomiting. The median age of cases was 31 years (range, 28 to 58 years), and six (86%) were female. Four cases visited a healthcare provider and were identified through routine disease surveillance, but none were hospitalized. Two additional cases submitted stool samples to the MDH PHL; one tested positive for *S.* Newport NEW390. The negative stool was collected 23 days after symptom onset.

Wedding reception foods were served buffet-style at a private home. A family member (who was not ill) prepared a red spaghetti sauce with pepperoni and Italian sausage in her home. The cake was purchased at a grocery store. All other foods were prepared by a friend of the bride. The bride refused to provide contact information for the food preparer or the name of the restaurant where he worked as the head chef. Food items prepared by the chef included spaghetti noodles, alfredo noodles, chicken alfredo sauce, breadsticks, and Caesar salad. The bride reported that cream for the chicken alfredo sauce was purchased at a grocery store in St. Michael, and the remaining ingredients were from a foodservice distributor. Candy favors (individually wrapped taffy and wrapped hard candy sticks) were provided on guest tables. None of the cases attended other wedding-related events with food, including a groom's dinner held the night prior and a sandwich lunch at the church.

The small number of cases and controls limited the power of the statistical analysis. In a univariate analysis, consuming chicken alfredo (7 of 7 cases vs. 3 of 6 controls; $p = 0.07$) approached significance.

Three *S.* Newport NEW390 cases were identified with specimen collection dates from July 10 through August 20, who did not attend the wedding. On July 20, a national posting from CDC identified two matching cases in another state. No specific commonalities were identified.

This was a foodborne outbreak of *S.* Newport infections associated with a privately catered wedding. The suspected outbreak vehicle was chicken alfredo prepared by a friend of the bride. However, this was not confirmed. Matching *S*. Newport cases not related to the wedding were identified, suggesting that the outbreak vehicle was a distributed food product. The investigation was hindered by lack of cooperation from the wedding hosts.

(29)
Salmonella Bredeney Infections Associated with Peanut Butter

July — Aitkin County/Multiple states

On August 10, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory identified a *Salmonella* Bredeney isolate with MDH pulsed-field gel electrophoresis (PFGE) subtype designation BDY9. The case was interviewed as part of routine surveillance activities. On August 23, PulseNet (the national molecular subtyping network for foodborne bacterial disease surveillance) noticed matches to *S.* Bredeney BDY9 in multiple states. By September 10, 21 cases had been reported in 13 states, and the Centers for Disease Control and Prevention (CDC) initiated a multi-state investigation.

In Minnesota, a case was defined as a Minnesota resident with laboratory-confirmed infection with *S.* Bredeney PFGE subtype BDY9.

Cases were contacted for an interview by phone regarding illness history and potential exposures. A questionnaire developed by CDC was used in addition to the Minnesota routine *Salmonella* surveillance form.

Information collected from case interviews was shared with CDC, other states, and the United States Food and Drug Administration (FDA).

CDC coordinated a multi-state investigation of cases. FDA conducted the plant investigation and initiated recalls.

One case was identified in Minnesota. The case had illness onset on July 27, 2012. The case was hospitalized for 6 days and recovered. The case had diarrhea, vomiting, fever, and cramps. The case was interviewed on August 13, before knowing that she was part of the outbreak. At that time, the case reported eating Creamy Valencia Peanut Butter from Grocery Chain A in the week prior to illness onset.

Nationally, 42 cases with the outbreak strain of *S.* Bredeney were reported from 20 states: Arizona, California, Connecticut, Illinois, Louisiana, Massachusetts, Maryland, Michigan, Minnesota, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Pennsylvania, Rhode Island, Texas, Virginia and West Virginia. Illness onset dates ranged from June 14 to September 21, 2012. The median age of cases was 7 years (range, 1 year to 79 years). Fifty-nine percent were male. Among the 36 cases with available information, 10 (28%) were hospitalized. No deaths were reported [1].

Among the 33 cases with available information, 25 (78%) reported shopping at Grocery Chain A. All 25 of these cases reported eating one of two Grocery Chain A's branded peanut butter products in the week before illness onset: 23 (92%) cases reported eating Grocery Chain A Valencia Creamy Salted Peanut

Butter made with Sea Salt, and 2 (8%) cases reported eating Grocery Chain A Valencia Peanut Butter with Roasted Flaxseed [1].

On September 22, Grocery Chain A recalled its Creamy Salted Peanut Butter, which was manufactured by Sunland, Inc.in Portales, New Mexico. On September 24, Sunland, Inc. announced a recall of its peanut butter and other products containing nuts and seeds manufactured between May 1, 2012 and September 24. The recall was further expanded on October 4 and October 12, 2012, to include over 300 products, including raw and roasted shelled and in-shell peanuts [1].

The outbreak strain of *S.* Bredeney was isolated from open jars of peanut butter obtained from cases' homes by the Washington State Department of Agriculture laboratory, the New Jersey Department of Health laboratory, and the Virginia Division of Consolidated Laboratory Services [1].

The FDA conducted an investigation of the Sunland, Inc. manufacturing plant. The FDA isolated *Salmonella* from five peanut butter and shelled raw peanut samples that the company's internal testing had found to be negative. Two of those samples yielded the outbreak strain of *S.* Bredeney. The outbreak strain of *S.* Bredeney and other serotypes of *Salmonella* were also recovered from environmental samples taken at the plant during the investigation. Additionally, the FDA investigation uncovered that since 2009, Sunland distributed lots of peanut and nut butters that tested positive for *Salmonella* through the firm's internal testing program. As a result of the findings of the investigation at the manufacturing plant, FDA suspended Sunland, Inc.'s facility registration, thus prohibiting the company from introducing food into commerce [1].

This was a multi-state outbreak of *S.* Bredeney infections associated with consumption of peanut products produced by Sunland, Inc. The outbreak led to several peanut product recalls. It also led to a suspension of the company's registration, thus prohibiting it from producing food. One case associated with this outbreak was identified in Minnesota.

Reference

1. Centers for Disease Control and Prevention. Multistate Outbreak of *Salmonella* Bredeney Infections Linked to Peanut Butter Manufactured by Sunland, Inc. http://www.cdc.gov/salmonella/bredeney-09-12/index.html

(30)
Salmonella 9,12:-:1,5 Infections Associated with Turkey Jerky

July-August Becker County/Multiple states

On August 15, 2012, review of two routine surveillance interviews of *Salmonella* 9,12:-:1,5 pulsed-field gel electrophoresis (PFGE) subtype JVN73 cases reported to the Minnesota Department of Health (MDH) revealed several exposures in the Detroit Lakes area. A third case was interviewed on August 16 and a fourth case on August 20. Cases were called back regarding several Detroit Lakes exposures and all had consumed turkey jerky from a meat market in Detroit Lakes. The Minnesota Department of Agriculture (MDA) was contacted and an investigation was initiated.

On August 21, an MDA inspector conducted an environmental assessment of the meat market to review records, sanitation, and cooking and processing procedures. The inspector also obtained records, receipts, and samples of turkey jerky and assessed employees for illness.

A confirmed case was defined as a meat market patron from whom *S*. 9,5:-:1,5 JVN73 was isolated after consuming food from the market.

Four culture-confirmed cases were identified as part of this outbreak through routine surveillance. All four cases had consumed turkey jerky from the meat market. One additional case was identified but had no known connection to the market. This case had reported consuming jerky from another meat market in Park Rapids. MDA inspectors investigated the second market, but found no connection to the suspected market and no employee illness or other issues at the firm. The case could not be reached again for additional questions and was thus excluded from further analysis.

All four cases (100%) reported diarrhea and fever, three (75%) reported cramps, two (50%) reported vomiting, and two (50%) reported bloody stools. One case was hospitalized for two days. Cases all reported purchasing turkey jerky from the meat market in late July and early August. Exact dates of consumption of the jerky weren't available. The median duration of illness was 5 days (range, 3 days to 9 days).

Two *Salmonella* 9,12:-:1,5 JVN73 cases in North Dakota and one case in South Dakota were also identified as part of this outbreak. One North Dakota case had turkey jerky purchased on August 13 and 15. The second North Dakota case consumed beef sticks from the market that were purchased on August 10 and eaten on August 13. The South Dakota case consumed turkey jerky from the market sometime between August 3 and August 6.

The MDA inspector who visited the meat market found several things upon inspection. Several opportunities for cross-contamination were identified. Raw meats were stored in the same display case as the finished turkey jerky with little or no barrier between them. When the inspector inquired about employee illness, the firm reported some family members who work at the market were recently ill. Two types of turkey jerky were produced in the store; a whole muscle jerky and a ground turkey jerky. Cases in this outbreak consumed whole muscle turkey. Turkey jerky present at the store was not likely to be of the same lots consumed by ill cases, but samples were collected for testing at the MDA lab. A sample of raw turkey was also obtained for testing. One confirmed Minnesota case also had leftover jerky available for testing. The jerky from the store tested negative for *Salmonella*. The raw turkey was positive for *Salmonella,* but not the outbreak strain. The leftover jerky from the case household was positive for the outbreak strain of *Salmonella*.

The turkey jerky was produced using a dry smoking technique, meaning the jerky required refrigeration (unlike cured turkey jerky that can be purchased off the shelf at convenience stores). The water activity level in the jerky has to be exact for the turkey to be properly cured. It is possible there were problems with the drying process. Additionally, patrons reported temperature abusing the product after purchase, which could have led to amplification of *Salmonella* in the finished product.

On August 23, MDA and MDH released a joint consumer advisory and the firm destroyed all product they had on hand out of an abundance of caution. After the advisory, several complaints were received on the MDH Foodborne Illness Hotline. Five complaints were consistent with possible *Salmonella*

infection. One anonymous call was also received regarding cross-contamination issues at the market. This caller identified some of the same issues found by the MDA inspector, including cross-contamination on the scale used to weigh both finished and raw meat products.

This was an outbreak of *S*. 9,12:-:1,5 JVN73 infections associated with eating turkey jerky from a meat market in Detroit Lakes. The outbreak was identified through routine disease surveillance. Documented transmission to patrons occurred in late July and early August. Several issues were identified at the market that may have contributed to the outbreak.

(31)
Norovirus Gastroenteritis Associated with a Restaurant

August Hennepin County

On August 16, 2012, Hennepin County Public Health Protection – Epidemiology (PHP-Epi) received a report of illness from the Minnesota Department of Health (MDH) regarding two persons who had eaten at a restaurant in Maple Grove on August 14, 2012 and subsequently developed gastrointestinal illness.

Hennepin County Public Health Protection Environmental Health (PHP-EH) was notified and an outbreak investigation was initiated on August 16.

On August 16, a PHP-EH environmentalist spoke with a restaurant manager and requested names from the reservation list and credit card receipts for both lunch and dinner on August 14. PHP-Epi staff interviewed restaurant patrons to obtain information on food/beverage consumption and illness history. A case was defined as a person who ate at the restaurant during the week of August 12 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were obtained from three patrons and submitted to MDH for bacterial and viral testing.

During the course of the investigation two more complaints were received from parties who had eaten at the restaurant on August 12 and August 13.

PHP-EH environmentalists visited the restaurant on August 16 to evaluate food preparation and handling procedures and to interview employees regarding illness history and job duties.

Illness histories and exposure information were obtained: six brunch patrons from August 12; seven lunch patrons from August 13 and 14; and two dinner patrons from August 14. Ten (71%) cases were identified. Additionally, one attendee met the case definition but they also had had illness in their household, and one attendee reported mild gastrointestinal symptoms that did not meet the case definition; these two attendees were excluded from further analysis.

Nine cases (90%) reported diarrhea and/or vomiting, four (40%) reported abdominal cramps, and two (20%) reported fever. The median incubation period was 33.5 hours (range, 31.5 to 41 hours). The median duration of illness was 2 days (range, 2 to 4 days) for five cases who had recovered from their symptoms at the time of the interview. All three stool specimens tested positive for norovirus GII. Nucleic acid sequencing was conducted on all three of the positive norovirus specimens; the sequences were identical.

Statistical analyses were not done due to the small number of subjects in the analysis. Cases reported eating a variety of foods for lunch or dinner, including salads, appetizers, sandwiches, sides, and desserts. Items on the Sunday brunch buffet included a variety of potatoes, pastas, meats, breads and pastries, eggs, and fruit.

Illnesses histories and job duty information were obtained from 79 restaurant employees. Sixteen employees reported having had a gastrointestinal illness in the past 2 weeks. Illness onsets ranged from August 8 to August 19. Twelve front of the house staff (host/server/bus boy) and four kitchen staff reported having vomiting and/or diarrhea.

Stool specimens were obtained from two employees. The stool specimens tested positive for norovirus GII. Nucleic acid sequencing was conducted on the positive norovirus specimens; the sequences were identical to each other and to the three patron sequences.

During the establishment visit, PHP-EH environmentalists found that the establishment did not have an illness log. Some illness reports were being noted in the manager's book, however, not all ill employees were excluded from work. PHP-EH environmentalists did not observe bare-hand contact; however, bare-hand contact with ready-to-eat foods has historically been a problem in the establishment. PHP-EH environmentalists stressed the importance of handling of food and beverages, use of gloves or utensils when handling ready-to-eat foods, good handwashing, and exclusion of ill employees to the employees of the restaurant.

Based on the number of employees that had been ill or were reporting illness, the facility sanitized all surfaces with a strong bleach solution (5,000 ppm) as recommended by MDH Environmental Health. The ice was also discarded and machines and bins sanitized.

In addition, because there were so many ill employees, an illness screening form was instituted at the beginning of each shift. All employees reporting gastrointestinal illness were excluded from work for 72 hours after symptoms had resolved. The individual screening form was used for 30 days after the outbreak began. No additional ill employees were identified.

Management implemented all corrections and trained front of the house staff on "no bare-hand contact of ready-to-eat foods", including proper handwashing, glove use, tongs, and other measures to protect these items.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at a restaurant in Maple Grove. No single food item was statistically associated with illness. The source of contamination was most likely one or more infected food workers.

(32)

Salmonellosis Associated with Raw Meat Consumption of a Custom-Slaughter Cow

August Cottonwood County

On August 28, 2012, the Minnesota Department of Health (MDH) received a report from a Cottonwood County health care facility that seven individuals of Laotian descent developed a diarrheal illness after participating in a gathering of approximately 80 persons at a temple on August 19, where they consumed

a raw meat dish known as laab. On August 28, Cottonwood-Jackson Community Health Services and the Minnesota Department of Agriculture (MDA) were contacted and an investigation was initiated. An interview with a hospital translator revealed that no temple existed in the county; rather, what was reported to have been a common gathering was actually multiple household gatherings involving the same meat source. On August 25, a member of the Laotian community purchased a cow at an auction in Goodhue County, slaughtered the animal, and sold the meat to his neighbors over the next 2 days. Members of the community used the meat to prepare traditional dishes such as laab.

A case was defined as an individual who consumed beef supplied by the aforementioned community member on or after August 25 and subsequently developed diarrhea (≥3 loose stools in a 24-hour period) and/or had a positive stool culture for *Salmonella* Enteritidis or another enteric pathogen.

Twenty-four cases were identified; all were identified after presenting to area healthcare facilities. Five (21%) of 24 cases were hospitalized for their illness. All 24 (100%) were culture-confirmed with *Salmonella* and isolates were forwarded to the MDH Public Health Laboratory. Of the 24 cases, 15 (63%) were interviewed by MDH regarding their exposures and illness histories. No well controls were identified during these interviews. Of the 15 interviewed cases, all reported diarrhea, 13 (87%) reported a fever (maximum temperature range, 101 to 104° F), 9 (69%) reported abdominal cramps, 5 (33%) reported vomiting, and 3 (25%) of 12 reported blood in their stool. The median incubation period was 15 hours (range, 10 to 36 hours).

All of the *Salmonella* isolates were *Salmonella* Enteritidis. Two (8%) of 24 reported cases also tested positive for *Campylocter jejuni*. *Salmonella* Enteritidis pulsed-field gel electrophoresis (PFGE) subtypes in this outbreak were as follows: SE1B1 (n=22), SE192B204 (n=1), and SE139B205 (n=1).

MDA made several attempts to contact the individual responsible for purchasing and slaughtering the cow, and selling the implicated meat, but was unable to reach this individual. A sample of the meat was obtained from one of the cases at presentation to the hospital. The meat was tested in the MDA laboratory and was culture-positive for *Salmonella* Enteritidis SE1B1.

This was an outbreak of salmonellosis and campylobacteriosis associated with consumption and/or handling of undercooked beef. Undercooked beef can be a source of *Salmonella* infection and other enteric pathogens. It is important to cook beef to an internal temperature of at least 160° F before consumption.

(33)
Norovirus Gastroenteritis Associated with a Restaurant

August Hennepin County

On August 28, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from an individual who had dined at a restaurant in Edina, Minnesota on August 24. The complainant reported that all three individuals from her party had developed symptoms of gastrointestinal illness after their meal; the individuals resided in two separate households. Sanitarians from the City of Edina were notified, and an investigation was initiated on August 28.

A list of patrons from August 24 and 25 was obtained from the restaurant. Epidemiologists from MDH interviewed restaurant patrons to obtain information on food/beverage consumption and illness history. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (>3 loose stools in a 24-hour period). A stool specimen was obtained from one patron and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A sanitarian from the City of Edina visited the restaurant to evaluate food preparation and handling procedures and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 74 restaurant patrons. Eight (11%) cases were identified. Three people reported illness but did not meet the case definition, and thus were excluded from further analysis. Of the eight cases, seven (88%) reported diarrhea, five (71%) of seven reported cramps, five (63%) reported vomiting, and three (43%) of seven reported fever. The median incubation period was 26 hours (range, 21 to 43 hours). The median duration of illness was 72 hours (range, 37 to 168 hours) for the four cases with known recovery times. The one patron stool sample received tested positive for norovirus GII.

Cases reported meal dates of August 24, 25, and 26. Consumption of roasted potatoes was significantly associated with illness (6 of 8 cases vs. 5 of 61controls; odds ratio, 8.4; 95% confidence interval, 2.1 to 34.0; $p = 0.004$).

Illness histories and job duty information were obtained from 83 employees; two employees reported recently having a gastrointestinal illness, with onset dates of August 24 and 27. The employee with the August 24 onset date reported working while ill with diarrhea the morning of August 24, including cooking breakfast and preparation work (e.g., cutting and chopping vegetables) for lunch. A stool specimen was submitted to the MDH PHL from the employee with the August 27 onset date; the specimen tested negative for norovirus, *Campylobacter*, *E. coli* O157, *Salmonella*, and *Shigella*. Following the initial complaint on August 28, sanitarians and restaurant management established a screening protocol for employee illness. All employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms. The sanitarian also discussed the importance of handwashing for the prevention of norovirus transmission. Additionally, all foods that might have been prepared by an ill employee were discarded.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Edina. Roasted potatoes were implicated as the vehicle of transmission. An employee who would have been responsible for cooking/prepping the potatoes worked while actively ill with diarrhea. Since not all cases reported consuming roasted potatoes, it is likely that the ill employee contaminated other ready-to-eat food items as well.

(34)
Scombroid Poisoning Associated with a Restaurant

September — Dakota County

On September 11, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness among a group that had dined at a restaurant in Lakeville on September 7. The

complainant reported that three of six group members became ill with scombroid-like symptoms after consuming seared or blackened tuna at the restaurant. An investigation was initiated immediately.

MDH Environmental Health Services (EHS) sanitarians visited the restaurant on September 11 to evaluate food preparation and handling procedures, focusing their observation on tuna storage and handling. MDH staff interviewed the three ill patrons about food consumption and illness history. A case was defined as a patron who developed symptoms consistent with scombroid poisoning after eating tuna at the restaurant.

Three patrons were interviewed; two (67%) met the case definition and one had mild symptoms but did not meet the case definition. The incubation periods for the two cases were 30 minutes and 90 minutes. The durations of illness were 9.5 and 18 hours. One case reported dizziness, headache, red blotches on the body, facial flushing, and itching; the second case reported abdominal pain, red blotches on the face and body, and flushing of the face and chest. The patron with mild symptoms reported dizziness, stomach cramping, and diarrhea. No stool samples were submitted to MDH.

Due to the limited number of cases and non-ill controls, MDH was unable to conduct analyses to determine if food items were significantly associated with illness. However, all three ill patrons reported consuming seared or blackened tuna and the three non-ill group members did not eat the tuna.

During the environmental assessment, MDH EHS sanitarians spoke to establishment managers. A total of 15 units of tuna had been sold on the meal date and the restaurant had not received any additional complaints of illness from patrons. All cold-holding temperatures of tuna were below 41° F. There was no tuna left over from the September 7 meal date. Employees were educated on scombroid poisoning and safe cold-holding of fish.

This was a foodborne outbreak of scombroid poisoning associated with a restaurant in Lakeville. Tuna has been implicated in past scombroid outbreaks and was the likely source of illness in this outbreak.

(35)
Salmonella Bareilly Infections Associated with Sushi

September Hennepin County

In September 2012, the Minnesota Department of Health (MDH) Public Health Laboratory identified two *Salmonella* Bareilly isolates with MDH pulsed-field gel electrophoresis (PFGE) pattern designations BRL24 and BRL25. These two PFGE pattern were one band different from each other. There were no PFGE matches nationally. An investigation was initiated on October 2.

In Minnesota, a case was defined as a Minnesota resident with laboratory-confirmed infection with *S.* Bareilly PFGE subtypes BRL24 or BRL25.

MDH staff contacted cases by phone for an interview regarding illness history and potential exposures.

Both cases had eaten at the same restaurant in Minneapolis, Restaurant X. Hennepin County Public Health Protection (HCHP) epidemiologists identified additional restaurant patrons from reservation lists

for September 8 and September 11-13, and interviewed them about illness history and food consumption at the restaurant.

City of Minneapolis Environmental Health specialists visited the restaurant to evaluate food preparation and handling procedures, interview food workers, and collect fish samples for testing and invoices for tuna.

Stool samples collected from food workers who reported recent history of gastrointestinal illness were submitted to the MDH Public Health Laboratory for *Salmonella* testing.

Minnesota Department of Agriculture (MDA) laboratory tested fish samples and collected trace-back information for the tuna used at the restaurant.

Two cases, one with a *S.* Bareilly BRL24 and one with BRL25, were identified in Minnesota. The two cases had illness onset on September 9 and September 13, respectively. Neither case was hospitalized. Both cases reported having diarrhea and cramps; one case reported bloody stools, one vomiting, and one fever. The duration of diarrhea was 6 days for both cases. Both cases recovered.

One of the cases ate at a multiple restaurants in Minnesota and Florida in the 7 days prior to illness onset, including two sushi restaurants. One of the two sushi restaurants was Restaurant X, where he ate on September 8 with two meal companions who did not become ill. He had a variety of menu items including a Dynamite roll (tuna, albacore tuna, avocado and chili sauce), Maguro (yellowfin tuna), and Hotate (sea scallops). The second case reported eating at two restaurants in the week prior to onset, one of which was Restaurant X. The case ate at Restaurant X on September 12 and reported eating a Dynamite roll, California roll (snow crab, avocado, cucumber and Masago or caplin roe) and squid. Eating at Restaurant X was the only common exposure between the two cases, and the Dynamite roll was the only sushi type in common, although there may have been ingredients in common in different menu items. The cases' illness incubations were 21 and 24 hours, respectively.

Sixty-eight restaurant patrons identified from reservation lists were interviewed, including 43 who ate at the restaurant on September 8, 13 on September 11, 5 on September 12, and 7 on September 13. None reported symptoms consistent with a *Salmonella* infection. Among the 56 patrons who could provide at least some of the specific menu items eaten, 38 reported eating a tuna-containing sushi, and of those, 3 specifically mentioned eating the Dynamite roll. Due to the low number of persons remembering everything they ate and the small number of cases, statistical analysis to implicate a specific food item or ingredient was limited to tuna-containing sushi and Dynamite roll consumption. Eating a tuna-containing sushi was not statistically associated with illness (2 of 2 cases vs. 38 of 56 controls; odds ratio [OR], undefined; 95% confidence interval [CI], undefined; $p = 1.0$); however, eating a Dynamite roll was statistically associated with illness (2 of 2 cases vs. 3 of 56 controls; OR, undefined; 95% CI, undefined; $p = 0.006$). The restaurant provided information on numbers sold for the Dynamite roll: 35 Dynamite rolls were served on September 8, and 37 Dynamite rolls were served on the 12th.

Forty-four food workers interviewed. One food worker reported two separate instances of gastrointestinal illness in the month of September: vomiting of 4 days duration with onset on September 17, and diarrhea of 2 days duration with onset on September 28; no fever was reported. That person was excluded from work until results of testing of two stool specimens collected a day apart were available. Both specimens were negative for *Salmonella*.

The environmental health evaluation found that bamboo mats were used to roll sushi instead of the required plastic wrap, that sushi cutting boards were only washed, rinsed and sanitized at the end of the day, and there was bare-hand contact during sushi preparations. It is unknown if any of these findings contributed to transmission. Holding temperatures of raw fish and other raw foods were all 40° F or lower.

The ingredients in the Dynamite roll were albacore tuna, yellowfin tuna, lettuce, Kaiware (radish sprouts), avocado, rice, Gobo (a root vegetable), Thai chili peppers, and a chili sauce made of two purchased chili sauces, mirin, soy sauce and sesame seed oil.

Since *S.* Bareilly of a different PFGE subtype pattern was previously associated with tuna-containing products, additional information was gathered on tuna handling and sources. Yellowfin tuna was purchased as fresh loins, and Albacore tuna was purchased as frozen loins; no tuna scrape was used.

MDA attempted to trace back the Albacore and Yellowfin tuna. The Albacore tuna was traced back to a seafood company in Vancouver, British Columbia. The fish was purchased directly from fishermen fishing off the coast of North America. The precise source of the fish was not determined. The Yellowfin tuna originated from one of four possible suppliers in Louisiana, Florida, New Jersey, or Washington. It was not possible to identify the exact source of the fish served at the restaurant when the cases ate there.

Samples of Albacore and Yellowfin tuna were obtained from the restaurant at the time of the investigation for testing at the MDA laboratory, even though the samples obtained were not from the same shipments served at the restaurant during the outbreak. All the samples tested negative for *Salmonella*.

This was an outbreak of *S.* Bareilly infections associated with consumption of sushi at a restaurant in Minneapolis. Eating a Dynamite roll was statistically associated with illness. The contaminated food item or ingredient was not identified. Since only two cases were identified, the level of contamination was likely very low. No problems with handling that could have contributed to the outbreak were identified at the restaurant. No other cases were identified nationally.

(36)
Norovirus Gastroenteritis Associated with a Restaurant

September Hennepin County

On September 20, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of 23 co-workers who ate food provided by a restaurant in Brooklyn Park at a work meeting on September 18. No other foods were provided at the meeting, and no other foods were shared at the office in the 2 days before or after the meeting. City of Brooklyn Park Environmental Health (CBPEH) was contacted, and an investigation was initiated immediately.

CBPEH sanitarians visited the restaurant on September 20 to evaluate food preparation and handling procedures, and to interview food workers. Credit card receipts were not collected as they did not contain patron signatures. A case was defined as a meeting attendee who developed vomiting or diarrhea

(≥3 loose stools in a 24-hour period) after eating at the meeting. Stool samples collected from consenting individuals were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Twenty-two meeting attendees were interviewed, and 13 (59%) met the case definition. One meeting attendee reported illness that did not met the case definition and was excluded from analysis. The median incubation period for cases was 33 hours (range, 15 to 56 hours). The median duration of illness for the five cases who had recovered at the time of interview was 36 hours (range, 17 to 52 hours). Twelve (92%) cases reported diarrhea, 11 (85%) vomiting, 9 (69%) cramps, 4 (31%) fever, and none bloody stools. Stool samples submitted by three ill meeting attendees tested positive for norovirus GII.

By univariate analysis, consuming shredded cheese (13 of 13 cases vs. 5 of 8 controls; risk ratio, undefined; 95% confidence interval, undefined; $p = 0.04$) was significantly associated with illness.

CBPEH sanitarians interviewed 23 restaurant employees, and three reported recent gastrointestinal illness. These employees reported becoming ill on September 9, 16, and 20, respectively. The employee who became ill on September 20 reported that her son became ill on September 13 and that she was the employee that was primarily responsible for preparing the food served at the meeting. The restaurant reported that block cheese was shredded each morning but was not able to identify which employee shredded the cheese on September 18. The sanitarians observed good hand hygiene and use of gloves when handling ready-to-eat foods. The sanitarians discussed the importance of handwashing for the prevention of norovirus transmission, and all employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms. Restaurant management implemented their *Norwalk Prevention Protocol,* which included switching sanitizing solutions to 4% bleach, employee symptom surveys before each shift, sanitizing of the restaurant, and increased handwashing monitoring. Stool collection kits delivered to two ill employees were not returned.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Brooklyn Park. Shredded cheese was associated with illness. The source of contamination was likely an infected food worker.

(37)
Norovirus Gastroenteritis Associated with a Restaurant

September Hennepin County

On September 25, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint that three of six meal companions developed gastrointestinal illness after eating lunch at a restaurant in Wayzata on September 19. The meal companions reported no other recent common exposures. However, one individual reported also eating lunch at the restaurant on September 18 and that her meal companion for that meal had also become ill. City of Minnetonka Environmental Health (CMEH) was contacted, and an investigation was initiated immediately.

CMEH sanitarians visited the restaurant on September 26 to evaluate food preparation and handling procedures, interview food workers, and collect a reservation list for September 18-20. A case was defined as a restaurant patron who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Stool samples collected from consenting individuals were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-eight restaurant patrons were interviewed, and 14 (37%) met the case definition. The median incubation period for the cases was 32 hours (range, 14 to 106 hours). Twelve (86%) cases reported diarrhea, 11 (79%) vomiting, 9 (64%) cramps, 6 (43%) fever, and none bloody stools. The median duration of illness for the 12 cases who had recovered at the time of interview was 86 hours (range, 12 to 150 hours). Cases reported meal dates at the restaurant on September 18 (n=3), 19 (n=4), 20 (n=6), and 21 (n=1). Stool samples submitted by three ill patrons tested positive for norovirus GII. Nucleic acid sequencing was conducted on all three positive norovirus samples; the nucleic acid sequences were identical.

In the univariate analysis, no specific food item was associated with illness. However, consuming any sandwich (7 of 14 cases vs. 1 of 24 controls; odds ratio [OR], 23.0; 95% confidence interval [CI], 2.1 to 1,079; p = 0.002), any sandwich or salad (14 of 14 cases vs. 14 of 24 controls; OR, undefined; 95% CI, undefined; p = 0.006) were significantly associated with illness. Additionally, eating at the restaurant during lunch was associated with illness (11 of 14 cases vs. 10 of 24 controls; OR, 5.1; 95% CI, 1.0 to 34.6; p = 0.03). Among lunch patrons, consuming a sandwich was the only food that was associated with illness (7 of 11 cases vs. 1 of 10 controls; OR, 15.8; 95% CI, 2 to 786; p = 0.02).

CMEH sanitarians interviewed all 47 restaurant employees, and 14 reported recent gastrointestinal illness. These employees reported becoming ill on September 17 (n=1), 18 (n=1), 19 (n=2), 20 (n=7), and 21 (n=3), respectively. The employee who became ill on September 17, a server, reported an illness onset at 2:00 p.m. while at work. Three additional employees reported milder illness (only stomach cramps) including a cook who reported working while ill on September 18. The restaurant serves a "family meal" for employees daily between lunch and dinner service. Due to the large number of employees that became ill on September 20, it is likely that the family meals, particularly the meal on September 18 or 19, played a prominent role in transmission among restaurant staff. While employees were not asked if they ate the family meal on specific days, employees who reported eating a family meal were more likely to be ill than employees who did not report eating a family meal (14 of 17 vs. 13 of 29; risk ratio, 3.3; 95% CI, 1.1 to 9.9; p = 0.03). The restaurant was documenting employee illnesses in their employee illness log, and employees that reported gastrointestinal illness were being excluded from work. The sanitarians discussed the importance of handwashing for the prevention of norovirus transmission, and all employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Wayzata. Consuming ready-to-eat food items was associated with illness. The source of the contamination was one or more infected food workers.

(38)
Campylobacter jejuni Infections Associated with a Restaurant

September-October Dakota County

On October 22, 2012, review of a routine surveillance interview of a *Campylobacter jejuni* case reported to the Minnesota Department of Health (MDH) revealed that the case had eaten at Restaurant X in Apple Valley 4 days prior to illness onset on October 5. Review of previous *C. jejuni* cases identified an additional case that had eaten at Restaurant X on September 20. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on October 22, and an outbreak investigation was initiated.

All *Campylobacter* cases reported to MDH are interviewed about exposures and food consumption as part of foodborne disease surveillance in Minnesota. Epidemiologists reviewed the information gathered during the interviews of *C. jejuni* cases to identify other potential cases associated with eating at the restaurant. A list of patrons from September 20-October 1 was obtained from the restaurant. MDH staff interviewed restaurant patrons to obtain information on food/beverage consumption and illness history.

Cases were defined as ill persons who had *C. jejuni* isolated from stool or who had diarrhea (≥3 loose stools in a 24-hour period) lasting ≥48 hours and who reported eating at Restaurant X in the week prior to onset of symptoms.

On October 22 and 23, MDH sanitarians visited the restaurant to evaluate food preparation and handling procedures and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 74 patrons. Nine (12%) cases were identified. One person reported illness but did not meet the case definition, and thus was excluded from further analyses.

Of the nine cases, all reported diarrhea and cramps, four (44%) reported fever, three (33%) reported vomiting, and two (22%) reported blood in their stools. Five (56%) cases were female. The median age of cases was 50 years (range, 33 to 58 years). The median incubation period was 3 days (range, 1 to 4 days) for the six cases with known meal dates. The median duration of illness was 4.5 days (range, 3 to 8 days) for the six cases who had recovered at the time of interview. One (11%) patient was hospitalized for 5 days as a result of their illness. Two cases had a stool specimen test positive for *Campylobacter jejuni*; one isolate was identified as pulsed-field gel electrophoresis (PFGE) subtype CMP235 and the other isolate was identified as PFGE subtype CMP236.

Cases with known meal dates reported eating at the restaurant from September 20 to October 1. Cases reported eating a variety of foods, including starters, sandwiches, burgers, and sides; no food item was significantly associated with illness.

An environmental health assessment of the restaurant on October 22 revealed eight critical violations and four non-critical violations, including possible routes of cross-contamination. A 20-foot prep table was observed to be used for preparation of both raw meats and ready-to-eat foods with no clear separation or designation between raw and ready-to-eat foods. Additionally, no procedures were in place to show that the prep table was cleaned and sanitized between uses. Furthermore, several cooked items (e.g., chicken, taco meat) were stored on top of raw beef and raw chicken in a walk-in cooler; food containers did not have any lids or other coverings. A repeat inspection on October 23 found that all cross-contamination issues had been corrected.

This was a foodborne outbreak of *Campylobacter jejuni* infections associated with Restaurant X in Apple Valley. No specific food vehicle was identified. The most likely cause of the outbreak was cross-contamination from raw meat to one or more ready-to-eat food items. As a result of the outbreak, the restaurant instituted measures to prevent cross-contamination.

(39)
Salmonella Javiana Infections Likely Associated with Cucumbers or Iceberg Lettuce

October-November Multiple counties/Multiple states

On October 23, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Javiana isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Centers for Disease Control and Prevention [CDC] *Xba*l designation JGGX01.0500; MDH designation JVN74). The cases were both interviewed using a standard questionnaire. A review of the national PulseNet database revealed six additional *S*. Javiana isolates with the outbreak PFGE pattern in four states. A multi-state investigation was subsequently initiated. From October 24 through October 31, the MDH PHL received two additional *S*. Javiana isolates with the outbreak PFGE pattern.

A case was defined as a person from whom *S*. Javiana with the outbreak PFGE pattern (JGGX01.0500) was isolated, with a specimen collection date after October 1, 2012. Minnesota cases were interviewed with a broad-based exposure questionnaire. Exposures of interest identified during hypothesis generation were compared to the 2007 FoodNet Population Survey using a binomial probability model. The Minnesota Department of Agriculture (MDA), the South Dakota Department of Health (SDHD), and the Arizona Division of Public Health Services (ADPHS) conducted traceback investigations of suspect products.

Nationally, 37 cases from 9 states were identified in this outbreak, (Arizona 3, California 15, Illinois 6, Michigan 2, Minnesota 4, North Dakota 2, New Jersey 1, South Dakota 1, and Wisconsin 3). The cases had a median age of 23 years (range, 1 to 83 years) and illness onset dates from August 6 through November 10. Twenty (50%) cases were female. Six cases were hospitalized.

Geographically, cases were clustered in the midwest and west/southwest with an outlying case in New Jersey. These distinct geographic clusters also displayed strong demographic differences. For instance, 13 of 16 (81%) of west/southwest cases were male, whereas 13 of 18 (72%) midwest cases were female. The west/southwest cases were also slightly older (median age, 30 years; range, 0.3 to 95 years) compared to midwest cases (median age, 21.5 years; range, 6 to 65 years).

The four Minnesota cases had a median age of 33 years (range, 9 to 65 years) and illness onset dates from October 3 through October 20. All four cases reported diarrhea and cramps, two (50%) reported bloody stools, one (25%) reported vomiting, and one (25%) reported fever. No Minnesota cases were hospitalized.

Upon initial interview, all four Minnesota cases reported eating at different Chain A restaurant locations in the week prior to illness onset. Nationally, only the South Dakota case also reported eating at a Chain A location. While cases reported consuming a variety of sub sandwiches at the restaurants, all five reported consuming cucumbers, four (80%) iceberg lettuce, four (80%) American cheese, three (60%) green peppers, three (60%) black olives, three (60%) pickles, and two (40%) spinach. Among the Minnesota cases, three (75%) reported consuming bananas, three (75%) eggs, and three (75%) different brands of shredded cheddar cheese. No other food items were reported by more than two cases.

A case-case comparison study was conducted to evaluate the hypothesis that eating at restaurant Chain A was associated with illness. Four age- and gender-matched comparison cases of non-Javiana *Salmonella* serotypes with illness onsets from October 1 through October 31, 2012 were selected per case. The match was broken for the analysis due to the small number of cases. Eating at restaurant Chain A was associated with illness among Minnesota cases (4 of 4 cases vs. 3 of 13 comparison cases; odds ratio, undefined; 95% confidence interval, undefined; p = 0.007).

Nationally, 23 cases were interviewed. Consuming iceberg lettuce (19 of 23 [83%] cases vs. 46% in the population survey; p = 0.06), fresh spinach (8 of 20 [40%] cases vs. 24% in the population survey; p = 0.08), and cucumbers (14 of 22 [64%] cases vs. 47% in the population survey; p = 0.09) approached being significantly associated with illness.

MDA and SDHD conducted a traceback of the cucumbers and iceberg lettuce consumed by cases from the restaurant Chain A locations. ADPHS conducted a traceback of the cucumber and iceberg lettuce consumed by two cases after purchase at different retail locations. Distributor A in Rogers, Minnesota supplied the cucumbers and iceberg lettuce to all four restaurants Chain A locations in Minnesota at which cases dined. Distributor A received cucumbers from Distributor B in Minneapolis, Minnesota and iceberg lettuce from Producer A in Salinas, California. SDHD determined that Distributor C in Omaha, Nebraska supplied both the cucumbers and iceberg lettuce to the Chain A restaurant location where the South Dakota case ate. Distributor C also received cucumbers from Distributor B in Minneapolis, Minnesota and iceberg lettuce from Producer A in Salinas, California. Records indicated three possible common growers for the cucumbers: a grower in Norman Park, Georgia; a grower in Vizcanio, Baja California, Mexico; and a grower in Vicente Guerrero, San Quintin Baja California, Mexico. Records indicated 17 possible common iceberg lettuce growers that supplied Producer A. The Arizona case reported purchasing both cucumbers and iceberg lettuce from a grocery store and small market. The ADPHS iceberg lettuce traceback found no connection to Producer A. The cucumbers traced back to growers in Sonora, Mexico and Nogales, Arizona.

This was a multi-state outbreak of *S*. Javiana infections. Four cases of *S*. Javiana related to this outbreak were identified in Minnesota. In Minnesota, cases were associated with eating at restaurant Chain A. Exposure histories and tracebacks conducted for cases in Minnesota and South Dakota suggested that the most likely vehicle was either iceberg lettuce or cucumbers. Consumption of these produce items by cases in all of the involved states was higher than expected based on the FoodNet Population Survey, although the differences were not quite statistically significant. The tight distribution of case illness onsets also suggests a product with a short shelf life, which is consistent with a produce item like iceberg lettuce or cucumbers. The national investigation was limited in that only 23 of 37 cases were interviewed. In addition, the demographic differences between the two geographic clusters suggest that the two may not have been directly related.

(40)
Suspected Viral Gastroenteritis Associated with a Restaurant

October Hennepin County

On October 10, 2012, the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit received a complaint of gastrointestinal illness following a meal at a restaurant in Plymouth on October 8. A second patron illness complaint from the restaurant was received by HSPHD

on October 11. The Minnesota Department of Health (MDH) and HSPHD environmental health unit were notified on October 11, and an investigation was initiated.

A list of patrons identified from the restaurant's reservation list was provided to HSPHD. HSPHD epidemiologists interviewed the patrons about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. No patrons agreed to submit stool samples to the MDH Public Health Laboratory for testing.

HSPHD sanitarians visited the restaurant on October 12 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

Five patrons were interviewed by HSPHD epidemiologists. While the restaurant supplied a list of names for HSPHD to call, only three additional patrons were interviewed. Only the two patrons from the original complaints met the case definition. Both reported vomiting and diarrhea, one reported cramps, one reported fever, and neither reported bloody stools. Incubation periods were 33 and 34 hours. One case reported symptom duration of 8 hours; the other was still experiencing symptoms at the time of interview.

The first case ate brunch at the restaurant on October 7 and had roast beef, scrambled eggs, an English muffin with egg and hollandaise sauce, a ham and cheese omelet, cheesy hash browns, fresh fruit, and water. Two dining companions accompanied this case to brunch, but the case refused to give their contact information to HSPHD. The second case consumed lunch at the restaurant on October 8 and ate a walleye sandwich, French fries, chicken wings, spicy green beans, and iced tea. Three others ate with the case, but none agreed to be interviewed by HSPHD.

Three controls were interviewed and reported eating a wide variety of foods. Each control dined with others (groups of 5, 17, and 20 people) and passed along the HSPHD epidemiology phone number to their dining companions. However, no additional patrons called in. The small number of cases and controls prevented a meaningful statistical analysis of specific food items.

HSPHD sanitarians visited the restaurant on October 12 and did not note any critical violations. The sanitarians provided norovirus education to the restaurant and a reminder that ill employees must be excluded from work for 72 hours following the resolution of gastrointestinal symptoms. They further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, and thorough disinfection. The restaurant conducted a full cleaning and disinfection of the facility and agreed to screen all employees daily for gastrointestinal illness before starting their shift.

Illness histories and job duty information were obtained from 77 restaurant employees. Six employees reported recent gastrointestinal illness. Five of the ill employees were servers and one was a host. Onset dates of illness were October 8 (n=2), October 9, 10, 12, and 14. One of the employees with an illness onset on October 8 reported working as a server at the restaurant while ill. The ill employees with later illness onsets were excluded from work until 72 hours after the resolution of symptoms.

This was a foodborne outbreak of suspected noroviral gastroenteritis associated with a restaurant in Plymouth. While an etiology was not confirmed, the incubation periods and symptoms were compatible

with norovirus. The vehicle of transmission was not identified; however, the most plausible scenario is that ready-to-eat foods were contaminated by ill or recently ill food workers.

(41)
Suspected Viral Gastroenteritis Associated with a Restaurant

October Hennepin County

On October 12, 2012, the Minnesota Department of Health (MDH) notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit of a complaint of gastrointestinal illness among several co-workers who had shared a lunch on October 10 catered by a restaurant in Eden Prairie. HSPHD epidemiology notified the HSPHD environmental health unit on October 12, and an investigation was initiated.

A list of co-workers from the catered meal and additional patrons identified from restaurant catering orders for October 10 were provided to HSPHD. HSPHD epidemiologists interviewed the patrons about food consumption and illness history. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating food from the restaurant. No patrons agreed to submit stool samples to the MDH Public Health Laboratory for testing.

HSPHD sanitarians visited the restaurant on October 12 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

Sixteen patrons from the co-worker's group and the restaurant's catering list were interviewed by HSPHD epidemiologists; four individuals (25%), all from the group of co-workers, met the case definition. One additional patron reported illness that did not met the case definition and was excluded from analysis. The median incubation period for the cases was 28 hours (range, 7 to 33 hours). All four cases reported diarrhea, three (75%) fever, two (50%) cramps, two (50%) vomiting, and none bloody stools. The median duration of illness for the three cases who had recovered at the time of interview was 17.5 hours (range, 8 to 20 hours).

All four cases consumed catered foods at a work meeting. Foods consumed included a variety of sandwiches, salads, soups, and bottled beverages. The 12 controls interviewed also reported eating a wide variety of sandwiches, salads, and soups. No food items were associated with illness.

HSPHD sanitarians visited the restaurant on October 12 and noted issues with the restaurant's sanitizer system. The system that automatically measures the quaternary ammonia (quat) sanitizer was not correctly dispensing, and staff were not testing the solutions to ensure the correct quat concentration. Education was provided on how to manually test the quat concentration, and the restaurant remedied the problem with their auto-fill system. The restaurant conducted a full cleaning and disinfection of the facility and agreed to screen all employees daily for gastrointestinal illness before starting their shift.

Illness histories and job duty information were obtained from 22 restaurant employees. One employee reported vomiting and diarrhea beginning the morning of October 9 and resolving later that evening. This employee worked preparing sandwiches on October 10, the implicated meal date, as well as on October 11 and 12. An additional employee reported one episode of vomiting on October 12, but did not work on that date and did not return to work until 72 hours after the resolution of symptoms.

HSPHD sanitarians provided norovirus education to the restaurant to inform employees that they must be excluded from work for 72 hours following the resolution of gastrointestinal symptoms. They further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, and thorough disinfection.

This was a foodborne outbreak of suspected viral gastroenteritis associated with a restaurant in Eden Prairie. While an etiology was not confirmed, the distribution of incubation periods and symptoms were compatible with norovirus. The vehicle of transmission was not confirmed; however, the most plausible scenario is that ready-to-eat sandwich items were contaminated by the ill food worker who prepared sandwiches.

(42)
Suspected Bacterial Intoxications Associated with an Event Center

October Ramsey County

On October 26, 2012, managers at Caterer X (caterer for an event center) contacted their local health department, the City of St. Paul Department of Safety and Inspections, to report two independent complaints of gastrointestinal illness. The complainants had attended a conference at the event center on October 16 and 17. Reported illness onsets were during the evening of October 16.The City of St. Paul notified the Minnesota Department of Health (MDH); an investigation was initiated immediately. MDH followed-up by interviewing the two complainants and contacting the organizer of the conference to gather more information about the event.

City of St. Paul sanitarians visited the event center on October 30, October 31, and November 1 to evaluate Caterer X's food preparation and handling procedures and to gather specific information pertaining to the event. In addition, City of St. Paul sanitarians conducted interviews of those employees who were noted as being ill on the establishment's illness log the week of the conference, and contacted the establishment via telephone on November 5 to gather additional information on food handling methods.

MDH staff received a contact list of all attendees of the conference (over 500 people) and sent out a mass email to attendees requesting that anyone who became ill contact MDH. MDH received several responses and interviewed both ill patrons and non-ill patrons about food consumption and illness history. A case was defined as an individual who attended the conference and who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) within 12 hours after eating at the conference on October 16. Stool samples collected from consenting attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Forty-five conference attendees were interviewed, and 12 (27%) met the case definition. Eight attendees reported illness that did not meet the case definition and were excluded from analyses. The median incubation period from the lunch meal on October 16 was 6.25 hours (range, 3.0 to 11.5 hours). The median duration of illness was 22 hours (range, 11.5 to 42.0 hours). Nine cases reported diarrhea (75%), eight (67%) reported vomiting, eight (67%) reported abdominal cramps, two (17%) reported fever, and one (8%) reported bloody stools. Two cases visited an emergency room, but no cases were hospitalized.

Three stool specimens (all from attendees who reported illness but did not meet the case definition) were submitted to MDH; one tested positive for *Clostridium perfringens* enterotoxin Type A. All three stool specimens were negative for norovirus, *Campylobacter, Salmonella,* Shiga toxin-producing *E. coli, Shigella*, and *Yersinia*.

Food items served to the attendees on October 16 included bagels, cream cheese, peanut butter, preserves, coffee, tea, bottle juices for breakfast; harvest salad, rolls, whipped butter, porcini turkey Milanese with mushroom sauce, bread stuffing, mixed vegetables, stuffed Portobello mushroom (vegetarian entrée), chocolate cream pie, coffee, tea, iced tea, and ice water for lunch; and cookies and soda for afternoon snack. There was an evening reception held for attendees at the event center, but more than half of the cases did not attend the reception. All of the food items served to the attendees were prepared by Caterer X. The breakfast and snack items were self-serve, and the lunch was plated by Caterer X staff.

In the univariate analysis, no food items were significantly associated with illness. However, consuming chocolate cream pie (12 of 12 cases vs. 18 of 25 controls; odds ratio [OR], undefined; 95% confidence interval [CI], undefined; $p = 0.07$), whipped butter (9 of 11 cases vs. 13 of 25 controls; OR, 4.1; CI, 0.7 to 23.2; $p = 0.14$) and turkey Milanese (12 of 12 cases vs. 20 of 25 controls; OR, undefined; CI, undefined; $p = 0.15$) approached significance.

Illness histories and job duty information were obtained from three catering employees who were noted as being ill on the employee illness log the week of the conference. None of the three employees reported having had gastrointestinal illness previous to, on, or after the implicated meal date.

During the environmental assessment, Caterer X managers reported that they took cook temperatures of the turkey medallions and checked the temperatures of the electric hot boxes where foods were being held. Mangers reported that the mushroom sauce served over the turkey entrée was heated until boiling and then remained simmering in a skillet until service; however, no temperatures were taken during this process. The chocolate cream pie was prepped the day of the event and consisted of a homemade shortbread cookie shell which was filled with chocolate mousse made from a dry mix and cream. Managers reported that the prepped desserts were held in a refrigerator until they were plated. The establishment did not have temperature logs to verify that adequate food temperatures had been met and maintained on the day of the event. In addition, sanitarians found that one of the two thermocouples used to take food temperatures was broken. MDH received reports from several attendees that the turkey medallions were raw or undercooked; this could not be confirmed during the environmental assessment. In addition, the lunch service was delayed 45 minutes due to an agenda change; however, catering managers reported that all hot foods remained plated in the electric hot boxes during this delay. City of St. Paul sanitarians provided education on temperature monitoring and recording, and management at Caterer X has hired a person to provide additional food safety education to staff.

This was an outbreak of foodborne illness associated with a conference held at an event center, in St. Paul. The etiology was not confirmed, but the distribution of incubations and symptoms were compatible with a bacterial intoxication, such as that caused by *Staphylococcus aureus* or the emetic form of *Bacillus cereus*. The cause of bacterial amplification was not specifically identified, but the environmental health investigation revealed the potential for time-temperature abuse.

(43)
Norovirus Gastroenteritis Associated with a Restaurant

October Hennepin County

On October 24, 2012, the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit received a complaint of gastrointestinal illness among a large church group that had eaten catered foods from a restaurant in Maple Grove on October 21. The Minnesota Department of Health (MDH) and HSPHD environmental health unit were notified on October 24, and an investigation was initiated.

A list of names from the church group and additional patrons identified from restaurant catering and take-out orders on October 21 were provided to HSPHD. HSPHD epidemiologists interviewed the patrons about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating food from the restaurant. Two patrons agreed to submit stool samples to the MDH Public Health Laboratory for bacterial and viral testing.

HSPHD sanitarians visited the restaurant on October 25 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

Forty patrons were interviewed by HSPHD epidemiologists, including 27 patrons from the church group and 13 patrons identified from other catering or take-out orders. Nineteen cases (all from the church group) were identified. The median incubation period for the cases was 27.5 hours (range, 6 to 41.5 hours). Seventeen (89%) cases reported cramps, 14 (74%) vomiting, 11 (58%) diarrhea, 1 (5%) fever, and none bloody stools. The median duration of illness was 24 hours (range, 7 to 48 hours). Stool specimens collected from two cases tested positive for norovirus GII.

Twenty-one controls were interviewed (8 from the church group and 13 from other catering and take-out orders). Cases and controls from the church group all reported eating a wide variety of the foods. Catered foods from the restaurant included chicken, ribs, shredded pork, brisket, beans, coleslaw, cornbread muffins, and French fries. Non-catered food/beverage items included homemade cookies, bars, lemonade, fruit punch, and bottled soda. A large bowl of ice with tongs was provided by the party host, and guests served themselves. Controls identified from other catering and take-out orders on October 21 also reported eating a wide variety of meats and side dishes from the restaurant. No food item was statistically associated with illness.

HSPHD sanitarians visited the restaurant on October 25 and did not note any critical violations. Illness histories and job duty information were obtained from 57 restaurant employees. Five employees reported recent gastrointestinal illness. Two servers reported illness prior to the implicated meal date (onsets on October 14 and 16), and a linecook, host, and server reported illness onset after the implicated meal date (October 22 and 25). The two ill employees with illness onsets on October 25 were excluded from work until 72 hours after the resolution of symptoms.

HSPHD sanitarians provided norovirus education to the restaurant and a reminder that ill employees must be excluded from work for 72 hours following the resolution of gastrointestinal symptoms. They further stressed the importance of proper handling of food and beverages, use of gloves when handling

ready-to-eat foods, good handwashing, and thorough disinfection. The restaurant conducted a full cleaning and disinfection of the facility and agreed to daily screen all employees for gastrointestinal illness before starting their shift.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Maple Grove. The vehicle of transmission was not identified; however, the most plausible scenario is that ready-to-eat foods were contaminated by an ill or recently ill food worker.

(44)
Norovirus Gastroenteritis Associated with a Restaurant

November Ramsey County

On November 6, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of 41 co-workers who ate food provided by a restaurant in St. Paul at a retirement party on November 2. No other foods were provided at the event. City of St. Paul Environmental Health (CBPEH) and MDH Environmental Health (EH) were contacted, and an investigation was initiated immediately.

CBPEH and MDH EH sanitarians visited the restaurant on November 6 to evaluate food preparation and handling procedures, interview food workers, and collect contact information for additional November 2 catering orders. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating food from the restaurant. Stool samples collected from consenting individuals were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Twenty-eight party attendees from the original complaint were interviewed, and 16 (57%) met the case definition. One party attendee reported illness that did not met the case definition and was excluded from analysis.

Four additional November 2 catering orders were contacted, and one group reported six individuals ill with gastrointestinal symptoms after their meal of lasagna, tortellini, focaccia, dessert bars, and a chop salad. A restaurant employee, who does not work in food service, reported that she had ordered a chop salad on November 3 to serve at a private gathering. Subsequently, 4 of 15 individuals at that gathering developed gastrointestinal illness.

A total of 36 patrons from the three groups were interviewed, and 24 met the case definition (16, 4, and 4, respectively). The median incubation period for cases was 30.5 hours (range, 15 to 55 hours). The median duration of illness for the 18 cases who had recovered at the time of interview was 2 days (range, 1 to 4 days). Twenty-two (92%) cases reported diarrhea, 20 (83%) vomiting, 15 (63%) cramps, 9 (38%) fever, and none bloody stools. Stool samples submitted by five ill restaurant patrons, including the ill restaurant employee, tested positive for norovirus GII. Nucleic acid sequencing was conducted on all five positive norovirus samples; the nucleic acid sequences were identical.

Among the retirement party attendees, consuming the grilled asparagus with roasted red peppers and kale was significantly associated with illness (15 of 16 cases vs. 3 of 11 controls; odds ratio, 40.0; 95% confidence interval, 2.9 to 1,890; $p < 0.001$). A small number of non-ill controls interviewed among the

two other groups who reported illness precluded a meaningful analysis of food exposures. However, both groups ordered the chop salad, which was the only food item reported by the majority of cases in both groups (4 of 4 and 3 of 4, respectively).

CBPEH and MDH sanitarians interviewed 157 restaurant employees, and 15 reported recent gastrointestinal illness. These employees reported becoming ill on October 11, 14, 19, 22, 26, 27, November 4, 5, 7, 9, 10 (n=2), 11 (n=2), and 13, respectively. The restaurant did not have a glove use policy; while gloves are available to staff, they do not require glove use when handling ready-to-eat foods. The restaurant had received a complaint from the retirement party but had not forwarded to the City of St. Paul as required. Sanitarians found the employee illness policy at the restaurant inadequate. Management stated that sick employees are sent home if they have visible symptoms. However, the facility had not provided education or training on the handwashing or the exclusion of food workers who have diarrhea and/or vomiting. Sanitarians also noted that a number of hand sinks in the restaurant were missing soap. The grilled asparagus with roasted red peppers and kale was grilled the evening of November 1. The dish was then assembled and packaged the following morning. The sanitarians discussed the importance of handwashing and minimizing bare-hand contact with ready-to-eat foods for the prevention of norovirus transmission, and all employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms. Stool collection kits delivered to two ill food workers were not returned. As a result of the outbreak, the restaurant implemented a new policy requiring the use of gloves when working with ready-to-eat foods and a new employee illness policy including training of employees on the exclusion policy.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in St. Paul. Grilled asparagus with roasted red peppers and kale was associated with illness for one catering order, and the chop salad was consumed by the majority of cases in the two additional orders who reported illness. Numerous restaurant employees reported recent gastrointestinal illness, and an infected food worker was the likely source of the contamination.

(45)
Suspected Bacterial Intoxications Associated with a Catered Event

November Hennepin County

On November 6, 2012, the food manager at a homeless shelter in Minneapolis contacted their local health department, Minneapolis Environmental Health (MPLS EH), to report complaints of gastrointestinal illness in 13 persons who had eaten a meal catered by a restaurant at a shelter on the evening of November 5. MPLS EH notified the Hennepin County Human Services and Public Health Epidemiology Unit (HSPHD Epi) and the Minnesota Department of Health (MDH); an investigation was initiated immediately. HSPHD Epi contacted the HSPHD Environmental Health Unit (HSPHD EH) because the restaurant was located in their jurisdiction.

On November 6, MPLS EH spoke with the food manager at the shelter and requested a list of persons who had eaten the catered meal on November 5. HSPHD epidemiologists conducted interviews with those who ate the catered meal to obtain information on food consumption and illness history. A case was defined as a person who subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating the catered meal on the evening of November 5.

On November 7, HSPHD EH spoke with the manager of the restaurant to ensure that the facility did not have any more of the product that was served at the shelter meal. Additionally, the environmentalist questioned managers about employee illness and discussed food flows for the catered event. On November 8, 2012, HSPHD EH visited the restaurant to conduct an onsite inspection of the facility.

Illness histories and exposure information were obtained from 29 persons who had eaten the catered meal on November 5. Twenty-two (76%) patrons met the case definition. Nineteen cases (86%) reported vomiting, 10 (45%) reported diarrhea, and 2 (9%) reported cramps. None reported fever. The median incubation period was 2.75 hours (range, 45 minutes to 6.5 hours). The median duration of illness was 14 hours (range, 10.75 to 36 hours) for the seven cases who had recovered from their symptoms at the time of the interview.

Cases reported eating a variety of food items including pulled pork sandwiches, pasta with meatballs in sauce, baked beans, coleslaw, cookie, and assorted beverages. Statistical analysis was done but none of the food items were statistically significant. Of the cases, 18 (82%) ate pulled pork, 22 (100%) ate pasta with meatballs, 11 (50%) ate beans, 9 (41%) ate coleslaw, 18 (82%) ate a cookie, 9(41%) had milk, and 13 (76%) of 17 had water.

On November 7 the manager of the restaurant reported that the van that carries the catered food was broken on the day of the event so the food was transported in a car from the catering facility in Maple Grove to the shelter in downtown Minneapolis. No temperature control measures were put in place during transport of the food and no temperatures were taken before the food left the catering facility. None of the catering staff had eaten the food and none reported illness.

During the inspection of the restaurant on November 8, HSPHD EH reviewed cooling procedures and found that there were no cooling logs or specific procedures in place in the establishment to verify if the cooling time and temperature requirements had been met for the foods served at the catered meal. HSPHD EH discussed how to properly cool food items and how to keep cooling logs and records to verify that proper cooling requirements are being met with the catering manager. On November 9, 2012, a follow up inspection was conducted by HSPHD EH to ensure that the cooling logs were being used, cooling procedures were meeting temperature requirements, and that catered food was being transported in a licensed vehicle.

This was an outbreak of foodborne illness associated with eating food at a homeless shelter, in Minneapolis, that had been catered by a restaurant. The etiology was not confirmed, but the distribution of incubations and symptoms were compatible with a bacterial intoxication caused by *Staphylococcus aureus* or *Bacillus cereus*. The cause of bacterial amplification was not specifically identified, but the environmental health investigation revealed the potential for time-temperature abuse.

(46)
Norovirus Gastroenteritis Associated with an Event Center

November Blue Earth County

On November 16, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in persons who attended Banquet A on November 13. Approximately 460 people attended. Several of the businesses called the event organizer to report

illnesses among persons who attended. Later that day, MDH received an additional complaint of gastrointestinal illness among people who attended a separate event, Banquet B, at the same event center on November 14. The complainant reported that approximately 20 of the 500 attendees became ill after that event. An outbreak investigation was initiated on November 16.

Contact lists of attendees of each event were obtained from the original complainants. The list of attendees for the event on November 13 consisted of contact persons for invited businesses and organizations. MDH staff followed-up with each business and asked for contact information for event attendees. Event attendees were interviewed to determine illness history before and after attending an event at the event center and food and drink consumption during the event. A case was defined as an individual who attended either Banquet A or Banquet B, and who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after the event. Stool samples were requested from consenting persons meeting the case definition and were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

An MDH environmental health specialist initiated an investigation at the event center on November 16, and gathered information about each event and evaluated food preparation and handling procedures. Additionally, the environmental health specialist and epidemiology staff conducted interviews with select members of the event center staff and with staff of Caterer X, the business that provided the food for both events.

A total of 120 attendees were interviewed from both events; 80 attended Banquet A on November 13, and 40 attended Banquet B on November 14. Eleven attendees reported mild illness that did not meet the case definition and were excluded from further analyses. Fifty (46%) persons met the case definition, including 34 (47%) from the November 13 event, and 16 (43%) from the November 14 event. Forty-six cases reported diarrhea (92%), 41 (82%) reported vomiting, 37 (74%) reported abdominal cramps, 18 (43%) reported fever, and one (2%) reported bloody stools. No cases visited the emergency room or were hospitalized. The median incubation was 32 hours (range, 0.5 to 79 hours). The median duration of illness was 47 hours (range, 9 to 121 hours). Five stool specimens were submitted to MDH; four tested positive for norovirus GII.1, and all had identical nucleic acid sequences.

The attendees of the event on November 13 were served a plated dinner that included either a vegetarian pasta entrée or steak, mashed potatoes, gravy, mixed vegetables, lettuce salad with choice of dressing served by attendees at the table, bread, and red velvet cake. Coffee and ice water were available at the tables, and alcoholic beverages were served from a bar. Food items served at the November 14 luncheon included pre-made ham and cheese and ham and turkey sandwiches, creamy noodle soup, apples, bananas, and oranges. Coffee and ice water were also available. The food for the luncheon was prepared on November 13. Both events were catered by Caterer X, and all food was prepared in the kitchen at the event center. The bar at the November 14 event was staffed by event center bartenders.

Several statistical analyses were conducted including event-specific case-control analyses and a cohort analysis including only complete cohorts that attended the November 13 event. No single food item was significantly associated with illness in any of the univariate statistical analyses.

Illness histories and job duty information were obtained from 21 employees of Caterer X and 9 employees of the event center that participated in the implicated events. No illness was reported previous to, on or after the implicated meal dates among the event center staff. Fourteen employees (67%) of

Caterer X reported illness that met the case definition. The catering employees shared a staff meal after the event on November 13 that consisted of the same foods served at the event. One dishwasher reported onset of vomiting and diarrhea on November 12 at approximately midnight. This person went to work while ill on November 13 and worked for 1 hour before being sent home due to illness. The employee returned to work at 6:30 p.m. that evening and worked until 10:30 p.m. putting dishes away and was also at work on November 14. It was reported that he did not vomit or have diarrhea while working. He did not submit a stool specimen for testing. The remaining food workers had illness onset from November 14 through 16. Three food workers submitted stool specimens to MDH; all three were positive for norovirus GII.1, with nucleic acid sequences that were identical to noroviruses in specimens collected from attendees.

On November 16, environmental health specialists instructed the caterer to implement a series of interventions including excluding any ill food workers until 72 hours after resolution of symptoms, using an employee gastrointestinal illness screening form, discarding all opened ready-to-eat foods and ice, cleaning and sanitizing of food contact surfaces and ice machines, and implementing a "no bare-hand contact" policy.

This was a foodborne outbreak of norovirus gastroenteritis associated with an event center in Mankato. A specific food vehicle was not identified. An ill dishwasher was the most likely source of the outbreak.

(47)
Salmonella Saintpaul Infections Associated with a Thanksgiving Dinner

November St. Louis County

On July 3, 2014, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Saintpaul isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (STP92). Initial interviews revealed that both cases had eaten at the same private Thanksgiving dinner, and an investigation was initiated.

A case was defined as a person from whom *S*. Saintpaul with PFGE pattern STP92 was isolated. Minnesota cases were interviewed with a broad-based exposure questionnaire, and about the implicated meal.

Two cases were identified, with illness onsets on November 23 and November 25. The cases were 38 and 51 years old, and one case was female. Both cases reported diarrhea and fever, one case reported cramps, and neither case reported bloody stools or vomiting. Neither case was hospitalized. The cases reported incubation periods of 30 hours, and 72 hours and illness durations of 5 and 9 days.

Both cases reported eating at a private home in Chisholm, Minnesota for Thanksgiving on November 22. Smoked turkey, oven-roasted turkey, stuffing, shrimp, deviled eggs, cheesy potatoes, summer sausage, cranberry sauce, sweet potatoes, carrots, broccoli, tomatoes, olives, dinner rolls, and cake were served. No other family members reported becoming ill. The small number of cases precluded a meaningful analysis of food exposures.

One of the cases reported purchasing a whole turkey from a grocery in International Falls. He smoked the turkey at home on November 21 before bringing it to the dinner on November 22. Specific details regarding how the turkey was smoked, stored, and reheated were not available.

This was an outbreak of *S*. Saintpaul infections associated with a dinner in a private home. While a vehicle was not identified, the preparation of the smoked turkey may have represented an opportunity for inadequate initial cooking or time/temperature abuse, resulting in the survival and proliferation of *Salmonella*. However, this could not be confirmed.

(48)
Norovirus Gastroenteritis Associated with a Wedding Reception

December Mower County

On December 4, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among attendees of a wedding reception held on December 1 at a restaurant in Le Roy, Minnesota. Approximately 400 attendees were at the reception. The complainant also reported attending a catered rehearsal dinner held on November 30 at a community center. Approximately 30 attendees were at this event. Additionally, a family holiday party was held at a private home on November 25, and family illness was reported in the week before the wedding. MDH Environmental Health and the Minnesota Department of Agriculture (MDA) were notified on December 5 and an investigation was initiated.

MDA inspectors contacted the caterer on December 5 to gather more information about what was served at the November 30 event, assess food preparation and handling practices, and to determine if any food workers had been ill before, during, or after the event.

MDH Environmental Health sanitarians contacted the restaurant on December 5 to determine if the restaurant had received any additional complaints of illness among patrons. An employee illness screening log was implemented at that time. A sanitarian visited the facility on December 6 to evaluate food preparation and handling procedures. Food workers were interviewed and asked to submit stool specimens if ill.

The original complainant provided a contact list for attendees of the wedding. MDH interviewed attendees to obtain information on food and beverage consumption and illness history. A case was defined as an individual who developed vomiting and/or diarrhea (≥3 stools in a 24-hour period) after attending a wedding-related event. Stool samples from consenting attendees were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 85 attendees were interviewed; 38 (45%) met the case definition. Nine attendees reported illness that did not met the case definition and were excluded from further analyses. Of the nine excluded attendees, three (4%) had illness onset before December 1, and two (2%) had illness onset on December 6 and were considered secondary cases. All attendees were asked about attendance at the holiday party on November 25 and the rehearsal dinner on November 30. Neither of these events were significantly associated with illness; only 12 (32%) cases with available information attended the holiday party, and

only six (17%) cases attended the rehearsal dinner. The only event that all cases reporting attending was the wedding reception on December 1.

Thirty-seven (97%) cases reported diarrhea, 29 (76%) reported vomiting, 26 (72%) reported abdominal cramps, 6 (18%) reported fever, and 1 (3%) reported bloody stools. The median incubation was 37.5 hours (range, 16.5 to 57 hours). The median duration of illness was 35 hours (range, 7 to 74.5 hours). No cases were hospitalized or sought medical attention. Three attendee stool specimens were submitted to the MDH PHL; two tested positive for norovirus GII, including a specimen from an attendee who had an illness onset on November 30. The remaining specimen was negative for norovirus. All three attendee stool specimens were negative for *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, and *Shigella*.

An MDA inspector interviewed all employees involved in the preparation and serving of the rehearsal dinner on November 30. No illness was reported before, during, or after the event. No improper food preparation or handling practices were observed. The meal served included shredded beef, au gratin potatoes, baked beans, coleslaw, macaroni salad, and a cake-type dessert that was brought by family members.

The food for the wedding reception was prepared by the restaurant. The dinner was served buffet-style at two separate locations in the facility; one upstairs and one downstairs. The upstairs buffet consisted of ham, chicken, green salad, macaroni salad, baked beans, rice, au gratin potatoes, rolls, and butter. The downstairs buffet consisted of ham, chicken, macaroni salad, baked beans, rice, au gratin potatoes, sweet corn, Waldorf salad, rolls, and butter. A variety of beverages were available including ice water, coffee, punch, and other drinks from the bar. Cake from a grocery store in Austin, Minnesota was served, and ham sandwiches were available later in the evening. Snacks on the tables included peanuts, M&Ms, mints, and puppy chow. These snacks were prepared by the complainant who reported that an individual who was staying at her home had onset of vomiting and diarrhea on November 30 while she prepared the snacks. The ill individual attended both the rehearsal dinner and the wedding reception.

Most guests consumed food from only one of the two buffets; however, neither buffet was significantly associated with illness. In the univariate analysis, consuming au gratin potatoes from the downstairs buffet (24 of 25 cases vs. 18 of 24 controls; odds ratio [OR], 8.0; 95% confidence interval [CI], 0.9 to 72.4; $p = 0.05$), ice (17 of 32 cases vs. 8 of 34 controls; OR, 3.7; 95% CI, 1.3 to 10.6; $p = 0.02$), and drinks from the bar (31 of 35 cases vs. 23 of 34 controls; OR, 3.7; 95% CI, 1.0 to 13.1; $p = 0.04$) were associated with illness. By multivariate logistic regression, no food item was independently associated with illness. Consumption of the snacks on the tables was not associated with illness.

MDH sanitarians interviewed all restaurant employees; four (44%) of nine food workers reported recent gastrointestinal illness, including one food worker who reported onset of diarrhea on November 28 and recovery on November 29. This employee's work duties on December 1 included set-up for the event and assembling salads, au gratin potatoes, and baked chicken. The remaining three ill food workers had onset of symptoms on December 3. All four food workers consumed leftovers from the wedding buffet on December 1.

Two food workers submitted stool specimens to MDH; one was positive for norovirus GII. Nucleic acid sequencing was conducted on norovirus positive samples from attendees and the food worker; the

nucleic acid sequences were identical. The food worker reporting onset of illness before the event did not test positive for norovirus.

MDH sanitarians did not find any violations in food preparation or handling during the inspection of the facility. Foods were kept at appropriate temperatures and proper handwashing and glove use were observed. However, since employee illness after the event was reported, an employee illness screening form was implemented to prevent ill employees from becoming sources of further transmission, and the restaurant was instructed to exclude ill food workers for 72 hours following the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a wedding reception held at a restaurant in Le Roy, Minnesota on December 1, 2012. Consumption of au gratin potatoes from the downstairs buffet, ice, and drinks from the bar were significantly associated with illness. Gastrointestinal illness was confirmed both in family members and a food worker prior to the event. Based on the statistical analyses of food items consumed, an infected food worker was the primary source of contamination. However, some of the cases could have occurred due to person-to-person transmission from ill attendees, or from consumption of foods contaminated by ill or recently ill wedding attendees.

(49)
Norovirus Gastroenteritis Associated with a Restaurant

December Anoka County

On December 13, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in two meal companions from separate households who ate lunch at a restaurant in Blaine, Minnesota on December 11. Both ill patrons consumed lettuce salads and reported onset of gastrointestinal illness on December 13. Anoka County Community Health & Environmental Services (ACCHE) was notified on December 13 and an investigation was initiated.

ACCHE sanitarians visited the facility on December 17 to conduct an environmental health assessment and interview employees regarding job-duties and illness histories. The manager of the facility was asked to provide contact information from patron credit card receipts from the suspected meal date of December 11.

Patrons were interviewed by MDH staff to obtain information on food and beverage consumption the restaurant and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 stools in a 24-hour period), or with laboratory-confirmed norovirus infection, after eating at the restaurant. Stool samples from consenting patrons were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Four (17%) of 24 patrons interviewed reported illness that met the case definition. The median incubation for cases was 32 hours (range, 14.5 to 34.5 hours). The median duration of illness was 43 hours (range, 26 to 52.5 hours). All four cases reported diarrhea, three (75%) reported abdominal cramps, two (50%) reported vomiting, one (25%) reported bloody stools, and one (25%) reported fever. No cases were hospitalized or sought medical attention. Three patron stool specimens were submitted to the MDH PHL; all three tested positive for norovirus GI. All three stool specimens were negative for *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, and *Shigella*.

All four cases reported eating a salad made with either chopped romaine lettuce mixed with spring mix (n=2), or chopped romaine alone (n=2). In the univariate analysis, consumption of romaine lettuce (4 of 4 cases vs. 4 of 20 controls; odds ratio, undefined; p = 0.01) was associated with illness.

ACCHE sanitarians interviewed 52 (65%) of 80 employees of the restaurant; of these, three (6%) reported recent gastrointestinal illness. No employees reported illness onset before the implicated meal date of December 11. One employee had onset of vomiting on December 12, one had onset of diarrhea on December 14, and one did not report an onset date but was excluded from work on December 15 due to recent vomiting. The employee who reported onset of diarrhea on December 14 was out of the country for the week preceding onset of symptoms. No employee reported working while ill. No stool specimens were submitted by employees for viral or bacterial testing.

The restaurant had a routine inspection on December 6, 2012. At that time, both improper holding temperatures in the salad preparation refrigerator and a lack of supplies at several handwashing sinks were reported. During the evaluation conducted on December 17 as part of the outbreak investigation, all handwashing sink violations had been corrected, and the salad preparation refrigerator had been serviced and was holding foods at temperatures between 39 and 41° F. Food workers preparing salads were observed wearing gloves and washing hands frequently. The spring mix served is a pre-cut bagged product. Romaine lettuce is cut and prepared at the restaurant daily.

As a result of this investigation an employee illness screening form was put into place and ill employees were excluded until 72 hours after the resolution of gastrointestinal symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Blaine, Minnesota. Consumption of romaine lettuce was significantly associated with illness. The source of the contamination was not identified. However, based on the presence of ill food workers after the implicated meal date, the most plausible source of the contamination was an unidentified infected food worker who contaminated the lettuce used to make the salads.

(50)
Norovirus Gastroenteritis Associated with a Restaurant

December Blue Earth County

On December 18, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among three of four meal companions from separate households who ate lunch at a restaurant in Mankato, Minnesota on December 14. All three ill patrons reported onset of vomiting and diarrhea on December 15. Two of the three ill patrons also reported attendance at a work holiday party on December 13. However, the lunch on December 14 was the only meal that all three ill individuals shared. MDH Environmental Health staff were notified on December 18 and an investigation was initiated.

MDH Environmental Health sanitarians visited the facility on December 18 to conduct an environmental health assessment and interview employees regarding job duties and illness histories. An employee contact list and work schedule was provided so that additional employees could be contacted via telephone by MDH staff. All four patrons from the original complaint were interviewed about food and

beverage consumption at the restaurant and illness history. Contact information for additional restaurant patrons was not available.

A case was defined as a patron who developed vomiting and/or diarrhea (≥3 stools in a 24-hour period) after eating at the restaurant. Stool samples from consenting patrons and employees were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Three of four (75%) patrons who were interviewed by MDH staff met the case definition. The median incubation was 27.5 hours (range, 27.5 to 31 hours). The median duration of illness was 37 hours (range, 21.5 to 66.5 hours). All three cases reported diarrhea and vomiting, two (67%) reported cramping, and none reported fever or bloody stools. No cases were hospitalized or sought medical attention. One patron stool sample was submitted to the MDH PHL. The specimen tested positive for norovirus GII and negative for *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, and *Shigella*.

All three cases reported consuming a pasta dish served with parmesan chicken. The patron who was not ill reported consuming a pasta dish without chicken and a Rice Krispie bar. Meaningful statistical analysis of food items could not be performed because additional controls could not be recruited.

Interviews were completed for 27 (96%) of 28 food workers. Eight (30%) food workers reported recent illness. Employee illness onsets ranged from November 28 to December 18. Two ill employees reported illness onset before the implicated meal date, on November 28 and December 7, with recoveries on November 29 and December 8, respectively; three reported illness onset on December 14, with recoveries on December 14, 15, and 18, respectively; two reported illness onset on December 15, with recoveries that same day; and one employee reported illness onset on December 18 and recovery that same day. One employee reported working as a sauté cook while experiencing gastrointestinal illness on December 16 and 17. Additionally, five employees reported returning to work within 24 hours of symptom resolution on the following dates: November 29, December 15, and December 16. Employees who reported recent illness reported performing a variety of food preparation and handling tasks. Four of these employees reported their primary job responsibility as cooking; three reported taking orders, garnishing and serving plates; and one reported washing dishes.

Stool samples were submitted by three recently ill food workers to the MDH PHL; all three tested positive for norovirus GII. Nucleic acid sequencing was conducted on norovirus positive samples from patrons and food workers; the nucleic acid sequences were identical.

An MDH Environmental Health sanitarian visited the facility on December 18. Although no violations were found, it was observed that the facility was lax in maintaining the employee illness log. Since employee illness was reported before and after the implicated meal date, an employee illness screening log was put into place on December 18, ill employees were excluded for 72 hours following the resolution of symptoms, and all ready-to-eat foods that were prepared by ill or recently ill employees were discarded. Employees were also advised on proper handwashing and glove use.

This was a foodborne outbreak of norovirus gastroenteritis associated a restaurant in Mankato, Minnesota. A specific food vehicle could be not identified because statistical analysis could not be performed. Based on the evidence, an ill or recently ill food worker was the likely source of contamination.

(51)
Norovirus Gastroenteritis Associated with a Restaurant

December Hennepin County

On December 17, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a party of three individuals who had eaten at a restaurant in Minneapolis, Minnesota on December 15. The complainant reported that all three individuals, from three different households, had become ill. Hennepin County Public Health Protection – Epidemiology (PHP-Epi) and Minneapolis Environmental Health (MEH) was notified immediately and an outbreak investigation was initiated.

MDH interviewed the original complainants, and MEH environmentalists obtained credit card receipts for December 15 from the establishment to obtain contact information for additional patrons. A case was defined as a person who ate the restaurant in Minneapolis on December 14 or December 15 and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On December 17, MEH environmentalists visited the restaurant to evaluate food preparation and handling procedures and to interview employees regarding illness history and job duties. On December 18, PHP-Epi staff began interviewing patrons identified from credit card receipts.

During the course of the investigation MDH received three additional complaints: one from a party of two who ate at the establishment on December 14; a second from a party of three who ate at the establishment on December 15; and a third from an individual who had eaten several meals at the establishment on December 14, 15, and 16.

Thirty-seven patrons were interviewed (3 patrons from December 14 and 34 patrons from December 15), and 14 (38%) met the case definition. One patron reported illness that did not meet the case definition and was excluded from analyses. The median incubation period for cases was 35 hours (range, 12 to 43 hours). The median duration of illness for the three cases who had recovered at the time of the interview was 24 hours (range, 15 to 33 hours). Fourteen cases (100%) reported diarrhea, 11 (78%) reported vomiting (78%), 10 (77%) reported abdominal cramps, 3 (21%) reported fever, and none reported bloody stools.

Eight stool specimens (from seven patrons and one employee) were submitted to MDH. The seven samples submitted by patrons tested positive for norovirus GII and were negative for *Campylobacter*, *Salmonella*, Shiga toxin-producing *E. coli*, and *Shigella*. The seven positive specimens were sequenced, and all specimens had an identical nucleic acid sequence. The employee stool sample tested negative for norovirus and for the mentioned bacterial pathogens.

Patrons reported eating a variety of different menu items. In a univariate analysis, consuming spring rolls was significantly associated with illness (10 of 13 cases vs. 9 of 22 controls; odds ratio, 1.6; 95% confidence interval, 1.0 to 22.6; $p = 0.04$). No other foods were associated with illness.

Illnesses histories and job duty information were obtained from 20 restaurant employees. None of the employees reported having had a gastrointestinal illness previous to or on the implicated meal date. One

employee reported a fever on December 15; this was the employee whose stool sample was tested at MDH.

During the establishment visit, MEH environmentalists viewed bare-hand contact with mint and lettuce (both are ingredients in the spring rolls). MEH environmentalists issued a glove order and stressed the importance of proper handling of food and beverages, use of gloves or utensils when handling ready-to-eat foods, good handwashing, and exclusion of ill food handlers to restaurant employees. Based on the number of patrons who were reporting illness, the facility sanitized all surfaces and equipment with a strong bleach solution (5,000 ppm) as recommended by MDH Environmental Health.

Management implemented all corrections and trained staff on minimizing bare-hand contact with ready-to-eat foods and proper handwashing.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at a restaurant in Minneapolis, Minnesota. The spring rolls were statistically associated with illness. The source of contamination was not identified.

(52)
Norovirus Gastroenteritis Associated with a Restaurant

December Hennepin County

On December 26, 2012, the Minnesota Department of Health (MDH) notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit of two independent patron illness complaints from parties who had eaten at the same restaurant on December 22. The Minneapolis Division of Environmental Health (MDEH) unit was notified and an investigation was initiated.

MDH interviewed the patrons from the two original complainant groups. A list of patrons from the restaurant's reservation lists for December 21, 22, and 23 were provided to HSPHD. HSPHD epidemiologists interviewed these patrons about food consumption and illness history. A case was defined as a restaurant patron who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant. Five patrons agreed to submit stool samples to the MDH Public Health Laboratory for bacterial and viral testing.

MDEH sanitarians visited the restaurant on December 26 and December 27 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

Sixty-two patrons were interviewed by MDH and HSPHD epidemiologists (20 patrons with a December 21 meal date, 19 with a December 22 meal date, and 23 with a December 23 meal date). Nineteen (31%) patrons met the case definition (18 from December 22 and 1 from December 23). The median incubation period for the cases was 36.5 hours (range, 21 to 48 hours). Fifteen (79%) cases reported diarrhea, 15 (79%) reported vomiting, 11 (58%) reported cramps, seven (37%) reported fever, and none reported bloody stools. The median duration of illness for the 17 cases who had recovered at the time of interview was 24 hours (range, 7 to 48.5 hours). Stool specimens collected from five cases tested positive for norovirus GII.

Forty-three controls were interviewed (20 from the December 21 meal date, one from the December 22 meal date, and 22 from the December 23 meal date). Cases and controls both reported eating a wide variety of foods including hamburgers, pasta entrees, fish entrees, mashed potato entrees, salads, bread and butter, and beverages. Eating the bread and butter basket placed on each table was significantly associated with illness (17 of 19 cases vs. 19 of 38 controls; odds ratio, 8.5; 95% confidence interval, 1.7 to 42.0; $p = 0.004$).

MDEH sanitarians visited the restaurant on December 26 and December 27 and did not note any critical violations; however, some issues were observed including bare-hand contact while cutting bread and preparing produce, one hand sink was missing a nailbrush, and a designated hand sink was needed in the dishwashing area. Illness histories and job duty information were obtained from 31 restaurant employees. No employees reported gastrointestinal illness prior to or on the implicated meal date. One server reported vomiting beginning the afternoon of December 24. This employee did not work while ill or on the implicated meal dates. The sanitarians provided norovirus education to the restaurant and stated that ill employees must be excluded from work for 72 hours following the resolution of gastrointestinal symptoms. They further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, and thorough disinfection. MDEH issued a glove order, and the restaurant conducted a full cleaning and disinfection of the facility.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Minneapolis. The bread and butter basket placed on each table was significantly associated with illness. While the source of the contamination was not identified, the most plausible scenario is that the bread baskets were contaminated by an unidentified ill or recently ill food worker.

(53)
Norovirus Gastroenteritis Associated with a Restaurant

December Olmsted County

On December 31, 2012, Olmsted County Public Health Services (OCPHS) responded to a message left during the weekend by the manager of a restaurant in Rochester that several individuals within a group of 11 reported becoming ill after eating a meal at the restaurant on December 27. An individual from this group also reported the illnesses to OCPHS. The Minnesota Department of Health (MDH) foodborne illness hotline received two additional independent complaints of illness among patrons who ate at the restaurant. The first complaint was an individual who was at the restaurant on December 30. The second patron complainant reported that eight of eight persons became ill after visiting the restaurant on December 27. OCPHS staff contacted the original complainant and identified at least five ill individuals from a group of 11 people from five different households. The information was reviewed by OCPHS staff, MDH was consulted, and an investigation was initiated.

Environmental Health Specialists from OCPHS went to the restaurant on the afternoon of December 31 to evaluate food preparation and handling procedures, interview staff regarding recent illness and job duties, and collect credit card receipts for additional patron contact information. An employee illness screening log was put into place at this time.

Patrons from the original complaints and the credit card list were interviewed regarding recent food and beverage consumption and illness history. A case was defined as an individual who ate at the restaurant and subsequently developed vomiting or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were obtained from consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 50 patrons were interviewed; 23 (46%) met the case definition of illness. An additional seven (14%) patrons reported illness that did not meet the case definition and were excluded from analyses. The median incubation was 39 hours (range, 22 to 58 hours). The median duration of illness was 33.5 hours (range, 16.5 to 121 hours). Of the 23 cases, 21 (95%) reported diarrhea, 20 (87%) reported vomiting, 17 (77%) reported abdominal cramps, and 10 (48%) reported fever. One case sought medical attention at a doctor's office; no cases were hospitalized.

Five ill patrons submitted stool samples to the MDH PHL for testing. Four tested positive for norovirus GII. Nucleic acid sequencing was performed on all four positive specimens; the nucleic acid sequences were all identical.

In the univariate analysis, only consumption of appetizers was significantly associated with illness (9 of 22 cases vs. 1 of 16 controls; odds ratio [OR], 11.1; 95% confidence interval [CI], 1.2 to 99.2; $p = 0.02$). However, only nine (41%) interviewed cases reported consuming an appetizer. Additionally, consumption of a salad (4 of 22 cases vs. 0 of 16 controls; OR, undefined; $p = 0.12$) or seafood (5 of 22 cases vs. 0 of 15 controls; OR, undefined; $p = 0.07$) approached significance.

Nineteen (90%) of 21 restaurant staff members were interviewed. No food workers reported being ill with either vomiting or diarrhea during the past month. Managers reported that employees were visually screened for illness before the investigation. The employee screening log implemented by the sanitarian was not used consistently during the investigation.

Several concerns were noted by the sanitarians during the environmental health assessment. Management reported that employees are required to wash their hands before beginning work. However, at the time of the inspection it was noted that the hot water for the kitchen hand sink was not functioning, the paper towel dispenser was not feeding properly, and it did not appear that the soap dispenser was being used. Additionally, the water flow in the employee restroom sink was so restricted that thorough handwashing was not possible. The towel used to wipe plates and work surfaces was being rinsed out in the handwashing sink, and the chlorine concentration in the kitchen towel bucket was zero. On January 2, it was noted that ready-to-eat food in a bulk container was being portioned with a plate instead of a handled container, and a server was observed using a bare hand to turn tortillas being warmed on a griddle.

As a result of the environmental health assessment, the following interventions were enacted: eliminating bare-hand contact with ready-to-eat foods; reviewing of employee illness and handwashing policies and procedures with all staff; querying all staff on a daily basis for symptoms of diarrhea or vomiting and excluding any ill employees for at least 3 days after resolution of symptoms; discarding ready-to-eat food prepared on the dates of the suspect meals; and, cleaning and sanitizing with special attention to areas receiving hand contact by staff and customers.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Rochester, Minnesota. Consumption of appetizers was significantly associated with illness. However, only 9 of 22 interviewed cases reported consuming an appetizer, suggesting that other ready-to-eat foods may have been contaminated as well. Earlier this year, this restaurant was associated with a probable foodborne outbreak of suspected norovirus gastroenteritis (see #1). Food safety risks related to lack of adequate systems to manage employee illness, handwashing, and cross-contamination that were identified during that outbreak were still present during this investigation. While no food worker reported gastrointestinal illness in the month prior to this outbreak, it is possible that an unidentified infected food worker was the source of the contamination.

Probable Foodborne Outbreaks

(1)
Suspected Norovirus Gastroenteritis Probably Associated with a Restaurant

March Olmsted County

On March 12, 2012, a restaurant in Rochester received a complaint that three of nine patrons developed vomiting and diarrhea after eating at the restaurant on March 10. The restaurant manager forwarded the complaint to Olmsted County Public Health Services (OCPHS), which followed up with the complainant. Initially, the complainant reported that the ill patrons were from the same household. However, the following day the complainant reported additional illnesses among other households. OCPHS contacted the Minnesota Department of Health (MDH), and an investigation was initiated

OCPHS sanitarians visited the restaurant on March 13 to evaluate food preparation and handling procedures, collect credit card receipts for additional patrons from March 12 through 14, and interview food workers. OCPHS interviewed the complainant group and additional restaurant patrons identified through credit card receipts. A case was defined as a patron who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant.

Eighty-eight restaurant patrons were interviewed; four (5%) met the case definition (all from the initial complaint). The median incubation period for the cases was 22 hours (range, 22 to 28 hours). Duration of illness information was not available as all four cases were still ill at the time they were interviewed. All four cases reported diarrhea, three (75%) vomiting, two (50%) cramps, and none fever or bloody stools. No stool specimens were submitted.

No food items were associated with illness. Cases reported consuming a variety of food items including, enchilada, steak, hamburger, salad, beans, and rice.

OCPHS interviewed 22 restaurant employees, and 4 employees reported recent gastrointestinal illness. Employees reported becoming ill on February 27, March 2, March 8, and March 10. One employee reported working as a busser while ill on March 10, respectively. All employees with vomiting and/or diarrhea were excluded from work until 72 hours after the resolution of symptoms.

During the investigation sanitarians and restaurant management established a screening protocol for employee illness. The restaurant was instructed to document employee illness in their employee illness log, eliminate bare-hand contact with ready-to-eat foods, discard ready-to-eat foods from March 10, and thoroughly clean food contact surfaces using a bleach solution. The sanitarian also discussed the importance of handwashing for the prevention of norovirus transmission.

This was an outbreak of gastroenteritis probably associated with a restaurant. While an etiology was not confirmed, the incubation period and symptoms were compatible with norovirus gastroenteritis. A vehicle was not identified. Multiple ill food workers were identified and were the likely source of the contamination.

(2)
Gastroenteritis Probably Associated with Adolescent Treatment Facility

August St. Louis County

On August 30, 2012, the director of an adolescent treatment facility contacted their Minnesota Department of Health (MDH) Environmental Health sanitarian to inform him that approximately 20 individuals at the facility for inpatient treatment had become ill with vomiting and diarrhea on August 24. An investigation was initiated immediately.

A MDH sanitarian visited the facility on August 30 to evaluate food preparation and handling procedures and interview food workers. MDH staff interviewed patients about food consumption and illness history. A case was defined as a treatment facility patient who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period). Stool samples were not available for testing.

Five patients were interviewed; four (80%) met the case definition. One additional patient reported illness that did not met the case definition and was excluded from analysis. The median duration of illness was 2.5 days (range, 1 to 6 days). Three (75%) cases reported diarrhea, three (75%) vomiting, three (75%) fever, one (25%) fever, and none bloody stools. Illness onset dates included August 24 (n = 3) and 25 (n = 2). Information provided by the staff at the facility indicated that 20 of 55 (36%) individuals in the inpatient program had recently developed gastrointestinal illness. No illness in outpatient program participants, who do not eat meals at the facility, was reported.

The lack of non-ill controls prevented a statistical analysis of specific food items

A MDH sanitarian interviewed both treatment facility employees who work in food service. Initially, both employees were reported as being ill with gastrointestinal symptoms; however, when they were interviewed, only one reported recent illness. The employee developed vomiting and cramps on August 16; recovered on August 18 and returned to work that day.

This was an outbreak of gastroenteritis associated with patients in the in-patient program at an adolescent treatment facility. Limited access to information regarding patient food consumption and illness symptoms prevented a full investigation. The etiologic agent and the vehicle of transmission were not identified. The presence of a recently ill food worker is the most plausible source of the contamination; however, person-to-person transmission could not be ruled out.

(3)
Norovirus Gastroenteritis Probably Associated with a Party

November Hennepin County

On November 28, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint that 5 of 14 meal companions developed gastrointestinal illness after eating at Restaurant A in Minneapolis as part of a birthday party on November 24. A majority of the meal companions reported several additional common exposures including a catered meal from Restaurant B on November 23, cake from Bakery X on November 24, and soup at a private residence on November 25. Hennepin

County Human Services and Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH) were contacted and an investigation was initiated.

MDEH sanitarians visited Restaurant A and Bakery X on November 26 to evaluate food preparation and handling procedures and discuss employee illness policy. The party organizer provided contact information for attendees. A case was defined as a birthday party attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after the gatherings. Stool samples collected from consenting individuals were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Nine party attendees were interviewed, and four (44%) met the case definition. The median incubation period for the cases from the meal at Restaurant A was 31.5 hours (range, 26 to 41 hours). All four cases reported diarrhea and cramping, three (75%) fever, two (50%) vomiting, and none bloody stools. The duration of illness for both cases who had recovered at the time of interview was 2 days. Stool samples submitted by one ill attendee tested positive for norovirus GII.

A majority of the meal companions reported several common exposures including a catered meal from Restaurant B on November 23 (3 of 4 cases vs. 4 of 5 controls), dinner at Restaurant A on November 24 (4 of 4 cases vs. 5 of 5 controls), cake from Bakery X on November 24 (4 of 4 cases vs. 5 of 5 controls), and soup at a private residence on November 25 (3 of 4 cases vs. 2 of 5 controls).

MDEH sanitarians visited both Restaurant A and Bakery X on November 30. During the visit, the sanitarians discussed employee illness policy, the importance of handwashing for the prevention of norovirus transmission, and the need to exclude all employees with vomiting and/or diarrhea from work until 72 hours after the resolution of symptoms. While the restaurant and bakery did not report having ill employees, the bakery did not maintain an employee illness log and was instructed to do so. The restaurant was instructed to inform MDEH of all illness complaints and to have employees use gloves when handling ready-to-eat foods.

This was an outbreak of norovirus gastroenteritis probably associated consumption of food at or from a commercial food establishment as part of a birthday party. The complaint group had several common exposures during the incubation period. As a result, neither a vehicle nor the source of the contamination was identified. However, based on the distribution of incubations, the exposure most likely occurred on November 24, thus narrowing the potential source to Restaurant A or Bakery X.

(4)
Rotavirus Gastroenteritis Probably Associated with a Potluck

December Hennepin County

On December 28, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint that 30 of 100 extended family members who attended a potluck held at a church in Minneapolis on December 23 developed gastrointestinal illness. All of the foods served at the event were prepared in private homes. The Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit was notified, and an investigation was initiated.

The complainant provided a list of e-mail contacts for family members who attended the potluck, and an e-mail was sent to this list instructing them to call MDH. MDH staff interviewed attendees about food consumption and illness history. A case was defined as a potluck attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after the event. Stool samples collected from consenting attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Only nine potluck attendees called MDH and were interviewed; four (44%) met the case definition. One attendee reported illness that did not met the case definition and was excluded from analysis. The median incubation period for the cases was 46.5 hours (range, 37.5 to 57 hours). The median duration of illness was 4 days (range, 3 to 6 days). All four cases reported diarrhea and cramping, two (50%) fever, one (25%) vomiting, and none bloody stools. Stool samples submitted by two ill potluck attendees tested negative for standard bacterial enteric pathogens (*Salmonella*, Shiga toxin-producing *E. coli*, *Shigella*, *Campylobacter*) and norovirus, astrovirus, and sapovirus, but both tested positive for rotavirus.

The limited number of cases and non-ill controls precluded a meaningful statistical analysis of food exposures. The complainant reported that a family member had been ill with gastroenteritis for "several weeks" prior to the event and that she prepared the meatballs. However, that family member was not interviewed.

This was a probable foodborne outbreak of rotavirus gastroenteritis associated with a potluck in Minneapolis. The vehicle and source of contamination were not identified. Person-to-person transmission could not be ruled out.

(5)
Norovirus Gastroenteritis Associated with a Community Lunch

December Todd County

On December 31, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among 5 individuals from a group of 10 who had attended a community Christmas lunch held at the Bertha Community Center in Bertha, Minnesota on December 25. The complainant developed vomiting and diarrhea 33 hours after consuming turkey, mashed potatoes, stuffing, sweet potatoes, bread, butter, gravy, carrot cake, and cranberries at the dinner. Approximately 75 people attended the dinner, and most food items were prepared for the event in a private home. An investigation was initiated.

MDH staff contacted the lunch organizer to obtain information on food preparation and handling, and a list of attendees. The attendee list was reported to MDH over the phone from a handwritten sign-in sheet, and phone numbers were looked up for persons who could be found in online directories. MDH interviewed lunch attendees to obtain information on food/beverage consumption and illness history.

A case was defined as an individual who ate food prepared for the Bertha Community Center lunch and subsequently developed vomiting and/or diarrhea (≥3 stools in a 24-hour period). A secondary case was defined as an individual who lived in the same household as a primary case and developed vomiting and/or diarrhea at least 24 hours after the primary case. Stool samples were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A total of 68 lunch attendees were identified on the handwritten sign-in list. Among the 26 (38%) attendees who were interviewed, 4 (15%) primary cases were identified, including the original complainant. In addition, one secondary case was identified and was excluded from further analyses. Two individuals reported vomiting with a short incubation period (5 hours and 7.5 hours) from the lunch and were also excluded from further analyses. The median age of cases was 70 years (range, 50 to 76 years), and two (50%) cases were female. The median incubation period for cases was 41 hours (range, 15 to 62 hours). All four cases reporting diarrhea and vomiting, three (75%) reported cramps, and none reported fever or bloody stools. The duration of illness for the one case who had recovered at the time of interview was 17.5 hours. Two sought medical attention, and one was hospitalized. Three stool samples tested positive for norovirus GII.4 Sydney with identical nucleic acid sequences at MDH PHL. Two of the specimens were from primary cases from different households, and the third specimen was from the secondary case who lived in the same household as a norovirus-positive primary case.

Nineteen controls were enrolled in a case-control study. Three of those interviewed did not attend the lunch, but consumed food from the lunch brought to their homes by attendees. In a univariate analysis, no food items were significantly associated with illness.

All foods for the event, except desserts, were prepared in a private home by the event organizer. Some items were finished or heated on-site at the community center, but the center kitchen was not large enough for full preparation of the food. The event organizer reported that no one in her household was ill with vomiting or diarrhea prior to or following the meal. Cake and cookies for the event were brought in by other attendees. The carrot cake was made by a local cake decorator in her home; she was not ill.

The meal was self-serve buffet-style and consisted of turkey breasts held in a roaster, canned green and baked beans in crockpots, bread in open bags, gelled canned cranberries, homemade cranberries with and without sugar, gravy served in a slow-cooker, potatoes and sweet potatoes, individual pats of butter, lemonade with ice that was made in the private home and stored in a cooler, coffee, milk, and ice water served in pitchers. Glassware and silverware were brought from the home of the party organizer and rinsed in hot water at the center to remove dust. Several attendees assisted in refilling the food line and minor food preparation; the organizer reported that they wore gloves.

There were multiple reports of illness in the general community and in extended family or friend groups of attendees during the outbreak time period, though it was often unclear what type of illness (i.e., respiratory or gastrointestinal) was involved.

This was a probable foodborne outbreak of norovirus gastroenteritis associated with a community lunch held at Bertha Community Center. Food items were prepared in private homes where no illness had been reported prior to the lunch. The vehicle and route of transmission were not determined; foodborne transmission was most likely, but this could not be confirmed. The mechanism of contamination of foods served at the lunch could have been through contact by a food handler or by an attendee. Several instances of illness in the general community were reported, and two attendees reported vomiting with an incubation too short to be associated with the lunch, suggesting that norovirus was prevalent in the community at the time.

Confirmed Waterborne Outbreaks

(1)
Cryptosporidiosis Associated with a Hotel Waterpark

March Crow Wing County

A routine surveillance interview of a laboratory-confirmed *Cryptosporidium* case conducted by the Minnesota Department of Health (MDH) on March 22, 2012 revealed that the case had gone swimming at a waterpark in Baxter, Minnesota on March 3 while attending a birthday party. It was also reported during the interview that at least one additional birthday party attendee had become ill with similar symptoms after swimming at the waterpark; MDH epidemiologists were able to confirm this information on March 26. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on March 26, and an outbreak investigation was initiated.

Contact information for waterpark groups and aquatics staff was provided to MDH by the waterpark. MDH staff interviewed waterpark guests about their illness and exposure histories. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the waterpark. A case was defined as a waterpark user who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following waterpark exposure. Stool kits were sent to three waterpark guests for bacterial, parasitic, and viral testing at the MDH Public Health Laboratory (PHL).

MDH sanitarians visited the waterpark on March 26 to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 118 waterpark guests. Forty-three (36%) cases were identified, including the initial laboratory-confirmed case. Fourteen waterpark guests reported illness but did not meet the case definition, and thus were excluded from further analysis. One waterpark guest submitted a stool sample to MDH PHL; the sample was negative for *Cryptosporidium*. *Cryptosporidium parvum* subtype BGP4 was identified in the one positive specimen received by MDH PHL, from the initial laboratory-confirmed case.

Of the cases, all 43 cases reported diarrhea, 32 (76%) of 42 reported cramps, 15 (35%) reported fever, 9 (21%) reported vomiting, and 8 (20%) of 40 reported weight loss. The median incubation period was 6 days (range, 2 to 12 days) for the 15 cases who only swam at the waterpark once in the 2 weeks prior to illness onset. Cases reported swim dates of March 2 to March 17. The median duration of illness was 7.5 days (range, 3 to 18 days) for the 38 cases who had recovered by the time of interview. Of the 42 cases with known information, 9 (21%) reported visiting a health care provider for their illness, including one case who was hospitalized for 3 days.

No specific location at the waterpark was significantly associated with illness. However, swallowing water while swimming was significantly associated with illness (26 of 34 cases vs. 10 of 49 controls; odds ratio, 12.7; 95% confidence interval, 4.4 to 36.4; $p < 0.001$).

All waterpark staff members were screened for recent illness; no staff reported being recently ill with vomiting and/or diarrhea.

On March 26, the waterpark voluntarily closed in order to be superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Upon inspection, all three waterpark pools were found to be operating properly and were within state regulatory limits for pH and chlorine levels. However, *Cryptosporidium* can survive and be transmitted even in properly operated pools.

The waterpark reopened on March 29; anyone with symptoms of gastrointestinal illness was told by staff not to enter the waterpark until 2 weeks following the resolution of symptoms. Signage was also posted at the facility alerting patrons not to swim if they were experiencing diarrhea.

This was an outbreak of cryptosporidiosis associated with swimming at a hotel waterpark. Although the original source of contamination was not identified, an infectious waterpark user most likely introduced the parasite into the waterpark.

(2)
Cryptosporidiosis Associated with a Hotel Waterpark

March St. Louis County

On March 26, 2012, the Minnesota Department of Health (MDH) foodborne and waterborne illness hotline received a complaint that six of eight individuals from two separate households had become ill with diarrhea and cramps 4 to 9 days after swimming at a hotel waterpark in Duluth on March 10. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on March 26, and an outbreak investigation was initiated.

Contact information for waterpark groups and aquatics staff was provided to MDH by the waterpark. MDH staff interviewed waterpark guests about their illness and exposure histories. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the waterpark. A case was defined as a waterpark user who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following waterpark exposure. Stool samples collected from seven consenting patrons were submitted to the MDH Public Health Laboratory for bacterial, parasitic, and viral testing.

MDH sanitarians visited the waterpark to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 229 waterpark guests. Ninety-seven cases were identified, including 22 with stool specimens that tested positive for *Cryptosporidium*. Seventy-nine cases were Minnesota residents, while the remaining were residents of Wisconsin (n=13) and Canada (n=5). Forty-five waterpark guests reported illness but did not meet the case definition, and thus were excluded from further analysis. Sixteen positive specimens were received by the MDH Public

Health Laboratory, including 10 specimens that were submitted through routine surveillance by clinical laboratories; *Cryptosporidium parvum* subtype BGP3 was identified in all.

Of the cases, 92 (99%) of 93 reported diarrhea, 82 (91%) of 90 reported cramps, 36 (40%) of 91 reported vomiting, 31 (34%) of 92 reported fever, and 25 (31%) of 80 reported weight loss. The median incubation period was 8 days (range, 2 to 14 days) for the 32 cases who only swam at the waterpark once in the 2 weeks prior to illness onset. Cases reported swim dates of March 3 to March 25. The median duration of illness was 7 days (range, 3 to 16 days) for the 47 cases who had recovered by the time of interview. Of the 86 cases with known information, 35 (41%) reported visiting a health care provider for their illness, including one case who was hospitalized for 3 days.

Several exposures were significantly associated with illness, including going in the paradise playground area (72 of 80 cases vs. 57 of 76 controls; odds ratio [OR], 3.0; 95% confidence interval [CI], 1.2 to 7.4; $p = 0.01$), going down the kiddie slide (65 of 80 cases vs. 43 of 77 controls; OR, 3.4; 95% CI, 1.7 to 7.0; $p < 0.001$), going on the water walk (65 of 77 cases vs. 51 of 74 controls; OR, 2.4; 95% CI, 1.1 to 5.4; $p = 0.02$), going in the lazy river (74 of 81 cases vs. 57 of 77 controls; OR, 3.7; 95% CI, 1.5 to 9.4; $p = 0.003$), getting one's face wet (78 of 81 cases vs. 54 of 75 controls; OR, 10.1; 95% CI, 2.9 to 35.6; $p < 0.001$), and swallowing water while swimming (55 of 75 cases vs. 22 of 69 controls; OR, 5.9; 95% CI, 2.9 to 12.1; $p < 0.001$).

Illness histories and exposure information were obtained from 41 waterpark staff members; one lifeguard reported being ill with diarrhea March 6-7.

On March 26, the waterpark voluntarily closed in order to be superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Upon inspection, the waterpark was found to be operating at high combined chlorine levels. Review of the water quality reports from March showed multiple occasions on which the combined chlorine residual had exceeded the state pool code of 0.5 parts per million; no corrective action was noted on the reports.

The waterpark reopened on March 27; anyone with symptoms of gastrointestinal illness was told by staff not to enter the pool until 2 weeks following the resolution of symptoms. Signage was also posted at the facility alerting patrons not to swim if they were experiencing diarrhea.

This was a waterborne outbreak of cryptosporidiosis associated with a hotel waterpark. Although the original source of contamination was not identified, an infectious waterpark user most likely introduced the parasite into the waterpark. The high combined chlorine levels recorded indicates that the chlorine that was present in the pool was not acting as an effective disinfectant, leading to a protracted amount of time during which waterpark users were at risk for becoming infected.

(3)
Suspected *Pseudomonas aeruginosa* Dermatitis Associated with a Hotel Pool and Hot Tub

April Otter Tail County

On April 20, 2012, the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section received a phone call from a parent who had held a birthday party at a hotel in Fergus Falls on April 15. The caller reported that at least seven of nine party attendees had developed rashes after going in the hotel pool and whirlpool on April 15. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on April 20, and an outbreak investigation was initiated.

The party organizer declined to provide MDH with contact information for party attendees; however, the party organizer did distribute MDH's contact information to the party attendees and ask that they call MDH. MDH staff interviewed party attendees about their illness and exposure histories.

MDH sanitarians conducted an onsite inspection of the swimming pool and hot tub facilities on April 20.

Seven (78%) of nine attendees reported developing rashes consistent with *Pseudomonas* dermatitis. No other symptoms were reported. Cases reported onset of illness 1 to 2 days after going in the swimming pool and hot tub at the hotel. Three (43%) cases were seen by a physician for their rash and were clinically diagnosed with hot tub folliculitis.

The birthday party was held from 3 p.m. to 5 p.m. on April 15. All party attendees reported going in both the swimming pool and hot tub.

Upon inspection of the swimming pool and hot tub, both facilities were immediately closed. The swimming pool had total, free, and combined chlorine levels of 0. The hot tub had a free chlorine level of 0.4 ppm and a combined chlorine level of 0.2 ppm. None of these levels were within the state limits. Additionally, the facility lacked complete pool records and documentation and did not have a certified trained operator.

This was a waterborne outbreak of suspected *Pseudomonas aeruginosa* dermatitis associated with a hotel swimming pool and hot tub. The poor monitoring of disinfection levels by the pool operator was ultimately responsible for the outbreak.

(4)
Cryptosporidiosis Associated with an Aquatic Center

June-July Lyon County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on July 18, 2012 revealed that both cases had gone swimming at an aquatic center in Marshall, Minnesota during the 2 weeks prior to illness onset. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on July 18, and an outbreak investigation was initiated.

Contact information for aquatic center groups and aquatics staff was provided to MDH by the aquatic center. MDH staff interviewed aquatic center patrons about their illness and exposure histories. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the aquatic center. A case was defined as an aquatic center user who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following aquatic center exposure.

MDH sanitarians visited the aquatic center on July 18 and 19 to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 112 aquatic center patrons. Seven (6%) cases were identified, including three cases that tested positive for *Cryptosporidium* at a clinical laboratory. Three aquatic center patrons reported illness but did not meet the case definition, and thus were excluded from further analysis. One case's stool sample was received at the MDH Public Health Laboratory; however, molecular identification to species was not successful.

Of the cases, all seven reported diarrhea, five (100%) of five reported cramps, four (57%) of seven reported vomiting, four (57%) of seven reported weight loss, and two (33%) of six reported fever. Reported onset dates range from June 29 to July 15. The median incubation period could not be calculated, as all cases with known exposure dates reported swimming more than once in the 2 weeks prior to illness onset. The median duration of illness was 6 days (range, 4 to 8 days) for the two cases who had recovered by the time of interview. For the six cases with available information, four (67%) reported visiting a health care provider for their illness, including two cases who were hospitalized.

No specific day, pool, or swimming activity was associated with illness.

Twenty-eight aquatic center staff were interviewed about recent illness and job duties. Three (11%) reported being recently ill with vomiting and/or diarrhea lasting 3 or more days, with reported onset dates ranging from June 18 to July 13. Staff reported working while ill. Ill staff were restricted from working while ill and for 2 weeks following the resolution of symptoms.

On July 18, the aquatic center voluntarily closed in order to be superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Upon inspection, the aquatic center was found to be operating properly and was within state regulatory limits for pH and chlorine levels. However, *Cryptosporidium* can survive and be transmitted even in properly operated pools.

The aquatic center reopened on July 20; anyone with symptoms of gastrointestinal illness was told by staff not to enter the aquatic center until 2 weeks following the resolution of symptoms. Signage was also posted at the facility alerting patrons not to swim if they were experiencing diarrhea.

This was an outbreak of cryptosporidiosis associated with swimming at an aquatic center. Although the original source of contamination was not identified, an infectious aquatic center user most likely introduced the parasite into the aquatic center. Individuals continuing to swim while ill, including

aquatics staff, most likely led to a protracted amount of time during which aquatic center users were at risk for becoming infected.

(5)
Cryptosporidiosis Associated with a Swim Pond

July Washington County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on July 24, 2012 revealed that both cases had gone swimming at a swim pond in Lake Elmo, Minnesota during the 2 weeks prior to illness onset. Reported swim dates were July 1 for one case and July 9, 10, and 11 for the other case. Sanitarians from Washington County Department of Public Health and Environment were contacted on July 26, and an outbreak investigation was initiated.

Contact information for individual swim pond users was not available; however, contact information for swim pond user groups was provided to Washington County and MDH by the swim pond. MDH staff contacted swim pond user group leaders in order to do additional case finding. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the swim pond. A case was defined as a swim pond user who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following swim pond exposure.

Washington County sanitarians visited the swim pond on July 26 and 27 to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties. A list of swim pond employees was provided to Washington County by the swim pond.

Five cases were identified, including two cases that tested positive for *Cryptosporidium* at a clinical laboratory; *Cryptosporidium parvum* subtype BGP3 was identified in both specimens at the MDH Public Health Laboratory.

Of the cases, all five reported diarrhea, four (80%) reported vomiting, three (60%) reported abdominal cramps, two (50%) of four reported weight loss, and one (20%) reported blood in their stools. No one reported fever. Reported onset dates ranged from July 3 to July 17. Reported swim dates ranged from July 1 to July 11. The median incubation period was 3 days (range, 2 to 4 days) for the four cases with only one reported swim date. The median duration of illness was 7 days (range, 7 to 19 days) for the three cases who had recovered by the time of interview. Four (80%) cases reported visiting a health care provider for their illness, including one case who was hospitalized for 4 days.

MDH attempted to contact the group leaders of organizations that had registered with the swim pond; none of the group leaders who returned the calls reported knowing of any children developing gastrointestinal illness after being at the swim pond.

On July 26, the swim pond voluntarily closed in order to be superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*. A press release issued by the county alerted patrons to the swim pond closing and of the importance of anyone

with diarrhea staying out of all recreational water venues while they are symptomatic and for 2 weeks following the resolution of symptoms.

A swim pond is an artificial body of water contained within a lined, sand-bottom basin, intended for public swimming, relaxation, or recreational use. Swim ponds include a water circulation system for maintaining water quality and do not include any portion of a naturally occurring lake or stream. Swim ponds are exempt from the regulatory requirements that public pools must follow.

Despite not being routinely inspected, MDH, or its designee, has statutory authority to investigate waterborne outbreaks at swim ponds. Upon inspection, the swim pond was found to be operating at low chlorine levels. Review of chemical records from June and July found numerous instances in which the chlorine level was recorded at zero, with varying chlorine levels across the zones of the swim pond; no corrective action was indicated.

Eleven swim pond staff were interviewed about recent illness and job duties. No one reported being recently ill with diarrhea or vomiting.

The swim pond reopened on July 28. Signage was posted at the facility alerting patrons not to swim if they were experiencing diarrhea and for 2 weeks following the resolution of symptoms.

This was an outbreak of cryptosporidiosis associated with swimming at a swim pond. Although the original source of contamination was not identified, an infectious swim pond user most likely introduced the parasite into the swim pond. The lack of uniform and consistent disinfection most likely contributed to the outbreak.

(6)
Cryptosporidiosis Associated with a Community Splash Pad

July Stearns County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on July 23, 2012 and August 10, 2012 revealed that both cases had played in a splash pad in Waite Park in the 2 weeks prior to illness onset. Sanitarians from Stearns County Environmental Services (SCES) were contacted on August 10, and an outbreak investigation was initiated.

Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the splash pad. A case was defined as a splash pad user who subsequently developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting ≥3 days, with illness onset 2 to 14 days following aquatic center exposure.

A sanitarian from SCES contacted the splash pad operator to determine if they had received any reports of illness or if any fecal incidents or mechanical issues had occurred in July.

Only the original two cases detected through routine surveillance were identified. Both cases had *Cryptosporidium parvum* subtype BGP18 identified in a stool sample.

Both cases reported diarrhea and cramps. One (50%) of the cases also reported weight loss. Reported dates at the splash pad were July 5 and July 15. The median incubation period was 4.5 days (range, 2 to 7 days). The median duration of illness was 12 days (range, 9 to 15 days).

A sibling of one of the cases also tested positive for *Cryptosporidium*. While this child had also been at the splash pad, she did not become ill until 15 days later, and thus was classified as a secondary case.

The splash pad was closed on August 10. On August 13, the splash pad was superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*. Review of the pool logs showed poor monitoring of disinfection levels on multiple occasions throughout the summer.

This was an outbreak of cryptosporidiosis associated with playing in a splash pad. Although the original source of contamination was not identified, an infectious splash pad user most likely introduced the parasite into the water. It is important for splash pad users to realize that while there is no standing water in a splash pad, the spray water will rinse any contaminants such as fecal matter from diarrhea off of a person, which will be recirculated to other users.

(7)
Cryptosporidiosis Associated with a Community Splash Pad

July Benton County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on July 23, 2012 revealed that both cases had played in a splash pad in Sauk Rapids, Minnesota multiple times in the 2 weeks prior to illness onset. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on July 24, and an outbreak investigation was initiated.

Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the splash pad. A case was defined as a splash pad user who subsequently developed either a laboratory-confirmed *Cryptosporidium* infection, or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting ≥3 days, with illness onset 2 to 14 days following splash pad exposure.

MDH sanitarians visited the splash pad to conduct a field assessment.

Only the original two cases detected through routine surveillance were identified. Both cases had *Cryptosporidium* in a stool sample; one sample was received at the MDH Public Health Laboratory and tested positive for *Cryptosporidium parvum* subtype BGP18.

Both cases reported diarrhea, vomiting, cramps, and fever. Both cases reported onset dates of July 15. The median incubation period could not be calculated, as both cases reported being at the splash

pad multiple times in the 2 weeks prior to illness onset. Both cases had ongoing illness at the time of interview.

The splash pad was closed on July 24 and superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Review of the water quality reports from early July showed multiple occasions on which the free chlorine residual was recorded at zero while the splash pad was experiencing multiple mechanical problems. Additionally, combined chlorine was not being measured as required by the pool code.

An MDH sanitarian discussed appropriate chemical monitoring and noting any corrective actions or addition of chemicals in the daily pool record with the pool operator.

This was an outbreak of cryptosporidiosis associated with playing in a splash pad. Although the original source of contamination was not identified, an infectious splash pad user most likely introduced the parasite into the water. The lack of disinfectant in the water would have led to a protracted time at which splash pad users were at risk.

(8)
Cryptosporidiosis Associated with a Youth Camp

July Crow Wing County

On August 1, 2012, the Minnesota Department of Health (MDH) foodborne and waterborne illness complaint hotline received a complaint from a parent whose child had become ill with vomiting and diarrhea after returning home from a youth camp in Brainerd, Minnesota the week of July 22-27. On August 8, MDH received a call from a physician reporting diarrheal illness in a second child who also had attended that camp the same week. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on August 8, and an outbreak investigation was initiated.

Contact information for campers was provided to MDH by the camp administration. MDH staff interviewed campers about their illness and exposure histories. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had attended the camp. A case was defined as a camper who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following camp attendance. Stool kits were sent to three campers for bacterial, parasitic, and viral testing at the MDH Public Health Laboratory (PHL).

MDH sanitarians visited the camp to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 51 campers. Sixteen (31%) cases were identified. Four campers reported illness but did not meet the case definition, and thus were excluded from further analysis. Three campers submitted a stool sample to the MDH PHL; *Cryptosporidium hominis* subtype HGP4 was identified in all three specimens.

Of the 16 cases, 15 (94%) reported diarrhea, 13 (81%) reported cramps, 7 (44%) reported fever, 5 (42%) of 12 reported weight loss, and 4 (29%) of 14 reported vomiting. The median incubation period could not be calculated, as cases reported swimming the entire week of camp. The median duration of illness was 7 days (range, 4 to 16 days) for the 11 cases who had recovered by the time of interview. One case reported visiting a health care provider for their illness.

All campers reported swimming in the lake daily while at camp. Swallowing water while swimming was significantly associated with illness (6 of 13 cases vs. 4 of 26 controls; odds ratio, 4.7; 95% confidence interval, 1.0 to 21.7; $p = 0.03$). No specific cabin, drinking water exposure, or other camp activity was associated with illness.

This was an outbreak of cryptosporidiosis associated with swimming in a lake at a youth camp. The original source of contamination was not identified. However, as the species of *Cryptosporidium* identified in the stool of infected campers is only transmitted by humans, the role of any non-human source can be ruled out.

(9)
Cryptosporidiosis Associated with an Aquatic Center

August Hennepin County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on August 17, 2012 revealed that both cases had gone swimming at an aquatic center in Bloomington, Minnesota during the 2 weeks prior to illness onset. One of the cases reported swimming at the aquatic center while actively ill with diarrhea. Sanitarians from the City of Bloomington Environmental Health (CBEH) were contacted on August 17, and an outbreak investigation was initiated.

Contact information for aquatic center users was provided to CBEH by the aquatic center. CBEH staff interviewed aquatic center patrons about their illness and exposure histories. Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the aquatic center. A case was defined as an aquatic center user who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea ($\geq$3 loose stools in a 24-hour period) or vomiting lasting $\geq$3 days, with illness onset 2 to 14 days following aquatic center exposure.

CBEH sanitarians visited the aquatic center on August 17 to conduct a field assessment of the facility and to interview staff regarding recent illness and job duties.

Illness histories and exposure information were obtained from 118 aquatic center patrons. Six (5%) cases were identified, including four with stool specimens that tested positive for *Cryptosporidium*. All four positive specimens were received by the MDH Public Health Laboratory, including three specimens that were submitted through routine surveillance by clinical laboratories; *Cryptosporidium parvum* subtype BGP3 was identified in all.

Of the cases, all six reported cramps, five (83%) reported diarrhea, two (40%) of five reported fever, and two (33%) reported vomiting. Reported onset dates ranged from August 8 to August 17. The median incubation period was 6 days (range, 2 to 12 days) for the five cases who only reported swimming one

time at the aquatic center in the 2 weeks prior to illness onset. The median duration of illness was 6 days (range, 3 to 30 days) for the four cases who had recovered by the time of interview.

Nineteen aquatic center staff were interviewed about recent illness and job duties. Three (16%) reported being recently ill with vomiting and/or diarrhea lasting ≥3 days, with reported onset dates ranging from July 31 to August 10. Ill staff were restricted from working while ill and for 2 weeks following the resolution of symptoms.

On August 17, the aquatic center voluntarily closed in order to be superchlorinated at 20 parts per million for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Upon inspection, the aquatic center was found to be operating properly and was within state regulatory limits for pH and chlorine levels. However, *Cryptosporidium* can survive and be transmitted even in properly operated pools.

The aquatic center reopened on August19; anyone with symptoms of gastrointestinal illness was told by staff not to enter the aquatic center until 2 weeks following the resolution of symptoms.

This was an outbreak of cryptosporidiosis associated with swimming at an aquatic center. Although the original source of contamination was not identified, an infectious aquatic center user most likely introduced the parasite into the aquatic center. Individuals continuing to swim while ill most likely led to a protracted amount of time during which aquatic center users were at risk for becoming infected.

(10)
Cryptosporidiosis Associated with a Community Aquatic Center

August Goodhue County

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on August 31, 2012 revealed that both cases had gone swimming at an aquatic center in Red Wing in the 2 weeks prior to illness onset. Sanitarians from MDH Food, Pools, and Lodging Services (FPLS) were contacted on August 31, and an outbreak investigation was initiated.

Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the aquatic center. A case was defined as an aquatic center user who subsequently developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following aquatic center exposure.

The aquatic center had closed for the season the last week of August. An MDH sanitarian contacted the aquatic center pool operator to determine if the aquatic center had received any reports of illness or if any fecal incidents or mechanical issues had occurred in early August.

Only the original two cases detected through routine surveillance were identified. Both cases had *Cryptosporidium parvum* subtype BGP3 identified in a stool sample.

Both cases reported diarrhea and cramps. One (50%) of the two cases also reported vomiting, fever, and weight loss. Reported onset dates were August 6 and 13. The median incubation period could not be calculated, as one case reported multiple swim dates and the other case was unsure of the exact swim date prior to illness. The median duration of illness was 13.5 days (range, 12 to 15 days). One case was hospitalized for 3 days for his illness.

Review of pool records indicated that there had been a vomiting accident in the aquatic center on August 1 and a fecal accident on August 6. Despite having a fecal response protocol, limited information on the chlorine concentration and the length of superchlorination time was documented.

This was an outbreak of cryptosporidiosis associated with swimming at an aquatic center. Although the original source of contamination was not identified, an infectious aquatic center user most likely introduced the parasite into the aquatic center. Since the outbreak was not detected until after the aquatic center was closed for the season, an extensive investigation was not conducted.

(11)
Pontiac Fever Associated with a Residential Hot Tub

November Hennepin County

On November 14, 2012, the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section was forwarded an e-mail complaint by the Hennepin County Human Services and Public Health Department. The complainant reported that four family members had become ill with fever, cough, and other flu-like symptoms after attending a hot tub party at a relative's home on November 10 in Brooklyn Park, Minnesota. An investigation was initiated on November 14.

Contact information for the attendees was provided by the complainant. MDH epidemiology staff interviewed party attendees to obtain information on exposures and illness history. A case was defined as a hot tub party attendee who subsequently developed fever and/or chills and at least one respiratory symptom.

Of five individuals interviewed, four (80%) met the case definition. All four cases reported fever and muscle aches, three (75%) cases reported cough, two (67%) of three cases reported chills, two (67%) of three cases reported headache, two (67%) of three cases reported dizziness, two (67%) of three cases reported tightness in chest, one (33%) of three cases reported sore throat, and one (33%) of three cases reported vomiting. The median incubation period was 43 hours (range, 41.5 to 45 hours) for the three cases with known onset times. The median duration of illness was 37.25 hours (range, 25.5 to 49 hours) for the two cases who had recovered at the time of interview. One (25%) case visited a medical provider for their symptoms.

The only people to go in the hot tub on November 10 were the four cases; all of the cases reported spending 1 to 2 hours in the hot tub.

The owner of the hot tub reported that the hot tub was an eight person residential model unit housed in an outside enclosure in a private backyard. The hot tub had been drained and cleaned in October and was last used approximately 2 weeks prior to the November 10 party. The owner reported that they add

chlorine or oxidizing shock after using the hot tub; however, they do not routinely check the chemicals and did not check the chemicals prior to use on November 10.

This was an outbreak of acute febrile illness associated with a residential hot tub. The symptoms, incubation period, and high attack rate are characteristic of Pontiac Fever, a milder illness caused by *Legionella* bacteria. The improper maintenance and lack of disinfection of the hot tub likely led to the proliferation of the bacteria. The owner of the hot tub was referred to the Centers for Disease Control and Prevention's recommendations for disinfection of hot tubs contaminated with *Legionella*.

Animal Contact Outbreaks

(1)
Cryptosporidiosis Associated with a Local Humane Society Event

March Goodhue County

On April 16, 2012, the Minnesota Department of Health (MDH) received a report through routine surveillance of cryptosporidiosis in an attendee of a petting zoo event held at the Goodhue County Humane Society on March 31. At the Humane Society's first ever "Spring Fling" event, attendees were encouraged to interact and have their pictures taken with neonatal livestock species (calf, lamb, and goat), bunnies, chicks, and dogs and cats of all ages available for adoption. An investigation was initiated on April 16.

It was estimated that over 100 individuals attended the event, though no formal attendance list existed. The executive director of the Humane Society was contacted and questioned about animals present, the day's activities, and any illness in attendees, employees, and volunteers who worked at the event. A partial list of attendees was prepared by the Humane Society director and provided to MDH; to ascertain additional cases, past patrons and donors were contacted. Individuals responsible for supplying the animals present for the event were also contacted, questioned about their illness history, and asked to submit stool specimens from their animals. Approximately 93 individuals were identified in association with this event, including 6 Humane Society employees.

A case was defined as an individual who attended the Humane Society event on March 31 and who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, with illness onset 2 to 14 days following the event. All cases were offered the opportunity to submit a stool sample to the MDH Public Health Laboratory (PHL) for bacterial and parasitic testing.

Illness histories and exposure information were obtained from 88 event attendees. Thirty-one cases were identified, including five with stool specimens that tested positive for *Cryptosporidium*. Of the 31 cases, all reported diarrhea, 28 (90%) reported abdominal cramps, 16 (52%) reported vomiting, 14 (45%) reported fever (maximum temperature range, 99-103° F), and 2 (6%) reported bloody stools. The median incubation period was 5.5 days (range, 1 to 12 days), and the median illness duration was 7 days (range, 3 to 15 days). Thirteen cases sought medical care; none were hospitalized. Four positive specimens were received by the MDH PHL, including one specimen that was submitted though routine surveillance by clinical laboratories; *Cryptosporidium parvum* subtype BGP5 was identified in all four specimens.

No activities were significantly associated with illness.

At the time of the investigation, the goat, lamb, and calf had been returned to their original owners and/or sold. A calf was reported by multiple attendees as having obvious signs of diarrhea; this calf had been sold to a farm in Washburn County, Wisconsin. The Wisconsin Division of Public Health (WDPH) was notified, and the owner of the calf was contacted by MDH staff regarding the outbreak investigation. Stool kits were sent to the owners of the calf as well as four other owners known to have provided animals for the event. Stool samples from a goat, two dogs, and a cat were returned for testing; all were negative for *Cryptosporidium*. The sample from the calf with diarrhea was never returned, even after

multiple conversations with the owner. MDH worked with the executive director of the Humane Society to identify methods to disinfect the environment and to minimize risk of additional human and animal cases.

This was an outbreak of cryptosporidiosis caused by *Cryptosporidium parvum.* The likely source was a calf with diarrhea that was on display at a petting zoo.

(2)
Salmonella Muenchen Infections Associated with Poultry Contact

April Mower County/Multiple states

On May 25, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified a *Salmonella* Muenchen case isolate that matched three Indiana case isolates. Shortly after, the CDC began a nationwide investigation that included 13 cases from eight states that had matching pulsed-field gel electrophoresis (PFGE) patterns (Minnesota subtype designation SMU46).

A case was defined as a Minnesota resident who had a culture-confirmed infection with *S.* Muenchen SMU46 with illness onset from March 1 through September 1, 2012. All *Salmonella* cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of enteric disease surveillance in Minnesota. The case was also specifically asked about live young poultry (e.g., chicks and ducks) contact.

If the case reported live young poultry contact then a stool sample collection kit was sent to the case household to obtain samples from the chicks and their environment. Samples would be cultured for *Salmonella,* and isolates serotyped and subtyped by PFGE. An MDH epidemiologist would contact the feed store where the case reportedly purchased the chicks and would work with the Minnesota Board of Animal Health to identify source hatcheries.

The lone case identified in Minnesota was a 2.5-year-old male. His onset date was April 12. He reported diarrhea, bloody stool, and fever (maximum temperature 101.7 ° F). The case's illness had been ongoing for 15 days at the time of interview and he was not hospitalized.

The Minnesota case was interviewed on April 26 and reported contact with live young poultry and live adult poultry at his grandparents' house during the week before illness. The chicks and ducklings were purchased on April 4 from a feed store in Rochester, Minnesota. The source hatchery for this store was located in Zeeland, Michigan.

One chick fecal sample, one duck fecal sample, one duck and chick litter sample, and one fecal sample from adult poultry were collected from the grandparent's household. Both the duck and chicken fecal samples and the litter sample yielded *S.* Muenchen SMU46. The chick fecal sample yielded *S.* Kentucky.

The nationwide investigation found 21 *S.* Muenchen isolates of the outbreak PFGE subtype in eight other states. Onset dates ranged from March 29 through August 28. Fifty percent of cases were female, and ages ranged from <1 to 69 years (median age, 19.5 years). There was one reported hospitalization but no reported deaths. Four (33%) of 12 cases with available exposure information reported contact

with live poultry prior to illness onset. Source hatchery information was only available for the Minnesota case and one other case, which also traced back to the hatchery in Zeeland, Michigan.

This was an outbreak of *S.* Muenchen infections associated with live chicks and ducklings. Only two cases could be traced back to a source hatchery. Contact with poultry, particularly with young poultry, is a well-known risk factor for *Salmonella* infections in humans.

(3)
Salmonella Infantis Infections Associated with Poultry Contact

May Multiple counties/Multiple states

On May 21, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified a *Salmonella* Infantis case isolate that matched a nationwide cluster consisting of four cases from four states. This case was interviewed on May 21 and reported contact with live chicks. On May 31, a second *S.* Infantis case in Minnesota was identified through routine surveillance and also reported contact with live chicks. Both cases' isolates had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Minnesota subtype designation SIN93). The two cases lived in different counties. An investigation was initiated.

Cases were defined as Minnesota residents who had a culture-confirmed infection with *S.* Infantis SIN93 with illness onset from April 16 through September 16. (the time frame used for the national investigation). All *Salmonella* cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of enteric disease surveillance in Minnesota. Cases were also asked questions regarding the source of their live chicks.

Stool sample collection kits were sent to both case households to obtain samples from the chicks and their environment. Samples were cultured for *Salmonella,* and isolates were serotyped and subtyped by PFGE. An MDH epidemiologist contacted the feed stores where cases reportedly purchased the chicks and worked with the Minnesota Board of Animal Health to identify source hatcheries.

The two cases reported onsets of May 6 and May 14. Both cases were female, and their ages were 53 years and 79 years. Both reported diarrhea, vomiting, and cramps. One case reported a fever. Illness durations were 7 days and 17 days. Neither case was hospitalized. One case isolate was from stool and one was from urine.

A secondary *S.* Infantis SIN93 case was identified through routine surveillance. This case was female, 63 years old, and reported diarrhea, vomiting, and cramps with an illness onset of June 7. Her illness lasted 11 days, and she was hospitalized for 4 days. This case denied any live poultry contact in the 7 days prior to her illness onset. However, she was an employee of the clinical laboratory where one of the original case's specimens was cultured. The case's specimen was collected at the clinical laboratory on May 15, and the *S.* Infantis isolate was received at the MDH PHL on June 5. The secondary case could have been exposed to *S.* Infantis during her incubation period through handling of that case's specimen or resulting isolate in the clinical laboratory.

Known purchase dates for the chicks reported by the two primary cases were April 26 and May 3. Both cases purchased chicks at feed stores; one case purchased broilers and the other case purchased Cornish game hens.

Three chick fecal samples were collected from the first case household, and all three yielded *S.* Infantis SIN93. Four samples were collected from the second case household, including three fecal samples and one litter sample. The litter sample and one fecal sample yielded *S.* Infantis SIN93, and the other two fecal samples yielded *S.* Kentucky.

One feed store identified one source hatchery located in Rudd, Iowa while the other feed store identified three potential source hatcheries located in Rudd, Iowa; Bancroft, Iowa; and Lebanon, Missouri. The only hatchery that both feed stores had in common was located in Rudd, Iowa. This facility is a mail-order hatchery from which various poultry types can be delivered to private homes or agricultural feed stores in multiple states.

During the time period of the Minnesota investigation, 26 *S.* Infantis isolates of the outbreak PFGE subtype were identified in nine other states. Onset dates ranged from April 16 through September 16. Sixty-five percent of cases were female, and ages ranged from <1 to 89 years (median age, 50 years). There were seven reported hospitalizations and no reported deaths. Eleven (55%) of 20 cases with available exposure information reported contact with live poultry prior to illness onset. Nine potential source hatcheries for chicks purchased by cases in other states were identified. The national investigation traced the poultry purchases to a hatchery in Bancroft, Iowa. The Iowa Department of Health and the Iowa Department of Agriculture were informed about this outbreak and began communications with the Bancroft, Iowa hatchery.

This was an outbreak of *S.* Infantis infections associated with live chicks. Eight of the 11 cases with hatchery information could be traced back to a hatchery in Bancroft, Iowa. One Minnesota case could not directly be traced to the Bancroft, Iowa hatchery. However, it is common for hatcheries to drop-ship, a practice where one hatchery ships birds out for another hatchery that doesn't have the inventory to complete their customer's order. These drop-shipped birds are shipped under the name of the original hatchery, even though the birds actually came from another hatchery. It is possible that this occurred with the Minnesota case and cases in other states that did not trace back to the Bancroft, Iowa hatchery. Contact with poultry, particularly with young poultry, is a well-known risk factor for *Salmonella* infections in humans.

(4)

Salmonella Cotham Infections Associated with Bearded Dragon Contact

May 2012 – February 2013 Multiple counties/Multiple states

On April 15, 2014, the Minnesota Department of Health (MDH) was notified by the Centers for Disease Control and Prevention (CDC) of an outbreak of *Salmonella* Cotham and *Salmonella* Kisarawe infections linked to contact with pet bearded dragons. *S.* Cotham and *S.* Kisarawe are rare serotypes, and CDC considered all *S.* Cotham and *S.* Kisarawe cases from January 2012 through June 2014 to be part of the outbreak. An investigation was initiated in Minnesota.

Cases were defined as Minnesota residents who had a culture-confirmed infection with *S.* Cotham or *S.* Kisarawe with illness onset from January 1, 2012 through June 30, 2014 (the time frame used for the national investigation). All *Salmonella* cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of routine enteric disease surveillance in Minnesota. Cases who indicate a reptile exposure prior to illness are asked to complete a supplemental questionnaire with more detailed questions regarding their reptile contact. These questions ask about the type of reptile, reptile housing, food type and source, and cage cleaning practices prior to illness, as well as whether the cases would be interested in having their reptiles tested for *Salmonella*.

There were three Minnesota *S.* Cotham cases in the national outbreak. The onset dates for the cases were May 18, 2012, July 22, 2012, and February 12, 2013. Two cases were male, and case's ages were 13, 30, and 31 years. The three cases lived in different counties. All three cases reported diarrhea. Two cases reported nausea, two reported abdominal cramping, and two reported fever (temperature >101º F). One case reported blood in their stools. One case was still recovering from illness at the time of their interview; illness durations for the two other cases were 3 days and 16 days. Two cases were hospitalized; hospitalization durations were 3 days and 6 days. One case isolate was from stool, one was from blood, and one was from urine. The Minnesota cases all had different pulsed-field gel electrophoresis (PFGE) patterns: COT5, COT6, and COT8.

Two of the three Minnesota cases reported contact with bearded dragons. One of the cases reported daily contact with the pet bearded dragon that he owned; this case agreed to submit samples from his reptile at the time of his interview in 2012 but the samples were never returned to MDH. The other case reporting bearded dragon contact was an employee at Pet Store Chain A that had many other reptile exposures in addition to bearded dragon contact.

During the national investigation, 160 *S.* Cotham and 6 *S.* Kisarawe isolates were identified in 36 states. Of the 115 cases with onset information available, onset dates ranged from February 20, 2012 through June 30, 2014. Fifty-five percent of cases were female, and ages ranged from <1 to 79 years (median age, 3 years). Fifty-nine percent of ill persons were children aged 5 years or younger. Among 118 ill persons with available information, 44 (37%) were hospitalized. No deaths were reported. Eighty-six (83%) of 104 persons with available exposure information reported contact with reptiles or their environments before becoming ill. Of 74 persons specifically mentioning the type of lizard, 71 (96%) reported contact with bearded dragons.

Through a traceback investigation, multiple potential bearded dragon breeders were identified that supply lizards to stores in the United States where ill persons reported purchasing their animals. Environmental and reptile samples were collected during investigations at multiple domestic and international bearded dragon breeding operations and at a large national pet retail chain. A total of 454 samples were obtained, of which 320 (71%) yielded *Salmonella.* Of 291 *Salmonella* isolates serotyped, 46 (16%) yielded *S.* Cotham and 23 (8%) yielded *S.* Kisarawe.

This was an outbreak of *S.* Cotham infections associated with bearded dragon contact. Traceback investigations identified multiple bearded dragons that supply to United States pet stores. Contact with reptiles is a well-known risk factor for *Salmonella* infections in humans.

(5)
Salmonella Thompson Infections Associated with Poultry Contact

May Nobles County/Multiple states

On June 6, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified a *Salmonella* Thompson case isolate that matched a nationwide pulsed-field gel electrophoresis (PFGE) cluster that at the time consisted of six cases from four states. Information for three of the six cases involved in the nationwide cluster was available, and all three cases had reported contact with live young poultry (e.g., chicks and ducks). The Minnesota case isolate's PFGE subtype was designation TMP49. An investigation was initiated.

A case was defined as a Minnesota resident who had a culture-confirmed infection with *S.* Thompson TMP49 with illness onset from March 15 through May 31, 2012 and had contact with live young poultry. All *Salmonella* cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of enteric disease surveillance in Minnesota. The case was also specifically asked about live young poultry contact.

If the case reported live young poultry contact, a stool sample collection kit was sent to the case household to obtain samples from the poultry and their environment. Samples were cultured for *Salmonella,* and isolates serotyped and subtyped by PFGE. An MDH epidemiologist contacted the feed store where the case reportedly purchased the poultry and worked with the Minnesota Board of Animal Health to identify source hatcheries.

The lone Minnesota case was a 35-year-old female. Her onset date was May 22. She reported diarrhea, cramps, and nausea. Her illness duration was 8 days, and she was not hospitalized.

The Minnesota case was interviewed on June 8 and reported contact with live young poultry, specifically Buffington chicks, during the week prior to illness. The chicks were purchased on May 8 from a feed store in Luverne, Minnesota. The source hatchery for this feed store is located in Bancroft, Iowa.

Two chick fecal samples, one litter sample, and one fecal sample from adult poultry were collected from the case household. The litter sample yielded *S.* Thompson TMP49. One chick fecal sample yielded *S.* Thompson TMP50 (1 band different from TMP49) and the other fecal sample yielded *Salmonella* but a serotype could not be determined. The fecal sample from the adult poultry did not yield any *Salmonella.*

During the national investigation, 32 *S.* Thompson isolates of the outbreak PFGE subtype were identified in 16 states. Of the 15 cases with onset information available, onset dates ranged from March 21 through May 22. Fifty-nine percent of cases were female, and ages ranged from <1 to 85 years (median age, 13.5 years). There were four reported hospitalizations but no reported deaths. Nine (69%) of 13 cases with available exposure information reported contact with live poultry prior to illness onset. Only one source hatchery was identified for non-Minnesota cases, located in Protales, New Mexico. This hatchery was different from the hatchery associated with the Minnesota case.

This was an outbreak of *S.* Thompson infections associated with live young poultry. Poultry from six of the seven cases with hatchery information were traced back to the same hatchery in Protales, New Mexico. The Minnesota case was not traced to this hatchery. However, it is common for hatcheries

to drop-ship, a practice where one hatchery ships birds out for another hatchery that doesn't have the inventory to complete their customer's order. These drop-shipped birds are shipped under the name of the original hatchery, even though the birds actually came from another hatchery. It is possible that this occurred with the Minnesota case. Contact with poultry, particularly with young poultry, is a well-known risk factor for *Salmonella* infections in humans.

(6)
Shiga toxin-producing *E. coli* and *Cryptosporidium parvum* Infections Associated with an Educational Farm Camp

July Hennepin County

A routine surveillance interview of a laboratory-confirmed Shiga toxin-producing *E. coli* (STEC) case conducted by the Minnesota Department of Health (MDH) on August 2, 2012 revealed that the case had attended an educational farm camp in Minnetrista, Minnesota during July 9-13. It was also reported during the interview that at least one additional camp attendee had become ill with diarrhea. MDH notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and environmental health units on August 3, and an outbreak investigation was initiated.

All STEC cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of enteric disease surveillance in Minnesota. A list of campers and their contact information was obtained from the camp.

Cases were defined as persons who developed diarrhea (≥3 loose stools in a 24-hour period) after attending the farm camp. Epidemiologists reviewed the information gathered during the interviews of STEC and other reportable diarrheal pathogen cases to identify potential cases associated with the farm. Stool specimens were obtained from five camp attendees and submitted to the MDH Public Health Laboratory (PHL) for bacterial and parasitic testing.

MDH epidemiologists and veterinarians and an HSPHD epidemiologist and sanitarian visited the farm on August 3 to talk to farm staff about the camp and collect animal samples. These samples were tested for STEC, *Cryptosporidium*, *Campylobacter*, and *Salmonella*.

Illness histories and exposure information were obtained from 20 attendees of the camp. Ten (50%) cases were identified. One camper reported illness but did not meet the case definition, and thus was excluded from further analyses.

Among the 10 cases, reported onset dates ranged from July 15 to July 24. All cases were female, and the median age was 9 years (range, 8 to 10 years). All cases were residents of the seven county metropolitan area. The 10 cases included the initial case who tested positive for STEC and four who tested positive for *Cryptosporidium* at MDH PHL.

The one case that tested positive for STEC reported diarrhea, cramps, and fever. Her illness duration was 8 days. Her incubation period was 5 days when calculated from July 11, the midpoint of the camp week. She was hospitalized for 3 days for her illness. *E. coli* O111:NM pulsed-field gel electrophoresis (PFGE) subtype ECM489SB465 was isolated from a stool sample.

Among the four cases that tested positive for *Cryptosporidium*, all four reported diarrhea, cramps, weight loss, and bloating, three (75%) reported vomiting, and one (25%) reported fever. The median illness duration was 11.5 days (range, 6 to 14 days). The median incubation period was 7.5 days (range, 6 to 13 days) when calculated from July 11, the midpoint of the camp week. Three (75%) of the cases reported visiting a healthcare provider for their illness. Three (75%) of the cases who tested positive for *Cryptosporidium* had *C. parvum* subtype BGP5 identified in a stool sample; molecular subtyping on the fourth case's stool sample was not successful.

Among the five cases that did not test positive for a pathogen, all five reported diarrhea and cramps, one (25%) of four reported fever, one (20%) reported vomiting, and one (20%) reported blood in their stools. The median illness duration was 7 days (range, 7 to 14 days). The median incubation period was 6 days (range, 4 to 7 days) when calculated from July 11, the midpoint of the camp week. One of the cases reported visiting a health care provider for their illness, and one case reported calling a health care provider about their illness.

The Vet Skills Camp was a week-long day camp targeted to children ages 8 to 11 years. Campers experienced real veterinary work as they performed physical exams, groomed, and provided daily care for the animals. Campers interacted with a number of animals, including lambs, pigs, chickens, and calves. Campers paired up to work with a calf for the week. Caring for the calf included taking its temperature, feeding it, making daily observations on its health, giving medication, leading it, and washing it.

No individual activity was statistically associated with illness. Cases and controls all reported close contact with calves. Several cases reported working with calves that had very watery manure. Campers conducted all activities in street clothes and shoes. Cases also recalled instances where manure splashed on the clothing; only one (17%) of six campers reported changing clothes after camp. Of 10 campers' parents who responded, 9 (90%) reported not knowing that people can get diarrheal illnesses from animals. No educational material was given by facility to campers or their families regarding the risk of acquiring illnesses from animals. In addition, no signage regarding risk or prevention measures were in use at the farm.

According to the farm's protocol, handwashing was required after animal interactions. However, no handwashing facilities were available outside in the animal areas, and it was unclear how often campers were given an opportunity to wash their hands.

According to camp staff, eight 6-day-old bull calves arrived at the farm the week of July 2. Two of the calves developed bad scours shortly after arriving at the farm; these calves were identified as Calf #8456 and Calf #8459; camp staff denied any illness in any of the other calves.

On the August 3 farm visit, manure samples from eight calves were collected by MDH staff. *E. coli* O111:NM PFGE subtype ECM498SB465 was identified in Calf #8464; this pattern was indistinguishable from that found in the isolate from one camper. Additionally, *Cryptosporidium parvum* subtype BGP5 was identified in Calf #8453; this was indistinguishable from *C. parvum* found from three campers.

This was an outbreak of Shiga toxin-producing *E. coli* and *Cryptosporidium parvum* infections associated with an educational farm camp. Isolates or positive specimens from the human cases were

indistinguishable by molecular subtyping to those from calf samples taken on the farm. Ill animals, especially those with diarrhea, should not be allowed to interact with the public, including in an educational farm camp setting. Participants in these types of camps, as well as their parents, should be educated about the risk of acquiring illness from animals, and measures to prevent such illnesses. The facility was provided a copy of the *Compendium of Measures to Prevent Diseases Associated with Animals in Public Settings, 2011*, educational signs, and detailed recommendations to prevent zoonotic disease transmission at the farm.

(7)
Salmonella Typhimurium Infections Associated with Pet Hedgehogs

July — Ramsey County/Multiple states

On August 8, 2012, staff at the Minnesota Department of Health (MDH) interviewed the parent of a *Salmonella* Typhimurium case with pulsed-field gel electrophoresis (PFGE) subtype TM1075 (Centers for Disease Control and Prevention [CDC] designation JPXX01.1925) detected through routine surveillance. This case was a 7 year-old female whose illness onset was July 15. She owned a hedgehog that was purchased on July 5 and it had developed diarrhea on July 10, lasting 5 days. The case's family purchased the pet from a breeder in Richfield, Minnesota. The case was responsible for feeding and cleaning up the hedgehog's cage in addition to petting and playing with it. A second case with *S.* Typhimurium TM1075 from July was unreachable despite multiple attempts. Nationally, 26 cases of infection were identified from December 26, 2011 through April 8, 2013. Cases in Washington also identified hedgehog contact, and a national investigation was initiated in August.

A case was defined as a person with a *Salmonella* Typhimurium infection with PFGE subtype TM1075 from December 2011 through April 2013. Cases were interviewed for hedgehog contact.

The Minnesota case family that had been interviewed was contacted again to determine a day and time when MDH staff could sample their hedgehog for *Salmonella.* MDH staff took eight samples from the household with the 7 year-old *Salmonella* case. Swabs of cages and a bathing tub in addition to bedding, fecal samples, and pet food samples were collected both for the case-patient's hedgehog and an additional hedgehog that had been more recently purchased for the household.

Ultimately, only one Minnesota case could be definitively linked to hedgehog contact. This case had diarrhea, bloody diarrhea, vomiting, fever, and cramps, with symptoms lasting 10 days. She was not hospitalized. An earlier case was identified in Minnesota with onset on December 26, 2011. The case was a 14 year-old female who did not mention hedgehog contact in her initial interview and could not be reached for re-interview. A fourth case in Minnesota also occurred in December, 2012. This was an 82 year-old male with no known hedgehog contact or other pet or animal contact. He did not have any relatives or know of anyone else who owned a hedgehog.

Nationally, 27 cases with the outbreak strain were reported from 12 states: Alabama (1), Illinois (1), Indiana (1), Louisiana (1), Michigan (3), Minnesota (4), Missouri (1), New Hampshire (1), Ohio (5), Oregon (1), and Washington (7). Illness onset dates ranged from December 26, 2011, to April 8, 2013. The median case age was 15 years (range, <1 to 91 years); 58% of cases were female. Thirty-five percent of cases were children 10 years of age or younger. Eight patients were hospitalized. One death

associated with *Salmonella* infection was reported in Washington. Twenty (74%) patients who could be interviewed reported direct or indirect contact with hedgehogs during the week before illness onset.

Of the eight samples taken from the Minnesota case patient's home, the outbreak strain was isolated from an environmental swab of a container and sink in which hedgehogs were bathed. The outbreak strain was also isolated from an environmental swab from the cage of the second hedgehog purchased after the first hedgehog and case-patient became ill. In Illinois, the outbreak strain was isolated from environmental samples of a hedgehog's wheel, ramp, feed area, and bedding as well as from the pet hedgehog's feces. In Ohio, the outbreak strain was isolated from a pet hedgehog's feces.

USDA-APHIS Animal Care collaborated with CDC to identify the sources of hedgehogs linked to ill persons. Traceback investigations of pet hedgehogs from homes of ill persons identified multiple sources of hedgehogs in different states. Among 17 ill persons with available purchase information, hedgehogs were reportedly purchased from both USDA-licensed and unlicensed breeders as well as private individuals. USDA does not have authority over disease transmission due to such pets, only authority to assure safe, healthy, and humane treatment of the animals by the sellers.

Historic infections from 2010-2011 were also investigated to facilitate the traceback investigation. Fifteen PFGE matches to the outbreak strain were identified in 13 states. Onset dates for these infections ranged from April 18, 2010 to September 19, 2011. Epidemiologic information was available for six cases (based on archived state questionnaires). Three (50%) of six cases reported pet hedgehog contact. The three cases with no reported hedgehog contact could not be re-interviewed. Hedgehogs from two USDA-licensed facilities were linked to two historic infections through retrospective interviews by state epidemiologists. One breeder was previously identified; however, the other was newly identified as a result of these efforts.

Overall, nine USDA-licensed facilities were inspected by USDA-APHIS Animal Care inspectors. Traceback challenges among these facilities included the short-term (1 year) availability of records, frequent movement of hedgehogs between breeders, and case confidentiality concerns. Records were evaluated for all nine facilities, and six breeders also completed the hedgehog breeder questionnaire. The breeder in Minnesota was not a USDA-licensed facility, but staff at MDH attempted to contact them to discuss the outbreak and obtain information on the source of the hedgehogs. The breeder could not be reached despite multiple attempts. Based on available information, a single source of the hedgehogs was not identified, and no common feed or bedding could be identified.

Educational materials were created to raise awareness of the risk of *Salmonella* infection associated with pet hedgehogs as a result of this outbreak. Detailed advice to pet owners was included in the outbreak report on the CDC website: http://www.cdc.gov/salmonella/typhimurium-hedgehogs-09-12/advice-consumers.html, and an educational poster focused on small nontraditional pets was developed (available in English and Spanish): http://www.cdc.gov/healthypets/publications/index.html

This was an outbreak of *S.* Typhimurium infections associated with pet hedgehogs. Transmission likely occurred through contact with the hedgehogs and/or contact with environmental surfaces contaminated by hedgehogs. A single source for the hedgehogs could not be identified. This outbreak again highlights the need to raise awareness of the risk of *Salmonella* infections associated with pet hedgehogs and similar pocket pets among breeders, pet stores, pet owners, health-care professionals, and veterinarians.

Reference

1. Centers for Disease Control and Prevention (CDC). Notes from the field: Multistate outbreak of human *Salmonella* Typhimurium infections linked to contact with pet hedgehogs - United States, 2011-2013. MMWR Morb Mortal Wkly Rep. 2013 Feb 1;62(4):73.

(8)
Histoplasmosis Associated with a Barn Restoration

August Carver County

August 14, 2012, the Minnesota Department of Health (MDH) was notified by an infectious disease physician of two cases of histoplasmosis. Both individuals were carpenters who had worked on an old barn restoration project in Carver County that involved cleaning out the barn, restoring the integrity of the foundation, and replacing deteriorated wood in the floors and walls with new material. During the initial cleaning of the barn, birds, bats, and their droppings, and old hay were removed from the barn. The project began around July 19 and continued until approximately August 9, when work was suspended due to several workers falling ill. An investigation was initiated on August 16.

A list of employees working on the barn restoration was obtained from the project manager, and the employees were interviewed to obtain illness history and information on specific tasks performed. The owner of the property and residents currently living on the property were also contacted regarding their illness and exposure histories. MDH staff visited the worksite on August 21 to speak with the worksite manager and view the worksite layout. Environmental samples in and around the worksite were collected to test for *Histoplasma capsulatum*. These samples were collected for future academic research purposes only in collaboration with University of Minnesota mycologists. Currently no assay exists that can reliably detect the presence of *H. capsulatum* spores in the environment.

A case was defined as an individual who had entered the barn and developed a cough and fever 3 to 17 days following exposure. Eighteen (82%) of 22 persons associated with the restoration project or property were interviewed. Six (33%) of 18 interviewed persons met the case definition, all of whom were employees who worked on the restoration project. Two persons never entered the barn and one person reported illness, but did not meet the case definition; these three were excluded from further analysis. Of the six cases, all reported cough, headache, and chills, five (83%) reported weakness, five (83%) reported shortness of breath, four (67%) reported chest pain, four (67%) reported loss of appetite, and two (33%) reported weight loss, with one person reporting losing 16 pounds. The incubation period was 10 days for the two cases for whom a single, specific exposure date was known. The duration of illness was 6 days in the only individual whose symptoms had resolved at the time of interview; the remaining five cases reported that their symptoms were ongoing. All six cases sought medical attention for their illness. Two cases were diagnosed with histoplasmosis based on a positive urine and serum antigen detection test. Participating in the repair of the foundation was significantly associated with illness (6 of 6 cases vs. 2 of 9 controls; odds ratio, undefined; $p = 0.007$).

On August 22, a letter in English and Spanish was provided to the project manager to be distributed to all employees who worked on the project. The letter provided information about histoplasmosis and recommended that they see a healthcare provider if symptomatic. Employee receipt of the letter was confirmed via verbal communication with their work supervisors.

This was a histoplasmosis outbreak associated with restoration of an old barn in Carver County. *Histoplasma* can be found in soil and other material that is contaminated with bird and/or bat droppings. The disease is transmitted by inhalation of contaminated dust. It is likely that employees inhaled spores of *Histoplasma capsulatum* present in the environment while working on the restoration project.

(9)
Campylobacter jejuni Infections Associated with a Private Hobby Farm

August Winona County

On August 15, 2012, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of diarrhea, cramps, and fever (one reported a temperature of 102.5° F) among two co-workers who had eaten at a restaurant in Rochester, Minnesota on August 7. One also reported bloody stools, and both had ongoing diarrhea at the time of the report. The co-workers claimed they did not have any other common meals in the preceding week. Incubation periods were 15 and 27 hours from the restaurant meal. Both had eaten various pizzas from the restaurant buffet, and one had eaten cherry tomatoes from the salad bar. Olmsted County Public Health Services (OCPHS) was notified, and an investigation was initiated.

When stool samples from the two co-workers subsequently tested positive for *Campylobacter jejuni*, the risk factors for *C. jejuni* infection were explained, and the co-workers were asked again about any common experiences, including visits to a farm, fair, etc. The original complainant recalled working together with his co-worker on the co-worker's Winona County hobby farm on August 5.

OCPHS sanitarians visited the restaurant on August 15 to evaluate food preparation and handling procedures, interview employees (and exclude them from work as necessary based on their symptom history and a possible *Salmonella* etiology), obtain credit card receipts, and procure a complete list of foods served on August 7.

OCPHS staff interviewed restaurant patrons to obtain information on food/beverage consumption and illness history using contact information from credit card receipts.

A case was defined as a person who had contact with the Winona County hobby farm and subsequently had a stool sample test positive for *Campylobacter jejuni*. Stool samples were submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

The two co-workers from the original complaint were the only cases identified in this outbreak. Both were males aged 30-40 years. Both reported diarrhea of at least 8-day duration, stomach cramps, and fever (temperature of 102.5° F for one). One had bloody stools, and neither had vomiting. Neither case was hospitalized. The incubation period for both cases was 3 days from the August 5 farm work. Stool samples from both cases were positive for nalidixic acid-resistant *Campylobacter jejuni*. The isolates had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Minnesota pattern designation CMP31). The samples were negative for *Salmonella*, Shiga toxin-producing *E. coli*, *Shigella*, and norovirus.

Most of the animals on the hobby farm, which included 102 chickens, 16 turkeys, 9 swine, 6 cats, a dog, and a billy goat, were the farm owner's children's 4H animals; therefore, most of the daily animal chores

were conducted by the owner's three children. The owner reported that he typically spent about 1 hour per day in contact with the animals' environment, and less than 1 hour per day in direct contact with the animals. He reported that he frequently, but not always, washes his hands with soap and water after working/doing chores and before eating.

On August 5, the two men worked on an outdoor demolition project near the animal barn. They walked through the barn to look at the animals and may have touched fences and other parts of the animals' environment, but denied direct contact with the animals. The farm owner's co-worker reported that he did not wash his hands prior to having a tuna sandwich for lunch that day inside the home. The owner's children helped with the demolition project, but did not become ill.

No sanitation issues were identified at the Rochester restaurant. The restaurant does not use any raw meat products, and the case's incubation periods were not consistent with *C. jejuni* infection acquired at the restaurant.

This was an outbreak of *Campylobacter jejuni* infections associated with working on a private hobby farm that included chickens and turkeys. The outbreak was initially reported to the foodborne illness hotline as a suspected restaurant outbreak, and the co-workers involved later recalled working together on the hobby farm 3 days before their illness onsets. The most likely sources of *C. jejuni* were the chickens and turkeys on the hobby farm, and the route of transmission was via contact with the animals' environment. Lack of handwashing prior to eating after contacting the animals' environment likely contributed to at least one infection.

(10)
Salmonella Braenderup Infections Associated with Poultry Contact

October Olmsted County/Multiple states

On October 1, 2012, the Minnesota Department of Health (MDH) Public Health Laboratory identified a *Salmonella* Braenderup case isolate that matched a nationwide cluster consisting of cases from 10 states with matching pulsed-field gel electrophoresis (PFGE) patterns (Minnesota subtype designation BR88). The Minnesota case was interviewed on October 12, 2012 and reported contact with live chicks. An investigation was initiated.

A case was defined as a Minnesota resident who had a culture-confirmed infection with *S.* Braenderup BR88 and illness onset from July 25, 2012 through December 13, 2012 (the time frame used for the national investigation). All *Salmonella* cases reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of routine enteric disease surveillance. The case was also asked questions regarding the source of their live chicks.

Only one case was identified in Minnesota, a 6-year-old male with illness onset on August 30. Symptoms included diarrhea, nausea, vomiting, cramps, and a fever of 102° F. Illness duration was 8 days. The case was not hospitalized.

The case's parents could not remember the purchase date of the chicks, but they knew the chicks were delivered to their home on August 24. The chicks were purchased directly from a hatchery in Webster City, Iowa. After the initial interview, MDH was not able to reach the case household to ask for

permission to send fecal sample collection kits to the household. Therefore, no chick fecal samples were collected for testing.

Forty-five *S.* Braenderup outbreak cases were identified in 23 other states. Illness onset dates ranged from July 25, 2012 through December 13, 2013. Sixty-four percent of cases were female, and ages ranged from <1 to 88 years (median age, 23 years). There were six hospitalizations and no deaths. Twenty-six (74%) of 35 cases with available exposure information reported contact with live poultry prior to illness onset. Twelve potential source hatcheries in nine different states were identified. These included a hatchery in Webster City, Iowa; a hatchery in Lebanon, Missouri a hatchery in Cameron, Texas a hatchery in Portales, New Mexico; a hatchery in Caldwell, Indiana; a hatchery in Portland, Oregon; a hatchery in Polk, Ohio; a hatchery in Cincinnati, Ohio; a hatchery in Estacada, Oregon; a hatchery in Lancaster, California; a hatchery in Gonzales, California; and a hatchery in Fresno, California. All 12 hatcheries were contacted and asked to participate in a conference call regarding this outbreak. The Centers for Disease Control and Prevention (CDC) hosted the call and asked if hatcheries would be willing to work with CDC on these issues and if they would complete a survey.

This was an outbreak of *S.* Braenderup infections associated with live chicks. Six cases, including the Minnesota case, reported the hatchery in Webster City, Iowa as their source of live poultry, while the remaining cases reported one or more of 11 other hatcheries. CDC planned to work with all 12 hatcheries on voluntary *Salmonella* controls going forward. Contact with live poultry, particularly with young poultry, is a well-known risk factor for *Salmonella* infections in humans.

(11)
Cryptosporidiosis Associated with a Private Party on a Farm

November Scott County

A routine surveillance interview of a laboratory-confirmed cryptosporidiosis case conducted by the Minnesota Department of Health (MDH) on November 20, 2012 revealed that the case had attended a child's birthday party held at a farm on November 9. At the time, contact information for the party host was not available for additional follow up. On December 12, a second laboratory-confirmed cryptosporidiosis case was interviewed through routine surveillance (the original contact number provided was not in service and thus contacting the case was delayed) and also reported attending the same child's birthday party on November 9. An outbreak investigation was initiated.

All cases of cryptosporidiosis reported to MDH are interviewed about food consumption, animal contact, and other potential exposures as part of enteric disease surveillance in Minnesota.
A case was defined as a person who developed either a laboratory-confirmed *Cryptosporidium* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days, after attending the November 9 birthday party, with illness onset 2 to 14 days following the party.

An MDH epidemiologist worked with the parents of the two reported cases to get contact information for the party host in order to facilitate the investigation.The two cases reported onsets of November 14 and November 15. Both cases were female and 9 years old. Both reported diarrhea, cramping, and fever. One case reported weight loss and the other case was unsure if they had lost any weight. One case reported an incubation of 5 days and one reported an incubation of 7 days. Neither case had recovered by the time of interview.

Contact information for the party host was provided by a parent of one of the initial two cases. An MDH epidemiologist contacted the party host to get a complete list of birthday party attendees. The party host declined to provide this information. However, the host did agree to answer some questions.

A total of 10 children attended the party, including 4 of the birthday girl's siblings. Two adults also attended. This was a sleepover birthday party.

While at the birthday party the children petted goats, horses, mini llamas, chickens, and ducks. They also bottle fed two calves that had been purchased 2 weeks prior to the party. One of the calves had diarrhea at the time of the party. MDH offered to test the animals on the farm, but the party host declined.

The children ate frozen pizza, popcorn, and ice cream cake the night of the party and pancakes with milk and apple juice for breakfast the next morning.

One additional case was identified by speaking with the party host; this third case was the birthday girl. She became ill 5 days after her party and reported diarrhea, cramps, fever, and weight loss. Her duration of illness was 9 days. A stool kit was sent to her and returned to MDH. Her stool tested negative for *Cryptosporidium.* The party host denied any other illness among party attendees.

This was an outbreak of cryptosporidiosis associated with a birthday party held on a farm. Although no animal testing was performed, the likely cause of the outbreak was bottle feeding two calves, one of which had diarrhea at the time of the party.

Confirmed Foodborne Outbreaks
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Jan	Restaurant	21	2	Unknown	Norovirus	Unknown	Hennepin
2	Jan	Restaurant	10	2	Unknown	Norovirus	Ill food workers	Washington
3	Jan	Restaurant	3	2	Unknown	Norovirus	Likely infected food worker	Ramsey
4	Jan	Restaurant	7	4	Desserts	*Salmonella* Enteritidis	Improper cooking, contaminated product	Ramsey
5	Jan	Restaurant	8	1	Unknown	Norovirus	Infected food worker	Hennepin
6	Feb	Restaurant	2	1	Unknown	*Clostridium perfringens*	Time/temperature abuse	Hennepin
7	Feb	Restaurant	8	4	Multiple	Norovirus	Infected food workers	Winona
8	Mar	Restaurant	31	2	Appetizers	Norovirus	Unknown	Olmsted
9	Mar	Restaurant	3	2	Unknown	Norovirus	Unknown	Wilkin
10	Mar	Restaurant	9	4	Lettuce	Norovirus	Likely infected food worker	Washington
11	Mar	Banquet	18	18	Pasta	Group A *Streptococcus*	Unknown	St. Louis
12	Mar	Commercial product	1	1	Ricotta salata	*Listeria monocytogenes*	Contaminated product	Hennepin/ Multiple states
13	Mar	Restaurant	7	1	unknown	*Clostridium perfringens*	Time/temperature abuse	Washington
14	Apr	Restaurant	4	4	Egg dishes	*Salmonella* Enteritidis	Improper cooking	Wabasha
15	Apr	Restaurant	22	3	Baked ham and Swedish meatballs	Sapovirus	Unknown	Kandiyohi
16	Apr	Restaurant	8	3	Unknown	*Clostridium perfringens*	Time/temperature abuse	Dakota

Confirmed Foodborne Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
17	Apr	Restaurant	8	1	Unknown	Norovirus	Unknown	Ramsey
18	Apr	Catered event	25	4	Unknown	Sapovirus	Unknown	Ramsey
19	May	Farm	7	2	Raw milk	*Campylobacter jejuni*	Contaminated product	Hennepin
20	May	Private home	6	6	Unknown	*Salmonella* Newport	Unknown	Hennepin
21	Jun	Private home	7	1	Unknown	Norovirus	Likely infected attendee	Washington
22	Jun	Restaurant	11	10	Unknown	*Salmonella* Montevideo	Unknown	Olmsted
23	Jul	Restaurant	2	2	Suspected eggs	*Salmonella* Enteritidis	Unknown	Hennepin
24	Jul	Restaurant	9	2	Boxed lunches	Norovirus	Infected food worker	Olmsted
25	Jul	Commercial product	2	2	Cantaloupe	*Salmonella* Typhimurium	Contaminated product	Multiple counties/ Multiple states
26	Jul	Private party	8	3	Unknown	*Campylobacter jejuni*	Unknown	Hennepin
27	Jul-Aug	Commercial product	4	4	Cantaloupe	*Salmonella* Newport	Contaminated product	Multiple counties/ Multiple states
28	Jun	Private home	7	5	Unknown	*Salmonella* Newport	Unknown	Sherburne
29	Jul	Commercial product	1	1	Peanut butter	*Salmonella* Bredeney	Contaminated product	Aitkin/ Multiple states

Confirmed Foodborne Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
30	Jul-Aug	Meat market	4	4	Turkey jerky	*Salmonella* 9,12:-:1,5	Numerous	Becker/ Multiple states
31	Aug	Restaurant	10	3	Unknown	Norovirus	Infected food worker	Hennepin
32	Aug	Private home	24	24	Raw beef	*Salmonella* Enteritidis	Improper cooking, contaminated product	Cottonwood
33	Aug	Restaurant	8	1	Roasted potatoes	Norovirus	Ill food worker	Hennepin
34	Sep	Restaurant	2	0	Tuna	Scombroid toxin	Unknown	Dakota
35	Sep	Restaurant	2	2	Dynamite roll	*Salmonella* Bareilly	Contaminated product	Hennepin
36	Sep	Restaurant	13	3	Shredded cheese	Norovirus	Likely infected food worker	Hennepin
37	Sep	Restaurant	14	3	Ready-to-eat foods	Norovirus	Infected food workers	Hennepin
38	Sep-Oct	Restaurant	9	2	Unknown	*Campylobacter jejuni*	Cross-contamination	Dakota
39	Oct	Restaurant	4	4	Cucumbers or iceberg lettuce	*Salmonella* Javiana	Contaminated product	Multiple counties/ Multiple states
40	Oct	Restaurant	2	0	Unknown	Suspected viral gastroenteritis	Ill food worker	Hennepin
41	Oct	Catered event	4	0	Unknown	Suspected viral gastroenteritis	Ill food worker	Hennepin
42	Oct	Catered event	12	0	Unknown	Suspected bacterial intoxications	Time/temperature abuse	Ramsey

Confirmed Foodborne Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
43	Oct	Catered event	19	2	Unknown	Norovirus	Ill food worker	Hennepin
44	Nov	Catered event	24	5	Multiple	Norovirus	Ill food worker	Ramsey
45	Nov	Shelter	22	0	Unknown	Suspected bacterial intoxications	Time/temperature abuse	Hennepin
46	Nov	Banquet	50	4	Unknown	Norovirus	Ill food worker	Blue Earth
47	Nov	Private home	2	2	Unknown	*Salmonella* Saintpaul	Unknown	St. Louis
48	Dec	Catered event	38	2	Multiple	Norovirus	Infected food worker	Mower
49	Dec	Restaurant	4	3	Romaine lettuce	Norovirus	Likely infected food worker	Anoka
50	Dec	Restaurant	3	1	Unknown	Norovirus	Infected food workers	Blue Earth
51	Dec	Restaurant	14	7	Spring rolls	Norovirus	Unknown	Hennepin
52	Dec	Restaurant	19	5	Bread and butter	Norovirus	Unknown	Hennepin
53	Dec	Restaurant	23	4	Appetizers	Norovirus	Likely infected food worker	Olmsted

Total: 53

Probable Foodborne Outbreaks
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Mar	Restaurant	4	0	Unknown	Suspected norovirus	Ill food worker	Olmsted
2	Aug	Group home	4	0	Unknown	Unknown	Ill food worker	St. Louis
3	Nov	Unknown	4	1	Unknown	Norovirus	Unknown	Hennepin
4	Dec	Private party	4	2	Unknown	Rotavirus	Unknown	Hennepin
5	Dec	Private party	4	2	Unknown	Norovirus	Unknown	Todd

Total: 5

Confirmed Waterborne Outbreaks
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Mar	Water park	43	1	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Crow Wing
2	Mar	Water park	97	22	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	St. Louis
3	Apr	Hotel pool and hot tub	7	0	Recreational water	Suspected *Pseudomonas aeruginosa*	Improper maintenance	Otter Tail
4	Jun	Pool	7	3	Recreational water	*Cryptosporidium*	Likely infectious swimmer	Lyon
5	Jul	Swim pond	5	2	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Washington
6	Jul	Splash pad	2	2	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Stearns
7	Jul	Splash pad	2	2	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Benton
8	Jul	Camp	16	3	Recreational water	*Cryptosporidium hominis*	Likely infectious swimmer	Crow Wing
9	Aug	Pool	6	4	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Hennepin
10	Aug	Pool	2	2	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Goodhue
11	Nov	Private hot tub	4	0	Recreational water	*Legionella* (Pontiac Fever)	Improper maintenance	Hennepin

Total: 11

Animal Contact Outbreaks
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
1	Mar	Petting zoo	31	4	Calf	*Cryptosporidium parvum*	Goodhue
2	Apr	Private home	1	1	Chicks and ducklings	*Salmonella* Muenchen	Mower/Multiple states
3	May	Private home	2	2	Chicks	*Salmonella* Infantis	Multiple counties/Multiple states
4	May 2012-Feb 2013	Private home	3	3	Bearded dragons	*Salmonella* Cotham	Multiple counties/Multiple states
5	May	Private home	1	1	Chicks	*Salmonella* Thompson	Nobles/Multiple states
6	Jul	Camp	10	5	Calves	*Cryptosporidium parvum* and *E. coli* O111:NM	Hennepin
7	Jul	Private home	1	1	Hedgehogs	*Salmonella* Typhimurium	Ramsey/Multiple states
8	Aug	Barn	6	2	Contaminated dust	*Histoplasma capsulatum*	Carver
9	Aug	Farm	2	2	Likely live poultry	*Campylobacter jejuni*	Winona
10	Aug	Private home	1	1	Chicks	*Salmonella* Braenderup	Olmsted/Multiple states
11	Nov	Farm	3	2	Likely calves	*Cryptosporidium*	Scott

Total: 11

Person-to-Person Gastroenteritis Outbreaks
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
1	Jan	Nursing home	42	0	Person-to-person (PTP)	Suspected norovirus	Anoka
2	Jan	Nursing home	53	0	PTP	Suspected norovirus	Goodhue
3	Jan	Nursing home	18	0	PTP	Suspected norovirus	Koochiching
4	Jan	Nursing home	27	0	PTP	Suspected norovirus	Hennepin
5	Jan	Afterschool program	8	0	PTP	Suspected norovirus	Lake
6	Jan	Nursing home	23	0	PTP	Suspected norovirus	Hennepin
7	Jan	Independent living	20	0	PTP	Suspected norovirus	Ramsey
8	Jan	Nursing home	49	0	PTP	Suspected norovirus	St. Louis
9	Jan	Nursing home	8	0	PTP	Suspected norovirus	Renville
10	Jan	Nursing home	42	0	PTP	Suspected norovirus	Rock
11	Jan	Nursing home	81	0	PTP	Suspected norovirus	Hennepin
12	Jan	Nursing home	30	0	PTP	Suspected norovirus	St. Louis
13	Jan	Assisted living	39	0	PTP	Suspected norovirus	Wilkin
14	Feb	Nursing home	41	0	PTP	Suspected norovirus	Otter Tail
15	Feb	Assisted living	38	0	PTP	Suspected norovirus	Dakota
16	Feb	Assisted living	32	0	PTP	Suspected norovirus	Dakota
17	Feb	Assisted living	9	0	PTP	Suspected norovirus	Faribault
18	Feb	School	105	0	PTP	Suspected norovirus	Washington
19	Feb	School	32	1	PTP	Norovirus	Sibley
20	Feb	Nursing home	13	0	PTP	Suspected norovirus	Olmsted
21	Feb	Nursing home	11	0	PTP	Suspected norovirus	Hennepin
22	Feb	Assisted living	9	0	PTP	Suspected norovirus	Hennepin
23	Feb	School	16	0	PTP	Suspected norovirus	Blue Earth
24	Feb	Private home	12	1	PTP	Norovirus	Blue Earth
25	Feb	Nursing home	19	0	PTP	Suspected norovirus	Isanti
26	Feb	Nursing home	67	0	PTP	Suspected norovirus	Ramsey

Person-to-Person Gastroenteritis Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
27	Feb	Nursing home	29	0	PTP	Suspected norovirus	St. Louis
28	Feb	Nursing home	16	0	PTP	Suspected norovirus	Hennepin
29	Feb	Daycare	2	2	PTP	*Salmonella* 4,5,12:i:-	Hennepin
30	Feb	Nursing home	4	0	PTP	Suspected norovirus	Blue Earth
31	Mar	Nursing home	15	0	PTP	Suspected norovirus	Winona
32	Mar	Daycare	10	2	PTP	*Shigella sonnei*	Hennepin
33	Mar	Daycare	29	0	PTP	Suspected norovirus	Hennepin
34	Mar	Daycare	22	9	PTP	*Shigella sonnei*	Kandiyohi
35	Mar	Nursing home	49	0	PTP	Suspected norovirus	Crow Wing
36	Mar	Daycare	10	3	PTP	*Shigella sonnei*	Wright
37	Apr	Daycare	4	2	PTP	*Shigella sonnei*	Hennepin
38	Apr	Daycare	2	2	PTP	*Shigella sonnei*	Cass
39	Apr	Nursing home	25	0	PTP	Suspected norovirus	Hennepin
40	May	Daycare	3	3	PTP	*Shigella sonnei*	Ramsey
41	Jun	Daycare	2	2	PTP	*Salmonella* Montevideo	Olmsted
42	Jul	Daycare	10	10	PTP	*E. coli* O157:H7	Murray
43	Jul	Daycare	5	1	PTP	*Cryptosporidium parvum*	Ramsey
44	Jul	Daycare	4	4	PTP	*Shigella sonnei*	Ramsey
45	Jul	Daycare	3	1	PTP	*Cryptosporidium parvum*	Mower
46	Jul	Daycare	4	1	PTP	*Shigella sonnei*	Hennepin
47	Aug	Daycare	10	1	PTP	*Shigella sonnei*	Renville
48	Aug	Daycare	13	13	PTP	*Shigella sonnei*	Ramsey
49	Aug	Daycare	3	1	PTP	*Cryptosporidium*	Brown
50	Aug	Daycare	6	6	PTP	*E. coli* O157:H7	Stearns

Person-to-Person Gastroenteritis Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
51	Aug	Daycare	5	5	PTP	*E. coli* O157:H7	Grant
52	Aug	Daycare	4	4	PTP	*E. coli* O157:H7	Benton
53	Aug	Private home	2	2	PTP	*Salmonella* Newport	Brown
54	Aug	Daycare	2	2	PTP	*Shigella sonnei*	Ramsey
55	Aug	Daycare	9	3	PTP	*Shigella sonnei*	Ramsey
56	Aug	Daycare	13	4	PTP	*Shigella sonnei*	Ramsey
57	Aug	Daycare	9	9	PTP	*Shigella sonnei*	Washington
58	Sep	School	4	2	PTP	*Shigella sonnei*	Washington
59	Sep	Daycare	2	2	PTP	*Shigella sonnei*	Anoka
60	Sep	Daycare	3	3	PTP	*E. coli* O157:H7	Otter Tail
61	Sep	School	25	0	PTP	Suspected norovirus	Hennepin
62	Sep	School	14	0	PTP	Suspected norovirus	Sibley
63	Sep	Daycare	14	2	PTP	*Cryptosporidium parvum* and *C. hominis*	Goodhue
64	Oct	Daycare	2	1	PTP	*Shigella sonnei*	Mahnomen
65	Oct	Daycare	3	3	PTP	*E. coli* O157:H7	Mower
66	Oct	Nursing home	68	0	PTP	Suspected norovirus	Hennepin
67	Oct	Daycare	4	1	PTP	Cryptosporidium	Olmsted
68	Oct	Daycare	7	3	PTP	*Shigella sonnei*	Mahnomen
69	Oct	Food truck/apple orchard	7	3	PTP	Norovirus	Carver
70	Oct	Hospital	3	3	PTP	*Salmonella* Heidelberg	Multiple counties/ Multiple states
71	Oct	Daycare	2	2	PTP	*Shigella sonnei*	Ramsey
72	Oct	School	3	2	PTP	*Shigella sonnei*	Cass
73	Oct	Nursing home	8	0	PTP	Suspected norovirus	Washington

Person-to-Person Gastroenteritis Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
74	Nov	School	64	0	PTP	Suspected norovirus	Carver
75	Nov	Nursing home	6	0	PTP	Suspected norovirus	Wright
76	Nov	Nursing home	7	0	PTP	Suspected norovirus	Hennepin
77	Nov	School	9	0	PTP	Suspected norovirus	Kittson
78	Nov	Nursing home	78	0	PTP	Suspected norovirus	Ramsey
79	Nov	School	44	0	PTP	Suspected norovirus	Wright
80	Nov	School	89	0	PTP	Suspected norovirus	Brown
81	Nov	Daycare	3	1	PTP	*Cryptosporidium*	Stearns
82	Nov	Daycare	12	2	PTP	*Shigella sonnei*	Anoka
83	Nov	Nursing home	10	0	PTP	Suspected norovirus	Olmsted
84	Nov	Daycare	2	2	PTP	*Shigella sonnei*	Beltrami
85	Nov	Assisted living	54	0	PTP	Suspected norovirus	Ramsey
86	Nov	Nursing home	33	0	PTP	Suspected norovirus	Washington
87	Nov	Nursing home	10	0	PTP	Suspected norovirus	Pope
88	Nov	Nursing home	47	0	PTP	Suspected norovirus	Hubbard
89	Nov	Daycare	6	5	PTP	*Shigella sonnei*	Ramsey
90	Nov	Nursing home	54	0	PTP	Suspected norovirus	Hennepin
91	Nov	Assisted living	16	0	PTP	Suspected norovirus	Winona
92	Nov	Assisted living	12	0	PTP	Suspected norovirus	Crow Wing
93	Dec	School	24	0	PTP	Suspected norovirus	Meeker
94	Dec	School	35	0	PTP	Suspected norovirus	Cottonwood
95	Dec	School	189	0	PTP	Suspected norovirus	Ramsey
96	Dec	Nursing home	36	0	PTP	Suspected norovirus	Ramsey
97	Dec	Nursing home	25	0	PTP	Suspected norovirus	Goodhue
98	Dec	Nursing home	27	0	PTP	Suspected norovirus	Clay
99	Dec	Daycare	11	0	PTP	Unknown	Hennepin
100	Dec	Daycare	2	2	PTP	*E. coli* O157:H7	Olmsted

Person-to-Person Gastroenteritis Outbreaks
Minnesota, 2012 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
101	Dec	Nursing home	37	0	PTP	Suspected norovirus	Wabasha
102	Dec	Nursing home	15	0	PTP	Suspected norovirus	Olmsted
103	Dec	Nursing home	36	1	PTP	Norovirus	Norman
104	Dec	Restaurant	5	0	PTP	Unknown	St. Louis

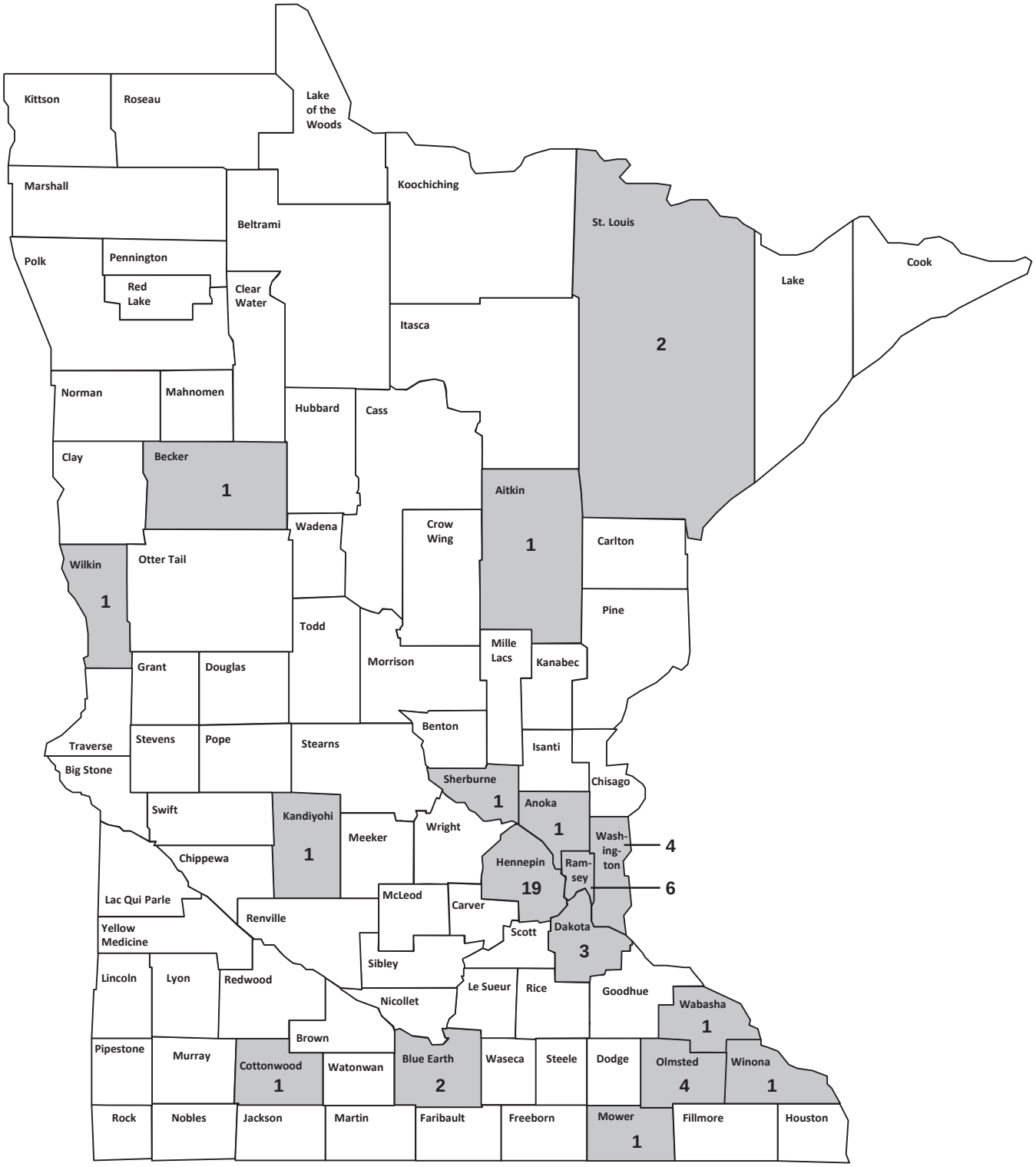
Total: 104

Gastroenteritis Outbreaks with Unknown Transmission Routes
Minnesota, 2012

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
1	Jan	Nursing home	48	0	Unknown	Suspected norovirus	Steele
2	Jan	Assisted living	41	0	Unknown	Suspected norovirus	Mower
3	Feb	Nursing home	125	2	Unknown	Norovirus	Faribault
4	Feb	Nursing home	50	0	Unknown	Suspected norovirus	Lake Of The Woods
5	Feb	Nursing home	56	0	Unknown	Suspected norovirus	Brown
6	Mar	Restaurant	8	0	Unknown	Unknown	Otter Tail
7	Mar	Private home	11	0	Unknown	Unknown	Hennepin
8	Jul	Picnic	12	2	Unknown	*E. coli* O157:H7	McLeod
9	Jul	County fair	5	5	Unknown	*E. coli* O157:H7	Stearns
10	Jul	Camp	8	2	Unknown	*E. coli* O26:NM	Otter Tail
11	Nov	Private home	8	0	Unknown	Suspected norovirus	Carver
12	Dec	Private party	15	1	Unknown	*Shigella sonnei*	Ramsey

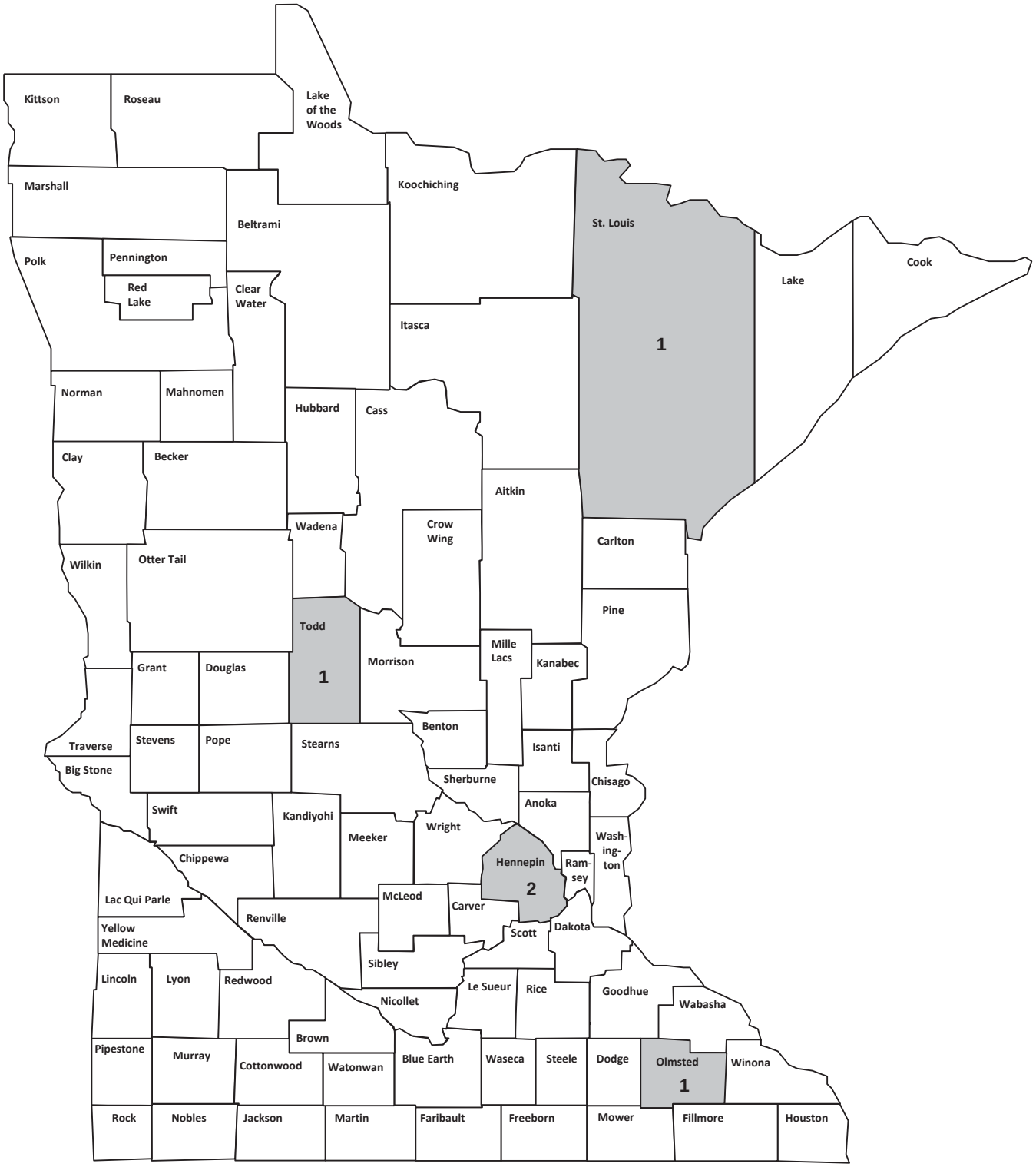
TOTAL: 12

Confirmed Foodborne Outbreaks by County, Minnesota, 2012 (n=50*)

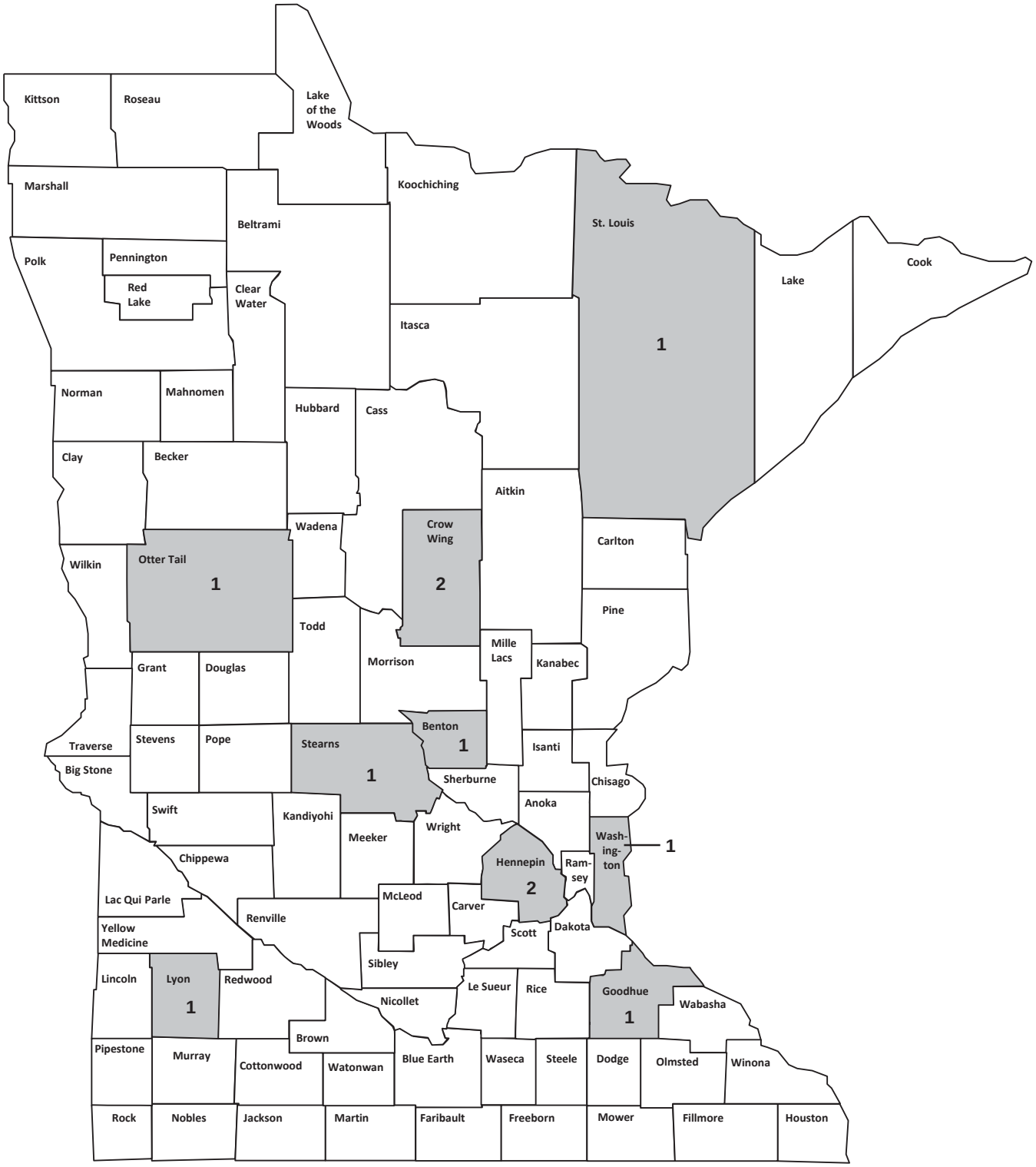


* The total number of confirmed outbreaks in 2012 was 53; however, the numbers on the map add up to 50. The remaining 3 outbreaks (#25, #27, and #39) involved multiple counties.

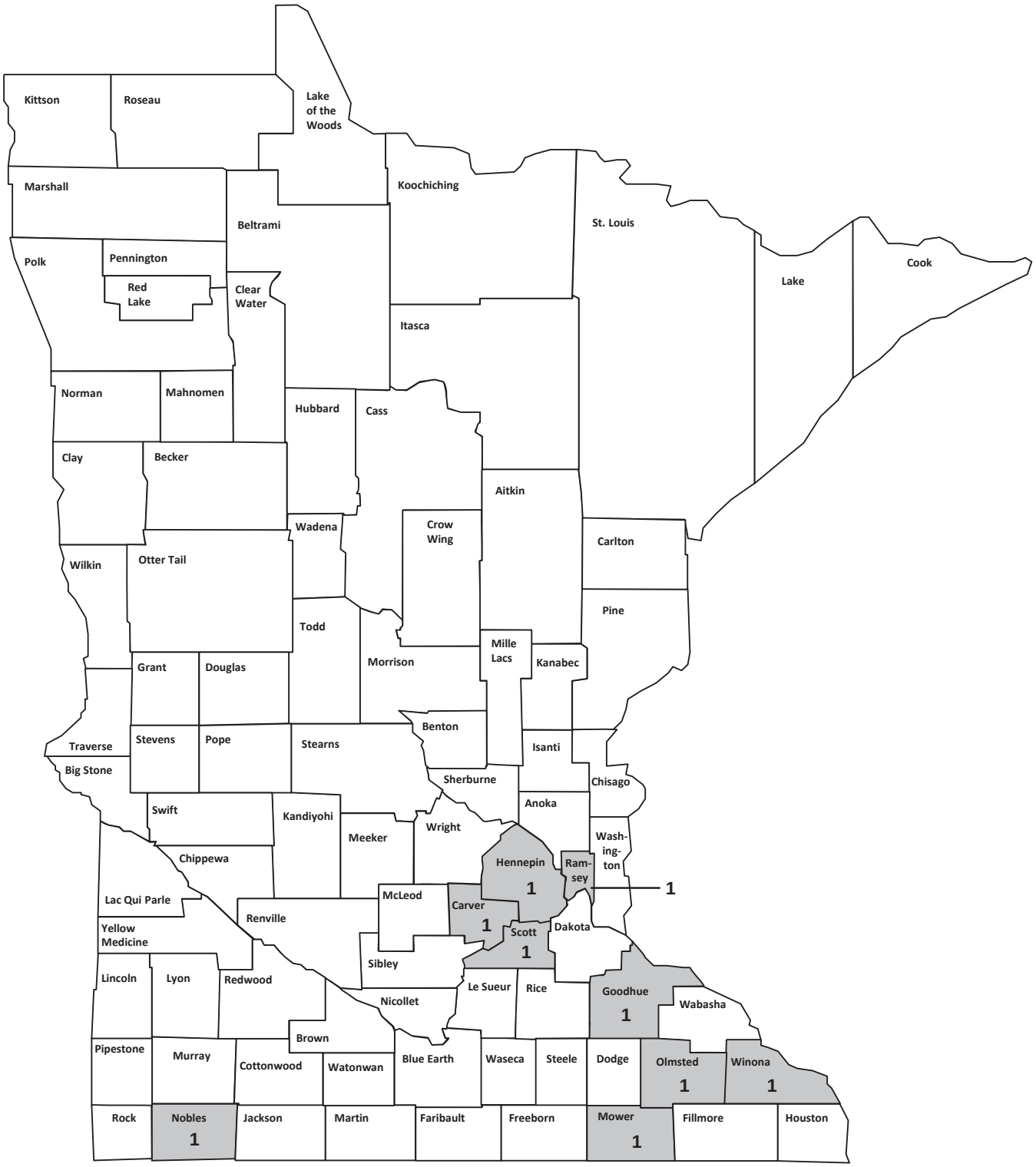
Probable Foodborne Outbreaks by County, Minnesota, 2012 (n=5)



Confirmed Waterborne Outbreaks by County, Minnesota, 2012 (n=11)

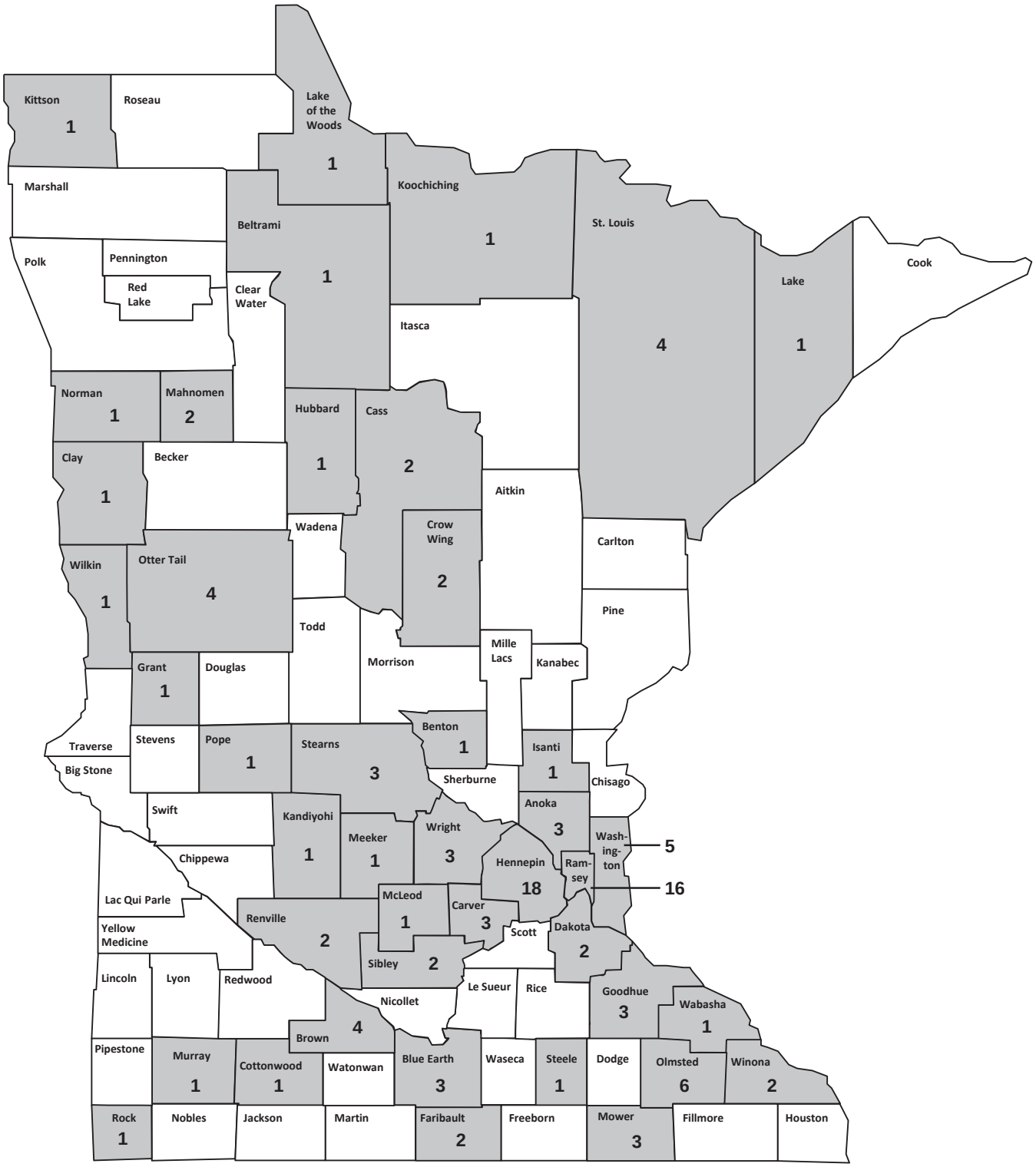


Animal Contact Outbreaks by County, Minnesota, 2012 (n=9*)



* The total number of outbreaks due to animal contact in 2012 was 11; however, the numbers on the map add up to 9. The remaining two outbreaks (#3, and #4) involved multiple counties.

Outbreaks with Other or Unknown Routes of Transmission, Minnesota, 2012 (n=115*)



* The total number of outbreaks with other or unknown route of transmission in 2012 was 116; however, the numbers on the map add up to 115. The remaining outbreak (#70) involved multiple counties.

Foodborne Illness Complaints, Minnesota, 2012

City and County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
Aitkin County	1	0	1
Anoka County	34	8	42
* Becker County	0	0	0
* Beltrami County	3	0	3
* Benton County	0	0	0
Big Stone County	0	0	0
Bloomington/Richfield, City of	47	40	87
* Blue Earth County	12	0	12
Brooklyn Park, City of	11	0	11
Brown County	0	0	0
* Carlton County	2	0	2
* Carver County	10	0	10
* Cass County	5	0	5
Chippewa County	0	0	0
* Chisago County	3	0	3
Clay County	2	0	2
* Clearwater County	0	0	0
* Cook County	2	0	2
Cottonwood County	0	0	0
* Crow Wing County	13	0	13
Crystal, City of	0	0	0
* Dakota County	64	0	64
* Dodge County	2	0	2
Douglas County	2	0	2
Edina, City of	19	10	29
Faribault County	1	0	1
* Fillmore County	0	0	0
* Freeborn County	3	0	3
Goodhue County	4	0	4
* Grant County	0	0	0
Hennepin County	74	25	99
Hopkins, City of	0	0	0
* Houston County	0	0	0

Foodborne Illness Complaints, Minnesota, 2012 (continued)

City or County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
* Hubbard County	0	0	0
* Isanti County	1	0	1
* Itasca County	2	0	2
* Jackson County	0	0	0
* Kanabec County	1	0	1
Kandiyohi County	3	0	3
* Kittson County	0	0	0
* Koochiching County	0	0	0
Lac Qui Parle County	1	0	1
Lake County	1	0	1
* Lake of the Woods County	0	0	0
Le Sueur County	2	0	2
Lincoln County	0	0	0
* Lyon County	1	0	1
* Mahnomen County	0	0	0
Maplewood, City of	18	0	18
* Marshall County	0	0	0
Martin County	1	0	1
* McLeod County	6	0	6
* Meeker County	1	0	1
* Mille Lacs County	5	0	5
Minneapolis, City of	141	0	141
Minnetonka, City of	16	1	17
Moorhead, City of	0	0	0
Morrison County	0	0	0
* Mower County	2	0	2
Murray County	0	0	0
Nicollet County	4	1	5
Nobles County	1	0	1
* Norman County	0	0	0
Olmsted County	16	47	63
* Otter Tail County	2	0	2
* Pennington County	1	0	1
* Pine County	2	0	2

Foodborne Illness Complaints, Minnesota, 2012 (continued)

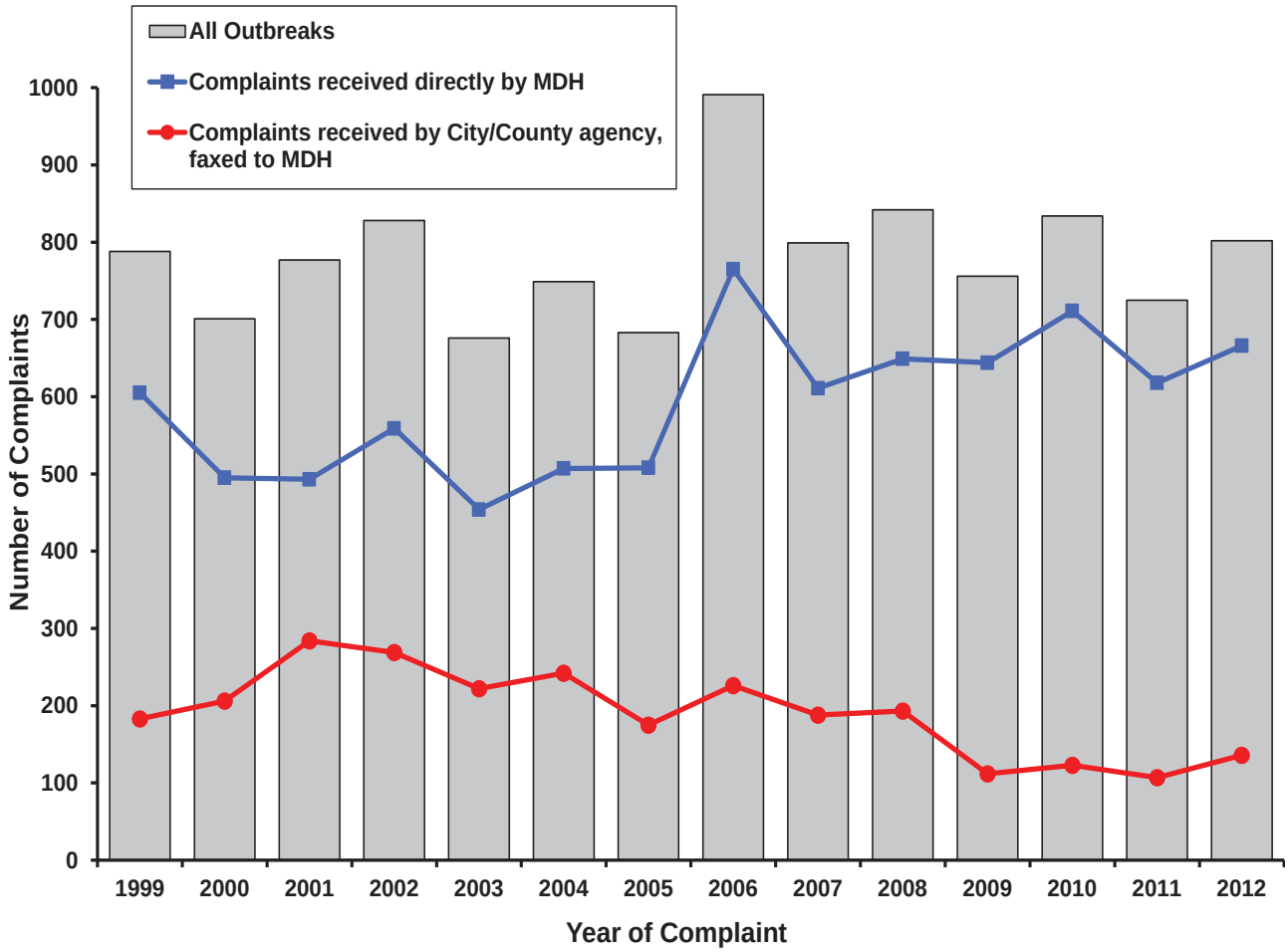
City or County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
Pipestone County	0	0	0
* Polk County	0	0	0
Pope County	0	0	0
Ramsey County	45	0	45
* Red Lake County	0	0	0
Redwood County	0	0	0
Renville County	0	1	1
* Rice County	3	0	3
Rock County	0	0	0
* Roseau County	1	0	1
St. Cloud, City of	6	0	6
St. Louis County	32	2	34
St. Louis Park, City of	14	0	14
St. Paul, City of	89	1	90
* Scott County	15	0	15
* Sherburne County	3	0	3
* Sibley County	2	0	2
Stearns County	4	0	4
* Steele County	2	0	2
Swift County	0	0	0
* Stevens County	0	0	0
Todd County	1	0	1
* Traverse County	0	0	0
Wabasha County	0	0	0
Wadena County	0	0	0
Waseca County	0	0	0
Washington County	36	0	36
Watonwan County	0	0	0
Wayzata, City of	4	0	4
Wilkin County	1	0	1
Winona County	7	0	7
* Wright County	7	0	7
Yellow Medicine County	1	0	1
Bureau of Indian Affairs	2	0	2

Foodborne Illness Complaints, Minnesota, 2012 (continued)

City or County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
FDA	0	0	0
MN Dept of Ag	50	0	50
MDH Environmental Health	5	0	5
U of M	3	0	3
USDA	0	0	0
Total	**875**	**136**	**1011**

* MDH Environmental Health Services jurisdiction (total number of reports faxed to MDH EHS Metro or District Offices = 176)

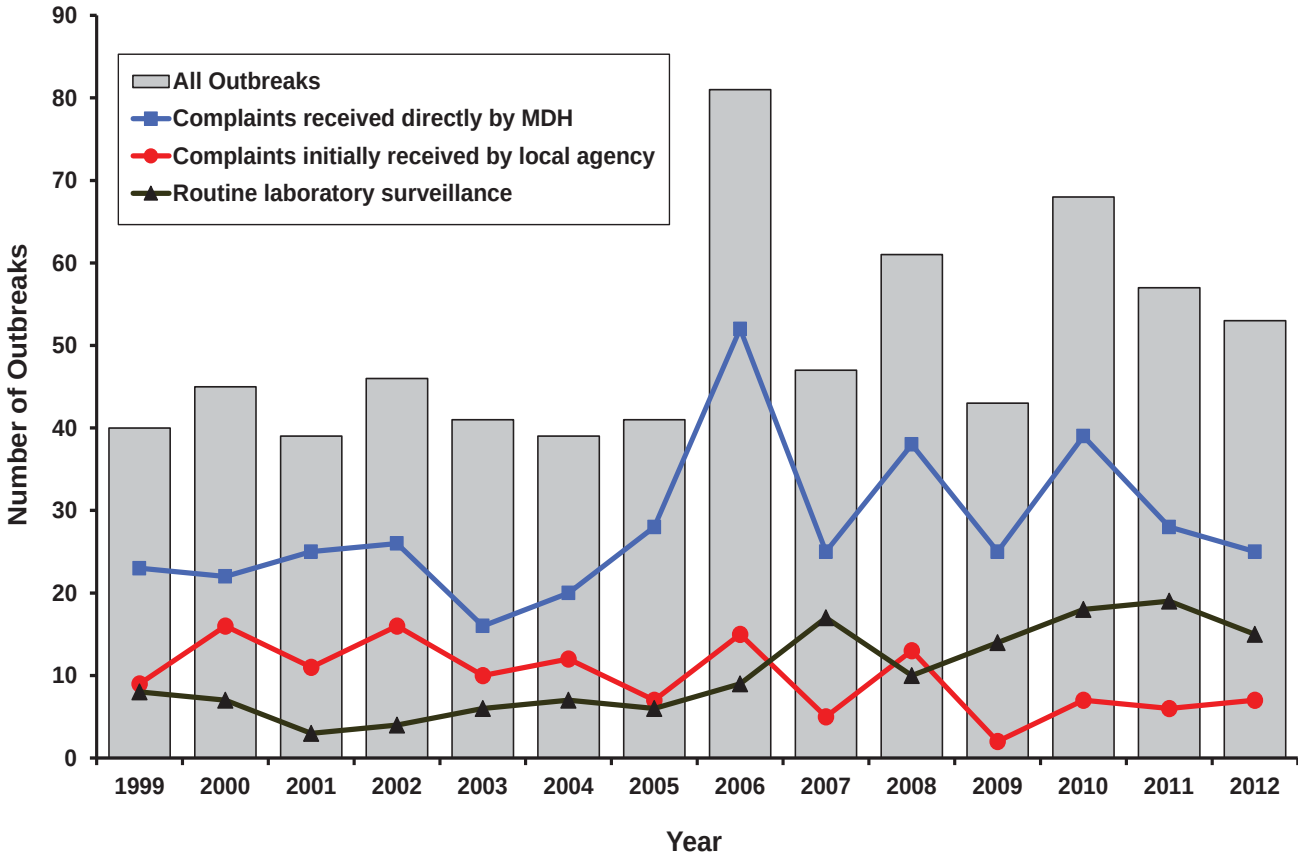
Figure 1. Number of Foodborne Illness Complaints per Year, Minnesota, 1999-2012



In 2012, MDH received 802 foodborne illness complaints. Detailed information on symptoms and a food history were obtained from each call (4-day food history if a single ill person or if all people lived in the same household), and the complaint was faxed to the appropriate jurisdiction for each restaurant, deli, grocery store, or other establishment mentioned in the complaint. Of the 802 complaints received, 666 (83%) were received directly through the MDH foodborne illness hotline (1-877-FOODILL) and 136 (17%) were reported to MDH by local public health agencies (Figure 1). In 2012, 32 (60%) of the 53 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via phone calls from the public; of those, 25 (78%) were reported directly to MDH (Figure 2).

See the Minnesota Integrated Food Safety Center of Excellence website for a more detailed description of the MDH foodborne illness complaint system: http://mnfoodsafetycoe.umn.edu/foodborne-illness-complaint-system/

Figure 2. Confirmed Foodborne Outbreaks by Method of Initial Identification, Minnesota, 1999-2012



Revised: 4/23/2014

Foodborne Illness Report
Minnesota Department of Health
Phone: (651) 201-5414 Fax: (651) 201-5082

Complaint date: _____/_____/_____ **Hotline call:** ☐ **How you got #_**_____ Tennessen: ☐

Agency: Minnesota Department of Health Reporter: _____

First Name:_____ Last Name: _____ Age: _____ ☐ Female ☐ Male

Address: _____ Zip: _____

Home phone: (_____)_____ Work phone: (_____)_____ Cell: (_____)_____

Establishment that the complainant suspects: _____

Number of persons exposed: _____ Number ill: _____ How many households with illness: _____

Did complainant call the establishment? : ☐Y ☐N If yes, who did they speak with: _____

**If a retail food product is suspected, please fill out page 4 (Retail Food Product Complaint) in addition to the 4-day food history*

ILLNESS HISTORY Illness Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Vomiting ☐Y ☐N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Diarrhea ☐Y ☐N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

# of stools per 24-hr. period (max): _____ Cramps ☐Y ☐N Fever ☐Y ☐N (temp:____) Bloody stools ☐Y ☐N

Other symptoms: _____ Visited health care provider ☐Y ☐N

If yes, name and location: _____ Date of visit: ____/____/____

Provider requested stool sample ☐Y ☐N If yes, date stool submitted: ____/____/____ Hospitalized ☐Y ☐N

FOOD HISTORY

If only one person is ill or if all ill persons live in same household, complete the entire four-day food history.
If more than one person is ill and they live in different households, record only the common meals.

Meal Time	Date: ____/____/____ *(work backward starting with onset date)*	Hours to Illness Onset
Brk: _____	location: _____ food/drinks: _____	____
	_____	
Lun: _____	location: _____ food/drinks: _____	____
	_____	
Sup: _____	location: _____ food/drinks: _____	____
	_____	
Other: _____	location: _____ food/drinks: _____	____

Meal Time **Date: ____/____/____** **Hours to Illness Onset**

Brk: _____ location: _____ food/drinks: _____ ____

_____

Lun: _____ location: _____ food/drinks: _____ ____

_____

Sup: _____ location: _____ food/drinks: _____ ____

_____

Other: _____ location: _____ food/drinks: _____ ____

Meal Time **Date: ____/____/____** **Hours to Illness Onset**

Brk: _____ location: _____ food/drinks: _____ ____

_____

Lun: _____ location: _____ food/drinks: _____ ____

_____

Sup: _____ location: _____ food/drinks: _____ ____

_____

Other: _____ location: _____ food/drinks: _____ ____

Meal Time **Date: ____/____/____** **Hours to Illness Onset**

Brk: _____ location: _____ food/drinks: _____ ____

_____

Lun: _____ location: _____ food/drinks: _____ ____

_____

Sup: _____ location: _____ food/drinks: _____ ____

_____

Other: _____ location: _____food/drinks: _____ ____

Complainant occupation: _____ Daycare exposure: Y N

Have you been swimming in the past 2 weeks: Y N If yes, where_____ Date: ____/____/____

Did you drink any well water in the past 2 weeks: Y N If yes, where _____

Any ill household members in the last week: Y N If yes, who_____ Date: ____/____/____

AGENCIES NOTIFIED □ MDH-EHS □ MDH-District Office □ MN Dept of Ag □ FDA □ USDA

□ Local Agencies: _____

Comments _____

HISTORY OF OTHERS ILL **Original Complainant's Name:_____**

First name:_____ Last name:_____ Age:____

Address: _____ Phone: _____

Illness Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Vomiting □Y □N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Diarrhea □Y □N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

# of stools per 24-hr. period (max): _____ Cramps □Y □N Fever □Y □N (temp:____) Bloody stools □Y □N

Other symptoms: _____

Meals in common: **Incubation**

Meal 1: location: _____ food/drinks: _____ ____

_____

Meal 2: location: _____ food/drinks: _____ ____

_____

Meal 3: location: _____ food/drinks: _____ ____

_____

First name:_____ Last name:_____ Age:____

Address: _____ Phone: _____

Illness Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Vomiting □Y □N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

Diarrhea □Y □N Onset: ____/____/____ Time: _____ Recovery: ____/____/____ Time: _____

# of stools per 24-hr. period (max): _____ Cramps □Y □N Fever □Y □N (temp:____) Bloody stools □Y □N

Other symptoms: _____

Meals in common: **Incubation**

Meal 1: location: _____ food/drinks: _____ ____

_____

Meal 2: location: _____ food/drinks: _____ ____

_____

Meal 3: location: _____ food/drinks: _____ ____

_____

Original Complainant's Name:_____

RETAIL FOOD PRODUCT COMPLAINT ***(please fill in as much information as you can)***

Name of product (please be specific): _____

Brand of product: _____

Manufacturer and/or distributor information (name and address): _____

_____

Container type, size and weight (18 oz. plastic bottle, 1 lb. paper carton, etc.): _____

USDA establishment number (if a packaged meat product): _____

UPC code (12-digit bar code): _____

Product/Lot/Best if Used By Date (BIUB) code: _____

_____

_____

Purchase location (name of store): _____

Address of purchase location: _____

Purchase date: _____

Does consumer still have the product or other containers of the same product? _____

_____

Other information: _____

_____

Foodborne Disease Outbreak Investigation Guidelines
Minnesota Department of Health
Phone: 651-201-5414
Fax: 651-201-5082

The Minnesota Department of Health (MDH) has developed a model for investigating foodborne illness using a centralized group of interviewers (Team Diarrhea) coordinated with local environmental health assessment of the establishment(s) involved in the outbreak. This approach allows us to rapidly respond to reports of outbreaks, standardize outbreak investigations, maintain a statewide database of foodborne diseases, and distribute information quickly and consistently.

When local agencies learn of a possible outbreak, they should notify the Minnesota Department of Health immediately to initiate an appropriate outbreak response.

During investigations, epidemiologists at MDH and local agencies will work with a network of environmental health specialists and other health agencies to evaluate critical elements of the outbreak. Environmental health inspectors and field epidemiologists will focus on restaurant inspection, interviewing employees, and assessing food preparation and safety, while the central group of epidemiologists will coordinate patron interviews, stool collection and testing, and data analysis. MDH is responsible for compiling and storing outbreak data and for summarizing outbreaks; however, local agencies are invited to write or contribute to all final reports. MDH has an outbreak report template available for agencies that choose to write their own final reports. All final reports should be faxed or mailed to MDH within a month of completion of the outbreak investigation. Minnesota outbreak reports will be included in the annual Minnesota Department of Health Gastroenteritis Outbreak Summary. MDH will forward outbreak information to the Centers for Disease Control and Prevention for national archiving. Detailed and thorough outbreak reports are critical in assessing the burden of foodborne disease outbreaks in Minnesota and nationally. This model of foodborne disease outbreak investigation, with a core group of epidemiologists and an extensive network of environmental health specialists, local, state and federal health agencies, and field epidemiologists distributed across the state provides Minnesotans with an efficient foodborne disease surveillance system.

Investigation Guidelines

When investigating outbreaks, MDH uses the following guidelines to ensure a prompt and appropriate response to possible outbreaks and to obtain consistent and useful data from every investigation.

Particular attention has been given to areas of investigations that are easily and frequently overlooked, but which are critical to agent and vehicle identification. A sample outbreak investigation questionnaire is attached. Epidemiologic data often offers the only evidence of an outbreak source and the responsible organism. Therefore, interviews with all cases and controls must be detailed, thorough, and consistent.

I. Patron Investigation

Tennessen Statements

The Tennessen statement is a requirement by the Minnesota Data Practices Act to inform the subject being interviewed of:

- The purpose of the interview
- Who will have access to the information
- The intended use of the information
- Any consequence of providing or not providing the requested information

Patient Information

The following questions capture the essential data needed to assess outbreaks caused by bacterial, viral, and parasitic organisms. The information below should be obtained in every interview.

1) Demographic and locating information on respondent

- Name and address
- Day and evening phone numbers
- Date of birth
- Gender

2) Illness History (verify that controls had no gastrointestinal symptoms)

- Fever (Yes/No) (Try not to ask if the person felt "feverish." Ask only if the person "had a fever.")
- Temperature (highest)
- Diarrhea (Yes/No)
- Date of diarrhea onset
- Time of diarrhea onset, in military time
- Maximum number of stools in a 24-hour period (This is critical information because the definition of diarrhea is **at least 3 loose stools in a 24-hour period**)
- Date of diarrhea onset
- Time of diarrhea onset, in military time
- Date of last episode of diarrhea
- Time of last episode of diarrhea
- Vomiting (Yes/No)
- Date of vomiting onset
- Time of vomiting onset, in military time
- Date of last episode of vomiting
- Time of last episode of vomiting, in military time
- Bloody stools (Yes/No)
- Abdominal cramps (Yes/No)
- First symptom

- Date of onset of first symptom (necessary in order to calculate the incubation period)
- Time of first symptom (The specific hour of onset, in military time, is necessary to calculate the incubation period)
- Date of recovery (necessary in order to calculate the duration of illness)
- Time of recovery (The specific hour of recovery, in military time, is necessary to calculate the duration of illness)
- Was person hospitalized? (Yes/No)
- If yes: where, admission date, discharge date
- Did person visit a physician? If yes, physician's name and phone number.
- Did person submit a stool culture? If yes, when.

3) Exposure History

- Ask about consumption of **every food** available to people involved in the outbreak.
- Ask specifically about **ice and water** consumption at every meal being evaluated.
- Ask specifically about **ice and water** consumed at any time other than at meals.
- Ask about all events associated with the outbreak.

Example: If the outbreak is associated with a wedding, ask about attendance at any showers, pre-wedding parties, the rehearsal dinner and the wedding reception. Occasionally, there may be two case clusters that need to be teased out in the epidemiological investigation. For example, one group may become infected at the bridal shower, and the organism may be transmitted at the wedding reception by a food vehicle such as the wedding cake made by the groom's sister the morning before the wedding.

4) Stool Cultures

Laboratory detection is most sensitive when samples are collected early in the course of illness. Always obtain stool samples as soon as possible when an outbreak is suspected. When this is not possible, samples should still be collected, even from persons whose symptoms have resolved. **Cases may continue to shed the bacteria or viruses for several days after recovery**. Persons with asymptomatic infections may excrete the organism for months.

Ideally, stool samples should be obtained from 4 to 6 cases. Samples should be refrigerated but NOT FROZEN until they are submitted to the laboratory. The exception to this is when a bacterial pathogen is suspected and specimens will not be submitted for several days, samples should be frozen until they are sent to MDH. For example, if stool kits are given to cases in a suspected *E. coli* O157:H7 outbreak on Friday and will not be delivered to MDH before Monday, samples should be frozen.

A viral pathogen (e.g., norovirus) may be suspected when the outbreak is characterized by:

1) Median incubation period of 24-48 hours, and
2) Vomiting in at least 50% of cases or vomiting more frequent than fever, and
3) Median duration ≤2 days

A bacterial pathogen (e.g., *Salmonella*, *E. coli* O157:H7) may be suspected when the outbreak is characterized by:

1) Fever and/or bloody stools
2) Median duration >2 days
3) Median incubation period of 3 days or more (some bacterial pathogens, e.g., *Salmonella*, can have a shorter median incubation)

II. Investigation at the Food Service Establishment – See page 145, "MDH Procedures for Conducting Environmental Investigations of Foodborne Disease Outbreaks"

III. Report Summarizing the Event

The final report will be entered into the statewide outbreak database and included in the state's annual summary of foodborne disease outbreaks. Every report includes the following information:

Background

- Date the investigating agency was notified of the outbreak
- Description of the initial report made to the investigating agency
- Date of the event
- Date of initiation of the investigation

Methods

- Who provided information about event attendees (names and/or phone numbers)
- Other agencies that were notified of the outbreak and investigation
- The number of people who attended the event
- The case definition used for the outbreak (the standard definition is vomiting or diarrhea, ≥ 3 stools in a 24-hour period, following the event)
- The number of people interviewed (at least one control should be interviewed per case, and ideally two or more controls should be interviewed per case)
- The number of stools collected for testing
- The pathogens that were tested for in the stool specimens
- Relevant environmental health measures implemented

Results

- The number of people interviewed who met the case definition
- The number of people interviewed with gastrointestinal symptoms who did not meet the case definition
- The percentage of interviewed cases with each of the following symptoms: diarrhea (≥ 3 stools in a 24-hour period), vomiting, fever, bloody stools, and abdominal cramps. Other symptoms may be listed as appropriate.
- The median incubation period and incubation range
- The median duration of illness and duration range
- Hospitalization status of cases
- Results of the stool testing (including PFGE results, if applicable)
- Food items or events that were statistically associated with illness

- The odds ratio(s), p-values, and confidence intervals of the implicated item(s)
- Results of food worker interviews (the number of ill food workers, any corrective actions taken)
- Results of food worker stool cultures
- All relevant information found in the environmental investigation

Conclusion

- Etiologic agent
- Implicated vehicle(s)
- Discussion of route of transmission
- Contributing factors to contamination and/or transmission (discuss all plausible sources of contamination when necessary)
- Defense of conclusion, if needed (for example, how do the symptoms, incubation period, and duration suggest a particular pathogen?)

MDH Procedures for Conducting Environmental Investigations of Foodborne Disease Outbreaks

I. Introduction

A systematic environmental investigation is a critical aspect of foodborne illness outbreak investigations. The environmental investigation aims to:

- Identify and eliminate the factors that could lead to further transmission;
- Clarify the nature and mechanism of disease transmission; and
- Provide information needed to design effective strategies to prevent future outbreaks.

The environmental investigation should be initiated as soon as notice of a suspect foodborne disease outbreak is received, but no later than 24 hours after being notified. The investigation of a suspect foodborne disease outbreak is different from a routine inspection. Such an investigation requires a systematic assessment of critical food handling procedures, focusing as much as possible on procedures suggested by preliminary epidemiological and/or laboratory information. The environmental investigation will be coordinated by an Environmental Health Specialist/ Sanitarian with involvement of laboratory and epidemiology staff. Any information gathered during the environmental investigation will be done in a manner that is consistent with the Data Practices Act.

II. Information Sharing

EHS personnel involved in the environmental investigation of the implicated FSE will be the main point of contact between the FSE and MDH. Regular communication with ADIC/LPH staff throughout the investigation is necessary to know of the status of the epidemiologic and laboratory investigations. In addition, the following persons should be updated on the progress of the environmental investigation on an on-going basis:

- EHS Outbreak Coordinator, if the outbreak is in MDH jurisdiction
- Your supervisor
- The principal epidemiologist (epidemiologist working on the outbreak).

Note: Media requests for information should be directed to the MDH communications office or the LPH PIO.

III. Conducting the Investigation

A. **Conference Call**: In most cases, a conference call between ADIC and EHS/LPH staff will be held during the initial phase of foodborne disease outbreak investigations. Pay special attention to any working hypotheses that are developed during the conference call. If a conference call is not held or is delayed, consult key staff from each program (ADIC, EHS, and PHL) regarding likely explanations for the outbreak, sample/specimen collection options and strategies, and enforcement options. Key information obtained during this call might include:

- Demographic information about cases
- Illness history for cases
- Number of cases
- Food consumption history
- Name and address of implicated establishment
- How the outbreak was identified
- Information about any suspect food vehicles
- Information regarding the suspected agent(s)
- Recent inspection reports (covering at least 2 inspections)

  This information is helpful in developing hypotheses regarding the likely agent, the likely vehicle, how and where the vehicle became contaminated and could suggest actions needed to reduce or eliminate the risk of further transmission.

B. **Contact the Establishment**: Contact the implicated establishment and request that the manager(s) or senior staff member(s) be available for a meeting with the on-site investigation team at the facility at a specified time. Also, when necessary, request information about:

- Menus
- Customer receipts or credit card receipts
- Employee work schedules
- Employee illness

In some situations, the facility's management may be instructed to fax/e-mail information to designated individuals in ADIC or LPH.

C. **Select Tools for the On-site Investigation**: Certain items are needed to facilitate collection of information and/or samples during an outbreak. It may be helpful to prepare an outbreak "kit" containing the following items for the on-site investigation:

- MDH foodborne outbreak investigation manual
- Food worker interview forms
- Fact sheets about suspected agents
- Information about handwashing and food worker illness
- Sterile sampling containers
- Specimen containers (stool kits)
- Appropriate media (transport or enrichment)
- Disinfection and sterilizing agents
- Cooler and ice packs
- Sterile implements for sample collection (e.g. scoops, spoons, tongs, tongue depressors, swabs)
- Telephone/pager numbers of key MDH/LPH personnel (including after hours contact numbers)
- Thermometers and data loggers
- pH meter
- Water activity meter
- Enforcement guide
- Camera

IV. On-site Investigation

A. **Management Meeting:** Upon arriving at the implicated establishment, introduce yourself to the FSE management and explain the purpose of your visit.

(1) Provide an overview of the investigation process, including a brief description of the roles of ADIC, LPH, and PHL.

(2) Answer questions and provide details regarding what is known about the outbreak up to that point. **Note: under no circumstances should protected information, such as a complainant's name be shared with establishment personnel (consult the data practices guide or your supervisor for further information).**

(3) Request management's assistance in:

a. Arranging employee interviews

b. Providing records for review (food temperature logs, employee illness records, food purchasing records, etc)

c. Providing work space for field team where possible

d. Arranging for sample/specimen collection and submission to PHL, if needed

B. Assess Management Control and Operation:

i. Ask about the training and experience of the manager.

ii. Identify the Person in Charge (PIC) at key times suggested by the initial outbreak information.

iii. Obtain information about the operation such as: days and times of operation, number of staff, number of shifts, staffing needs, etc.

iv. Ask about the duties performed by each staff member (including manager). In particular, ask about the food handling responsibilities of all staff.

v. Ask about the establishment's policy regarding ill workers and ask to view the employee illness logs.

C. Conduct Hazard Analysis:

i. Obtain flow charts of preparation procedures for potentially hazardous foods (PHFs), focusing on items suggested by initial outbreak information.

ii. Identify critical control points (CCP) and likely hazards (consult annex 5 of 2001 FDA Food Code for further information).

iii. Evaluate the establishment's monitoring procedures for CCPs by reviewing records, interviewing staff, or observing practices.

iv. Assess whether critical limits for PHFs are/were met by reviewing records, interviewing staff, taking measurements, and/or observing food preparation activities.

v. Determine if there is an appropriate mechanism for taking corrective actions when critical limits are exceeded. This can be accomplished by reviewing the establishment's records, interviewing staff, or observation.

Note: This approach to hazard analysis is applicable in all outbreaks linked to FSEs. An analysis based on formal HACCP principles should be attempted even in establishments that are not required to have HACCP plans.

D. Review Sanitation Standard Operating Procedures (SSOPs):

i. Observe establishment layout and food flow (look for opportunities for cross-contamination)

ii. Check cleanliness of equipment and utensils

iii. Check cleanliness of floors, walls, and ceilings

iv. Obtain cleaning schedules and procedures (note the use of high pressure sprayers)

v. Review sanitization procedures (type of sanitizer, appropriateness of use, appropriateness of concentration used)

vi. Evaluate water and wastewater systems

E. Collect Environmental and Stool Samples:

i. Collect samples of food remaining from suspect meal (if available and only after consultation with ADIC and PHL)

ii. Collect foods prepared in the same way as the suspect food, if none of the suspect food is available (only after consultation with ADIC and PHL)

iii. Label samples and establish chain of custody

iv. Store samples in a manner appropriate for the agent under suspicion

v. Arrange for collection and submission of stool samples

vi. Arrange delivery of samples to PHL as soon as possible but no later than 12 hours after collection

Note: Use appropriate sampling techniques and collect enough sample to aid identification of suspect agent (contact the PHL for further information).

F. Enforcement:

Enforcement actions against a FSE implicated in a foodborne disease outbreak should focus on operations and behaviors that are the likely cause of the outbreak. All observed critical violations must be noted and orders issued for immediate correction of each (see Minnesota Food Code for definition of critical violations). Enforcement actions may include:

i. Closing the facility;

ii. Issuing a fine;

iii. Excluding or restricting ill workers;

iv. Issuing embargo orders;

v. Condemning food; and/or

vi. Issuing correction orders

Note: some of the above enforcement actions require special considerations to ensure the desired effect. As a general rule, review all enforcement decisions with your supervisor before taking action.

G. Closing a FSE:

Closing a FSE may be necessary to eliminate the risk for further transmission of a foodborne disease agent. The recommendation to close a FSE should only be made after carefully assessing the following factors with your supervisor:

i. Evidence of ongoing transmission or insufficient information regarding whether transmission has been arrested

ii. The overall sanitary status of the establishment (including the availability of safe drinking water, and adequate waste disposal facilities)

iii. The establishment's record related to the correction of critical violations

iv. The availability of a qualified food service manager(s)

v. The number and type of critical violations observed

vi. The likely impact on food safety of mandatory staff exclusions and/or restrictions

vii. The agent involved in the outbreak

viii. The population at risk

Note: orders to close a FSE must be communicated to management in writing. The orders must specify when the facility is to be closed, why the facility is being closed, and the conditions that must be met before the facility is allowed to re-open.

H. Re-opening a FSE

Once it is determined by re-inspection that all conditions specified in the closure orders are met and after consultation with ADIC, the FSE must be permitted to re-open. Permission to re-open must be granted in writing.

I. Report

Upon completing the environmental investigation prepare a summary report containing the following headings and information:

i. Background

- Name and address of the establishment
- Number of ill patrons
- The suspect etiologic agent
- How the outbreak was identified
- How and when EHS was notified

ii. Findings

- Critical violations and repeat critical violations
- Food/surface testing results
- Unusual food preparation procedures
- Employee illness information
- Any other information that could have a bearing on the outbreak

iii. Actions

- Steps taken to confirm the cause of the outbreak
- Steps taken to curtail the outbreak (with dates)
- Education

iv. Conclusions

- Offer some explanation of why the outbreak occurred (based on environmental, epidemiological, and/or laboratory findings).

Note: Copies of summary report and any other documents pertaining to the environmental investigation such as photographs, orders, or video recordings must be submitted to the principal epidemiologist two weeks after completing the environmental investigation. A copy of the final report may be submitted to the FSE, plaintiff's attorneys, or other eligible parties if requested in writing (see data practices policies for further information).

J. Wrap-up (Lessons learned)

Each outbreak provides an opportunity to evaluate the effectiveness of our efforts to prevent foodborne disease outbreaks. At the conclusion of the outbreak investigation, you may be asked to collaborate with ADIC, LPH and PHL staff to identify any lessons learned, and develop fact sheets and other educational materials that could be used to train public health staff and food service workers.

SAMPLE FOODBORNE OUTBREAK INVESTIGATION QUESTIONNAIRE

Name of Outbreak
City, MN
Date

Date: _____

Interviewer: _____

Name:_____ Age _____ Sex: F M

Street:_____ City:_____ County: _____

State: _____ Zip code: _____ Phone (H)_____ (W)_____

Illness Onset: _____/____/_____ Time:_____ Recovery: _____/____/_____ Time:_____

Vomiting □Y □N Onset: ____/____/_____ Time: _____ Recovery: ____/____/_____ Time: _____

Diarrhea □Y □N Onset: ____/____/_____ Time: _____ Recovery: ____/____/_____ Time: _____

Number of stools per 24-hr period (max): _____ Diarrhea duration: _____ days/hours

Bloody stools □Y □N Cramps □Y □N Fever □Y □N Temperature _____◦F

First Symptom: _____ Onset Date: ____/____/_____ Time:_____

Other Symptoms: _____ Onset Date: ____/____/_____ Time:_____

Called Provider: □Y □N Visited Provider: □Y □N Office / ER Date of Visit: ____/____/_____

Provider requested stool sample: □Y □N Stool submitted: □Y □N Hospitalized: □Y □N

Are you willing to submit a stool sample for testing? ☐Y ☐N

Meal Date: _____/_____/_____ Meal Time: _____

[sample menu]

Fried chicken	Y	N	U	Soda (type:_____)	Y	N	U
Ham	Y	N	U	Fruit punch	Y	N	U
Au gratin potatoes	Y	N	U	Coffee	Y	N	U
Baked beans	Y	N	U	Water	Y	N	U
Potato salad	Y	N	U	Ice	Y	N	U
Tossed salad	Y	N	U	Other food or drink	Y	N	U
dressing: _____	Y	N	U	List: _____	Y	N	U
Angel food cake	Y	N	U		Y	N	U

Did anyone in your household experience gastrointestinal illness in the week prior to this meal? □Y □N

Name and relationship	Age	Onset date
_____	____	____/____/____
_____	____	____/____/____
_____	____	____/____/____