

MINNESOTA DEPARTMENT OF HEALTH 2010 GASTROENTERITIS OUTBREAK SUMMARY

Foodborne Outbreaks
Waterborne Outbreaks
Outbreaks with Other Routes of Transmission
Foodborne Illness Complaints
Foodborne Disease Outbreak Investigation Guidelines



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**MINNESOTA DEPARTMENT OF HEALTH
2010 GASTROENTERITIS OUTBREAK SUMMARY**

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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.

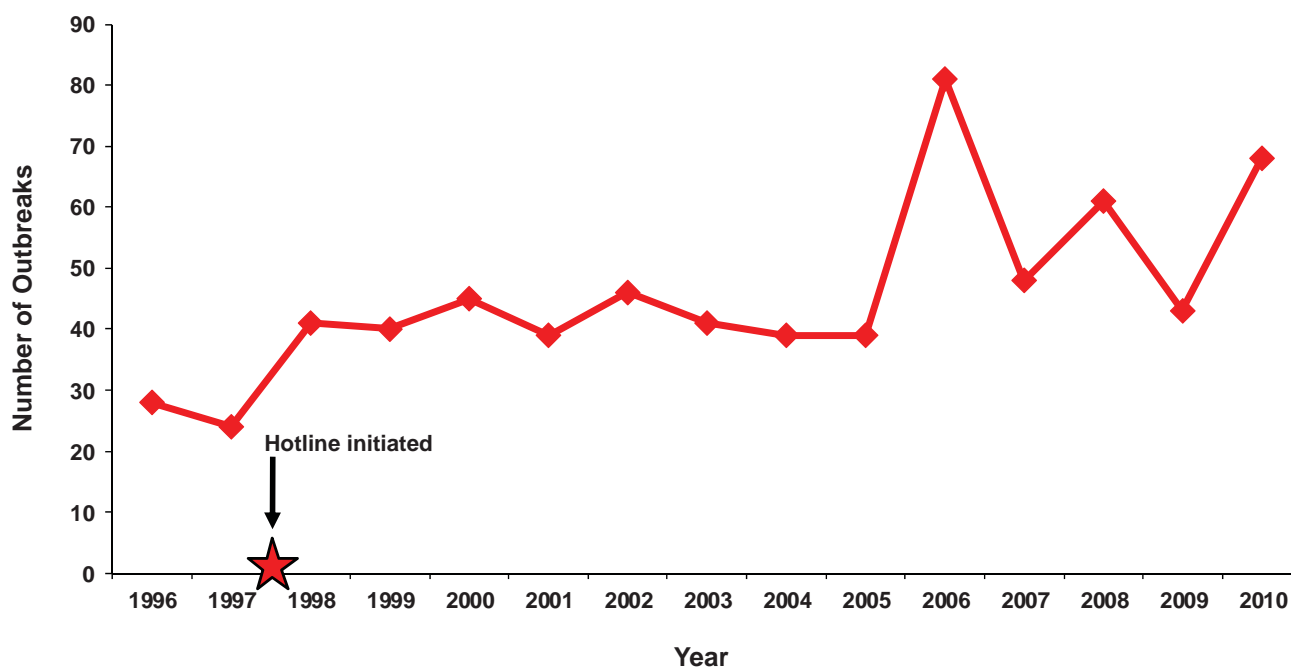
Outbreaks with Other or Unknown Routes of Transmission

These outbreaks are defined as two or more cases of illness related by time and place in which an epidemiologic evaluation suggests either person-to-person transmission occurred, or a vehicle other than food or water (e.g., animal contact) is identified. This category also includes outbreaks for which the route of transmission could not be determined.

Summary

In 2010, the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section identified a total of 164 outbreaks of gastroenteritis involving at least 3,311 cases of illness. The 164 outbreaks were classified as follows: 68 confirmed foodborne outbreaks, 14 probable foodborne outbreaks, 4 confirmed waterborne outbreaks, and 77 outbreaks with other or unknown routes of transmission (see page 1 for definitions). The median annual number of confirmed foodborne outbreaks from 1996-2009 was 41 (range, 24 to 81). The median number of cases identified per confirmed foodborne outbreak in 2010 was 7 (range, 2 to 38).

**Confirmed Foodborne Outbreaks by Year,
Minnesota, 1996-2010**



In 2010, 42 (62%) of the 68 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via phone calls from the public. Nineteen (28%) outbreaks were identified through routine laboratory-based surveillance of reportable bacterial pathogens, 4 (6%) were identified through a report from a physician, 1 (1%) outbreak was identified through a report from an institution, and 2 (3%) outbreaks were identified by other methods.

Of the 68 confirmed foodborne outbreaks, 40 (59%) were either laboratory-confirmed (n=32) or epidemiologically defined (n=8) outbreaks of norovirus gastroenteritis. There were 13 (19%) confirmed foodborne outbreaks caused by *Salmonella*, 4 (6%) by *E. coli* O157:H7, 2 (3%) by *Vibrio parahaemolyticus*, 2 (3%) by *Clostridium perfringens*, 1 (1%) by *Campylobacter jejuni*, one (1%) by *Campylobacter jejuni* and *Cryptosporidium parvum*, 1 (1%) by Shiga toxin-producing *E. coli*, and 1 (1%) by an unknown agent. The remaining three (4%) confirmed foodborne outbreaks were classified as suspected bacterial intoxications (caused by *Clostridium perfringens* or *Bacillus cereus*).

The predominance of norovirus as a cause of foodborne disease outbreaks in 2010 continues a pattern that has been observed for three decades in Minnesota. During 1981-2010, 475 (53%) of 889 confirmed

outbreaks of foodborne disease were due to norovirus, while 194 (22%) confirmed foodborne outbreaks were caused 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 13 confirmed foodborne outbreaks caused by *Salmonella* in 2010; this is the highest number of salmonellosis outbreaks identified in Minnesota in a single year. Five salmonellosis outbreaks were associated with a single food service establishment. The causes of restaurant outbreaks of salmonellosis are often complex and can involve consumption of raw produce items or undercooked foods of animal origin, infected food workers, cross-contamination between raw and ready-to-eat foods, environmental contamination, and inadequate cooking, hot holding, cooling, and reheating of multiple food items. Contaminated eggs or cross-contamination with shell eggs was the likely source contamination in 3 (60%) restaurant outbreaks. An additional four outbreaks were associated with private events including a church potluck, funeral ceremony, graduation party, and wedding reception. One outbreak was associated with a group home. The remaining three salmonellosis outbreaks were associated with commercially distributed products, including pre-packaged salad, blueberries, and frozen chicken entrées.

MDH identified four foodborne outbreaks caused by *E. coli* O157:H7 in 2010; three were associated with the consumption of commercial products, including packaged wheat snacks, in-shell hazelnuts, and artisanal cheese. The remaining *E. coli* O157:H7 outbreak was associated with consumption of raw milk or raw milk products from a Minnesota farm.

Routine surveillance detected two outbreaks caused by *Vibrio parahaemolyticus*. Both of these outbreaks were associated with consumption of raw oysters at a restaurant that were likely contaminated at the harvest site.

Two confirmed foodborne outbreaks of campylobacteriosis were identified in 2010; one was caused by *Campylobacter jejuni*, and one was caused by both *Campylobacter jejuni* and *Cryptosporidium parvum*. The outbreak caused by *C. jejuni* alone was associated with an office party; the second outbreak was associated with raw milk and raw milk products from a farm in Minnesota. This farm was also implicated as the source of an *E. coli* O157:H7 outbreak earlier in the year.

There was one outbreak of non-O157 Shiga toxin-producing *E. coli* associated with a high school physical education/environmental science class. Venison was implicated as the vehicle, and multiple potential routes of exposure were identified.

One confirmed foodborne outbreak in 2010 was of unknown etiology. Differences in the incubation periods of reported cases suggested multiple etiologies, with at least some of the illnesses likely caused

by a bacterial or marine toxin. Consumption of Hawaiian wahoo, jasmine rice, and stir-fried mixed vegetables were all significantly associated with illness.

Five of the confirmed foodborne outbreaks identified in Minnesota in 2010 were due to laboratory-confirmed or suspected bacterial intoxications caused by pathogens such as *Clostridium perfringens* and *Bacillus cereus*. 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 four waterborne gastroenteritis outbreaks identified by MDH in 2010; two were cryptosporidiosis outbreaks, one was a giardiasis outbreak, and one was an outbreak of *E. coli* O157:H7 infections. The two outbreaks of cryptosporidiosis were associated with a swimming beach and an aquatic center, respectively. The outbreak of giardiasis was associated with an untreated campground well. The *E. coli* O157:H7 outbreak was associated with a swimming beach.

There were 77 outbreaks with other or unknown routes of transmission in 2010. The majority of outbreaks in this category were associated with person-to-person transmission of enteric pathogens, predominantly norovirus, in nursing homes, schools, daycares, and other facilities. Two outbreaks were due to animal contact: *Cryptosporidium parvum* infections associated with an obstetrics class at a veterinary college, and *Campylobacter jejuni* infections among workers at a chicken processing plant. One outbreak was associated with exposure to *Salmonella* Typhimurium in clinical and teaching microbiology laboratories.

Confirmed Foodborne Outbreaks

(1)

Norovirus Gastroenteritis Associated with a Restaurant

January

Ramsey County

On January 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint from an individual who had eaten at a restaurant in St. Paul, Minnesota on January 3. The complainant reported that five of six meal companions from separate households became ill with vomiting and/or diarrhea approximately 30 hours after eating at the restaurant. Food items were shared among the meal companions and included sushi (cuttle fish, eel, tuna roll, spicy tuna roll, Minnesota roll, crunchy roll), calamari, edamame, green beans, seaweed salad, ice cream, and cheesecake. The individuals reported that they had no other recent meals in common; however, all six worked together at another foodservice establishment in St. Paul and had worked together prior to the meal at the restaurant. City of St. Paul Environmental Health staff were notified, and an investigation was initiated.

Staff from MDH interviewed meal companions of the complainant and additional restaurant patrons identified through credit card receipts to obtain information on food/beverage consumption and illness history. A case was defined as an individual who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after a meal at the restaurant. Stool specimens were obtained from consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Sanitarians from the City of St. Paul visited both restaurants to evaluate food preparation and handling procedures and begin conducting food worker interviews. Management staff were also questioned about reports of recent employee illness or additional patron complaints. Employee contact information and credit card receipt records for additional patrons who dined at the restaurant on January 3 were collected by the sanitarian. MDH staff interviewed remaining restaurant employees regarding recent illness history and job duties.

Illness histories and exposure information were obtained from four members of the complainant's party as well as 21 additional patrons identified through credit card receipts. Of these, 10 met the case definition. Three individuals reported experiencing illness that did not meet the case definition, and thus were excluded from further analysis. Nine cases (90%) reported diarrhea, seven (70%) vomiting, seven (70%) cramps, and four (44%) of fever. None reported bloody stools. The median incubation period was 33 hours (range, 2.5 to 52.5 hours). The median duration of illness was 24 hours (range, 4 to 53 hours) for the nine cases who had recovered at the time of the interview. Stool samples were collected from three cases identified through credit card receipts who resided in two separate households; all samples tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the samples, and the resulting sequences were identical.

Patrons were asked about consumption of items served at the restaurant including appetizers, soups, salads, sushi/sashimi, entrées, lunch entrées, teppanyaki, and desserts. Items on the sushi menu were organized into two categories: Maki sushi and Nigiri sushi/sashimi. Illness was found to be statistically associated with consumption of any item from the sushi menu (10 of 10 cases vs. 5 of 12 controls; odds ratio [OR], undefined; $p = 0.005$), as well as with Nigiri sushi (8 of 10 vs. 1 of 11 controls; OR, 40.0; 95% confidence interval [CI], 2.3 to 1943.8; $p = 0.002$) and Maki sushi (9 of 9 cases vs. 4 of 12 controls;

OR, undefined; $p = 0.005$). Consuming an item from the appetizer section of the menu was found to be inversely associated with illness (3 of 10 cases vs. 10 of 12 controls; OR, 0.09; 95% CI, 0.01 to 0.90; $p = 0.03$). No other menu item or ingredient was found to be statistically associated with illness.

Interviews were conducted for 10 employees at the restaurant; two (20%) reported experiencing recent gastrointestinal illness. Of these, one was a chef responsible for sushi preparation who had to leave work early on the night of the complainant's meal due to illness. This employee did not report experiencing vomiting and/or diarrhea but instead simply reported not feeling well that night. According to interviews, this employee would have been present in the restaurant during the time of the complainant group's meal. The second employee reported experiencing diarrhea but had an onset date consistent with that of the ill patrons. Neither of the two ill food workers submitted stool specimens to the MDH PHL.

No additional complaints were received by the restaurant, and no improper food preparation or handling practices were observed. Preparation of items on the sushi menu does not occur with the use of gloves. The sanitarian discussed with restaurant staff the importance of handwashing for the prevention of norovirus infection, and informed management that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms. Management was considering implementing a glove-use policy in the preparation of ready-to-eat food items upon conclusion of the investigation.

An inspection of the second restaurant revealed that the restaurant had not received any recent patron complaints and that there was no evidence of additional employee illness. Interviews were conducted with six of the approximately 18 total employees, including members of the management staff; no one reported experiencing recent gastrointestinal illness. There also were no recent entries in the restaurant's employee illness log. No improper food preparation or handling procedures were observed.

This was a foodborne outbreak of norovirus gastroenteritis associated with restaurant in St. Paul, Minnesota. The same norovirus sequence was identified in samples submitted from credit card receipt cases that dined at the establishment on the same day. Illness was statistically associated with consumption of items from the sushi menu, and a sushi chef had left work early on the meal date in question due to illness. Therefore, the likely source of contamination was one or more infected food workers who had contact with ready-to-eat food items.

(2)

Norovirus Gastroenteritis Associated with a Restaurant

January

Hennepin County

On January 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the manager of a restaurant in Edina about a complaint they had received from a guest who had dined at the restaurant on January 4. Staff from MDH was able to interview the complainant on January 12. The complainant reported that four of six individuals from her party had developed symptoms of gastrointestinal illness after their meal. Sanitarians from the City of Edina were notified, and an investigation was initiated on January 12.

A list of patrons from January 4 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). Stool specimens were obtained from two patrons and submitted to MDH Public Health Laboratory 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 34 restaurant patrons. Seven (21%) cases were identified. Two people reported illness that did not meet the case definition, and thus were excluded from further analysis.

All seven cases reported diarrhea, six (100%) of six reported cramps, four (57%) of seven reported vomiting, and one (25%) of four reported fever. The median incubation period was 30 hours (range, 27 to 49 hours) for the six guests with known illness onset times. The median duration of illness was 47.5 hours (range, 21 to 110 hours) for the six cases with known recovery date times. Both stool samples tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on both of the positive norovirus samples; the nucleic acid sequences were identical.

Consumption of any salad (7 of 7 cases vs. 6 of 24 controls; odds ratio [OR], undefined; $p < 0.001$), and specifically mandarin chicken salad (6 of 7 cases vs. 2 of 24 controls; OR, 66.0; 95% confidence interval, 3.8 to 2806.9; $p < 0.001$) were significantly associated with illness. The one case that did not consume mandarin chicken salad consumed a sirloin steak salad. Both the mandarin chicken salad and the sirloin steak salad contain the same mixture of three greens: romaine, iceberg, and spinach. The romaine and iceberg are both chopped and spun dry, while the spinach is used straight from the bag. The mixture has a 24-hour shelf life once prepared, so the salads served January 4 may have been prepared on January 3 or 4.

Illness histories and job duty information were obtained from 17 employees; two (12%) employees reported recent gastrointestinal illness. Employees reporting illness performed a number of different job duties at the restaurant, including food preparation.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Edina. Salad was implicated as the vehicle of transmission. Two ill employees were identified, and one or more of these ill employees likely were responsible for contaminating the food items.

(3)

Norovirus Gastroenteritis Associated with a Restaurant

January

Le Sueur County

On January 19, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a restaurant in Montgomery. The complainant reported that all four meal companions from three households developed vomiting and diarrhea after eating at the restaurant

on January 16. Le Sueur County Community Health (LSCCM) was notified and an investigation was initiated on January 19.

On January 21, 2010, the MDH foodborne illness hotline received a second illness complaint associated with the same restaurant. The second complainant reported that two of four meal companions developed vomiting and diarrhea after eating at the restaurant on January 16.

LSCCM sanitarians interviewed food workers and inspected the restaurant on January 19. Both complainants and their meal companions were interviewed by MDH staff about food consumption and illness history. Additionally, contacts from two groups that had purchased party platters on January 16 were contacted and asked about illness among meal companions. A case was defined as a restaurant patron who subsequently developed vomiting or diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from the eight individuals in the two complainant groups; six individuals met the case definition. The median incubation period for the cases was 33 hours (range, 26 to 37.5 hours). The median duration of illness was 36.5 hours (range, 35 to 38 hours). All six cases reported diarrhea and vomiting, five (83%) reported cramps, four (67%) reported fever, and none reported bloody stools. Four stool samples submitted by ill restaurant patrons tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the samples, and the resulting sequences were identical.

A lack of sufficient non-ill controls prevented a meaningful statistical analysis of specific food exposures. However, all six cases reported eating subs with lettuce, whereas the two controls ate subs without lettuce. No illnesses were identified among the party platter groups.

LSCCM sanitarians interviewed nine restaurant employees. While none of the employees reported illness prior to or on January 16, one employee reported a household member ill with vomiting and diarrhea from January 15 to 17 and subsequently became ill with vomiting on January 17. The ill food worker's job duties included sandwich preparation and cleaning. The food worker also reported working at the restaurant the same day that the complainants reported eating there. Bare-hand contact with ready-to-eat foods by food workers at the restaurant was not observed by the sanitarian.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. Although a specific food vehicle was not identified, all cases reported eating lettuce. The source of contamination was likely a food worker that reported caring for a household member ill with gastrointestinal symptoms prior to working the day the complainants were exposed and who was likely in the incubation period for norovirus gastroenteritis.

(4)

Suspected Bacterial Intoxications Associated with a Restaurant

January

Aitkin County

On January 25, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among individuals who attended a group dinner held at a

restaurant in Aitkin on January 19. The group reported no other recent meals in common. Aitkin County Environmental Services (ACES) was contacted and an investigation was initiated immediately.

An ACES sanitarian visited the restaurant on January 25 to evaluate food preparation and handling procedures and collect contact information for additional restaurant patrons. Dinner organizers provided contact information for additional dinner attendees. MDH staff interviewed dinner attendees and 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. Due to delayed notification of the outbreak, stool specimens were not collected.

Thirty-three patrons were interviewed; 20 (61%) met the case definition. Four patrons reported mild illness not meeting the case definition and were excluded from the analysis. The median incubation period for cases was 14 hours (range, 4 to 23 hours). The median duration of illness was 26.5 hours (range, 6 to 99 hours). All 20 cases reported diarrhea, 11 (55%) cramps, 1 (5%) fever, and none reported vomiting or bloody stools.

Prime rib was the only food item associated with illness (20 of 20 cases vs. 5 of 9 controls; odds ratio, undefined; $p = 0.02$).

The environmental assessment identified various critical temperature control problems. Kitchen staff reported that the prime rib was initially cooked on Sunday, January 17, and stored in large containers stacked on top of each other in the walk-in cooler; this likely prevented the prime rib from being cooled in an appropriate time frame. The prime rib was reheated prior to being served but did not reach the 165° F necessary to inactivate any vegetative cells germinated during cooling. Staff were trained to ensure that correct handling procedures for food preparation, service, and cooling were followed.

This was an outbreak of suspected bacterial intoxications associated with a restaurant in Aitkin. The etiology was not confirmed, but the distribution of incubations and symptoms were characteristic of *Clostridium perfringens*. The implicated vehicle, prime rib, is also consistent with a *C. perfringens* etiology. Potential for temperature abuse in the preparation of the prime rib was observed, and measures were taken to correct temperature control in the future.

(5)

Norovirus Gastroenteritis Associated with a Private Event

January

Ramsey County

On January 28, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a party held at a private home in Roseville on January 24. The complainant reported that four of six party attendees developed gastrointestinal illness. Foods served at the event included meatballs, shrimp, cocktail sauce, chips, salsa, Special K bars, potato chips, and party platter sub sandwiches from a restaurant in Arden Hills. Ramsey County Environmental Health (RCEH) was notified and an investigation was initiated on January 28.

Party attendees were interviewed by MDH staff about food consumption and illness history. A case was defined as a party attendee that developed vomiting or diarrhea (≥ 3 loose stools in a 24-hour period). A stool sample collected from a party attendee was submitted to the MDH Public Health Laboratory for

bacterial and viral testing. RCEH sanitarians interviewed food workers and inspected the restaurant on January 29.

Illness histories and exposure information were obtained from all six party attendees and four (67%) met the case definition. The median incubation period for the cases was 24.5 hours (range, 18.5 to 30.5 hours). The median duration of illness was 17 hours (range, 6 to 48 hours). All four cases reported vomiting, three (75%) reported diarrhea, two (50%) reported cramps, two (50%) reported fever, and none reported bloody stools. The stool sample submitted by an ill party attendee tested positive for norovirus genogroup II. No party attendees reported illness in their households the week before the event.

A lack of sufficient non-ill controls prevented a meaningful statistical analysis of specific food exposures. However, all four cases reported eating subs with lettuce and onion, whereas the two controls had subs without lettuce and onion.

RCEH sanitarians and MDH staff interviewed 12 restaurant employees, and none reported recent or current gastrointestinal illness. The restaurant did not have an employee illness log on-site and was not able to provide contact information for additional patrons. The sanitarian discussed the importance of handwashing for the prevention of norovirus transmission, and informed management that any employee with vomiting and/or diarrhea must be excluded from work until 72 hours after the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a private event. Although a specific food vehicle was not identified, all cases reported eating lettuce and onion on their subs. The most plausible source of contamination was an infected food worker who had contact with ready-to-eat foods. However, no ill food workers were identified and the ultimate source of contamination was not identified.

(6)

Norovirus Gastroenteritis Associated with a Restaurant

January

Olmsted County

On February 2, 2010, the manager of a restaurant in Rochester forwarded an illness complaint to Olmsted County Public Health Services (OCPHS). The original complainant was a member of a church group who reported that approximately 8 of 21 members had become ill with gastrointestinal symptoms after eating an evening meal at the restaurant on January 31. The manager stated that the group had ordered from a shortened version of the regular menu. OCPHS staff notified the Minnesota Department of Health (MDH) and an investigation was initiated.

OCPHS sanitarians visited restaurant on February 2 to evaluate food preparation and handling procedures and interview food workers. Sanitarians collected additional patron contact information from credit card receipts and a list of the church group diners was obtained from the event organizer. OCPHS staff interviewed patrons and members of the church group about food consumption and illness. 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 ill employees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-one patrons were interviewed, including 21 from the church group; 15 (10 from the church group) met the case definition. Twelve (87%) cases reported cramps, 11 (73%) diarrhea, 11 (73%) vomiting, 5 (33%) fever, and none bloody stools.

The median incubation period for the cases was 30 hours (range, 13 to 45 hours). However, one case who was a meal companion of four other cases became ill on the evening of January 30, and was not included in the data analysis. Duration of illness information was not available as cases were still ill at the time they were interviewed.

Food-specific attack rates were calculated separately for the church group who ordered from the shortened menu. Food-specific attack rates were not calculated for the other diners because their illnesses might have been due to sharing food with the individual who became ill 1 day before the suspect meal.

No food items were associated with illness.

Thirty-five restaurant employees were interviewed and five reported recent gastrointestinal illness. An employee who reported an illness onset of February 1 prepared foods on January 30 that might have been consumed by the church group on January 31. A stool specimen collected from this employee was positive for norovirus. No stool specimens were submitted by ill patrons.

The restaurant's handwashing practices, food-preparation practices, and employee health policies were reviewed by EH staff on February 2. Interventions intended to prevent further spread of illness were instituted by restaurant management, including mandatory glove use; exclusion of ill staff until 72 hours after resolution of symptoms; discard of all prepared ready-to-eat food and opened packages of ready-to-eat foods; and cleaning and sanitizing the facility, with special attention to areas receiving hand contact by multiple staff. Restaurant management was encouraged to return an unused employee toilet room to use, and to require staff to wash their hands at a control sink in the kitchen after toilet use.

On February 8, a caller left a voice message reporting gastrointestinal illness after eating at the restaurant on February 3. The caller left no return telephone number and attempts to reach the caller were unsuccessful. OCPHS management decided, despite the lack of conclusive information, that further control measures should be instituted. These measures included: voluntary, temporary closure; discard all prepared ready-to-eat food and opened packages of ready-to-eat foods; further cleaning and sanitizing, including dining room furniture, and washing and sanitizing all food contact surfaces, including equipment, dishware, flatware, glasses, utensils, etc.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. Although no specific food vehicle was identified, an ill food worker was documented and was the likely source of the contamination.

(7)

Norovirus Gastroenteritis Associated with a Restaurant

February

Hennepin County

On February 12, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from two people who had eaten at a restaurant in Minneapolis on February 9. On February 16, a second complaint of gastrointestinal illness was received from another party of two people who had eaten at the restaurant on February 12. MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units on February 16 and an investigation was initiated.

MDH interviewed both parties who reported gastrointestinal illness. 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 from February 9 through February 12. HSPHD epidemiology intended to contact other patrons of the restaurant who ate during this time period to assess illness and collect food histories; however, credit card receipt information from the restaurant did not contain patron names. MDH contacted the credit card company and learned it would be a difficult process to obtain patron names from the receipts.

On February 16, MDEH sanitarians visited the restaurant and inquired about other patron illness complaints and recent employee illness. The restaurant had not received any other patron illness complaints, and no employees were recently ill with gastrointestinal symptoms. The initial restaurant visit was followed-up with another visit to conduct a full inspection and interview all food workers about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures.

Both complainant groups were made up of two individuals. Besides dining at the restaurant, the two households did not report eating at any other common restaurants or any other related exposures.

Of the four individuals who were interviewed, all met the case definition. The median case age was 48.5 years (range, 29 to 67 years). All four cases reported diarrhea and cramps, three (75%) reported vomiting, and one (25%) reported fever. None of the cases reported blood in the stools. The median incubation was 33 hours (range, 24 to 48 hours). The median duration of gastrointestinal symptoms was 10 hours (range, 2 to 17 hours). A stool sample was submitted by one of the cases to the MDH Public Health Laboratory for bacterial and viral testing and was positive for norovirus genogroup II.

Three of the four cases ate a gyro of some kind, and two ate falafel. All four cases ate lettuce, tomatoes and pita bread as ingredients of the gyro or falafel. Gyros are served with a tzatziki sauce, and falafel is served with a tahini dressing. Sauces and dressings are prepared at the restaurant, and vegetables are also prepped by restaurant staff. Two cases reported drinking ice water.

All eight of the restaurant's employees were interviewed. None of the employees interviewed reported any recent gastrointestinal illness, or illness in household members. The restaurant did not keep an employee illness log. MDEH sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and

exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness.

During the course of inspecting the restaurant, MDEH sanitarians learned that items prepped at this restaurant location are also used at another location of the restaurant located in downtown Minneapolis and Restaurant B in Bloomington. Neither of these locations received any reports of patron illness.

This was a foodborne outbreak of norovirus associated with eating at a restaurant. The vehicle of transmission and source of contamination were not identified. A ready-to-eat item at the restaurant may have been contaminated by a food worker who did not report currently or recently being ill. Alternatively, a food ingredient may have been contaminated prior to entering the restaurant.

(8)

Norovirus Gastroenteritis Associated with a School

February

Hennepin County

On February 18, 2010 the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology unit received a report of a gastrointestinal illness outbreak at a middle school. An estimated 150-400 students were absent from school or had left during the day after becoming ill. Epidemiology notified the Minnesota Department of Health (MDH) and HSPHD environmental health and an investigation was initiated.

HSPHD epidemiologists interviewed students or parents of students about food consumption and illness history. A case was defined as a middle school student who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after eating at the school. A stool sample collected from a consenting case was submitted to the MDH Public Health Laboratory for bacterial and viral testing.

HSPHD sanitarians visited the school on February 19 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties.

The outbreak was reported by the school nurse at the school. Student illness began late in the school day on February 18 with the most absences on February 19. Some staff persons were also out due to illness. Interviews focused on the lunches served on February 16 and 17.

Fifty-eight students were interviewed. Twenty-five (43%) students met the case definition and twenty-nine were controls. Four additional students reported gastrointestinal illness; however their onset occurred prior to the rest of the group. All twenty-five cases reported vomiting. Eighteen (72%) reported diarrhea, fifteen (60%) reported cramps, nine (36%) reported fever, and none reported bloody stools. Most cases became ill on February 17 or the early morning of February 18. The median incubation from the February 16 lunch was 31 hours (range, 27 to 49 hours).

A stool specimen collected from one case tested positive for norovirus.

Based on incubation periods, the lunch meal on February 16 was the more likely source of norovirus and was the focus of this investigation. All food from the school cafeteria is prepared the same day it is served and much of it requires little or no preparation. All 12 of the school's cafeteria employees were

interviewed. No employees reported recent gastrointestinal illness; however one reported having had an ill child with gastrointestinal symptoms a few days prior.

A variety of food items are served at the school cafeteria. There is typically one main entrée each day, several side options, fruit, pizza, and an a la carte selection of cold foods. Students also reported eating a bagged lunch from home. The entrée on February 16 was beef tacos (tortillas, taco meat, cheese, toppings, etc.), and on February 17 it was a fish sandwich.

Univariate analysis indicated that illness was significantly associated with eating tortillas (12 of 25 cases vs. 5 of 29 controls; odds ratio [OR], 4.4; 95% confidence interval [CI], 1.3 to 15.4; $p = 0.02$), taco meat (12 of 25 cases vs. 5 of 29 controls; OR, 4.4; 95% CI, 1.3 to 15.4; $p = 0.02$), and lettuce (9 of 25 cases vs. 3 of 29 controls; OR, 4.9; 95% CI, 1.1 to 20.7; $p = 0.032$) from the February 16 lunch. In multivariate analysis, none of these foods were independently associated with illness. No items from February 17 were found to be significantly associated with illness.

The tortillas and taco meat were served by food service staff and the toppings were self-served by each student. It is possible that some food may have been contaminated by a food service worker (either ill and not reporting illness or asymptotically shedding virus), however, it is likely that the utensils for self-service may have also been contaminated. At least one of the early cases that were interviewed but excluded from analysis was at school and ate the tacos.

HSPHD sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. Self-service in the cafeteria was discontinued on February 18 and ketchup pumps were removed from use on February 19.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at a school. The vehicle of transmission and source of contamination were not identified. While food may have played some role in the spread of the illness, it is also very likely that there is a strong person-to-person component as well.

(9)

Norovirus Gastroenteritis Associated with a Restaurant

February

Dakota County

On February 23, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint from an individual who had dined at a restaurant in Burnsville, Minnesota on February 21. On February 25 and 26, MDH received two additional complaints from individuals who had dined at the restaurant in Burnsville on February 22. All of the complainants reported developing symptoms of gastrointestinal illness after their meal. Sanitarians from MDH Environmental Health Services (EHS) were notified, and an investigation was initiated on February 26.

Epidemiologists from MDH interviewed complainants and their meal companions 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). Stool specimens were obtained from four patrons and submitted to MDH for bacterial and viral testing.

Sanitarians from MDH EHS visited the restaurant on February 26 to evaluate food preparation and handling procedures and to interview staff regarding recent illness and job duties. Sanitarians also collected names and contact information for five independent complaints the restaurant had received but had failed to notify MDH about.

Illness histories and exposure information were obtained from eight restaurant patrons; all eight met the initial case definition. All four stool samples tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on all four of the positive norovirus samples; the nucleic acid sequences were identical for three of the samples. The specimen that did not match by nucleic acid sequencing was from an individual who reported a 7-hour incubation period from the restaurant meal; based on the discrepant laboratory results and short incubation period, this individual was excluded from further analysis.

All seven cases reported vomiting, six (86%) reported diarrhea, four (67%) of six reported cramps, and two (40%) of five reported fever. Cases reported meal dates of February 21 and 22. The median incubation period was 30 hours (range, 17.5 to 39 hours). The median duration of illness was 48.5 hours (range, 14 to 62 hours) for the four cases with known recovery dates and times.

Illness histories and job duty information were obtained from 58 employees; nine (16%) employees reported either being recently ill with gastrointestinal illness ($n=5$) or having a sick child at home ($n=4$). Employees reporting illness performed a number of different job duties at the restaurant, including food preparation.

A routine inspection of the restaurant had been conducted by an MDH sanitarian on February 12, 2010. Multiple violations were identified, including inadequate handwashing prior to food preparation. This was also observed on a February 17 follow-up inspection and during the February 26 outbreak environmental assessment.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Burnsville. Multiple ill employees were identified, and one or more of these ill employees likely were responsible for contaminating the food items. Inadequate handwashing by food workers had been documented multiple times in the weeks leading up to the outbreak; despite being educated on the importance of handwashing, inadequate handwashing was again observed at the time of the outbreak.

(10)

Norovirus Gastroenteritis Associated with a Church Supper

March

Hennepin County

On March 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a person who had eaten at a soup supper at a church on March 3. The complainant reported that approximately 15 additional soup supper attendees also had developed gastrointestinal illness. That same day, the MDH foodborne illness hotline received a report of illness from two people who had eaten at a fish fry at the same church on March 5. MDH notified the Hennepin

County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units on March 8, and an investigation was initiated.

HSPHD epidemiology obtained a list of the soup supper and fish fry attendees and interviewed them regarding food consumption and illness history. A case was defined as a person who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after eating at the soup supper on March 3 or the fish fry on March 5.

On March 10, MDEH sanitarians inspected the church kitchen and provided norovirus education to people who often prepare food for church events. The environmental health assessment of the kitchen focused on food handler illness, flow of food, food preparation, and food storage procedures.

Nineteen individuals were interviewed by HSPHD epidemiologists; of these 16 (84%) met the case definition. Ten (62.5%) of the cases were male. The median case age was 60 years (range, 55 to 89 years). All 16 cases reported diarrhea, 12 (75%) reported vomiting, 9 (56%) reported cramps, and 3 (19%) reported fever, and none reported bloody stools. The median incubation was 37 hours (range, 24 to 57.5 hours). The median duration of illness was 43 hours (range, 3 to 72 hours). Stool specimens collected from one ill soup supper attendee and two ill fish fry attendees tested positive for norovirus. Nucleic acid sequences for all three viral samples were identical.

A lack of sufficient non-ill controls prevented a meaningful statistical analysis of specific food exposures. Of the 14 cases who ate food from the soup supper, 13 (93%) ate beer cheese soup, 9 (64%) ate popcorn, 9 (64%) ate some type of dessert, 7 (50%) ate some type of bread, and 6 (43%) reported drinking a beverage (milk or coffee) provided by the church (several cases brought their own beverage from home). Of the cases who ate food at the fish fry, both ate fish, coleslaw, macaroni and cheese, and chocolate chip cookie. One (50%) ate a baked potato and French fries.

Although the church does not have a kitchen licensed by the City of Minneapolis, MDEH was invited to visit the church kitchen in order to provide education and inspect the kitchen. The MDEH sanitarians stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough cleaning and disinfection, and exclusion of ill food handlers. No kitchen volunteers reported gastrointestinal illness prior to helping prepare either meal. However, one volunteer reported that another volunteer was ill while helping to prepare both meals, but did not want to provide any additional details.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at two events at the church. The vehicle of transmission and source of contamination were not identified. However, the most plausible source of contamination was an infected volunteer food handler who had contact with ready-to-eat foods.

(11)

Norovirus Gastroenteritis Associated with a Restaurant

March

Hennepin County

On March 12, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a report of gastrointestinal illness among co-workers who had eaten at a restaurant in Minneapolis

on March 8. On March 17, MDH received a second independent complaint regarding gastrointestinal illness among co-workers from a different company who had eaten at the same restaurant on March 8. Hennepin County Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH) were notified and an investigation was initiated on March 12.

A MDEH sanitarian visited the restaurant on March 15 to evaluate food preparation and handling procedures and interview employees. Employees were asked about illness history, food consumption, and job duties performed since February 26. The complainants, their meal companions, and one additional co-worker were interviewed by HSPHD epidemiologists about food consumption and illness history. A case was defined as a restaurant patron who subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in 24-hour period). Stool samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

All six patrons interviewed met the case definition. Five patrons had eaten at the restaurant on March 8 and one ate there on March 10. All the cases reported vomiting, five (83%) had diarrhea and cramps, and two (33%) had fever. The median duration of illness was 40 hours (range, 3 to 90 hours). The median incubation period was 28.5 hours (range, 22 to 31 hours). Four stool specimens tested positive for norovirus genogroup II; nucleic acid sequences for two of the positive samples, representing both complaint groups, were identical.

No non-ill controls were identified; this prevented a meaningful statistical analysis of food exposures. Cases reported eating a variety of soups, salads, and beverages.

Food preparation occurred at the restaurant location and at a central commissary located in Minneapolis. Ten employees were interviewed; including four at the restaurant and eight at the central commissary. No employees reported recent gastrointestinal illness.

Upon inspection of the restaurant, the MDEH environmentalist observed employees following proper food handling techniques. The restaurant did not maintain an employee illness log as required by the Minnesota Food Code. The environmentalist stressed the importance of handwashing for norovirus prevention, provided educational materials about norovirus, and instructed the restaurant to maintain an employee illness log.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. A specific food vehicle and the source of contamination were not identified.

(12)

Norovirus Gastroenteritis Associated with an Event at an Entertainment Center

March

Hennepin County

On March 19, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint from a group of co-workers who had attended a work event at an entertainment center in St. Louis Park, Minnesota on March 13. The complainant reported that approximately 10 of the 45 attendees became ill with vomiting, diarrhea, and/or fever starting on March 14. Food items available at this event included multiple pizzas (with six different topping options) and a mixed green salad. The complainant reported that the attendees had no other recent meals or events in common, and that there

were household members of co-workers who developed illness after attending the event. St. Louis Park Environmental Health staff were notified, and an investigation was initiated.

Staff from MDH interviewed event attendees and additional entertainment center patrons to obtain information on food/beverage consumption and illness history. A list of catered parties from March 12 through March 14 was obtained from the establishment. The person listed for each order was contacted to determine if anyone in their group reported gastrointestinal illness after the meal. A case was defined as an individual who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) within 60 hours of consuming a meal at the entertainment center restaurant. Stool specimens were obtained from consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A sanitarian from St. Louis Park visited the facility to evaluate food preparation and handling procedures and interview management staff. Employee contact information and records for additional parties who dined at the entertainment center during the same time period were collected by the sanitarian. MDH staff interviewed restaurant employees who worked on March 13 regarding recent illness history and job duties.

Interviews were conducted for 38 individuals in the original complainant's party; 12 (32%) reported recent illness. One attendee reported developing illness 4 days after the event and was excluded from analysis. Another attendee reported experiencing illness that did not meet the case definition and was therefore also excluded from further analysis. Of the remaining 10 attendees who met the case definition, 9 (90%) had vomiting, 7 (70%) diarrhea, 7 (70%) cramps, and 4 of 8 (50%) fever. None reported bloody stools. The median incubation period was 36 hours (range, 25.5 to 54 hours) and the median duration of illness was 4 days (range, 3 to 5.5 days). Stool samples were collected from three cases; all samples tested positive for norovirus genogroup II.

There were around 15 to 20 pizzas prepared for the event. Pizza selections included cheese, pepperoni, sausage, pepperoni and sausage, supreme, and vegetarian. After excluding controls who had not consumed any food items during this event, foods that were significantly associated with illness included supreme pizza (7 of 10 cases vs. 2 of 21 controls; odds ratio [OR], 22.2; 95% confidence interval [CI], 2.3 to 305; $p = 0.001$), tomatoes on the salad (5 of 10 cases vs. 2 of 21 controls; OR, 9.5; 95% CI, 1.1 to 106; $p = 0.02$), and cucumbers on the salad (4 of 9 cases vs. 2 of 22 controls; OR, 8.0; 95% CI, 0.8 to 94.0; $p = 0.04$). No other menu item or ingredient was statistically associated with illness.

One of the attendees reported experiencing 2 days of diarrhea prior to this event; he had been symptom-free for 5 days before the event. This individual reported consuming supreme, pepperoni, sausage, and vegetarian pizza, as well as the salad. He also reported removing the tomatoes prior to consumption of the salad. A stool specimen was not collected from this individual, and he was excluded from all analyses as well.

An inspection of the entertainment center revealed that the restaurant had not received any additional patron complaints and that there was no evidence of recent employee illness. MDH staff was able to interview 16 employees who worked on March 13. Of these, only one (a bartender) reported experiencing recent gastrointestinal illness which was described as nausea combined with one episode of diarrhea that would have occurred approximately 2 weeks before the interview (which placed the onset date around March 11). MDH staff also spoke with contacts for two of the three additional parties who

were at the entertainment center during the same weekend: one was a party of 15 on March 12 and the other was a party of 40 on March 14. Neither contact reported illness within their group.

No improper food preparation or handling practices were observed during inspection of the establishment. The salad was a pre-washed and pre-shredded bag of mixed greens with lettuce, carrots, and cabbage. Therefore, no further processing or handling was required for the mixed greens. Roma tomatoes and cucumbers were sliced by entertainment center staff and added to the mixed greens prior to serving. The sanitarian discussed with restaurant staff the importance of handwashing for the prevention of norovirus transmission, and informed management that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with an event held at an entertainment center. Illness was statistically associated with consumption of supreme pizza, tomatoes on salad, and cucumbers on salad. The source of illness could not be confirmed. The restaurant did not receive any additional complaints and denied any employee illness. However, during an interview with MDH staff one employee reported experiencing mild gastrointestinal illness. Contacts for two additional parties that dined at the establishment during the same time period were also interviewed; neither was aware of illness among members of their party. An individual who was part of the original complainant's group reported having diarrhea prior to this event but had recovered prior to attending. Therefore, the source of contamination could have either been an ill attendee or an ill food worker who handled one or more ready-to-eat food items.

(13)

***Salmonella* Typhimurium Infections Associated with a Funeral**

March

Ramsey County

On April 9, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) notified MDH epidemiology staff of two *Salmonella* Typhimurium isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns that were identified through routine surveillance. The PFGE subtype was designated TM1038. It was determined through routine interviews that the one of the cases attended a Hmong funeral at a funeral home in Maplewood on March 27, 2010, prior to becoming ill. The case reported consuming raw cow's stomach while at the funeral and also stated that he believed the animal had been butchered at the facility immediately prior to the meal. The City of Maplewood was notified and an investigation was initiated.

Cases were identified through routine laboratory surveillance and were defined as individuals who attended the funeral and subsequently had culture-confirmed infection with *S. Typhimurium* TM1038. Staff from MDH interviewed cases to obtain information on food/beverage consumption and illness history. Cases were also asked to provide details about the gathering, including foods served and any reported illness among other attendees.

City of Maplewood staff contacted the funeral home to collect additional information about the event, including foods served and the practices surrounding the meal that was prepared. Contact information for the individual responsible for reserving the funeral home was also collected from the establishment.

Illness histories and exposure information were obtained from two cases. One case was a 64 year-old male who lived in Anoka County, and the other was a 58 year-old female who lived in Ramsey County. Both cases had illness onset on March 28, 2010. Both cases reported diarrhea, one bloody diarrhea, one fever, one cramps, and one vomiting. One of the two cases was hospitalized for 3 days as a result of this illness. Exact incubation periods from the meal served at the funeral could not be calculated as meal and/or onset times were not available. Neither case had recovered at the time of interview so illness duration also could not be calculated.

Following Hmong traditions, the funeral occurred over a 3-day period from March 26 to March 29. One of the two cases reported attending the event on both March 26 and March 27. This case reported consuming boiled beef and grapes on March 26 and boiled chicken and beef on March 27. The other case reported only attending the funeral on March 27. Foods consumed by this case included pudding with raw eggs, pork, fresh pea pods, and a piece of raw cow's stomach. MDH could not obtain contact information for other attendees, except for the funeral contact; therefore, a food-specific statistical analysis could not be performed.

The cases did not report knowledge of the other's illness during their interviews. The funeral home owner and funeral contact also denied any other illness among attendees. The first case was reached for interview on April 11, 2010; it was this interview that prompted the investigation into the event. The other case, however, was not interviewed until May 14, 2010.

Due to the delay in linking the second case to the funeral, the investigation could only be pursued to a limited extent initially since only one illness in a funeral attendee was documented at that time. On April 14, a City of Maplewood sanitarian contacted the owner of the funeral home. The sanitarian was informed that animals and/or butchering are not allowed on the funeral home premises. According to the owner, clients occasionally break contract and bring animals on site since this practice is so involved in the Hmong funeral ceremony. However, staff did not witness this occurring during the funeral in question. People who use the funeral home are instead referred to two local rendering facilities (in South St. Paul and Hugo) to have animal slaughter performed immediately before the funeral services.

This was an outbreak of *S. Typhimurium* TM1038 infections associated with a Hmong funeral ceremony. A specific food vehicle was not identified and the ultimate source of the outbreak was not determined. No additional cases of *S. Typhimurium* infection were identified through surveillance during this time period. The funeral was the only exposure that the two cases had in common; therefore, it is likely that illness was the result of a meal at this gathering. The vehicle likely was a food item that was contaminated prior to preparation. One of the cases reported consuming high risk food items (raw cow's stomach and pudding made with raw eggs) during the funeral. However, as most of the event attendees were not interviewed, contamination by an infected individual who was ill prior to or during the funeral could not be ruled out.

(14)

Suspected Bacterial Intoxications Associated with Catered Meals

March

Isanti County

On April 7, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the insurance company for a catering company in Cambridge reporting that several people had

become ill with vomiting and/or diarrhea following two meals the restaurant had catered for an event in Dalbo on March 31. Approximately 35-40 people were served at the meals, which were served at 12:00 p.m. and 6:00 p.m. The menu consisted of prime rib, yellow asparagus, garlic mashed potatoes, salad, dinner rolls, and brownies. Sanitarians from MDH Environmental Health Services (EHS) were notified, and an investigation was initiated.

Epidemiologists from MDH interviewed meal attendees to obtain information on food/beverage consumption and illness history. A case was defined as a meal attendee who subsequently developed diarrhea (≥ 3 loose stools in a 24-hour period). Due to the length of time that had elapsed between the cases' illnesses and the report of the outbreak, no stool samples were collected for testing. Sanitarians from MDH EHS visited the restaurant to discuss food preparation procedures.

Illness histories and exposure information were obtained from 27 meal attendees. Nineteen (70%) cases were identified, including 10 from the 12:00 p.m. meal and 9 from the 6:00 p.m. meal. All 19 cases reported diarrhea, 16 (84%) reported cramps, and 2 (11%) reported fever. The median incubation period was 12.25 hours (range, 0.5 to 18 hours). The median duration of illness was 32 hours (range, 8 to 137 hours) for the 13 cases who had recovered at the time of interview.

Consumption of garlic mashed potatoes was borderline significantly associated with illness (18 of 19 cases vs. 4 of 7 controls; odds ratio, 13.5; 95% confidence interval, 0.83 to 456; $p = 0.05$). No other food/beverage item or meal time was significantly associated with illness.

All of the food preparation for the meals was done by the catering company. In order to make the loaded mashed potatoes, potatoes were boiled the morning of the event. Some potatoes were cooled in the refrigerator for the evening meal, while the rest were mixed in a large stand mixer. Bacon bits, sour cream, heavy cream, and butter were added to the potatoes before being placed in the restaurant's steam table for holding. The tray containing the potatoes was subsequently placed into another portable steam table. The second steam table was unplugged and placed in the back of a private vehicle for an approximately 18 minute drive to the meal site. For serving, the steam table was plugged in at the meal site upon arrival. Temperatures were not taken at any time to ensure that hot holding requirements were met.

A routine inspection by an MDH EHS sanitarian was conducted on the implicated meal date. The inspection found a hot-holding violation with the mashed potatoes.

This was a foodborne outbreak associated with two catered meals served at a business. Illnesses were consistent with a bacterial intoxication. However, due to the time that had elapsed before the outbreak was reported, the etiology could not be confirmed. While loaded mashed potatoes were suspected, a specific ingredient could not be determined. The outbreak most likely resulted from improper hot-holding procedures.

Norovirus Gastroenteritis Associated with Sandwiches from a Restaurant

April

Hennepin County

On April 7, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a person who had purchased a sub sandwich at their workplace on April 1. On that same day, MDH also received an email from an employee at the same workplace reporting gastrointestinal illness after eating a sub sandwich on the same date. The second complainant reported that several additional co-workers also had developed gastrointestinal illness. MDH notified Hennepin County Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH) on April 7, and an investigation was initiated.

Several days a week, the complainants' workplace invites restaurants to bring in their sandwiches and other food items and sell these directly to the employees in the workplace kitchen. The sandwiches sold to employees on April 1 were from a restaurant in Minneapolis, but the workplace also brings in sandwiches from another restaurant in Plymouth on various days of the week. The workplace kitchen is not licensed for food vendors, and neither restaurant has a license to sell sandwiches at the workplace kitchen.

MDEH sanitarians inspected the restaurant on April 8 to conduct an environmental assessment and began interviewing employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures. HSPHD epidemiology obtained a list of workplace employees who purchased food on April 1 and interviewed them regarding food consumption and illness history. A case was defined as a patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples collected from consenting patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-three workplace employees were interviewed by HSPHD epidemiologists; 17 (51%) met the case definition. Sixteen cases (94%) reported diarrhea, 14 (82%) reported cramps, 10 (59%) reported vomiting, 8 (47%) reported fever, and 2 (12%) reported bloody stools. The median incubation was 34.5 hours (range, 26 to 59 hours). The median duration of illness was 55 hours (range, 16 to 117 hours). Stool specimens collected from three patrons tested positive for norovirus genogroup II with identical nucleic acid sequences.

On April 1, the restaurant sold a variety of sub sandwiches, bags of chips, and cookies at the workplace. The restaurant also provided bowls of sliced pickles, onions, jalapeños, and olives. Each self-service bowl had its own spoon or tongs. All of the cases interviewed purchased some type of sub sandwich, nine (53%) ate a cookie, eight (47%) ate a bag of chips, five (29%) ate olives, three (18%) ate pickles, two (12%) ate onions, and none ate jalapeños.

Fifteen controls were interviewed and also reported eating a variety of sub sandwiches, toppings, chips and cookies. No food item was significantly associated with illness.

All 10 restaurant employees were interviewed. One restaurant employee reported gastrointestinal illness with vomiting and diarrhea starting on March 20 and resolving on March 22. The ill employee reported

working at the restaurant while having gastrointestinal symptoms and during the 72-hour period after symptoms had resolved. Another employee reported diarrhea and cramps starting the morning of March 31 and lasting 48 hours. This employee worked during the day of March 31 preparing sandwiches. Most of the sandwiches sold in the company kitchen were prepared on April 1; however, some sandwiches and components were prepared on March 31.

MDEH sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough cleaning and disinfection, and exclusion of ill employees. The restaurant received no additional complaints or reports of additional employee illness.

A HSPHD sanitarian followed up with the workplace to discuss licensing issues. The workplace was not interested in obtaining a license to have vendors sell sandwiches in their kitchen; therefore, they immediately discontinued the practice.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating food from a restaurant. A specific food vehicle was not identified. The source of contamination was likely an ill food worker who prepared the sandwiches.

(16)

Norovirus Gastroenteritis Associated with a Restaurant

April

Ramsey County

On April 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a restaurant in Mounds View. The complainant reported that three of four meal companions in two households developed gastrointestinal illness after eating at the restaurant on April 6. Ramsey County Environmental Health (RCEH) was notified, and an investigation was initiated on April 8.

RCEH sanitarians visited the restaurant on April 8 and 9 to evaluate food preparation and handling procedures, and interview food workers. Sanitarians collected employee contact information and April 6 credit card receipt records. The complainants, their meal companions, and additional patrons identified through April 6 credit card receipts were interviewed by MDH staff 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.

Illness histories and exposure information were obtained from 12 patrons. A total of four (33%) patrons met the case definition, including three from the complaint group. The median incubation period for the cases was 31.5 hours (range, 29 to 40 hours). Illness durations were a minimum of 12 hours; three cases were still ill at the time they were interviewed. All four cases reported diarrhea and cramps. Three (75%) reported vomiting, one (25%) reported fever, and no cases reported bloody stools. Both stool samples submitted by ill patrons from the same complaint group tested positive for norovirus genogroup II with matching nucleic acid sequences.

The small number of cases prevented a robust statistical analysis of specific food exposures. Cases reported eating a variety of food items including cheese pizza, mostaccioli with meatballs, spaghetti and meatballs, salad, bread, and ice cream.

RCEH sanitarians and MDH staff interviewed 24 employees. Two employees reported gastrointestinal illness. A manager reported developing diarrhea and cramping on April 10. A server reported developing vomiting and diarrhea on April 3 and was working at the time that all four cases were exposed on April 6. A stool sample collected from this employee also tested positive for norovirus genogroup II. However, nucleic acid sequencing could not be performed.

The sanitarian discussed the importance of handwashing for the prevention of norovirus transmission, and informed management that any employee with vomiting and/or diarrhea must be excluded from work until 72 hours after the resolution of symptoms. Food workers were observed practicing proper handwashing. Although no bare-hand contact with ready-to-eat foods was witnessed during the outbreak evaluation, the restaurant was cited for this violation in its last two routine inspections on August 20, 2009 and March 17, 2010.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. Although no specific food vehicle was identified, an ill food worker was documented and was the likely source of the contamination.

(17)

***Salmonella* Chester Infections Associated with Chicken and Rice Frozen Entrées**

April-June

Multiple states

On May 24, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Chester isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Centers for Disease Control and Prevention [CDC] Xbal designation JCPX01.0060). The cases were both interviewed using a standard questionnaire. A review of the national PulseNet database revealed 23 additional *S. Chester* isolates with the outbreak PFGE pattern in 13 states. A multi-state investigation was initiated. MDH PHL received a third matching *S. Chester* isolate on June 26 after the implicated product had been recalled.

A case was defined as a person who had a *S. Chester* isolate with the outbreak PFGE pattern (JCPX01.0060) and who had illness onset since April 11. Minnesota cases were interviewed with a broad-based exposure questionnaire and re-interviewed several times about consumption of various specific food items.

One case household was visited, and food samples were collected and tested by the Minnesota Department of Agriculture (MDA).

For cases from other states, hypothesis-generating questionnaires were administered by the CDC and other states from late May to mid June. On June 15, a multi-state case-control study, coordinated by CDC was initiated to evaluate food items commonly reported in the hypothesis-generating questionnaires. This study included the Minnesota cases. Two controls per case were enrolled through sequential-digit dialing anchored on the case-patient's telephone number. Controls were matched to

case-patients by age-group and were included only if they reported no diarrhea or vomiting during the 2 weeks preceding the case-patient's illness onset date.

Consumption information about the implicated food product was given to the United States Department of Agriculture Food Safety and Inspection Service (USDA-FSIS).

Forty-five cases from 18 states were identified in this outbreak (Georgia, 8; California, 5; Virginia, 4; Washington, 4; Minnesota, Texas, Utah, 3 each; Colorado, Massachusetts, Oregon, South Carolina, 2 each; and Alaska, Illinois, Kentucky, Missouri, North Carolina, Oklahoma, Tennessee, 1 each). The three cases from Minnesota were all female and had a median age of 44 years (range, 9 to 85 years). All three cases reported diarrhea, two (66%) reported fever, one (33%) reported cramps and bloody diarrhea, and none reported vomiting. One case was hospitalized for 3 days.

Upon initial interviews, the first Minnesota case reported consuming multiple frozen meals during the week prior to illness onset. The parent of the second Minnesota case reported no consumption of frozen meals by that case in the initial interview. After repeated re-interviews, that parent reported that the child had consumed a Brand X Chicken and Rice frozen entrée during the week prior to illness onset and that they still had an intact package of this product that was purchased at the same time as the package consumed prior to the case's illness onset.

The intact Brand X Chicken and Rice frozen entrée package was collected from the case patient's home on June 15 and tested positive for the outbreak PFGE subtype of *S. Chester* on June 18. An additional sample was collected from a case-patient's home in Tennessee and tested positive for the outbreak PFGE subtype of *S. Chester* by the Tennessee Department of Health on July 19.

A total of 19 cases and 22 controls were enrolled in the case-control study. On June 18, consuming a Brand X frozen meal was significantly associated with illness. There was insufficient data from this study to implicate a specific frozen meal type. However, many of the cases reported eating a Brand X Chicken and Rice frozen entrée in the week before becoming ill.

All three Minnesota cases reported consuming a Brand X Chicken and Rice frozen entrée in the week prior to illness onset. All three reported cooking the frozen entrée in a microwave and letting the product stand for the time recommended in the cooking instructions before consuming it.

On June 17, Company A voluntarily recalled Brand X Chicken and Rice frozen entrée. USDA-FSIS staff conducted a food safety assessment at the facility that manufactured the implicated product.

This was a multi-state outbreak of *S. Chester* infections associated with eating Brand X Chicken and Rice frozen entrées. At the time of this report, information regarding a mechanism for contamination with and survival of *Salmonella* in the implicated product had not been provided by USDA-FSIS.

Reference

1. Investigation Update: Multistate Outbreak of Human *Salmonella* Chester Infections <http://www.cdc.gov/salmonella/chester/>

Norovirus Gastroenteritis Associated with a Restaurant

April

Dakota County

On April 28, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the manager at a restaurant in Inver Grove Heights, Minnesota who reported that the restaurant had received multiple complaints from individuals who had dined at the establishment from April 22 to April 24. The first complainant reported that four of four meal companions from separate households became ill with gastrointestinal symptoms after consuming food from the restaurant. The second complainant reported illness among two of three meal companions from two separate households. The third complainant reported becoming ill after dining alone. Food items consumed by the various complainants included multiple appetizers, sandwiches, and salads. MDH Environmental Health staff were notified, and an investigation was initiated.

Staff from MDH interviewed complainants, their meal companions, and restaurant patrons identified through credit card receipts to obtain information on food/beverage consumption and illness history. A case was defined as an individual who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after consuming food from the restaurant. Stool specimens were obtained from consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Sanitarians from MDH visited the restaurant to evaluate food preparation and handling procedures and begin conducting food worker interviews. Employee contact information was collected for remaining restaurant employees who were interviewed about recent illness history and job duties at a later time. Management staff were also questioned about reports of recent employee illness and additional patron complaints. Credit card receipt records for patrons who dined at the restaurant on April 24 were also requested by the sanitarians. As patron names were not printed on the credit card receipts, records were not collected for any additional meal dates.

Illness histories and exposure information were obtained from all eight members of the complainants' parties as well as four additional patrons identified through credit card receipts. Of these, seven (58%) met the case definition. One individual reported experiencing illness that did not meet the case definition, and thus was excluded from further analysis. All cases reported cramps, six (86%) vomiting, five (71%) diarrhea, and two (29%) fever. None reported bloody stools. The median incubation period was 37 hours (range, 31 to 45.5 hours). The median duration of illness was 74.5 hours (range, 52 to 85 hours) for the three cases who had recovered at the time of the interview. Stool samples were collected from two cases belonging to different complainant parties; both samples tested positive for norovirus genogroup I. Nucleic acid sequencing was conducted on the samples, and the resulting sequences were identical.

Cases reported eating a wide variety of foods, including chicken wings, chicken tacos, steak quesadillas, chips and cheese, chicken wraps, and chicken salads. The one individual who did not become ill from the original complainants' parties reported consuming the same items as ill meal companions. The four non-ill patrons identified through credit card receipts reported consuming chicken wings, chicken tacos, chips and salsa, steak entrées, house salads, and pasta with chicken. No food items were statistically significantly associated with illness.

An inspection of the restaurant did not reveal any improper food preparation or handling procedures. The restaurant had not received any additional patron complaints since contacting MDH. Evidence of food worker illness was immediately identified through conversations with management staff and initial employee interviews. Interviews were eventually conducted for all of the employees with available contact information; 11 (24%) of 45 reported experiencing recent gastrointestinal illness. The first reported onset date among food workers was April 15, but another employee reported gastrointestinal illness in a household member starting on April 14. Onset dates for additional food workers were: April 17 (n=1), April 18 (n=1) April 24 (n=2), April 25 (n=2), April 26 (n=1), and April 27 (n=1). Two employees could not recall the exact date of illness onset. Stool specimens were submitted from four ill food workers; all tested positive for norovirus genogroup I. Nucleic acid sequencing was conducted on the samples, and the resulting sequences were identical to each other and to the sequence identified in patron samples.

MDH sanitarians discussed with restaurant staff the importance of handwashing for the prevention of norovirus transmission and informed management that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms. Following the sanitarians' recommendation, the restaurant also required all employees to sign a waiver stating that they had not experienced any gastrointestinal illness before presenting to work. No additional complaints had been received at the time of this report.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Inver Grove Heights, Minnesota. The same norovirus sequence was identified in samples submitted from restaurant patrons in independent parties and from restaurant employees. The source of contamination was one or more infected food workers who had contact with ready-to-eat food items.

(19)

Norovirus Gastroenteritis Associated with a Restaurant

April

Aitkin County

On April 26, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a restaurant in McGregor, Minnesota. The complainant reported that three of five meal companions from three households developed gastrointestinal illness after eating at the restaurant on April 23. Aitkin County Environmental Services (ACES) was notified and an investigation was initiated on April 26.

On April 28, 2010, the MDH foodborne illness hotline received a second illness complaint associated with the same restaurant. The second complainant reported that four of six meal companions developed gastrointestinal illness after eating at the restaurant on April 23. The complainant also provided contact information for two additional families that were reported to have developed gastrointestinal illness after eating at the restaurant on April 23.

ACES sanitarians visited the restaurant on April 27 to evaluate food preparation and handling procedures and interview food workers. The complainants and their meal companions were interviewed by MDH staff about food consumption and illness history. No credit card receipts or reservation lists were available to assess additional patron illness. 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.

Illness histories and exposure information were obtained from 16 individuals; of these, 12 met the case definition. Two individuals reported illness that did not meet the case definition and were excluded from further analysis. All 12 cases ate at the restaurant on April 23. The median incubation period for the cases was 31 hours (range, 11 to 49 hours). The median duration of illness was 51.5 hours (range, 26 to 70 hours). Ten (83%) cases reported diarrhea, eight (67%) cramps, seven (58%) vomiting, six (50%) fever, and none reported bloody stools. Three stool samples submitted by cases from two groups of meal companions tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the samples, and the resulting sequences were identical.

A lack of sufficient non-ill controls prevented a meaningful statistical analysis of specific food exposures. Ten (83%) cases and both controls reported eating burritos.

ACES sanitarians interviewed all five restaurant employees. While none of the employees reported illness prior to or on April 23, a server reported developing vomiting and diarrhea on April 25. The ill employee worked on April 23 and reported consuming food from the restaurant. Bare-hand contact with ready-to-eat foods by food workers at the restaurant was observed by the sanitarian. The sanitarian discussed the importance of handwashing for the prevention of norovirus transmission and informed management that any employee with vomiting and/or diarrhea must be excluded from work until 72 hours after the resolution of symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in McGregor, Minnesota. Although no specific food vehicle was identified, the majority of cases reported eating a burrito. The most likely source of the contamination was an unidentified infected food worker. However, this was not confirmed.

(20)

Norovirus Gastroenteritis Associated with a Banquet

April

Crow Wing County

On April 29, 2010, a sanitarian from the Minnesota Department of Health (MDH) Environmental Health Services (EHS) received a call from the organizers of a fundraising banquet regarding several complaints they had received about the banquet that had been held to benefit their organization on April 25. The banquet had been catered by a restaurant and held at a church; both located in Baxter, Minnesota. According to the event organizers, approximately 275 people had attended the event. Epidemiologists from the MDH Acute Disease Investigation and Control section were notified, and an investigation was initiated.

A partial list of banquet attendees and volunteers was obtained from the event organizer. Epidemiologists from MDH interviewed event attendees about food/beverage consumption and illness history. A case was defined as a banquet attendee who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

A sanitarian from MDH EHS 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 67 banquet attendees. Thirty-eight (57%) cases were identified. Ten people reported illness that did not meet the case definition, and thus were excluded from further analysis. Stool specimens were obtained from two banquet attendees and submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-two (84%) cases reported diarrhea, 31 (82%) reported vomiting, 29 (76%) reported cramps, 17 (46%) of 37 reported fever, and 1 (3%) reported bloody stools. The median incubation period was 35.5 hours (range, 11 to 69 hours). The median duration of illness was 49 hours (range, 38.5 to 83 hours) for the nine cases who had recovered at the time of interview. Both stool samples tested positive for norovirus genogroup I. Nucleic acid sequencing was conducted on both of the positive norovirus samples; the nucleic acid sequences were identical.

In univariate analysis, consumption of seasonal vegetable (34 of 36 cases vs. 8 of 18 controls; odds ratio [OR], 21.3; 95% confidence interval [CI], 3.2 to 179.8; $p < 0.001$) and baby mixed greens salad (35 of 38 cases vs. 11 of 19 controls; OR, 8.5; 95% CI, 1.6 to 50.7; $p = 0.004$) were significantly associated with illness. Consumption of pasta salad (35 of 38 cases vs. 13 of 19 controls; OR, 5.4; 95% CI, 0.97 to 33.2; $p = 0.05$) and water (34 of 36 cases vs. 14 of 19; OR, 6.1; 95% CI, .86 to 52.9; $p = 0.04$) were borderline significantly associated with illness. Stepwise logistic regression converged to a model containing only seasonal vegetable (adjusted OR, 13.6; 95% CI, 2.3 to 81.5; $p < 0.001$) and the baby mixed greens salad (adjusted OR, 7.3; 95% CI, 1.1 to 49.3; $p = 0.03$).

MDH EHS obtained illness histories and job duty information from all 32 restaurant employees, including the three who worked the banquet; all denied being recently ill with any gastrointestinal symptoms. The restaurant actively utilized an employee illness log and an employee exclusion policy.

The seasonal vegetable, consisting of zucchini and squash, was sliced into quarters and grilled the evening prior to the banquet. The same evening the seasonal vegetable was prepared the restaurant hosted a seafood dinner event that included a menu of mussels and clams. The baby mixed greens salad consisted of a pre-washed bagged salad mix that was tossed with balsamic vinaigrette.

This was a foodborne outbreak of norovirus gastroenteritis associated with a fundraising banquet served at a church. Seasonal vegetables and baby mixed greens salad were implicated as the likely vehicles of transmission. While the ultimate source of contamination could not be identified, potential sources of contamination include an unidentified ill or recently ill food handler, or cross-contamination from raw shellfish.

(21)

***Salmonella* Typhimurium Infections Associated with a Pre-packaged Salad Mix**

April

Multiple states

On May 5, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) notified epidemiologists of three *Salmonella* Typhimurium isolates indistinguishable by pulsed-field gel electrophoresis (PFGE), pattern designation TM36 (PulseNet pattern designation JPXX01.0050).

The isolates had been received through routine surveillance. The PFGE pattern had not been seen in Minnesota since 2004. An investigation was initiated.

In Minnesota, cases were identified through routine surveillance and were defined as Minnesota residents from whom *S. Typhimurium* of PFGE pattern TM36 had been isolated. MDH staff interviewed cases about exposure history using a standard questionnaire. On May 9 and 10, a case-control study was conducted in Minnesota using three age-matched controls per case. The controls were recruited using a list of sequential phone numbers generated using the case's phone number's area code and prefix from a commercial phone directory database. Cases and controls were asked about consumption of several food items with specific detail on type, brand, and purchase information for salad consumption.

Staff from the Wisconsin Department of Health Services interviewed a Wisconsin case and also recruited matched controls. Data from the case-control study were analyzed using an unmatched analysis due to the small number of cases. Cases in other states were also interviewed using the Minnesota outbreak interview form.

Information notifying other states of the investigation was posted to the PulseNet web board on May 7. Centers for Disease Control and Prevention (CDC) OutbreakNet staff were notified of the investigation on May 10. Additional information was shared with all states using the OutbreakNet listserv on May 21.

The Minnesota Department of Agriculture (MDA) conducted a traceback investigation using shopper card information obtained from consenting cases. MDA worked directly with the producer of the implicated vehicle in an attempt to identify a contaminated lot or lots, and a specific contaminated ingredient.

Four cases of *S. Typhimurium* TM36 were identified in Minnesota. The cases had illness onset dates from April 22 to 28. Two (50%) cases were female. The median age of cases was 46 years (range, 14 to 55 years). All four cases reported diarrhea and fever, three (75%) had blood in their stool, and two (50%) had vomiting. The two cases who had recovered at the time of interview reported illness durations of 5 days and 23 days, respectively. One case (25%) was hospitalized for 5 days, and none of the cases died.

There were an additional six cases nationwide with the outbreak subtype: two in Mississippi, one in Illinois, one in Missouri, one in Texas, and one in Wisconsin. Information was obtained on three of those cases (Illinois, Missouri, and Wisconsin). Illness onset dates for these cases were April 23, 24 and 29. All three cases were females, aged 69, 71, and 75 years. All three had diarrhea and fever, one (33%) had

blood in her stool, and none had vomiting. Duration of illness was unknown. One case was hospitalized for 4 days, and none of the cases died.

On initial routine interview of the first three Minnesota cases, all three mentioned eating pre-packaged salads, and no other common exposures. A case-control study was initiated.

At the time of the case-control study there were three Minnesota cases, for which a total of nine matched controls were recruited. In an unmatched univariate analysis, consumption of pre-packaged lettuce/salad (3 of 3 cases vs. 1 of 8 controls; odds ratio [OR], undefined; 95% confidence interval [CI], 1.50 to undefined; $p = 0.02$), and Brand A Variety A pre-packaged salad (2 of 2 cases vs. 0 of 9 controls; OR, undefined; 95% CI, 1.93 to undefined; $p = 0.02$) were significantly associated with illness. Consuming Brand A pre-packaged lettuce/salad purchased from a Grocery Store Chain A location (2 of 2 cases vs. 0 of 9 controls; OR, undefined; 95% CI, 1.93 to undefined; $p = 0.02$) was also significantly associated with illness. Variety A pre-packaged salad contains iceberg lettuce, romaine lettuce, carrots, pea pods, red cabbage, and radishes. Several of these ingredients were associated with illness, including: pre-packaged carrots (3 of 3 cases vs. 1 of 9 controls; OR, undefined; 95% CI, 1.73 to undefined; $p = 0.02$), pre-packaged cabbage (3 of 3 cases vs. 1 of 9 controls; OR, undefined; 95% CI, 1.73 to undefined; $p = 0.02$) and romaine lettuce (3 of 3 cases vs. 0 of 9 controls; OR, undefined; 95% CI, 3.44 to undefined; $p = 0.005$).

With the Wisconsin case and matched controls combined with the Minnesota cases and controls, there were four cases and 12 controls evaluated with an unmatched univariate analysis. Consumption of pre-packaged lettuce/salad (4 of 4 cases vs. 3 of 11 controls; OR, undefined; 95% CI, 1.40 to undefined; $p = 0.03$), Brand A pre-packaged lettuce/salad (3 of 3 cases vs. 2 of 10 controls; OR, undefined; 95% CI, 1.22 to undefined; $p = 0.03$), Brand A Variety A pre-packaged salad (3 of 3 cases vs. 0 of 11 controls; OR, undefined; 95% CI, 4.26 to undefined; $p = 0.003$), Brand A pre-packaged lettuce/salad purchased from a Grocery Store Chain A location (3 of 3 cases vs. 0 of 11 controls; OR, undefined; 95% CI, 4.26 to undefined; $p = 0.003$), pre-packaged carrots (4 of 4 cases vs. 2 of 12 controls; OR, undefined; 95% CI, 2.28 to undefined; $p < 0.005$), pre-packaged cabbage (4 of 4 cases vs. 2 of 12 controls; OR, undefined; 95% CI, 2.28 to undefined; $p < 0.005$) and pre-packaged romaine lettuce (4 of 4 cases vs. 1 of 11 controls; OR, undefined; 95% CI, 3.55 to undefined; $p = 0.003$) were all significantly associated with illness.

The fourth Minnesota case was identified after the case-control study was conducted. This case also consumed Brand A Variety A pre-packaged salad.

Of the seven total nationwide cases that were interviewed, all seven reported eating pre-packaged lettuce salads. Five (71%) of the cases reported eating Brand A Variety A pre-packaged salad. Another case reported eating a Brand A pre-packaged salad with romaine and iceberg lettuce, and the seventh case ate pre-packaged salad of an unknown brand containing iceberg lettuce, cabbage, and carrots.

Shopper card records were available for two of the Minnesota cases and the Wisconsin case, and showed that they had purchased Brand A Variety A pre-packaged salad. The traceback of the Brand A Variety A salad consumed by the Minnesota and Wisconsin cases identified two possible lot numbers in common. These two lots were produced on April 8 and April 9 at a facility in Illinois. MDA and MDH worked with the producer, to try to identify common ingredients in salad varieties produced on those two dates, and ingredients that were used exclusively for the Variety A mix. No ingredients were used exclusively

in Variety A pre-packaged salads. All the ingredients were also used in many other varieties of salad. The U. S. Food and Drug Administration (FDA) was notified; and they visited the production facility in Illinois; however, no findings were reported back to MDA or MDH. Although a specific contaminated ingredient was not identified, the company reported deploying inspection teams to fields where ingredients used on those production dates were grown, to check water sources, animal intrusion, or any changes at those locations.

By the time the investigation occurred, lots in question were well past their Use By Dates. Additionally, it was clear that the outbreak had ended and no new cases were being identified. Therefore, no product recall was issued.

This was a multi-state outbreak of *Salmonella* Typhimurium infections associated with eating Brand A Variety A pre-packaged salad. Four cases were identified in Minnesota. Although two lots were identified that could have explained the outbreak, a specific contaminated ingredient was not identified.

(22)

***E. coli* O157:H7 Infections Associated with Raw Milk**

May-June

Sibley County

On May 18, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) notified MDH epidemiology staff of two *Escherichia coli* O157:H7 (O157) isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns that were identified through routine surveillance. The PFGE subtype was designated MN1138ECB265 and had never been identified in Minnesota prior to this. Both cases were interviewed using a standard MDH surveillance questionnaire by the following morning (May 19). The routine surveillance interviews indicated that one case might have consumed raw milk at home in the 7 days prior to illness onset. The raw milk had been purchased at Farm A in Gibbon, Minnesota. The second case did not report raw milk consumption during the initial interview, but upon subsequent interviews reported consuming milk from an organic farm in Gibbon at a family gathering held during the 7 days prior to illness onset. When this case was explicitly asked if the milk came from Farm A, she confirmed that it had. She also reported that other individuals who attended the family gathering became ill with gastrointestinal symptoms following the event, but this could not be confirmed through contact with the other attendees. On May 20, the MDH PHL notified epidemiology staff that another O157 isolate with the PFGE subtype MN1138ECB265 had been received through surveillance. The case was interviewed immediately using the standard questionnaire and denied consuming raw milk or raw milk products. However, the case did report attending a non-traditional school that had been associated with Farm A in the past in that it was a drop-off site where customers would purchase raw milk and other items from the farm. The Minnesota Department of Agriculture (MDA) was notified, and an investigation was initiated.

All O157 cases reported to MDH are interviewed by phone about potential exposures during the 7 days prior to illness onset, including food consumption in and outside of the home, as part of routine disease surveillance in Minnesota. Clinical laboratories are required to submit all O157 isolates to the MDH PHL for confirmation, serotyping, and routine PFGE subtyping using the enzymes *Xba*I and *Bln*I. Interviews of cases in cluster investigations are conducted using an iterative process. Using this dynamic model, suspicious exposures that are reported by initial cases are added to the standard interview for

subsequent cases. Additionally, initial cases may also be re-interviewed regarding suspicious exposures mentioned by subsequent cases.

Cases were defined as individuals with a laboratory-confirmed infection with O157 PFGE subtype MN1138ECB265 with illness onsets in May or June. Additional outbreak cases were identified through routine laboratory surveillance. Epidemiologists reviewed the information gathered during the interviews of O157 cases to identify other cases associated with Farm A. Customer lists were collected from Farm A to further identify any potential cases and to determine the extent of the outbreak.

When available, leftover products purchased from Farm A were collected from case households. The MDA Laboratory tested each submitted product for the presence of a variety of enteric pathogens, including O157 and other Shiga toxin-producing *E. coli* (STEC), *Campylobacter*, *Cryptosporidium*, *Listeria*, *Salmonella*, *Shigella*, and *Yersinia*, by polymerase chain reaction (PCR) and culture. If O157 or other STEC were isolated, isolates were submitted to the MDH PHL for serotyping and PFGE subtyping.

An inspection of the kitchen at the school attended by one of the cases was conducted by MDA on May 25, 2010, to determine if products from Farm A were served at this facility. MDA and MDH officials inspected Farm A on May 26 to document conditions at the farm and collect food, environmental, and animal samples. These samples were tested for the same pathogens and using the same methods described above. The MDA Laboratory tested the food samples, and the MDH PHL tested the environmental and animal samples.

On May 25, MDH epidemiologists were notified that a fourth O157 isolate with PFGE pattern MN1138ECB265 had been received through surveillance. This case was interviewed the following morning (May 26). At that time, a parent reported that the case had consumed raw milk and other products from Farm A prior to onset of illness. Because of the cumulative information at that time, MDH and MDA issued a health alert and press release on May 26 to notify the health care community and the public of the link between the O157 cases and raw milk from Farm A.

Case identification continued after the press release had been issued. In total, eight cases were identified in Minnesota. The median age was 12 years (range, 4 months to 78 years), and six (75%) cases were male. Illness onset dates ranged from May 1 to June 1, 2010. All cases had diarrhea, six (75%) had bloody diarrhea, five (63%) had abdominal pain or cramping, three (38%) had fever, and three (38%) had vomiting. Five (63%) of the cases were hospitalized for their illness, and one (13%) developed hemolytic uremic syndrome (HUS). The median duration of hospitalization was 3 days (range, 2 to 13 days). Only two of the cases had recovered at the time of interview; the duration of illness for these two cases was 10 and 14 days, respectively.

Of the eight O157 cases with isolates of the outbreak PFGE subtype reported to the MDH during the investigation, six (75%) reported consuming raw milk and/or raw milk products from Farm A prior to illness onset. However, one of the eight cases who reported not consuming raw milk products had onset of illness after that of a sibling who was a case who did consume raw milk from Farm A; this case was classified as a secondary infection. Therefore, six (86%) of the seven cases with primary infection reported consuming raw Farm A milk products prior to becoming ill. Three of these cases (7- and 15-year old males and a 78-year old female) consumed raw milk outside of the home, including two while at a friend's house and one at a family member's house. Of cases with Farm A product exposures in their

own household, one reported purchasing the products directly from the farm, one reported getting the products at a drop-off site, and one refused to provide information on how the product was acquired.

Thirty-five individuals were contacted from the customer list. Of these, three reported experiencing illness compatible with O157 and were sent stool specimen collection kits. The first was a 6 year-old female who experienced bloody diarrhea, fever, and nausea starting around April 25. The case's family reported purchasing raw milk, skim milk, eggs, and ground beef from the farm on a weekly basis. The second individual was 43 year-old female who reported bloody diarrhea which began on May 20. The third individual was this second individual's spouse and was a 53 year-old male who reported experiencing diarrhea that started on May 31. This household reported purchasing skim milk and eggs on a weekly basis from Farm A. Two of the kits (from the two from the same household) were returned to MDH PHL and were screened for the presence of *Campylobacter*, *Cryptosporidium*, *Listeria*, O157, STEC, *Salmonella*, *Shigella*, and *Yersinia*. No pathogens were identified in either sample.

On the May 25 inspection of the school, MDA was informed that the school does not provide any food or drinks to the students except for bottled water and pizza from a local restaurant 1 day a week. The school administrator reported that some of the parents of children who attend the school do purchase raw Farm A dairy products, and that it was possible that the case who attended this school either had consumed items at a friend's home unknowingly or that he represented a secondary infection.

Two cases had leftover products that they were willing to submit to MDA for testing. One case had only raw cheddar cheese, but it was product that the case consumed prior to illness onset. The other case had raw milk, raw cheddar cheese curds, raw cheddar cheese, and multiple meat products. The raw milk collected was not the same bottle that was consumed by the case prior to illness onset, but it was purchased at the same time. None of the product samples collected from case households were positive for O157 or other enteric pathogens.

During the May 26 inspection of Farm A, 80 environmental and animal samples were collected by MDH staff. Of these, O157 was identified in 28 samples, including the outbreak PFGE subtype of O157 in 26 of the 28 samples. Additionally, 33 environmental or animal samples were positive for non-O157 STEC, 16 for *Cryptosporidium*, 12 for *Campylobacter jejuni*, 1 for *Yersinia enterocolitica*, and 1 for enterotoxigenic *E. coli* (Table 1).

Twenty-four food or food production area samples were collected by MDA during the farm inspection. O157 was not detected in any of the samples. Three samples were positive for non-O157 STEC: raw cheddar cheese, raw herb and spice Gouda cheese, and bulk vat rinse water. Two of these three positives yielded non-O157 STEC isolates; a Shiga toxin-producing colony could not be isolated in the rinse water sample. Serotype could not be determined at the MDH PHL for the two non-O157 STEC isolates; as a result, they were sent to the Centers for Disease Control and Prevention (CDC) for further workup. CDC determined the serotypes to be O109:NM and O100:NM. PFGE was performed on the two food isolates; they yielded unique patterns that differed from each other. No other human clinical isolates of non-O157 STEC in Minnesota or nationwide were found to have indistinguishable PFGE patterns during the time frame of the investigation.

This was an outbreak of *E. coli* O157:H7 infections associated with the consumption of raw milk and/or raw milk products from Farm A in Gibbon, Minnesota. Eight cases were identified, including one case of HUS. The outbreak PFGE subtype of O157 was found in numerous animal and environmental samples

taken from various areas on the farm. Routine PFGE subtyping of O157 isolates combined with routine interviewing of cases enabled identification of the source of the outbreak with a small number of cases.

Table 1. Results of enteric pathogen testing of animal and environmental samples.*

Source/Site	<i>E. coli</i> O157:H7	O157:H7 PFGE	Shiga toxin genes	Non-O157 STEC**	<i>Campylobacter</i>	<i>Cryptosporidium</i>
Calf in hutch	-		stx1 and stx2	+	-	<i>C. ryanae</i>
Calf in hutch	-		stx1 and stx2	+	<i>C. jejuni</i>	<i>C. parvum</i>
Calf in hutch	-		stx1 and stx2	+	-	-
Dairy barn #1	-		stx1	+	-	-
Dairy barn #2	-		-	-	-	-
Dairy barn #3	-		stx1	+	-	Oocysts found
Dairy barn #4	-		stx1	+	<i>C. jejuni</i>	-
Dairy barn #5	+	MN1138ECB265	stx1 and stx2	+	-	Oocysts found
Dairy barn #6	-		-	+	-	-
Dairy barn #7	+	MN1138ECB265	stx1 and stx2	-	-	Oocysts found
Dairy barn #8	-		-	-	-	-
Dairy barn #9	-		stx1	+	-	-
Dairy barn #10	+	MN1138ECB265	stx1 and stx2	-	-	-
Dairy barn #11	-		stx1 and stx2	+	-	Oocysts found
Calves in pen 3 #1	-		stx1 and stx2	+	-	-
Calves in pen 3 #2	-		-	-	<i>C. jejuni</i>	-
Calves in pen 2 #1	+	MN1138ECB265	stx1 and stx2	Not cultured	-	Oocysts found
Calves in pen 2 #2	+	MN1138ECB265	stx1 and stx2		-	-
Calves in pen 1 #1	+	MN1143ECB265	stx1 and stx2	Not cultured	-	Oocysts found
Calves in pen 1 #2	+	MN1138ECB265	stx1 and stx2	+	<i>C. jejuni</i>	-
Calf in front tie stall	-		stx1 and stx2	+	<i>C. jejuni</i>	-
Bedding in cow pen 1 #1	-		stx2	+	-	-
Bedding in cow pen 1 #2	-		stx1 and stx2	+	<i>C. jejuni</i>	Oocysts found
Manure in cow pen 2 #1	+	MN1138ECB265	stx1 and stx2	-	<i>C. jejuni</i>	-
Cow pen 2#2	+	MN1138ECB265	stx1 and stx2	Not cultured	-	-
Cow pen 2#3	-		stx2	+	-	Oocysts found
Cow yard #1	-		stx1 and stx2	+	-	-
Cow yard #2	-		stx1 and stx2	+	-	Oocysts found
Cow yard #3	-		stx2	+	-	-
Cow yard #4	-		-	-	-	-

Source/Site	<i>E. coli</i> O157:H7	O157:H7 PFGE	Shiga toxin genes	Non-O157 STEC**	<i>Campylobacter</i>	<i>Cryptosporidium</i>
Cow yard #5	-		-	-	-	-
Cow yard #6	-		stx1 and stx2	+	-	-
Cow yard #7	-		-	-	<i>C. jejuni</i>	-
Cow yard #8	-		stx1 and stx2	+	<i>C. jejuni</i>	-
Cow yard #9	+	MN1144ECB265	stx1 and stx2	-	-	-
Cow yard #10	-		-	-	-	Oocysts found
Cow yard #11	-		-	-	-	-
Cow yard #12	-		stx1	+	-	-
Manure pile #1	-		-	-	-	-
Manure pile #2	-		stx2	+	-	Oocysts found
Manure pile #3	+	MN1138ECB265	stx1 and stx2	-	-	-
Manure pile #4	+	MN1138ECB265	stx1 and stx2	-	<i>C. jejuni</i>	-
Cow pasture #1	-		-	-	-	-
Cow pasture #2	-		stx1	+	-	-
Cow pasture #3	-		-	-	-	-
Cow pasture #4	-		-	-	-	-
Cow pasture #5	-		stx1 and stx2	+	-	-
Cow pasture #6	+	MN1138ECB265	stx1 and stx2	-	-	-
Cow pasture #7	-		-	-	-	-
Cow pasture #8	-		-	-	-	-
Cow pasture #9	-		-	-	-	Oocysts found
Cow pasture #10	-		-	-	-	-
Cow pasture #11	-		-	-	-	-
Cow pasture #12	-		-	-	-	-
Cow pasture #13	-		-	-	-	-
Cow pasture #14	-		-	-	-	-
Steer yard #1	-		-	-	-	-
Steer yard #2	+	MN1138ECB265	stx1 and stx2	-	<i>C. jejuni</i>	-
Steer yard #3	-		-	-	-	-
Steer yard #4	+	MN1138ECB265	stx1 and stx2	-	-	-
Steer yard #5	+	MN1138ECB265	stx1 and stx2	-	-	Oocysts found
Steer yard #6	+	MN1138ECB265	stx1 and stx2	-	-	-
Steer yard #7	+	MN1138ECB265	stx1 and stx2	-	-	-
Steer yard #8	+	MN1138ECB265	stx1 and stx2	-	-	-
Sheep #1	+	MN1138ECB265	stx1 and stx2	+	-	-
Sheep #2	+	MN1138ECB265	stx1 and stx2	+	<i>C. jejuni</i>	-
Sheep #3	-		stx1	+	-	-
Sheep #4	+	MN1138ECB265	stx1 and stx2	-	-	-

Source/Site	<i>E. coli</i> O157:H7	O157:H7 PFGE	Shiga toxin genes	Non-O157 STEC**	<i>Campylobacter</i>	<i>Cryptosporidium</i>
Sheep #5	+	MN1138ECB265	stx1 and stx2	+	-	-
Sheep #6	+	MN1138ECB265	stx1 and stx2	Not cultured	-	-
Pig #1	-		-	-	-	Oocysts found
Pig #2	-		stx2	+	-	-
Pig #3	-		stx2	+	-	-
Pig #4	-		stx2	+	-	-
Pig #5	-		Not tested	-	-	-
Heifer #1	-		stx1 and stx2	+	-	-
Heifer #2	+	MN1138ECB265	stx1 and stx2	-	-	-
Heifer #3	+	MN1138ECB265	stx1 and stx2	-	-	-
Heifer #4	+	MN1138ECB265	stx1 and stx2	Not cultured	-	-
Heifer #5	+	MN1138ECB265	stx1 and stx2	-	-	-
<p>* All samples negative for <i>Listeria</i>, <i>Salmonella</i>, and <i>Shigella</i>. <i>Yersinia enterocolitica</i> was identified in Steer yard #8, and enterotoxigenic <i>E. coli</i> was identified in Pig #4.</p> <p>** Samples were considered positive for non-O157 STEC if: 1) non-O157 STEC was isolated by culture; or 2) Shiga toxin genes were identified but the sample was negative for <i>E. coli</i> O157 by culture.</p>						

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***Salmonella* Enteritidis Infections Associated with a Restaurant**

May

Beltrami County

On May 20, 2010, review of routine surveillance interviews of *Salmonella* Enteritidis pulsed-field gel electrophoresis (PFGE) subtype JEGXX01.0004 cases reported to the Minnesota Department of Health (MDH) revealed that two cases had patronized a restaurant in Bemidji, Minnesota in the week before illness onset. MDH Environmental Health Services (EHS) was contacted and an investigation was initiated.

All *S. Enteritidis* isolates received by the MDH Public Health Laboratory are subtyped by PFGE using two enzymes, *XbaI* and *BlnI*. All *S. Enteritidis* cases are interviewed about potential exposures, including foods consumed 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.

MDH EHS sanitarians conducted an environmental assessment of the restaurant on May 21 and collected credit card receipt records. MDH EHS sanitarians and epidemiologists interviewed restaurant employees about gastrointestinal illness since May 1. The cases, their meal companions, and additional patrons identified through May 5, 6, and 7 credit card receipts were interviewed by MDH staff about food consumption and illness history.

A confirmed case was defined as a restaurant patron from whom *S. Enteritidis* JEGXX01.0004 was isolated after eating at the restaurant. A probable case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

A case-control study was conducted to evaluate particular food items at the restaurant that may have been associated with illness. All confirmed and probable cases were included in the analysis. Controls were restaurant patrons who were identified from May 5, 6, and 7 credit card receipts and who reported no gastrointestinal symptoms after eating at the restaurant.

The Minnesota Department of Agriculture (MDA) and the United States Food and Drug Administration (FDA) conducted traceback investigations of the epidemiologically implicated product. A total of seven cases were identified. Five confirmed cases were identified through routine surveillance. Two probable cases were identified; one was a meal companion of a confirmed case, and the other was a patron identified through credit card receipts. One patron identified through credit card receipts reported illness that did not meet the case definition and was excluded from analysis.

All seven cases reported diarrhea, cramping, and fever. Five (71%) reported vomiting and two (29%) reported bloody diarrhea. The median duration of illness for the four cases who had recovered by the time of interview was 8 days (range, 8 to 10 days). One case was hospitalized. Three cases reported eating at the restaurant on May 5, two on May 6, and two on May 7. The median incubation period was 24 hours (range, 16 to 115 hours).

Cases reported eating a variety of foods including chili rellenos, enchiladas, tacos, and burritos. By univariate analysis, consuming a chili relleno was the only food item significantly associated with illness (4 of 7 cases vs. 2 of 34 controls; odds ratio, 22.7; 95% confidence interval, 2.1 to 339.0; Fisher's exact 2-tailed $p = 0.004$).

MDH EHS sanitarians conducted an environmental assessment on May 21 which included a review of the chili relleno preparation process. The chilis were deep fried, peeled, stuffed with cheese, and frozen. In batches, the frozen chilis were then dredged in flour, dipped in egg whites, deep fried, and refrigerated. When ordered, the chili rellenos were warmed for a few minutes in an oven, covered with sauce, and put in a microwave to melt the cheese.

Sanitarians noted a high potential for cross-contamination in the preparation of the chili rellenos. The cook preparing the chili rellenos did not properly wash their hands after cracking shell eggs and separating egg whites. Only two other menu items, Mexican flan and huevos rancheros, contained eggs. Neither of these menu items was consumed by cases. MDH EHS sanitarians and MDH staff interviewed all 16 employees; none reported recent gastrointestinal illness.

MDH obtained food invoices from the restaurant; these invoices identified a distributor in Fargo, North Dakota as the source of shell eggs used in the restaurant during the implicated meal dates. MDA contacted the distributor, and distribution records indicated that they received the shell eggs from an egg producer in New Hampton, Iowa. All of the traceback information was forwarded to the FDA. The producer was subsequently implicated in a large multi-state outbreak of *Salmonella* Enteritidis infections.¹

This was an outbreak of *S. Enteritidis* SE1B1 infections associated with eating at a Mexican restaurant in Bemidji. The outbreak was identified through routine disease surveillance. Documented transmission to patrons occurred from May 5-7. Consumption of chili rellenos was significantly associated with illness. The potential for cross-contamination from raw eggs to cooked chili rellenos and other ready-to-eat foods was identified as the likely mechanism for food contamination.

Reference

1. <http://www.cdc.gov/salmonella/enteritidis/>

(24)

Clostridium perfringens Intoxications Associated with a Restaurant

May

Washington County

On May 10, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among several individuals from separate households who had eaten a buffet meal at a restaurant in Woodbury, Minnesota on May 9 (Mother's Day). Washington County Public Health and Environment (WCPHE) was notified, and an outbreak investigation was initiated. Three additional complaints about the May 9 buffet from separate households were received by WCPHE on May 10.

A reservation list of restaurant patrons from May 9 (representing over 650 guests) was obtained from the restaurant by WCPHE. Staff from WCPHE interviewed patrons to obtain information on buffet food and beverage consumption, and illness history. A case was defined as a person who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) following a meal at the restaurant. Stool specimens were obtained from consenting patrons and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

WCPHE conducted an inspection of the restaurant focusing on employee hygiene, employee work schedule and illness logs, food-handling practices, and equipment sanitation. An employee list with contact information, work schedules, and duties was obtained from the restaurant. WCPHE staff interviewed employees who worked on May 8 and 9, using a standard questionnaire about recent illness history (including household members) and job duties.

Illness histories and exposure information were obtained from 36 patrons who dined at the restaurant on May 9. Twenty-three (64%) patrons met the case definition. Twenty-two (96%) cases reported diarrhea, four (17%) reported vomiting, and one (4%) reported fever. The median incubation period was 9.5 hours (range, 2.5 to 24 hours). The median duration of illness was 33 hours (range, 3.5 to 59 hours). The median age of cases was 39 years (range, 3 to 69 years). Four cases submitted stool samples for testing; samples tested positive for *Clostridium perfringens* enterotoxin A. All four samples were culture-positive for *C. perfringens* with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns. The stool samples were negative for all other bacterial and viral enteric pathogens.

In the univariate analysis, consumption of prime rib (18 of 23 cases vs. 4 of 13 controls; odds ratio, 8.1; 95% confidence interval, 1.7 to 37.8; $p = 0.005$) was significantly associated with illness. None of the other buffet food items, beverages or ice were statistically associated with illness.

Illness history and food worker duties were obtained from 64 (84%) of the 76 individuals employed by the restaurant. Fifty-two of the 76 employees had worked on May 9. Of these food workers 86% (45 of 52) were interviewed.

One ill food worker was identified through the investigative process and sent home. The ill food worker had a similar illness history as the patrons. A stool specimen was obtained from the consenting employee and submitted to MDH PHL for bacterial and viral testing. The sample tested positive for *C. perfringens* enterotoxin A and was culture-positive for *C. perfringens* with a PFGE pattern that matched *C. perfringens* isolates from cases. The employee's sample also tested positive for norovirus.

The ill food worker, a line cook, had worked on May 9 and May 11. The food worker developed vomiting and diarrhea on May 11. Purportedly the line cook was not ill prior to May 11 and did not consume food items prepared at the restaurant on May 9.

During the employee interviews, investigators discussed and emphasized that restaurant employees cannot work while ill with vomiting and/or diarrhea and that proper handwashing must be followed. Management began checking each employee as upon arrival each shift to check for any symptoms of illness and discuss employee health policies. Management was directed to exclude any sick employee and report to WCPHE. A strict no bare-hand contact policy was put into place at the establishment.

Based on the May 10 environmental health investigation and a review of food preparation practices with the restaurant's head chef and general manager, the following preparation and cooking practices were identified. Prime rib was found in that oven (double shaam) at 109° F. Prime rib had been cooking overnight. The restaurant was ordered to discard prime rib, turkey and any other item cooked in the Alto Shaam. During the preparation of the buffet prime ribs for cooking, a plug of meat was removed from the core of each prime rib, and the hole was filled with an uncooked garlic and spice mixture. The prime rib final cook temperatures were not being monitored and food temperature logs were not being utilized. The restaurant was provided with Minnesota Food Code requirements for cooking prime rib. If prime rib is to be cooked to lower temperatures (as allowed in Minnesota Food Code) the meat must be left whole; inserts are not allowed. The restaurant immediately changed the cooking process for the prime rib. The restaurant was ordered to use a food thermometer to monitor food temperatures while cooking, cooling, and reheating. Food temperature logs were put into place.

A drawer cooler under the cook line was found at 50° F. Walleye, pasta, and brisket were discarded. A repair person was immediately contacted regarding the cooler. Orders were provided to begin cleaning and sanitizing all surfaces in the kitchen (e.g., all equipment, handles, handwashing stations). Orders were provided to dump the ice and clean and sanitize all bar equipment. Any food items remaining from the May 9 buffet were discarded.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with consumption of prime rib at a Mother's Day buffet held at a restaurant in Woodbury, Minnesota on May 9. The outbreak resulted from inadequate cooking and hot holding temperatures of prime rib, which created a favorable environment for *C. perfringens* proliferation and survival.

***Salmonella* Enteritidis Infections Associated with a Restaurant**

May

Olmsted County

On June 13, 2010, 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 two cases had patronized a restaurant in Rochester, Minnesota in the week before illness onset. Olmsted County Public Health Services (OCPHS) was contacted and an investigation was initiated.

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

OCPHS sanitarians conducted an environmental assessment of the restaurant on June 14. They collected credit card receipt records, interviewed restaurant employees about gastrointestinal illness since June 1, and collected environmental samples. The cases, their meal companions, and additional patrons identified through May 20 credit card receipts were interviewed by MDH staff about food consumption and illness history. A confirmed case was defined as a restaurant patron from whom *S. Enteritidis* SE1B1 was isolated after eating at the restaurant.

A case-control study was conducted to evaluate specific food items at the restaurant that might have been associated with illness. All confirmed cases were included in the analysis. Controls were restaurant patrons identified using May 20 credit card receipts who reported no gastrointestinal symptoms after eating at the restaurant.

The Minnesota Department of Agriculture (MDA) conducted a traceback investigation of the epidemiologically implicated product.

Three confirmed cases were identified through routine surveillance. All three confirmed cases reported diarrhea and cramping, two (67%) reported bloody diarrhea, one (33%) reported fever, and none reported vomiting. The median duration of illness was 15 days (range, 9 to 18 days). One case was hospitalized. The meal date for all three cases was May 20. The median incubation period for the two cases for whom an incubation period could be calculated was 126 hours (range, 96 to 156 hours).

Cases reported eating a variety of foods. By univariate analysis, consumption of hard-boiled eggs (2 of 3 cases vs. 0 of 11 controls; odds ratio [OR], undefined; Fisher's exact 2-tailed $p = 0.04$), cheese-stuffed mushroom caps (2 of 3 cases vs. 0 of 11 controls; OR, undefined; Fisher's exact 2-tailed $p = 0.04$), and honeydew (2 of 3 cases vs. 0 of 11 controls; OR, undefined; Fisher's exact 2-tailed $p = 0.04$) were significantly associated with illness. The small number of cases precluded a meaningful multivariate analysis.

OCPHS sanitarians interviewed all 12 employees; no employees reported recent gastrointestinal illness. Upon environmental inspection, sanitarians noted several violations. The employee bathroom did not have soap. The kitchen handwashing stations did not have hot water. Serving pans were left to dry next

to raw meat. Employees were observed handling raw products and not properly washing hands before handling other food items. There was potential for cross-contamination in the walk-in cooler due to ready-to-eat foods being stored directly below tubs of raw chicken. Additionally, surfaces throughout the kitchen, including commonly touched surfaces and equipment, were soiled. Sanitarians ordered a thorough environmental cleaning and sanitation of the restaurant. Handwashing sinks were ordered to be repaired and properly supplied. Restaurant management was directed to review and reinforce the importance of proper handwashing and to re-organize the walk-in cooler, storing raw meat below ready-to-eat foods. Sanitarians also ordered serving pans be protected from contamination by storing them in a different location or installing a shield/ barrier between the pans and where raw meat is stored. All nine environmental samples taken from kitchen surfaces were negative for *Salmonella*.

OCPHS sanitarians obtained invoices from the restaurant; these invoices identified a supplier in New Hope, Minnesota as the sole supplier of shell eggs to the restaurant. MDA contacted the supplier, and distribution records indicated that they received shell eggs from Distributor B, Producer A, and Producer B in Clarion, Iowa. All of the traceback information was forwarded to the FDA and Producer B was subsequently implicated in a large multi-state outbreak of *Salmonella* Enteritidis¹.

This was an outbreak of *S. Enteritidis* SE1B1 infections associated with eating at a restaurant in Rochester. The outbreak was identified through routine disease surveillance. Documented transmission to patrons occurred on May 20. Consuming hard-boiled eggs, honeydew, and cheese-stuffed mushroom caps was associated with illness. Eggs are the most common vehicle for *S. Enteritidis*; therefore the implication of hard-boiled eggs in the analytic study identified a plausible explanation for the outbreak. Eggs supplied to the restaurant traced back to a producer in Iowa which was implicated as the source of a large multi-state outbreak of *S. Enteritidis* infections. Potential cross-contamination issues were identified, and cross-contamination of ready-to-eat foods also could have contributed to transmission.

Reference

1. <http://www.cdc.gov/salmonella/enteritidis>

(26)

Suspected Norovirus Gastroenteritis Associated with a Funeral Luncheon

May

Blue Earth County

On May 26, 2010, the Minnesota Department of Health (MDH) foodborne diseases unit received an illness complaint from Brown-Nicollet Environmental Health. Complainant illness was reportedly associated with a funeral luncheon catered by Caterer X of Mankato. Church congregation members also provided various cakes for dessert; cookies and muffins were brought in by the family of the deceased. The complainant contacted the mortuary, who in turn contacted the caterer. The caterer reported the illness to Brown-Nicollet County. The initial complainant reported two individuals with gastrointestinal illness after eating at the funeral luncheon on May 21. An investigation was initiated.

Brown-Nicollet Environmental Health staff went to the caterer on May 27 to evaluate food preparation and handling procedures and to interview food workers. The complainants, additional funeral attendees, and church members who worked at the funeral and/or made desserts were interviewed by MDH staff about food consumption and illness history. A case was defined as a funeral luncheon attendee who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples

collected from consenting attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Nineteen attendees were interviewed, and 13 (68%) met the case definition. Twelve cases (92%) reported diarrhea, eight (62%) reported cramps, five (38%) reported vomiting, and three (23%) reported fever. No cases reported bloody stools. The median incubation period was 44 hours (range, 35 to 67 hours). The median duration of illness was 45 hours (range, 27 to 56 hours). All stool samples submitted by ill attendees tested negative for norovirus, *Salmonella*, *Shigella*, *Campylobacter*, *E. coli* O157:H7, and *Vibrio*.

The relatively small number of non-ill controls precluded a robust statistical analysis of specific food exposures. Nearly all cases (and controls) reported eating the fruit salad (12 of 13 cases vs. 5 of 6 controls). A variety of other food items including potato salad, turkey and ham sandwiches, pickles, various cakes, cookies, and muffins were also consumed.

Brown-Nicollet Environmental Health staff interviewed the four catering employees. None reported recent gastrointestinal illness. Environmentalists stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, proper handwashing, and exclusion of ill employees.

This was a foodborne illness outbreak associated with a funeral luncheon. The etiology was not confirmed. However, the distribution of incubations and symptoms were characteristic of norovirus gastroenteritis. A specific vehicle or source of contamination was not identified.

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Norovirus Gastroenteritis Associated with a Restaurant

June

Hennepin County

On June 1, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received independent complaints of gastrointestinal illness from two groups of co-workers who had eaten at a restaurant in St. Anthony on May 28. A third complaint of illness associated with a meal at the restaurant on May 29 was reported to MDH on June 4. MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and environmental health units on June 1, and an investigation was initiated.

HSPHD sanitarians visited the restaurant on June 2 to conduct an environmental assessment and interview employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures.

HSPHD epidemiology obtained a list of co-workers from Business A and interviewed them regarding food consumption and illness history. MDH interviewed the patrons from the other two complainant groups. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

Twelve patrons were interviewed by HSPHD and MDH staff. Eight (67%) met the case definition. All eight cases reported vomiting, seven (88%) diarrhea, seven (88%) cramps, six (75%) fever, and none

reported bloody stools. The median incubation was 35.5 hours (range, 27 to 39 hours). The median duration of illness for the seven cases who had recovered at the time of interview was 19 hours (range, 4.5 to 47 hours). Stool specimens collected from three cases tested positive for norovirus genogroup II with identical nucleic acid sequences.

The small number of non-ill controls precluded a meaningful statistical analysis of specific food exposures. Five (63%) of cases ate a sub sandwich, two (25%) ate a salad, one (13%) ate a wrap sandwich, and one (13%) ate a bag of potato chips.

All seven of the restaurant's employees were interviewed; none reported recent gastrointestinal illness or ill family members. HSPHD sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, proper handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints or reports of employee illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating food from a restaurant. The vehicle of transmission and source of contamination were not identified.

(28)

Norovirus Gastroenteritis Associated with a Restaurant

May

Anoka County

On June 1, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a patron who ate at a restaurant in Coon Rapids on May 30. On June 2, MDH received an additional complaint from two patrons who developed vomiting and diarrhea after eating at the restaurant on May 30. The same day, Anoka County Community Health and Environmental Services (ACCHES) received four complaints of gastrointestinal illness in six patrons from four households. All six had also eaten at the same restaurant on May 30. An outbreak investigation was initiated immediately.

On June 4, ACCHES received two additional complaints of illness from patrons who also ate at the restaurant on May 30. On June 9, the MDH received a complaint from a patron who had become ill after eating at the restaurant on June 2.

In total, from June 1 to June 9, the MDH and ACCHES received nine independent illness complaints regarding the restaurant in Coon Rapids. Meal dates ranged from May 30 to June 2. Of the 15 total people included in the complaining dining parties, 11 reported illness.

MDH staff conducted telephone interviews with patrons who ate at the restaurant from May 30 through June 1 and whose phone numbers were ascertained from credit card receipts. A case was defined as a person who ate at the restaurant who subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

Stool samples were collected from consenting patrons and complainants and were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Environmental health specialists from ACCHEs visited the restaurant on June 2 to perform an environmental assessment. The employee illness log and patron credit card receipts from May 30 through June 1 were obtained from the restaurant.

Staff from MDH and ACCHEs interviewed employees about gastrointestinal illness history, work schedules, and food consumed at the restaurant. Employees who reported recent vomiting or diarrhea were excluded from working at the restaurant until 72 hours after resolution of symptoms. During the investigation, the restaurant hired a staff member to monitor employee handwashing at the restaurant.

Eighty-seven restaurant patrons were interviewed, including the 15 original complainants. Twenty-four cases (28%) were identified, representing four meal dates: May 30 (n=17), May 31 (n=4), June 1 (n=1) and June 2 (n=2). Of the 24 cases, 21 (88%) had diarrhea, 19 (79%) had vomiting, 18 (75%) had cramping, five (21%) had fever, and one (4%) had bloody stools. The median incubation period was 32 hours (range, 13 to 52 hours). For the nine cases who had recovered by the time of interview, the median duration of illness was 42 hours (range, 6 to 99 hours). Three cases called or visited a medical provider, and none were hospitalized.

MDH collected stool samples from two ill restaurant employees and three ill patrons, including one from a complainant. The three patrons ate at the restaurant on May 30. All five stool samples tested positive for norovirus genogroup II.4 New Orleans. Further laboratory tests were conducted on four of the samples, including one from an employee. All four positive specimens had identical nucleic acid sequences.

By univariate analysis, eating steak (19 of 24 cases vs. 33 of 63 controls; odds ratio [OR], 3.45; 95% confidence interval [CI], 1.17 to 11.4; $p = 0.04$), salad (21 of 23 cases vs. 39 of 62 controls; OR, 6.19; 95% CI, 1.47 to 41.6; $p = 0.02$), ranch dressing (7 of 17 cases vs. 9 of 60 controls; OR, 3.97; 95% CI, 1.13 to 13.3; $p = 0.04$), or French dressing (5 of 15 cases vs. 6 of 60 controls; OR, 4.50; 95% CI, 1.05 to 18.1; $p = 0.04$) was significantly associated with illness. By multivariate analysis using logistic regression, eating salad was significantly associated with illness in an adjusted model including steak and salad (OR, 5.07; 95% CI, 1.06 to 24.2; $p = 0.04$).

Interviews were conducted with 152 (96%) of 158 employees, of which 19 (12%) reported some illness. Of the 19 ill food workers, 13 (68%) met the case definition for gastrointestinal illness. Interviewed employees reported illness onsets ranging from May 16 through June 5, with five reporting onset before May 30 and eight reporting onsets after May 30. One employee who reported onset of diarrhea on May 28, worked while ill May 29 to May 31, and had to leave work early on May 31 due to illness. The employee had host/managerial duties May 29 and May 31 and served food to tables on May 30. Due to recent illness, two employees were told during their interviews with MDH staff that they could not immediately return to work as planned. The employee illness log obtained from the restaurant by environmental health specialists showed continuous transmission of 'flu' illness and indicated vomiting in nine employees dating back to March 29.

Environmental health specialists evaluating the restaurant did not observe bare-hand contact with ready-to-eat foods. They noted that the salad preparers wore gloves and used tongs to handle salad ingredients. Handwashing practices were reviewed and no problems were noticed.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Coon Rapids, Minnesota. Salad was statistically implicated as the vehicle of transmission. The level of illness and evidence of transmission among employees is a strong indicator that ill employees were the source.

(29)

Suspected Norovirus Gastroenteritis Associated with a Cooking School

June

Dakota County

On June 8, 2010, the Minnesota Department of Health (MDH) was informed by a food worker, who was being interviewed as part of a confirmed norovirus outbreak investigation at a restaurant in Coon Rapids that employed him, that he had attended a morning cooking class at a cooking school in Mendota Heights on June 3 while ill with vomiting and diarrhea. At this class, the students prepared individual meals and then shared the food items amongst themselves. He reported that approximately five classmates were missing from class several days later and that one student left class on June 8 with gastrointestinal symptoms. The cooking school in Mendota Heights also has a restaurant that is staffed by students. An outbreak investigation was started immediately.

MDH staff conducted phone interviews with students who were enrolled in the morning and afternoon cooking classes at the cooking school in Mendota Heights. A case was defined as anyone who attended class on June 3 or after who subsequently became ill with vomiting or diarrhea (≥ 3 loose stools in a 24-hour period). Stool collection kits were sent to consenting cases to be submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

An environmental health specialist from MDH visited the cooking school in Mendota Heights on June 10 to inspect the restaurant, interview food workers, and review ill employee procedures.

Twenty-one cooking school classmates were interviewed including 12 (57%) from the morning class and 9 (43%) from the afternoon class. Four persons, all from the morning class, reported illness and met the case definition, while no illnesses were reported from the afternoon class. Illness onset dates ranged from June 5 to June 8. Among the cases, all four reported vomiting, fever and cramps, and three (75%) reported diarrhea. The incubation periods for these individuals from the June 3 class were 42, 78, 96, and 121 hours, respectively. Two cases had recovered from their illness at the time of interview and reported illness durations of 45 hours and 46 hours, respectively. All cases reported attending class while experiencing diarrhea and/or vomiting. All cases consumed foods prepared by classmates on multiple class dates prior to illness onsets. Because all students cooked the same dish and no one could identify whose dish they consumed on a specific day, an implicated meal or dish could not be identified. Three stool kits were sent to cases but none were returned to MDH PHL.

MDH sanitarians evaluating the cooking school in Mendota Heights discovered that no one from this class worked at the onsite restaurant. No employee illness or illness complaints were reported by the restaurant. Employee/student illness exclusion policies and handwashing procedures were reviewed with management.

One case also reported working at a restaurant in Owatonna while ill with vomiting and diarrhea. The manager of that restaurant was contacted and no other employees reported any illness. Management was

encouraged to remind workers not to work while ill, to review handwashing procedures with staff, and to be extra vigilant about keeping an employee illness log.

This was an outbreak of viral gastroenteritis associated with attendance at a cooking class at a cooking school in Mendota Heights. Illness likely occurred when classmates consumed foods either handled or prepared by the index ill food worker and transmission likely occurred on subsequent days, either from the index ill food worker or from classmates as they returned to class while symptomatic. Although no stool kits were returned to MDH, the description of reported illnesses and association with a confirmed norovirus outbreak strongly suggest norovirus as the etiologic agent.

(30)

***Salmonella* Muenchen Infections Associated with a Graduation Party**

June

Dakota County

A routine surveillance interview of a *Salmonella* Muenchen case conducted by the Minnesota Department of Health (MDH) on June 15, 2010 revealed that the case had attended an extended family member's graduation party in the week prior to illness onset. The case reported that she was aware of several other individuals who had attended the June 4 party becoming ill, including at least one who was also positive for *Salmonella*. On June 16, an MDH epidemiologist spoke with the graduation party hostess. The party hostess reported that food for the approximately 170 guests had been prepared by a caterer in Stillwater. She also reported that she had heard of individuals becoming ill after the party. Sanitarians from Washington County Public Health and Environment (WCPHE) were notified, and an outbreak investigation was initiated.

An MDH epidemiologist requested contact information for party guests from the party hostess.

All *Salmonella* 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 *S. Muenchen* cases to identify other potential cases associated with events catered by the caterer of the June 4 graduation party.

Epidemiologists from MDH interviewed graduation party guests to obtain information on food/beverage consumption and illness history. Guests were also asked to provide contact information for other graduation party guests.

Cases were defined as persons who had *S. Muenchen* pulsed-field gel electrophoresis subtype SMU97 isolated from stool cultures or persons who had fever and/or diarrhea (≥ 3 loose stools in a 24-hour period) after attending the June 4 graduation party.

WCPHE sanitarians contacted the caterer to assess illness history and food preparation procedures.

Despite several attempts to obtain a list of graduation party guests, the party hostess only provided MDH with the names of seven guests. Illness histories and exposure information were obtained from 16 guests. Seven cases were identified, including four (52%) with a stool specimen testing positive for *Salmonella* Muenchen SMU97. All cases reported diarrhea, six (87%) reported cramps, four (57%) reported fever, three (43%) reported bloody stools, and one (14%) reported vomiting. The median incubation period

was 66 hours (range, 25 to 72 hours). The median duration of illness was 7 days (range, 3 to 7 days) for the three cases that had recovered at the time of interview. No cases required hospitalization for their illness.

When contacted by a WCPHE sanitarian, the caterer reported that she was not a licensed caterer. The caterer had prepared the food for the graduation party at her private home in Stillwater and at the graduation party home site. The caterer was notified on June 16 to immediately cease all catering operations until she obtained the proper license.

Food prepared by the caterer consisted of ground beef sliders with caramelized onions and cheese; barbeque chicken sandwiches with tomato, lettuce, and white barbeque sauce; Caesar salad; roasted vegetable pasta salad; and fresh cut fruit, including pineapple, cantaloupe, melon, grapes, strawberries, and mango. Popcorn from a machine the party hostess had rented, frosted sugar cookies from a bakery in St. Paul, and petit fours from a bakery in Woodbury were also served.

No food items were statistically associated with illness.

This was a foodborne outbreak of *Salmonella* Muenchen infections associated with a graduation party. Due to a lack of cooperation from the party hostess, a comprehensive epidemiologic investigation could not be performed. A specific food vehicle could not be identified. The unlicensed caterer that was hired for the event was ordered to cease all catering operations until she obtains the proper licensure to operate her business.

(31)

Norovirus Gastroenteritis Associated with a Restaurant

June

Washington County

On June 15, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of four individuals from two separate households who had become ill with gastrointestinal illness after dining together at a restaurant in Woodbury, Minnesota on June 10. Washington County Public Health and Environment (WCPHE) was notified, and an outbreak investigation was initiated.

A WCPHE environmental health specialist conducted complainant interviews to obtain information on consumption of foods, beverages, event and social activities, and illness history. A case was defined as a person who ate at the restaurant on June 10 and subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). WCPHE attempted to obtain a list of patrons from the restaurant; however, the restaurant did not utilize a patron reservation system and the patron credit card receipts did not have names printed on them. A stool specimen was collected from an ill complainant and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

On June 15, a WCPHE environmental health specialist inspected the restaurant, focusing on food preparation practices, employee health and hygiene, and managerial compliance with recording employee illness history. An employee list with contact information, work schedules, and duties was obtained from the restaurant. WCPHE staff interviewed employees that worked June 9-15, using a standard questionnaire about recent illness history (including illness in household members) and job duties.

Only the four complainants were interviewed; all individuals met the case definition. All four cases reported diarrhea and cramps, three (100%) of three reported fever, and three (75%) of four reported vomiting. The median incubation period was 36 hours (range, 30 to 38 hours). The median duration of illness was 56 hours (range, 53 to 72) for the three cases who had recovered at the time of interview. The case stool specimen tested positive for norovirus genogroup II.

Cases had different main entrées; however, all cases shared a mixed greens salad which was served family-style and accompanied by bread sticks. It was unclear whether the salad and bread sticks were placed in serving dishes by wait staff or other foodservice workers.

Of the 126 restaurant employees, 74 employees worked at some point during June 9-15. Of these employees, 63 (85%) were interviewed. Two employees (wait staff) reported gastrointestinal symptoms, including diarrhea and vomiting, with onsets of June 11 and 12. Both employees denied any gastrointestinal symptoms on or before June 10, and both returned to work on June 15. Neither employee submitted a stool specimen for testing. No additional employee illness was reported for the month of June.

Employees were observed washing hands and using gloves and utensils during food preparation and service. Handwashing sinks were functional and stocked with soap, single-use towels, and a fingernail brush. The restaurant did not receive any other customer complaints.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. The specific vehicle of transmission was not identified. The most likely source of the outbreak was one or more unrecognized ill food workers with viral transmission occurring through contamination of ready-to-eat food items, such as salad and bread sticks.

(32)

Norovirus Gastroenteritis Associated with a Restaurant

June

Hennepin County

On June 16, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline was notified by a restaurant in Minneapolis that they had received three independent complaints of gastrointestinal illness from patrons who had eaten lunch at the salad bar on June 11. MDH notified Hennepin County Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH) on June 16, and an investigation was initiated.

MDH staff interviewed the three complainant groups, and HSPHD epidemiologists interviewed additional restaurant patrons identified from credit card receipts. 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 on June 11.

On June 17, MDEH sanitarians visited the restaurant to conduct a full inspection and interview food workers about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures.

Ten patrons were interviewed. Eight (80%) met the case definition. Six (75%) cases were male. The median case age was 34.5 years (range, 27 to 55 years). All eight cases reported vomiting, seven (88%) reported diarrhea, six (75%) reported cramps, three (38%) reported fever, and one (13%) reported bloody stools. The median incubation was 27 hours (range, 5 to 33.5 hours). The median duration of illness was 29.5 hours (range, 0.25 to 41 hours). A stool sample submitted by one of the cases to the MDH Public Health Laboratory for bacterial and viral testing was positive for norovirus genogroup II.

Only two controls were interviewed. The small number of non-ill controls precluded a meaningful statistical analysis of specific food exposures. All cases and controls reported eating a wide variety of vegetables, salad toppings, pasta salads, soups, breads, and desserts from the restaurant's extensive salad bar.

All 18 restaurant employees were interviewed. A cook reported developing diarrhea on June 10 and preparing foods for the salad bar on June 10 and June 11, while ill. Four additional employees reported developing gastrointestinal illness after the implicated meal date; three reported eating food items from the restaurant on June 11. MDEH sanitarians reviewed the norovirus exclusion policy for food handlers and reiterated that when norovirus is suspected as the cause of an outbreak, any food handler with vomiting or diarrhea must be excluded from work until 72 hours after the resolution of symptoms.

MDEH sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at a restaurant. A specific food vehicle was not identified. The source of contamination was a cook who reported preparing ready-to-eat foods for the salad bar while ill.

(33)

Norovirus Gastroenteritis Associated with a Rehearsal Dinner

June

Otter Tail County

On June 14, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness following a wedding held in Fergus Falls over the weekend of June 11 to 13. The rehearsal dinner was held on Friday, June 11 at the groom's parents' house, and the wedding reception dinner was held at a banquet hall on Saturday, June 12. The original complainant knew of several illnesses among the estimated 180 wedding attendees, with ill individuals reporting symptoms of diarrhea and vomiting that began late Saturday night through Sunday morning. The rehearsal dinner was attended by approximately 40 individuals. The foods served at the rehearsal dinner were all prepared by the groom's mother and included ham, meatballs, potatoes, vegetables, fruit, Jell-o, and ice cream. Subsequent attendee interviews revealed that a cake prepared by another individual was also served. The reception meal was held at the banquet hall but the food was prepared and served by members of a private organization; both facilities were located in Fergus Falls. The reception meal included chicken breast, gravy, baked potatoes, corn, rolls, salad, and cake; chicken nuggets and mashed potatoes were available for children. The wedding party was served a plated meal while all other

reception guests were served by private organization staff from the buffet line. MDH Environmental Health staff were notified, and an outbreak investigation was initiated.

A list of attendees was obtained from the bride and groom. Staff from MDH interviewed these individuals to obtain information on food/beverage consumption and illness history. A case was defined as a wedding event attendee who subsequently developed vomiting and/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 sanitarian from MDH contacted the banquet hall and the private organization to evaluate food preparation and handling procedures. MDH sanitarians also interviewed all employees from these two facilities.

Illness histories and exposure information were obtained from 54 wedding event attendees. Of these, 28 (52%) met the case definition. Among the cases, 25 (89%) reported vomiting, 24 (86%) diarrhea, 19 (70%) of 27 cramps, 8 (33%) of 24 fever, and 1 (4%) of 26 bloody diarrhea. Two of the cases visited a medical provider for their illness, and one was hospitalized overnight. The median incubation period from the rehearsal dinner was 38.5 hours (range, 28.5 to 61 hours), and the median incubation period from the reception meal was 14.5 hours (range, 4.5 to 37 hours). The median duration of illness was 27 hours (range, 3 to 81 hours) for the 16 people who had recovered at the time of interview. Seven cases submitted stool samples to the MDH PHL; all tested positive for norovirus genogroup II. Sequencing was performed on a subsample of the isolates; all four samples tested had identical sequences.

Attendance at the rehearsal dinner was strongly associated with illness (24 of 28 cases vs. 1 of 26 controls; odds ratio, 150; 95% confidence interval, 13.5 to 4,061; $p < 0.001$). As only one control who attended the rehearsal dinner was interviewed, meaningful food-specific analyses could not be performed. Therefore, no individual food items served at the rehearsal dinner were found to be significantly associated with illness.

All items at the rehearsal dinner except for the cake were prepared by the groom's mother. She did not reported experiencing gastrointestinal illness prior to the event but did develop vomiting and diarrhea on Sunday, June 13. One female attendee reported that her son started feeling sick on Friday, June 11 at 7:00 p.m. and had vomiting and diarrhea the next morning, but he did not attend any of the wedding events. The mom only attended the reception and had onset illness herself on Sunday, June 13 at 7:00 p.m. (consistent with other guests). The only other individual who reported illness prior to the event was a woman who had one episode of vomiting on June 5 and then had a second bout of illness including vomiting and diarrhea on June 13. This woman prepared the cake that was served at this meal. No other individuals who attended the rehearsal dinner reported being ill prior to or during this meal.

The onsets for the four individuals who met the case definition but did not attend the groom's dinner were: June 13 at 8:00 a.m., June 13 at 8:30 a.m., June 13 at 4:00 p.m., and June 13 at 7:00 p.m. Therefore, the incubation periods for these individuals from the reception dinner (the only joint meal they attended) were: 14, 14.5, 22, and 25 hours. One of these cases was the aforementioned woman whose son developed illness on June 11. Two of these individuals had relatives who attended the rehearsal dinner and became ill, including two children who developed illness shortly after the reception on June 12. The last case was a woman who experienced only three episodes of diarrhea over the course of 2 hours.

MDH sanitarians were able to contact all 12 employees from the banquet hall and the private organization who worked at this event; none reported experiencing recent gastrointestinal illness. The employees were also asked about foods consumed during the event, and nine reported consuming foods leftover from the reception meal. None of the employees became ill after consuming these items.

This was a foodborne outbreak of norovirus gastroenteritis associated with attendance at a wedding rehearsal dinner held at a private home. The attack rate among rehearsal dinner attendees was so high that there were not sufficient controls (i.e., non-ill persons) to identify a specific food vehicle. A small number of additional cases likely occurred through person-to-person transmission of norovirus from infected rehearsal dinner attendees to family members or other contacts on the day of the reception.

(34)

***Vibrio parahaemolyticus* Infections Associated with a Restaurant**

June

Hennepin County

On July 1, 2010, the Minnesota Department of Health (MDH) notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units of a *Vibrio parahaemolyticus* case identified through routine MDH surveillance. All *V. parahaemolyticus* cases reported to MDH are interviewed about food consumption and other potential exposures as part of enteric disease surveillance in Minnesota. The case indicated eating raw oysters at a restaurant in Minneapolis on June 11. An investigation was initiated immediately.

MDH interviewed the confirmed *V. parahaemolyticus* case and other members of his dining party. HSPHD epidemiologists interviewed additional restaurant patrons identified from credit card receipts. Cases were defined as restaurant patrons who had *V. parahaemolyticus* isolated from a stool culture or who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) within 4 days after eating at the restaurant.

On July 2, MDEH sanitarians and a representative of the U.S. Food and Drug Administration (FDA) visited the restaurant to conduct a full inspection and gather preliminary information for a traceback of the oysters consumed by the case.

No culture-confirmed patron cases were identified in addition to the one case identified through surveillance and interviewed by MDH; however, the case's spouse also ate raw oysters and reported gastrointestinal symptoms meeting the case definition. MDH interviewed 13 other members of the original case's dining party. Most only drank cocktails while at the restaurant, none reported eating raw oysters, and none reported gastrointestinal symptoms. The original *V. parahaemolyticus* case reported that another dining companion consumed raw oysters and had gastrointestinal symptoms; however, MDH was unable to reach this individual after multiple attempts.

Five additional patrons identified from a list of patron credit card receipts were interviewed by HSPHD epidemiologists. All five reported eating some type of raw oyster (types reported included Blue Point, Hood, James River, Kumamoto, Malpeques, Steamboat, and Totten Inlets oysters). None reported illness.

Both of the identified cases reported experiencing diarrhea and abdominal cramps, and one also reported nausea, headache, rash, and bloating. Both cases had an incubation period of 19 hours; illness durations were 6 hours and 9 days, respectively. The confirmed case reported having seven raw oysters at the restaurant while his wife reported consuming only two raw oysters. They were part of a dish called the “Chef’s Dozen” which included fresh oysters that were selected by the chef, sushi, and other raw bar items. One of the cases stated there were at least three different types of oysters in this dish and that types were most likely Totten Inlets, Hood Canal, and Tree Island. This information was supplied to the FDA to help inform their traceback investigation.

The chef reported that in the week prior to the cases’ meal date the restaurant received a shipment of Chesapeake Bay oysters (harvest date of June 4 from Virginia), a shipment of Hood Canal, Steamboats, and Kusshis oysters (harvest date of June 6 from Bruce Port in Washington and the Kusshis from British Columbia), and a shipment of James River, Blue Point, and Malpaques oysters (harvest date of June 7 from Virginia, New York, and Prince Edward Island, respectively). During the July 2 visit to the restaurant, the FDA representative collected shellfish tags from the implicated oysters to begin a traceback investigation of the oyster harvesters. At the time of this report, results of the traceback investigation had not been provided by FDA. MDEH also conducted an inspection and noted overall compliance with food code requirements for food preparation. The restaurant received no additional complaints of illness.

This was a foodborne outbreak of *V. parahaemolyticus* infections associated with eating raw oysters at a restaurant. The outbreak was identified through MDH routine laboratory surveillance.

(35)

Suspected Norovirus Gastroenteritis Associated with a Wedding Reception Dinner

June

Ramsey County

On June 29, 2010, the City of St. Paul was notified by the head chef at a hotel that they had received a complaint of gastrointestinal illness from the groom of a wedding reception that was held at the hotel on June 12. The groom reported knowing of at least 16 of 96 guests who became ill with vomiting and/or diarrhea approximately 36 to 48 hours after the reception. On July 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline was notified by the City of St. Paul about the complaint.

A list of wedding guests was obtained from the bride and groom, and an invoice with food and beverages served at the wedding reception was provided by the hotel. In addition to the reception, information was also collected on food and beverages served at the rehearsal dinner on June 11 and the gift opening on June 13. Staff from MDH interviewed wedding guests to obtain information on food/ beverage consumption and illness history. Information was also extracted from completed interview forms from interviews of wedding guests conducted by employees of the hotel, independent of the MDH investigation. A case was defined as a wedding guest who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after a wedding event. Interviews were not conducted for food workers of the hotel; however, an employee illness log was provided by the hotel.

Illness histories and exposure information were obtained from 46 wedding guests. Fifteen (33%) cases were identified. Thirteen (87%) cases reported vomiting, 13 (87%) reported diarrhea, 11 (73%) reported cramps, and 7 (70%) of 10 reported fever. The median incubation period from the wedding reception

dinner was 45.5 hours (range, 28 to 78 hours). The median duration of illness was 44 hours (range, 26 to 59 hours).

Consumption of wedding cake (15 of 15 cases vs. 22 of 30 controls; odds ratio, undefined; $p = 0.04$) was significantly associated with illness. The wedding cake was prepared, cut, and served by staff at the hotel. Illness was not significantly associated with attending the rehearsal dinner or the gift opening.

Because of the long time lapse between the wedding reception and the initiation of the investigation, no stool samples were requested from either guests or employees.

The employee illness log noted that an ill cocktail server stayed home from work on June 10 with vomiting.

This was a foodborne outbreak of suspected norovirus gastroenteritis associated with attendance at a wedding reception dinner held at a hotel. The etiologic agent was not confirmed; however, the symptoms and incubation periods were characteristic of norovirus gastroenteritis. Wedding cake was implicated as the likely vehicle of transmission. The source of contamination was not identified but most likely was one or more ill or recently ill food workers. Due to the delayed notification of the outbreak, an exhaustive environmental health and epidemiologic investigation could not be performed.

(36)

Suspected Foodborne Bacterial Intoxications Associated with a Restaurant

June

Blue Earth County

On June 21, 2010, Brown-Nicollet Environmental Health (BNEH) received two independent illness complaints associated with a restaurant in Mankato. The first complainant reported that one of five meal companions developed gastrointestinal illness after eating at the restaurant on June 20. The second complaint reported that two of four meal companions developed gastrointestinal illness after eating at the restaurant on June 20. BNEH contacted the Minnesota Department of Health (MDH) and an investigation was initiated.

An MDH sanitarian visited the restaurant on June 21 to evaluate food preparation and handling procedures and interview food workers. The complainants were interviewed by MDH staff 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. The restaurant was unable to provide credit cards receipts for additional patrons.

Illness histories and exposure information were obtained from three individuals. All three patrons met the case definition. All three cases reported vomiting, two (67%) reported diarrhea, and one (33%) reported cramps. No cases reported fever or bloody stools. The median duration of illness for the two cases who had recovered at the time of interview was 6 hours (range, 1.5 to 10 hours). The median incubation period was 4.5 hours (range, 4 to 11 hours). No stool samples were submitted.

The small number of cases and lack of non-ill controls prevented a statistical analysis of specific food exposures. Cases reported eating a variety of food items including chicken and steak fajitas, beef enchiladas, tacos, chips, and salsa. Two cases ate beef enchiladas, chips, and salsa.

The environmental health assessment revealed multiple time-temperature abuse issues. Foods in the prep unit were found to be between 46° and 55° F. Cooked chicken and beef were found to be held at 65° F in stainless steel pans for an extended period of time.

This was a foodborne outbreak of suspected bacterial intoxications associated with a restaurant. The etiology was not confirmed. However, the distribution of incubations and symptoms were compatible with intoxications caused by *Staphylococcus aureus* or the emetic form of *Bacillus cereus*. While the vehicle was not identified, the environmental health assessment documented time-temperature abuse of multiple food items, supporting this scenario.

(37)

***Salmonella* Baildon Infections Associated with Restaurant Chain A**

June-July

Multiple states

On June 29, 2010, the Kentucky Department of Health identified three isolates of *Salmonella* Baildon with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns. On June 30, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that one clinical *Salmonella* Baildon isolate submitted through routine surveillance matched the cluster identified by Kentucky. The subtype was designated by the Centers for Disease Control and Prevention (CDC) as TDEX01.0001. The Minnesota pattern designation for this subtype was BLD1. Also on June 30, the Wisconsin Division of Public Health sent an e-mail to the national Foodborne Outbreaks Listserv alerting colleagues that they were investigating 12 cases of *S. Baildon* that also appeared to match the Kentucky posting. A multi-state investigation was initiated on June 30.

A case was defined as a person who had a *S. Baildon* isolate with the outbreak PFGE pattern (TDEX01.0001) and who had illness onset since May 1. Minnesota cases were interviewed with a broad-based exposure questionnaire and re-interviewed several times about consumption of various specific food items and patronage at restaurants.

For cases from other states, hypothesis-generating questionnaires were administered by CDC and other states from late June to mid July. On July 19, a multi-state case-control study coordinated by CDC was initiated to evaluate food items and restaurants commonly reported in hypothesis-generating questionnaires. This study included Minnesota cases. Up to three neighborhood controls per case were enrolled. Controls were matched to case-patients by age group, and reported no diarrhea or vomiting during the one week preceding the case-patient's illness onset date.

Sanitarians from Washington County Public Health and Environment visited a Restaurant Chain A location in Cottage Grove on July 7 to request supplier invoices. Staff from the MDH Foodborne, Vectorborne, and Zoonotic Diseases Unit, the MDH Environmental Health Services Section, and the Minnesota Department of Agriculture (MDA) Dairy and Food Inspection Division contacted Restaurant Chain A multiple times to request information on shipments of cheese, lettuce, and tomato to the Cottage Grove and Burnsville Restaurant Chain A locations. Requests for information to Restaurant Chain A were made both directly and via CDC, per CDC and Restaurant Chain A's request.

The MDA Dairy and Food Inspection Division worked with colleagues from other state agriculture departments and the U.S. Food and Drug Administration to conduct traceback investigations of potentially contaminated products.

Eighty cases from 15 states were identified in this outbreak, including five from Minnesota.¹ The five Minnesota cases had a median age of 19 years (range, 1 to 75 years), and four (80%) were female. Onset dates ranged from June 20 to July 2. All five cases reported diarrhea, four (80%) reported cramps, three (60%) reported fever, two (40%) reported bloody diarrhea, and one (20%) reported vomiting. The median duration of illness was 6 days (range, 5 to 7 days). None of the cases were hospitalized.

Eating at Restaurant Chain A was found to be significantly associated with illness (25 of 39 cases vs. 10 of 87 controls; matched odds ratio, 20.2; 95% confidence interval, 4.9 to 178.3; $p < 0.001$). Among persons eating at Restaurant Chain A, no specific food item or ingredient was found to be associated with illness. Cases reported eating at 22 different Restaurant Chain A locations in the week before becoming ill; three locations were identified where more than one case reported eating.

Three (60%) Minnesota cases reported eating at Restaurant Chain A in the week prior to illness onset. The Minnesota cases reported eating at Restaurant Chain A locations in Burnsville, Minnesota; Cottage Grove, Minnesota; and Eau Claire, Wisconsin. Traceback work by MDA and state and federal regulatory partners did not yield any conclusive findings.

This was a multi-state outbreak of *Salmonella* Baildon infections associated with eating at Restaurant Chain A. A specific food vehicle was not identified. However, since one-third of the cases did not report eating at Restaurant Chain A, the vehicle was most likely a product that was commercially distributed to Restaurant Chain A and other food service locations.

Reference

1. CDC Investigation Announcement: Multistate Outbreaks of Human *Salmonella* Hartford and *Salmonella* Baildon Infections, <http://www.cdc.gov/salmonella/baildon-hartford/>

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***Salmonella* Enteritidis Infections Associated with a Restaurant**

June

Hennepin County

On July 14, 2010, 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 three cases had patronized the same restaurant in Minneapolis, Minnesota in the week before illness onset. Hennepin County Public Health Department (HSPHD) Epidemiology and the Minneapolis Division of Environmental Health (MDEH) were contacted and an investigation was initiated.

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

MDEH sanitarians conducted an environmental assessment of the restaurant on July 16 and interviewed restaurant employees. Cases and their meal companions were interviewed by MDH staff about food consumption and illness history. Credit card receipts to identify additional June 26 and 27 patrons were not available.

A confirmed case was defined as a restaurant patron from whom *S. Enteritidis* SE1B1 was isolated after eating at the restaurant. A probable case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Controls were well meal companions of confirmed cases.

Nine patrons were interviewed and seven total cases were identified. Five confirmed cases were identified through routine surveillance. Two probable cases were identified among meal companions of confirmed cases. A total of five patron cases (three confirmed and both probable cases) occurred among one group of meal companions. Six (86%) cases were female. The median case age was 27 years (range, 23 to 31 years).

All seven cases reported diarrhea. Six (86%) reported cramping, five (71%) reported fever, four (57%) reported bloody diarrhea, and one (14%) reported vomiting. The median duration of illness was 8 days (range, 6 to 12 days). No cases were hospitalized. Meal dates for cases were June 26 or June 27. The median incubation period for cases was 92 hours (range, 12 to 147 hours).

Cases reported eating a variety of foods including chicken tortilla soup, ceviche, shrimp, steak taco, burrito, salsa, beans, and rice. All seven cases reported consuming guacamole and tortilla chips. Five cases reported consuming salsa. Only two controls were interviewed; this precluded a meaningful statistical analysis of specific food exposures.

MDEH sanitarians conducted an environmental assessment on July 16 and interviewed all 14 employees; none reported recent gastrointestinal illness. During a routine inspection of the restaurant on June 2, raw chicken was being prepared on a small table directly above an uncovered bin containing tortilla chips. The restaurant was instructed to change this practice, but on June 22 the chips were still being stored below the chicken prep table. The situation had been remedied upon a July 8 re-inspection. However, on July 17, an open container of fresh cilantro was found stored under the chicken prep table. The container was removed immediately.

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 June 26 and June 27. A specific food vehicle could not be confirmed through an analytic study. However, all cases reported consuming guacamole and tortilla chips, and environmental health evaluations revealed high potential for cross-contamination of these ready-to-eat food items from raw chicken.

***E. coli* O157:H7 Infections Likely Associated with a Packaged Wheat Snack**

July

Hennepin County

On July 9, 2010, the Minnesota Department of Health (MDH) was notified by health care providers (two physicians and an infection control practitioner) of bloody diarrhea in Hispanic children from four households. These four children and an additional case identified through routine surveillance tested positive for *E. coli* O157:H7 (O157) with indistinguishable two-enzyme pulsed-field gel electrophoresis (PFGE) patterns (Minnesota pattern designation MN286ECB13). All of the cases lived in the same geographical area of Minneapolis, and several had attended the same birthday party on July 3. An investigation was initiated.

Culture-confirmed cases were identified through routine laboratory surveillance and were defined as Minnesota residents with a laboratory-confirmed O157 infection with PFGE subtype MN286ECB13 after July 3. Probable cases were defined as siblings of culture-confirmed cases with onset of symptoms compatible with O157 around July 5, but who were not tested or tested negative for O157. One stool sample was collected from the ill sibling of a case and was tested at the MDH Public Health Laboratory for bacterial pathogens.

Case isolates were submitted to the Centers for Disease Control and Prevention (CDC) for subtyping using multiple-locus variable-number tandem repeat analysis (MLVA).

Phone interviews regarding illness history and potential exposures were conducted for all cases. The birthday party host initially agreed to provide a list of party attendees but was subsequently unreachable after multiple follow-up attempts.

A case-control study was conducted using community controls recruited in person by MDH staff from four public parks in the cases' neighborhood on July 21. Controls were sampled from a heavily Hispanic population. Two frequency-matched controls were recruited per case in two general age categories, 1 to <8 years or 18 to <40 years. Only one person per household was eligible for enrollment: for case-households with more than one case, only the case with the earliest illness onset date was included. Exclusion criteria for controls included having a history of diarrhea or vomiting in the month of June, or not residing in the neighborhood surrounding the parks. Controls were interviewed with a standard questionnaire that included questions about exposures common among cases.

The Minnesota Department of Agriculture tested foods obtained from case households and suspect foods from retail outlets.

A total of nine culture-confirmed cases in eight households were identified. Eight of the isolates were analyzed by MLVA and all were indistinguishable from each other; furthermore, the MLVA pattern new to the CDC database. Two siblings of a confirmed case who tested negative for O157 at a clinical laboratory met the definition for probable cases.

Dates of illness onset for the 11 cases (9 confirmed, 2 probable) ranged from July 4 to July 16, 2011 with six (55%) becoming ill on July 5. Five (45%) cases were female and seven (64%) were Hispanic. The median age of cases was 4 years (range, 1 to 56 years). All 11 cases reported diarrhea, 10 (91%)

had blood in their stool, 6 (55%) had fever, and 3 (27%) had vomiting. Of the seven cases who had recovered at the time of interview, the median duration of illness was 6 days. Four (36%) cases were hospitalized, one (10%) developed hemolytic uremic syndrome (HUS). The median duration of hospitalization was 3 days (range, 2 to 16 days). None of the cases died.

At the time the case-control study was conducted, there were eight cases from six households. One case from each household was included in the study. Of the 22 people approached for enrollment as controls, two refused, seven were not eligible or were excluded, and 13 were interviewed. By univariate analysis, shopping at Grocery Store A (3 of 6 cases vs. 0 of 13 controls; odds ratio [OR], undefined; 95% confidence interval [CI], 1.59 to undefined; $p = 0.02$), consumption of Brand A packaged snacks (4 of 4 cases vs. 1 of 13 controls; OR, undefined; $p = 0.002$), and consumption of Brand B Cotija cheese (3 of 6 cases vs. 0 of 12 controls; OR, undefined; 95% CI, 1.45 to undefined; $p = 0.02$) were significantly associated with illness.

Two cases were identified after the case-control study recruitment ended. These two cases did not fit the main outbreak demographics; both were non-Hispanic adults. In an analysis including these two cases in the case-control study, shopping at Grocery Store A (3 of 8 cases vs. 0 of 13 controls; OR, undefined; 95% CI, 1.10 to undefined; $p = 0.04$), consumption of Brand A packaged snacks (4 of 6 cases vs. 1 of 13 controls; odds ratio [OR], 24.0; 95% confidence interval [CI], 1.57 to 633.6; $p = 0.02$), and consumption of Brand B Cotija cheese (3 of 8 cases vs. 0 of 12 controls; OR, undefined; 95% CI, 1.01 to undefined; $p = 0.05$) were still significantly associated with illness.

Five of the 11 cases attended the same birthday party on July 3 where Brand A packaged wheat snacks were provided in a snack bag for each guest. An additional four cases reported consuming a similar snack of unknown brand. Interviews of other party attendees were not possible because the party host stopped returning calls from MDH. The Brand A snacks for the party were purchased from Grocery Store A. Thirty-two bags of chili flavor and lime flavor Brand A Variety A fried wheat snacks collected from Grocery Store A with the same "Best if Used By" date as the Brand A snacks served at the party tested negative for O157 and other Shiga toxin-producing *E. coli*. An open package of Brand B Cotija cheese collected from a case's household also tested negative.

Two O157 cases with isolates of the outbreak PFGE pattern and specimen collection dates in early June, 2010 were identified by routine surveillance. The MLVA pattern of these cases differed from the outbreak pattern at four loci. A cluster of O157 cases with the outbreak PFGE pattern was also under investigation in New York at a similar time. MLVA analysis showed that the New York case isolates differed at more than six loci from the Minnesota outbreak isolates.

This was an outbreak of *E. coli* O157:H7 infections. Brand A packaged wheat snacks were implicated in a case-control study and were the suspected vehicle. However, these snacks were not definitively implicated. Two cases identified after the initial cluster did not fit the main outbreak demographic and did not appear to have a common link. Whatever the vehicle, this may have represented transmission in the community. An alternative vehicle is conceivable; the investigation was limited by the inability to conduct a cohort study of the birthday party.

***Salmonella* Enteritidis Infections Associated with a Restaurant**

July

Ramsey County

On July 23, 2010, 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 three cases had patronized a restaurant in St. Paul, Minnesota on July 4. City of St. Paul Division of Environmental Health (SPDEH) was 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 that are indistinguishable by PFGE are compared to identify potential common exposures. Information gathered during routine interviews is reviewed by an MDH epidemiologist.

A SPDEH sanitarian conducted an environmental assessment of the restaurant on July 23 to interview restaurant employees and collect a reservation list for July 4 patrons. The cases, their meal companions, and additional patrons identified through July 4 credit card receipts were interviewed by MDH staff about food consumption and illness history.

A confirmed case was defined as a restaurant patron from whom *S.* Enteritidis SE1B1 was isolated after eating at the restaurant. A probable case was defined as a restaurant patron who subsequently developed diarrhea (≥ 3 loose stools in a 24-hour period) lasting ≥ 3 days. Controls were restaurant patrons identified from the July 4 reservation list who reported no gastrointestinal symptoms after eating at the restaurant.

The Minnesota Department of Agriculture (MDA) conducted a traceback investigation of the epidemiologically implicated product.

A total of 36 restaurant patrons were interviewed. Of these, three culture-confirmed cases were identified through routine surveillance and one probable case was identified from the reservation list. Five patrons identified from the reservation list reported illness that did not meet the case definition and were excluded from further analyses.

All four cases reported diarrhea, fever, and cramping. Three (75%) reported vomiting, and one (25%) reported bloody diarrhea. No cases were hospitalized. The meal date for all four cases was July 4. The median incubation period for cases was 49 hours (range, 44 to 81 hours). The median duration of illness was 6 days (range, 5 to 8.5 days).

Cases reported eating a variety of foods including eggs benedict, muffuletta benedict, french toast, mixed greens, and calamari. By univariate analysis, consuming muffuletta benedict (3 of 4 cases vs. 3 of 26 controls; odds ratio [OR], 23.0; 95% confidence interval [CI], 1.16 to 1,256; $p = 0.018$), Hollandaise sauce (4 of 4 cases vs. 4 of 26 controls; OR, undefined; 95% CI, 3.35 to infinity; $p = 0.003$), or any eggs (4 of 4 cases vs. 8 of 25 controls; OR, undefined; 95% CI, 1.50 to infinity; $p = 0.021$) were significantly associated with illness. The small number of cases precluded a multivariate analysis.

A SPDEH sanitarian and MDH staff interviewed 30 restaurant employees; none reported recent gastrointestinal illness. Upon environmental inspection, the sanitarian noted several violations.

Unpasteurized shell eggs were used in the Hollandaise sauce and Caesar dressing. The sanitarian reviewed the preparation of the Hollandaise sauce with the chef. The chef stated that during preparation the Hollandaise sauce reached a temperature of 150° F to 160° F; however, this temperature was not verified. Each batch of Hollandaise sauce was then kept on the prep line for 2 hours. The restaurant was ordered to discontinue using unpasteurized eggs in Hollandaise sauce and Caesar dressing.

SPDEH sanitarians obtained invoices from the restaurant; these invoices identified a distributor in St. Paul, Minnesota as the sole supplier of shell eggs used in the restaurant on July 4. MDA contacted the distributor, and distribution records indicated that they received the shell eggs from Producer A in Woodville, Wisconsin. MDA contacted Producer A, and distribution records indicated that Producer A received the shell eggs from Producer B in Galt, Iowa. All of the traceback information was forwarded to the US Food and Drug Administration and Producer B was subsequently implicated in a large multi-state outbreak of *Salmonella* Enteritidis¹.

This was an outbreak of *S. Enteritidis* SE1B1 infections associated with eating at a restaurant in St. Paul. The outbreak was identified through routine disease surveillance. Documented transmission to patrons occurred on July 4. Consumption of Hollandaise sauce and eggs were significantly associated with illness. The use of unpasteurized shell eggs in the Hollandaise sauce was identified as the likely mechanism for food contamination.

Reference

1. <http://www.cdc.gov/salmonella/enteritidis/>

(41)

***Salmonella* Newport Infections Associated with Commercially Distributed Fresh Blueberries**

July-August

Multiple counties

On August 4, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) notified MDH epidemiology staff of two *Salmonella* Newport isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns that were identified through routine surveillance; the subtype was designated NEW251. Attempts were made to interview both individuals with a standard questionnaire. Over the next 2 days, three additional indistinguishable isolates were identified by the MDH PHL. All five specimens were from females over 50 years of age from Alexandria, Minnesota. An investigation was initiated.

A case was defined as a person who had a *S. Newport* isolate that matched the outbreak PFGE pattern (NEW251), with a specimen collected after July 15, 2010. Cases were interviewed with a broad-based questionnaire and re-interviewed several times about various specific food items.

On interview, cases reported shopping at the same grocery store (Grocery A), which had a customer shopper card program. On August 6, the Minnesota Department of Agriculture (MDA) was notified of the *S. Newport* cases, and a request was made to obtain purchase history information from Grocery A based on shopper card numbers provided by consenting cases.

A case-control study was initiated on August 10 to evaluate food items frequently reported by cases. Four controls for each case were recruited using phone lists generated using reverse-directory of

addresses in the vicinity of the case's home. Controls were restricted to females over 50 years of age who reported no diarrhea or vomiting since the week preceding the case's illness onset date.

MDA conducted a traceback investigation of the implicated product.

On early interviews, cases reported frequent fresh blueberry consumption, and three specifically reported purchasing blueberries in 1 pint containers from Grocery A in Alexandria.

A total of 5 cases and 20 controls were enrolled in the case-control study. Consuming fresh blueberries was statistically associated with illness (5 of 5 cases vs. 8 of 19 controls; odds ratio [OR], undefined; $p = 0.02$). Consuming fresh blueberries from the grocery also was statistically associated with illness (3 of 3 cases vs. 3 of 18 controls; OR, undefined; $p = 0.03$). No other food item was associated with illness.

On August 17, a sixth case was identified as a female from Otter Tail County. This case also reported being an avid blueberry consumer. She reported purchasing blueberries in 1 pint containers from Grocery B in Battle Lake.

A seventh individual with the outbreak PFGE pattern was identified on August 23. This individual had contact with someone who was ill with diarrhea prior to his own illness onset and denied any commercial blueberry consumption; therefore, he was classified as a potential secondary case and excluded from any further analyses.

All six primary cases were female, with a median age of 66 years (range, 54 to 82 years). Of the six primary cases, all six reported diarrhea, five (100%) of five reported fever, five (100%) of five reported cramps, three (60%) of five reported bloody diarrhea, and two (40%) of five reported vomiting. The one case who had recovered at the time of interview had an illness duration of 7 days. One case was hospitalized for 4 days.

Shopper card receipts confirmed blueberry purchases for three of the cases prior to illness: Case 1 purchased two pints of blueberries from Grocery A on July 14; Case 2 purchased two pints of blueberries from Grocery A on July 13; and Case 3 purchased 12 pints of blueberries from Grocery A on July 14. Purchase date information was unavailable for the other two cases. Grocery A was having a sale on blueberries July 11-15 for \$1.66/pint. Grocery A was asked to provide MDH and MDA with all invoices for blueberries received between June 26 and July 23. The manager of Grocery A stated that blueberries sold July 13 and 14 most likely would have come from invoices dated July 10, 12, or 13. This led to a presumed link to a firm in Michigan.

An onsite investigation of Grocery A on August 16 by an MDA inspector found no reported employee illnesses or significant events (e.g., power outages). No repackaging of blueberries is conducted at the store. An environmental assessment of the walk-in produce storage cooler, retail display cooler, and produce processing area was conducted, and no issues were found.

On August 20, MDA received Point of Sale UPC information for all blueberries sold at Grocery A during July 11-17 associated with a shopper card number. All three cases for which there was shopper card information had one common UPC. Grocery A received blueberries with the implicated UPC on July 13 from Produce Distributor A. The invoice for this shipment was inadvertently not provided to MDH and MDA by Grocery A or Produce Distributor A when all invoices were originally requested.

The manager of Grocery B stated that they purchase all of their produce from Produce Distributor A. Based on the dated receipt from the sixth case, blueberries were purchased at Grocery B on July 15. Grocery B provided point of sale UPC information for blueberries sold at the store for the weeks of June 27, July 4, and July 11. The only blueberries sold on July 15, the date of purchase for the case, had the same UPC associated with the cases who shopped at Grocery A. These blueberries were part of a shipment received by Grocery B from Produce Distributor A on July 12.

The UPC was identified as belonging to a producer, which sells blueberries under two brand names. The producer sent two shipments of blueberries to Minnesota between June 25 and July 12, both to Produce Distributor A. The shipments originated from the producers packing facility in Alma, Georgia. Results of the traceback were forwarded to the U.S. Food and Drug Administration.

This was an outbreak of *S. Newport* infections associated with commercially distributed fresh blueberries. The older age distribution of the cases may be explained by the claimed health and anti-aging benefits of blueberries. The utilization of point-of-use UPC information was critical in identifying that the blueberries originated at a packing facility in Alma, Georgia. The MDH or MDA are not aware of any on-farm investigation; the ultimate source of the contamination is unknown.

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***Campylobacter jejuni* and *Cryptosporidium parvum* Infections Associated with Raw Milk**

July-August

Multiple counties

In May 2010, an outbreak of *E. coli* O157:H7 infections was found to be associated with the consumption of raw milk and/or other raw dairy products from Farm A in Gibbon, Minnesota. The outbreak investigation included a May 26 onsite farm inspection during which 80 animal and environmental samples were collected; 16 samples tested positive for *Cryptosporidium* and 12 tested positive for *Campylobacter jejuni* at the Minnesota Department of Health Public Health Laboratory (MDH PHL).

On August 6, 2010, the MDH Foodborne, Vectorborne, and Zoonotic Diseases Unit received a report from a physician of a patient who had been diagnosed with *Campylobacter*. During the clinic visit, the family of the case reported consuming raw milk and other raw dairy products from Farm A prior to illness onset; six of seven other family members also reported being ill with similar gastrointestinal illness. The Minnesota Department of Agriculture (MDA) was notified, and an outbreak investigation was initiated.

All *Campylobacter* and *Cryptosporidium* cases reported to MDH are interviewed about food consumption and other potential exposures as part of enteric disease surveillance in Minnesota.

Cases were defined as persons who: a) had *Campylobacter jejuni* isolated from stool and who reported consuming raw milk from Farm A in the week prior to onset of symptoms; b) persons who had *Campylobacter jejuni* pulsed-field gel electrophoresis (PFGE) subtype CMP170 isolated from stool and who reported consuming raw milk from an unnamed source in the week prior to onset of symptoms; or c) persons who had *Cryptosporidium parvum* subtype BGP3 identified in a stool sample and who reported consuming raw milk from Farm A in the 2 weeks prior to onset of symptoms. Epidemiologists

reviewed the information gathered during routine interviews of *Campylobacter* and *Cryptosporidium* cases to identify potential cases associated with raw milk.

When available, leftover products purchased from Farm A were collected from case households. The MDA Laboratory tested each submitted product for the presence of phosphatase and for *Campylobacter*.

Seven cases were identified, including three with *Campylobacter jejuni* and four with *Cryptosporidium parvum*. Reported onset dates ranged from July 29 to August 28. Five (71%) cases were male, and the median age was 14 years (range, 3 to 38 years). All cases were residents of the seven county Twin Cities metropolitan area.

Among the three *Campylobacter jejuni* cases, all three reported diarrhea, cramps, and fever. Two (67%) reported blood in their stools, and one (33%) reported vomiting. The median illness duration was 14.5 days (range, 14 to 15 days) for the two cases who had recovered at the time of interview. Two (67%) *Campylobacter jejuni* case isolates were PFGE subtype CMP170 isolated from a stool sample; this subtype was found in two calves on Farm A during the May 26 onsite inspection associated with the *E. coli* O157:H7 outbreak investigation.

Among the four *Cryptosporidium parvum* cases, all four reported diarrhea and weight loss. Three (75%) reported cramps, three (75%) reported fever, and two (50%) reported vomiting. The median illness duration was 9 days (range, 3 to 14 days). All four individuals had *Cryptosporidium parvum* subtype BGP3 identified in a stool sample; this subtype was found in a calf on Farm A during the May 26 onsite inspection associated with the *E. coli* O157:H7 outbreak investigation.

Of the seven cases, four (57%) reported consuming raw milk and/or raw milk products obtained from Farm A drop-off sites prior to illness onset, two (29%) reported getting raw milk from an individual who was identified as a Farm A drop-site location, and one (14%) reported consuming raw milk from an unnamed farm.

One case household had leftover ice cream that they were willing to submit to MDA for testing. The ice cream tested positive for phosphatase, indicating that the milk used to make the ice cream was not pasteurized. The ice cream was negative for *Campylobacter*.

MDH issued a press release on October 28 alerting the public of the ongoing risk associated with consuming products from Farm A.

This was an outbreak of *Campylobacter jejuni* and *Cryptosporidium parvum* infections associated with the consumption of raw milk and/or other raw dairy products from Farm A in Gibbon, Minnesota. Seven cases were identified, including three with *Campylobacter jejuni* and four with *Cryptosporidium parvum*. Isolates or positive specimens from the human cases were genetically indistinguishable to those from animal samples taken on the farm during the May 2010 *E. coli* O157:H7 outbreak investigation associated with the same farm.

***Salmonella* Infantis Infections Associated with a Church Potluck**

August

Hennepin County

On August 11, 2010, through routine surveillance the Minnesota Department of Health (MDH) Public Health Laboratory identified two isolates of *Salmonella* Infantis with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (subtype designated SIN65). On routine interview by MDH epidemiologists, both cases reported eating at the same large church potluck event in Brooklyn Park prior to onset of illness. While both had attended other group meal events around the time of illness onset, this was the only meal they shared in common. Attendance at the potluck was estimated to be over 100 people. It was reported that many other potluck attendees also had been ill. City of Brooklyn Park Environmental Health staff were contacted and an investigation was initiated immediately.

A partial list of potluck attendees and a list of menu items were obtained from the church pastor. Attendees were interviewed to obtain food/beverage consumption and illness histories. A case was defined as a potluck attendee who subsequently developed diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples were collected from two additional ill attendees about 2 weeks after clinical signs had resolved and were tested for bacterial pathogens.

Of the 54 potluck attendees interviewed, 21 (39%) met the case definition. Five attendees reported symptoms but did not meet the case definition and were excluded from the analysis. Twenty-one cases reported diarrhea, 17 (85%) fever, 16 (84%) abdominal cramps, 5 (24%) vomiting, and 3 (18%) blood in the stools. The median incubation was 14 hours (range, 0.5 to 28 hours), and the median duration of illness was 98.5 hours (range, 34 to 230.5 hours). Although some of the reported incubation periods were shorter than expected for *Salmonella*, fever and two or more days of diarrhea were also reported in all of the cases with incubation periods < 12 hours; therefore, these attendees were retained as cases in the analysis. Seven cases visited their health care provider, including the two index cases whose stool samples yielded *Salmonella* Infantis at a clinical laboratory. No cases were hospitalized. Both of the additional stool samples that were submitted to MDH by ill potluck attendees as part of the investigation also were or tested culture-positive for *S. Infantis* SIN65.

Foods served at the potluck included cornbread, rice bread, rice doughnuts, various types of rice (both plain and mixed with vegetables and meats), tuna salad, potato salad, macaroni salad, various chicken dishes, gravy, pork chops, boiled pork, kidney beans, meatballs, salmon, steak, and fruits. Beverages included punch, bottled water, soda, and a variety of other bottled drinks.

Of the foods available at the potluck, macaroni salad (15 of 19 cases vs. 10 of 26 controls; odds ratio [OR], 6.0; 95% confidence interval [CI], 1.5 to 23.3; $p = 0.007$) and meatballs (13 of 18 cases vs. 8 of 27 controls; OR, 6.2; 95% CI, 1.6 to 23.1; $p = 0.005$) were significantly associated with illness in the univariate analysis. In a multivariate analysis, only macaroni salad remained independently associated with illness (adjusted OR, 8.0; 95% CI, 1.8 to 34.8; $p = 0.006$).

The person who prepared the macaroni salad was interviewed. Ingredients included potatoes (peeled and cooked), fresh carrots and peas (boiled for 5 minutes), mayonnaise, eggs (hard-boiled > 30 minutes and chopped) and canned lunch meat. All ingredients except the mayonnaise and canned lunch meat had been cooked before being added to the salad. Chicken was sometimes prepared in the same home

kitchen in which the macaroni salad for the church potluck was prepared, but the food preparer did not recall whether any chicken had been prepared on the same day as the macaroni salad. The food preparer and three family members denied any history of illness in the month preceding or in the days following the potluck event.

This was a foodborne outbreak of *Salmonella* Infantis infections associated with a church potluck meal. Macaroni salad was identified as the vehicle. While some of the incubation periods reported were shorter than expected, symptoms reported in these cases were consistent with *Salmonella* gastroenteritis. Recall bias may have skewed reported illness onset times due to widespread awareness among potluck attendees that others had been ill following the event. Although no clear source for contamination of the macaroni salad was identified, cross-contamination during preparation is the most plausible cause. This outbreak illustrates the importance of education on good food hygiene practices for those who prepare food for large groups. This is particularly true for food preparers and settings that are not subject to food safety regulations.

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***Campylobacter jejuni* Infections Associated with an Office Party**

August

Ramsey County

Routine surveillance interviews of two *Campylobacter jejuni* cases conducted by the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section on August 27, 2010 revealed that both cases had attended the same office party on August 4.

All *Campylobacter* cases reported to MDH are interviewed about food consumption and other exposures 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 attending the office party.

An MDH epidemiologist contacted party organizers on multiple occasions to request a list of party attendees.

Cases were defined as persons who had *C. jejuni* isolated from stool or who had diarrhea (≥ 3 loose stools in a 24-hour period) lasting ≥ 3 days and who reported attending the August 4 office party in the week prior to onset of symptoms.

Illness histories and exposure information were obtained from 25 office party attendees. Three (12%) cases were identified.

All cases reported diarrhea and cramps, two (67%) reported fever, and two (67%) reported blood in their stools. The median incubation period was 4 days (range, 1 to 5 days). The median duration of illness was 7 days (range, 4 to 11 days). Two cases had a stool specimen test positive for *Campylobacter jejuni*; both isolates were indistinguishable by pulsed-field gel electrophoresis (PFGE).

Food for the party included pulled pork and rotisserie chicken purchased from a restaurant in St. Paul, potato salad purchased from a grocery store and multiple salads, desserts, and other miscellaneous food

items prepared and/or brought by attendees. Cases reported eating a variety of foods at the party; no food item was statistically associated with illness.

This was a foodborne outbreak of *Campylobacter jejuni* infections associated with an office party. No specific food vehicle was identified. However, as campylobacteriosis is rarely transmitted person-to-person, an item containing undercooked chicken or ready-to-eat-foods cross-contaminated from raw or undercooked chicken is the most plausible source.

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Foodborne Outbreak Associated with a Restaurant

August

Hennepin County

On August 17, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a party of two who had eaten the Hawaiian wahoo fish lunch special at a restaurant on August 13. MDH notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units on August 17, and an investigation was initiated.

MDH interviewed the original complainant group. HSPHD epidemiologists initially interviewed other restaurant patrons who consumed the Hawaiian wahoo fish lunch special, as identified from credit card receipts. The outbreak investigation was later expanded to include additional patrons who dined at the restaurant on August 13, as identified from the restaurant's reservation list. 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 specimen was collected and submitted to the MDH Public Health Laboratory for bacterial and viral testing.

On August 18, MDEH sanitarians visited the restaurant to conduct a full inspection. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, food storage procedures, and the specific handling and preparation of the Hawaiian wahoo. MDEH sanitarians returned to the restaurant on August 20 to interview all food workers about illness history and work duties.

Forty-four patrons were interviewed: two from the original complaint, six identified from credit card receipts as having consumed wahoo, and 36 from the reservation list. Eight (18%; two from the complaints, five from credit card receipts, and one from reservations) met the case definition. Seven (88%) cases had diarrhea, four (50%) had cramps, three (38%) had vomiting, and none had fever or bloody stools. None of the cases were hospitalized. Five (63%) of the cases were male. The median case age was 40 years (range, 25 to 55 years). The median incubation was 6 hours (range, 3 to 55 hours). The median duration of illness was 12 hours (range, 0.5 to 36 hours). One patron submitted a stool specimen for testing. The specimen was negative for norovirus, *Campylobacter*, Shiga toxin-producing *E. coli*, *Salmonella*, *Shigella*, and *Yersinia*. The specimen was collected on August 28, 15 days after illness onset, therefore testing for bacterial toxins was not feasible.

A family of four reported that one of their children had an episode of diarrhea immediately before eating at the restaurant. The three other members of the family subsequently became ill, but their incubation periods suggested person-to-person transmission among the family members, therefore, they were excluded from further analyses.

The original complainant group (two individuals from different households with no other common exposures) both reported eating the Hawaiian wahoo lunch special. The Hawaiian wahoo, a scombroid fish, was only served at the restaurant on August 13 as a lunch special and is not a permanent menu entrée. Neither of the complainants reported any neurological symptoms associated with histamine fish poisoning, so illness caused by scombroid was ruled out.

Credit card receipts were initially used to identify persons who had ordered the Hawaiian wahoo. The Hawaiian wahoo entrée was served with jasmine rice and stir-fried mixed vegetables; six of the seven (86%) patron cases identified up to this point in the investigation reported eating the Hawaiian wahoo and also reported eating the jasmine rice and stir-fried mixed vegetables. When the investigation was expanded to include persons identified from the reservation list who dined at the restaurant on August 13, the one additional case identified reported not eating the Hawaiian wahoo or jasmine rice and stir-fried mixed vegetables. Case patrons also reported eating bread, soup, salads, and different beverages. The two (25%) cases who did not eat Hawaiian wahoo ate another entrée (seafood salad with baby scallops, lump crab and baby shrimp, or red snapper with grilled shrimp; neither were served with jasmine rice or the stir-fried mixed vegetables).

Univariate analysis indicated that illness was significantly associated with eating Hawaiian wahoo (6 of 8 cases vs. 1 of 32 controls; odds ratio [OR], 93.0; 95% confidence interval [CI], 7.2 to 1197; $p < 0.001$), jasmine rice (6 of 8 cases vs. 6 of 32 controls; OR, 13.0; 95% CI, 2.1 to 81.0; $p = 0.006$), and stir-fried mixed vegetables (6 of 8 cases vs. 6 of 32 controls; OR, 13.0; 95% CI, 2.1 to 81.0; $p = 0.006$). In multivariate analysis, none of the foods were independently associated with illness.

Fifty-three (88%) of the restaurant's employees were interviewed. Three employees reported illness; these employees all reported eating Hawaiian wahoo, the jasmine rice, and the stir-fried mixed vegetables at work prior to illness onset.

For the purpose of illness characterization, the three employees were included with the patron cases; their incubations were calculated from consumption of the Hawaiian wahoo, jasmine rice and stir-fried mixed vegetables. Among these eight patron-cases and three ill employees, eight (five patrons and the three employees) (73%) had an incubation shorter than 8 hours (median, 3 hours; range, 1 to 8 hours) and three (27%) had incubations longer than 32 hours (median, 54 hours; range, 33 to 55 hours). Among the cases with shorter incubations, all eight cases reported diarrhea, five (63%) reported vomiting, and four (50%) reported cramps. The median duration of illness was 13 hours (range, 2 to 23 hours). Two of the three (67%) cases with longer incubations reported diarrhea, one (33%) reported vomiting, and one (33%) reported cramps. The median duration of illness for just those with a long incubation was 15 hours (range, 0.5 to 36 hours). Separate univariate analyses were conducted for the short incubation cases and for the longer incubation cases. The Hawaiian wahoo, jasmine rice, and stir-fried mixed vegetables remained significant for both groups, and no additional foods were found to be significantly associated with illness. No food items were significant when multivariate analysis was done using just the short incubation cases or just the long incubation cases.

No additional employees reported illness before or after the implicated meal date. MDEH sanitarians ascertained that the Hawaiian wahoo was marinated in soy-lime marinade: soy sauce, fresh lime juice, chopped garlic, sugar, and rice vinegar. The fish was then grilled and served over jasmine rice with stir-fried mixed vegetables and Sriracha butter. Proper preparation and handling of the Hawaiian wahoo and other fish were noted. MDEH sanitarians noted overall compliance with food code requirements for food preparation. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of additional employee illness.

This was a foodborne outbreak of unknown etiology; it is unclear if this was an outbreak caused by two different agents. Differences in the illness incubation periods suggest multiple etiologies. At least some of the illnesses were likely caused by a bacterial or marine toxin. Consumption of Hawaiian wahoo, jasmine rice and stir-fried mixed vegetables were all significantly associated with illness.

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Norovirus Gastroenteritis Associated with a Restaurant

August

Olmsted County

On August 17, 2010, Olmsted County Public Health Services (OCPHS) received a call from a manager of a restaurant in Rochester, Minnesota regarding a complaint of gastrointestinal illness that the restaurant had received. At least seven employees of a car dealership had become ill with vomiting and/or diarrhea approximately 24 to 48 hours after eating food that had been delivered from the restaurant for lunch on August 14. The restaurant manager also reported that a restaurant employee became ill with vomiting on August 15, a day after the meal served at the car dealership. No additional complaints of illness had been received by the restaurant or by OCPHS. An investigation was initiated.

OCPHS obtained a complete list of persons from the car dealership who ate the lunch meal from the restaurant on August 14. Lunch attendees were then interviewed about food consumption and illness history. A case was defined as a person who ate at lunch from the restaurant on August 14 and subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

OCPHS Environmental Health Specialists visited the restaurant on August 17 and 18 to evaluate food preparation and handling procedures. A list of all employees who worked between August 9 and 17 or prepared food for meals served on August 14 were also interviewed to determine their food handling practices and about illness history. Restaurant management staff was asked to implement interventions to prevent further transmission. Employees who reported recent vomiting or diarrhea were excluded from working at the restaurant until 72 hours after resolution of symptoms.

Stool specimens were collected from cases, ill food workers, and the sick child of a food worker, and sent to the Minnesota Department of Health (MDH) Public Health Laboratory for testing.

Twenty-one of 24 lunch attendees were interviewed, and 16 (76%) met the case definition. All 16 reported nausea, 14 (88%) diarrhea, 13 (81%) abdominal cramps, 10 (63%) vomiting, and eight (50%) fever. The median incubation was 44 hours (range, 32 to 65 hours). Most of the persons interviewed were still ill at the time of the interview; therefore, illness duration could not be calculated. There were

anecdotal reports of gastrointestinal illness among employees of the car dealership prior to the lunch, and one of the lunch attendees reported having an illness onset approximately less than 2 hours after the lunch. This attendee was excluded from analysis.

Twelve restaurant employees were interviewed. One employee reported experiencing vomiting with onset on August 16. The employee who prepared the sandwiches on August 14 reported having no gastrointestinal symptoms, but reported that her 4-year old child had vomiting on August 13. Additionally, another employee had a recent history of gastrointestinal illness and recovered before returning to work.

Eight stool specimens were tested at MDH: four from lunch attendees (including the attendee with the possible 2-hour incubation period), two from the restaurant employees that reported gastrointestinal illness, one from a non-ill restaurant employee who prepared the sandwiches, and one from the ill child of the latter restaurant employee. Five of the eight specimens tested positive for norovirus, including samples from three lunch attendees, the restaurant employee with onset on August 16, and the child of the restaurant employee who prepared the sandwiches. Sequencing was attempted on the norovirus recovered from all five positive specimens; however, the laboratory was only able to sequence four. All four had identical nucleic acid sequences, genotype GII.6. The norovirus recovered from the positive specimen from the lunch attendee that had the possible 2-hour incubation was untypeable. The subtype of the GII.6 genotype had not been documented in Minnesota previously.

Food served at the lunch included several “giant subs”: a club sub with turkey, ham, roast beef, American cheese; a turkey sub; a seafood sub made with imitation crab; a tuna sub; a “BMT” sub with pepperoni, salami, ham; a cold cut sub with turkey bologna, turkey salami, turkey ham; and a ham sub. The sandwiches included lettuce, tomato, olives, green pepper, and other optional toppings. All subs were prepared at the restaurant. A side container of jalapeños, and individual packets of mayonnaise and mustard were provided with the sandwiches. An assortment of cookies (chocolate chip, M&M, oatmeal raisin, double chocolate, and macadamia nut) baked at the restaurant were also served.

The environmental health assessment at the restaurant did not find any deficiencies: both handwashing sinks in the kitchen were stocked and operational; gloves were present and being used to limit bare-hand contact; good handwashing practices were observed; and, the employee restroom handwashing sink was supplied with soap and paper towels. According to managers, a double handwash (once in the restroom and again upon returning to the kitchen) is required after employees use the restroom. Other restaurant practices regarding food handling were appropriate.

During the investigation, measures were implemented to prevent further transmission: the manager was asked to exclude ill employees from work for at least 72 hours; to reinforce employee handwashing; and, to wash, rinse, sanitize and air-dry all food-contact utensils and surfaces.

This was an outbreak of norovirus gastroenteritis associated with eating sandwiches from a restaurant. Matching viral sequences between the ill child of the restaurant employee who prepared the foods, a restaurant employee who became ill after the implicated meal, and lunch attendees implicate the restaurant sandwiches as the source of this outbreak. Although norovirus from the lunch attendee with early onset was untypeable, that person’s illness was likely unrelated to the meal.

(47)

Suspected Norovirus Gastroenteritis Associated with a Catered Picnic

August

Ramsey County

On August 24, 2010, a Ramsey County Environmental Health (RCEH) sanitarian was informed of an illness complaint by management at a restaurant in Roseville. The manager reported that the restaurant catered a company picnic on August 17 and that 20 of 40 attendees developed gastrointestinal illness. The Minnesota Department of Health (MDH) was notified and an investigation was initiated.

A RCEH sanitarian collected menu information on August 24 and contacted restaurant management to assess employee illness on September 1. The company refused to provide contact information for employees who would have attended the picnic. However, the MDH foodborne disease hotline number was provided to staff. A case was defined as a company picnic attendee who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples collected from consenting picnic attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from five picnic attendees. All five met the case definition. The median incubation period was 45.5 hours (range, 42 to 49 hours). The median duration of illness was 79 hours (range, 47 to 107 hours). All five cases reported diarrhea, four (80%) reported vomiting and cramps, two (40%) reported fever, and one (20%) reported bloody stools. One stool sample submitted by an ill attendee seven days after their illness onset tested negative for norovirus and standard bacterial pathogens.

The absence of controls precluded a statistical analysis of specific food exposures. All foods served at the picnic were catered by the restaurant and included pulled pork, pulled beef, pulled chicken, baked beans, potato salad, and cookies. All five cases reported consuming potato salad, four (80%) reported consuming baked beans, three (60%) reported consuming pulled pork, and two (40%) reported consuming pulled beef, pulled chicken and cookies.

A RCEH sanitarian met with restaurant management on September 1. The manager reported that no employees were ill prior to or following August 17. However, employees were not individually interviewed. While the potato salad was not produced at the restaurant, onion, celery, and hard boiled eggs were added at the restaurant.

This was a foodborne outbreak of gastroenteritis associated with a company picnic catered by a restaurant in Roseville. The etiology was not confirmed. However, the distribution of incubations and symptoms were characteristic of norovirus gastroenteritidis. The vehicle was not identified.

(48)

***Salmonella* Enteritidis Infections Associated with a Group Home**

August

Pope County

On September 2, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Enteritidis isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns; the two patients were both

from Starbuck, Minnesota and resided in the same group home. This PFGE pattern of *S. Enteritidis* (Minnesota designation SE1B1) was associated with a multi-state outbreak due to shell eggs that resulted in the recall of shell eggs from two Iowa producers in mid August.

MDH staff contacted the group home to collect information regarding the cases' illness histories and food exposures in the 7 days prior to illness onset and to assess illness among group home employees and other residents. The group home provided grocery store credit card receipts and a menu of foods served during the week prior to the cases' illness onsets.

A confirmed case was defined as a group home resident from whom *S. Enteritidis* SE1B1 was isolated.

The Minnesota Department of Agriculture (MDA) conducted a traceback investigation of the suspected product.

The group home was contacted on September 3. There were four residents and nine employees in the group home. The group home reported no additional illness in other residents or staff beyond the two cases identified through routine surveillance. The cases' illness onsets were August 22 and 23. Both cases reported diarrhea and fever. Neither reported vomiting or bloody stool. The median duration of illness was 9 days (range, 8 to 10 days). Neither case was hospitalized.

In the week prior to the cases' illness onsets the group home served eggs on multiple occasions including scrambled eggs for breakfast on August 15, an egg salad sandwich for lunch on August 16, a chef salad with hardboiled eggs on August 19, an egg bake with scrambled eggs for dinner on August 19, and a salad with hardboiled eggs on August 21.

The group home reported that they had purchased and served eggs that had been recalled but were unable to provide specific brand and plant information. Credit card receipts revealed that the group home had purchased shell eggs from Grocery A in Alexandria on August 9 and Grocery B in Alexandria on August 16. MDA contacted Grocery B and determined that they did not sell any of the recalled eggs. MDA determined from distribution records that Grocery A in Alexandria received recalled shell eggs from a producer in Iowa.

This was an outbreak of *S. Enteritidis* SE1B1 infections associated with a group home. The outbreak was identified through routine disease surveillance. Eggs recalled due to a multi-state outbreak of the same PFGE subtype were the likely source of the infections.

Reference

1. <http://www.cdc.gov/salmonella/enteritidis/>

(49)

***Vibrio parahaemolyticus* Infections Associated with Raw Oyster Consumption at a Restaurant**

August

Hennepin County

On August 30, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory received an isolate of *Vibrio parahaemolyticus* recently collected from a Minnesota resident. A routine follow-up interview revealed that the case had consumed raw oysters at a restaurant in Edina, Minnesota on

August 24, 2010, and began experiencing gastrointestinal symptoms the following day. City of Edina Environmental Health was notified, and an outbreak investigation was initiated.

Staff from MDH interviewed restaurant patrons to obtain information on food/beverage consumption and illness history. A case was defined as an individual who had *V. parahaemolyticus* isolated from a stool culture or who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) within 4 days after eating at the restaurant.

City of Edina staff visited the restaurant on September 8 to conduct an environmental assessment of the restaurant. Credit card receipts for additional patrons who dined at the restaurant from August 23 to August 25 were collected. City of Edina staff also collected tags for oysters that would have been in use at the restaurant on August 24. This information was forwarded on to the U.S. Food and Drug Administration (FDA) to facilitate traceback of the product.

Illness histories and exposure information were obtained from 16 patrons: seven dined at the restaurant on August 23, three on August 24, and six on August 25. Only the original *V. parahaemolyticus* case and her spouse met the case definition. Both of the cases reported experiencing stomach cramps, nausea, and diarrhea. The confirmed case had an incubation period of 23 hours and an illness duration of 7 days. These values were not available for the other case, only that he reported having a milder illness.

While at the restaurant, the confirmed case consumed three oysters from the small oyster sampler (menu description says “one each of today’s oysters”) and had the monkfish as her main entrée. Her spouse had the same fish and one of the oysters from the sampler. The cases could not recall the type or harvest location for the oysters that were consumed during their meal at the restaurant. None of the 14 patrons indentified through credit card receipts who could be contacted for an interview reported becoming ill after eating at the restaurant. However, only four (29%) of the credit card receipt patrons reported consuming raw oysters while at the restaurant. None of these patrons were able to name the type of oysters that were consumed during their meal.

According to the inspection performed by City of Edina staff, the restaurant uses only one supplier for its fresh seafood, which is located in Minnesota. They order oysters twice per week from the east coast and once per week from the west coast. Oysters generally stay onsite for 3 to 4 days with some variability because of business level. The restaurant sells about 200 oysters per day during the week and up to 300 oysters per day during the weekend. The menu is changed on a daily basis at the restaurant and includes about four types of oyster each day. However, other types of oysters may be onsite and used when the menu options run out. Because of this, the restaurant could not state with certainty which oysters would have been used in preparation of the sampler platter that was consumed by the cases. City of Edina staff did not identify any food preparation or handling violations during the restaurant inspection.

Oyster tag and invoice information was collected from the restaurant and forwarded to FDA officials. At the time of this report, no traceback information had been supplied by FDA. MDH and FDA staff did not receive any additional reports of illness regarding oysters during the investigation.

This was an outbreak of *Vibrio parahaemolyticus* infections associated with consumption of raw oysters at a restaurant in Edina, Minnesota. The oysters were most likely harvested from contaminated waters but the exact type of oyster consumed, and subsequently its harvest site, could not be determined.

(50)

***Salmonella* Enteritidis Infections Associated with Two Weddings Catered by an Unlicensed Caterer**

August

Becker County

On September 2, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the Becker County Community Health Department reporting that a clinician at a Detroit Lakes clinic had seen two family members with bloody diarrhea; both family members had attended a wedding reception on August 27. A follow-up phone call from an employee of the MDH Acute Disease Investigation and Control Section (ADIC) to the two ill individuals revealed that they had multiple meals in common, including a wedding reception at a community center on August 27. Neither individual was able to provide contact information for the bride or groom; however, a relative that they provided contact information for was able to provide names of the bride and groom but declined to give a telephone number. On September 3, the MDH foodborne illness hotline received a call from the same clinic in Detroit Lakes reporting that they had seen a patient who had become ill with diarrhea 4 days after working for the caterer of the August 27 wedding. The clinic in Detroit Lakes notified MDH on September 7 that one of the two family members who presented to their office on September 2 and the catering company worker were both positive for *Salmonella*; their specimens were ultimately determined to be *Salmonella* Enteritidis pulsed-field gel electrophoresis subtype SE1B1. Sanitarians from MDH Environmental Health Services were notified, and an investigation was initiated.

Staff at the community center provided contact information for the caterer (Caterer X) and the mother of the bride.

MDH sanitarians spoke with Caterer X to discuss food preparation procedures. A menu, list of events she had catered, and list of food workers were provided to MDH by Caterer X. MDH sanitarians interviewed food workers about illness history and work duties.

All *Salmonella* 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 *S. Enteritidis* cases to identify other potential cases associated with events catered by Caterer X.

Epidemiologists from MDH interviewed guests of events catered by Caterer X to obtain information on food/beverage consumption and illness history. Guests were also asked to provide contact information for other wedding guests.

Cases were defined as persons who had *S. Enteritidis* SE1B1 isolated from stool cultures or who had fever and diarrhea (≥ 3 or more loose stools in a 24-hour period) and who reported eating at an event catered by Caterer X in the 7 days prior to onset of illness.

An MDH epidemiologist made multiple unsuccessful attempts to contact the family of the bride of Wedding A. Wedding A was held at a community center on August 27. The menu consisted of pulled pork, hot turkey on a bun, cheesy hash brown potatoes, fresh fruit, Italian pasta salad, relish tray, chocolate-covered strawberries, and cake.

On September 10, MDH ADIC received a call from a family member of one of the confirmed *Salmonella* cases from Wedding A asking MDH to stop the outbreak investigation. This case reported that her family had been threatened and harassed by family members of the bride from Wedding A since the initiation of the outbreak investigation. The caller also reported that additional family members had been ill but feared that there would be serious repercussions if they reported their illnesses.

On September 13, a routine surveillance interview of a *S. Enteritidis* SE1B1 case revealed that he had attended a different wedding (Wedding B) catered by Caterer X in the week prior to illness onset. The parent of the case reported that they knew of additional people ill who attended the wedding, including one who also was positive for *Salmonella*. The parent provided names and a telephone number for the bride and groom.

Wedding B took place in Lake Park on August 28. On September 14, an MDH epidemiologist spoke to the bride from Wedding B to gather more information and to request a guest list. She reported that approximately 200 guests had attended the August 28 reception. She refused to provide MDH with a guest list and denied that anyone had become ill, despite having been personally contacted by individuals who had become ill. Caterer X had provided MDH with contact information for the father of the bride for Wedding B during the initial Wedding A investigation. An MDH epidemiologist contacted him to try and obtain a guest list; however, he stated that his daughter had the list and should be able to help.

Illness histories and exposure information were obtained from 12 guests (4 from Wedding A and 8 from Wedding B). Seven cases were identified (four culture-confirmed), including four from Wedding A and three from Wedding B. All cases reported diarrhea, six of six reported cramps, six of six reported fever, five of six (83%) reported bloody stools, and two of six (33%) reported vomiting. The median incubation period was 38 hours (range, 18 to 75 hours). Only one case had recovered at the time of interview; he reported illness duration of 14 days. One (14%) case was hospitalized for 4 days.

Due to the limited number of controls, meaningful food-specific analyses could not be performed. Therefore, no individual food items served at the weddings were found to be significantly associated with illness.

When contacted by an MDH sanitarian, Caterer X reported that while she had a food manager's certificate, she was not a licensed caterer and had never sought licensure from MDH or the Minnesota Department of Agriculture. She reported that she does some food preparation at her home on her family's dairy farm but usually operates out of various commercial clubs or churches. Caterer X was notified on September 7 to immediately cease all catering operations until she obtained the proper license.

For Wedding A, the chocolate-covered strawberries were made by the mother of the bride and the cake was from a bakery; all other food was prepared by Caterer X and her employees. Some of the food for

Wedding A was prepared at a licensed kitchen in the community center while others were prepared at Caterer X's home; Caterer X could not recall specifically where or how foods had been prepared.

The menu for Wedding B consisted of pulled pork, chicken, garlic bread, cheesy potatoes, fresh fruit, and cake. Staff from the facility reported that the food for Wedding B was not prepared at the facility.

Eight employees were interviewed regarding job duties and illness histories; only the employee who became ill with diarrhea 4 days after working at Wedding A and subsequently tested positive for *S. Enteritidis* reported recent gastrointestinal illness. There were at least four additional employees who worked at Wedding A and/or Wedding B that MDH was unable to reach for interview. Employees reported performing a variety of job duties, including food preparation, set-up, serving, and dishwashing.

This was a foodborne outbreak of *Salmonella* Enteritidis infections associated with two weddings catered by Caterer X. Due to a lack of cooperation from the families involved, an exhaustive epidemiologic investigation could not be performed. A specific food vehicle could not be identified. Caterer X was ordered to cease all catering operations until she obtains the proper licensure to operate her business.

(51)

Norovirus Gastroenteritis Associated with a Wedding Reception

August

Itasca County

On August 31, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint from an individual who attended a wedding reception at an event center in Grand Rapids, Minnesota on August 28. The complainant reported additional gastrointestinal illness among reception attendees. MDH Environmental Health Services (MDH EHS) was notified and an investigation was initiated on September 1.

An MDH EHS sanitarian visited the event center on September 1 to evaluate food preparation and handling procedures and interview food workers. The sanitarian collected contact information for employees from management and additional wedding reception attendees from a reception organizer. The complainant and additional reception attendees were interviewed by MDH staff about food consumption and illness history. A case was defined as a wedding reception attendee who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool samples collected from consenting reception attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from 41 reception attendees. A total of 21 (51%) attendees met the case definition; four reported illness that did not meet the case definition and were excluded from the analysis. The median incubation period for cases was 36 hours (range, 14 to 54 hours). The median duration of illness for the 17 cases who had recovered at the time of interview was 37 hours (range, 17 to 94.5 hours). Eighteen (86%) cases reported diarrhea, 14 (67%) reported cramps, 12 (57%) reported vomiting, eight (38%) reported fever, and one (5%) reported bloody stools. Both stool samples submitted by ill reception attendees tested positive for norovirus genogroup II with matching nucleic acid sequences.

Foods at the wedding reception were served buffet-style and included spaghetti with meat sauce, fettuccine alfredo with chicken, chicken strips, garlic bread, rolls, and a mixed greens salad. By univariate analysis, consumption of the mixed greens salad (18 of 21 cases vs. 8 of 16 controls; odds ratio, 6.0; 95% confidence interval, 1.22 to 32.8; Fisher's exact 2-tailed p = 0.03) was the only food item associated with illness.

A child developed gastrointestinal illness the day prior to the reception and was reported to have vomited at a table during the reception but after the meal. Neither the child nor the child's guardian reported consumption or contact with the mixed greens salad. Also, two cases reported attending the reception and not consuming the buffet meal. One case reported only drinking mixed drinks and consuming chocolate candy at the reception. The other case reported consuming a chicken alfredo pizza from event center and drinking mixed drinks at the reception.

MDH EHS sanitarians and MDH staff interviewed nine event center employees. One employee was not able to be interviewed. None reported recent gastrointestinal illness at the time of interview. Management reported on September 7 that employees developed gastrointestinal symptoms with illness onsets after September 4. The sanitarian discussed the importance of handwashing for the prevention of norovirus transmission, and informed management that any food worker with vomiting and/or diarrhea must be excluded from work until 72 hours after the resolution of symptoms.

This was an outbreak of norovirus gastroenteritis associated with consumption of mixed greens salad at a wedding reception held at an event center. However, the source of the contamination was not identified. There also was evidence of person-to-person transmission of norovirus at the event.

(52)

***Clostridium perfringens* Intoxications Associated with a Catered Work Picnic**

September

Anoka County

On September 2, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from employees from a school district who attended a beginning of the year picnic at a park on September 1. The event was catered by a catering company, with additional foods provided by the school district. MDH notified Anoka County Community Health and Environmental Services (ACCHES) on September 3 and an investigation was initiated.

ACCHES sanitarians inspected the catering company on September 3. The inspection of the catering company focused on flow of food, food preparation, and food storage procedures.

The original complainant supplied contact information for school district employees who attended the picnic to MDH. MDH staff interviewed picnic attendees regarding illness and food consumption history. A case was defined as a person who had attended the picnic and subsequently developed diarrhea (≥ 3 loose stools in a 24-hour period). Stool kits were delivered to two cases for *Bacillus cereus*, *Clostridium perfringens*, and *Staphylococcus aureus* testing.

Forty-one employees who attended the picnic at the park were interviewed. Eighteen (44%) met the case definition. All 18 cases reported diarrhea, 16 (88%) reported cramps, 2 (11%) reported bloody diarrhea, and none reported vomiting. The median incubation period was 15 hours (range, 6 to 19 hours). The

median duration of illness for the 14 cases who had recovered at the time of the interview was 20 hours (range, 5 to 40 hours). Both stool samples tested positive for *Clostridium perfringens* enterotoxin A; in addition *C. perfringens* of the same pulsed-field gel electrophoresis subtype (designated PERF35) was cultured from both stool samples.

The pulled pork, pulled turkey, sauce, buns, potato salad, and coleslaw served at the picnic were prepared by the catering company. The school district supplied the pork and beans, pickles, ice cream, cake, soda, and ice.

By univariate analysis, consumption of pulled turkey (17 of 18 cases vs. 12 of 23 controls; odds ratio [OR], 15.6; 95% confidence interval [CI], 1.6 to 374.3; $p = 0.003$) was significantly associated with illness. No other food items approached significance in the analysis. There was no pulled turkey leftover after the picnic; therefore, the MDH Public Health Laboratory was not able to test the turkey.

Inspection of catering company by ACCHEs found that pre-cooked pulled turkey had been used. Both the turkey and pork were delivered to the park in electric roasters that were powered by a generator. The school district employees served themselves.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with a school district picnic at a local park. Pulled turkey was implicated as the likely vehicle of transmission. Although the specific contributing factors could not be confirmed, it is likely there was time and temperature abuse of the pulled turkey served in an electric roaster at the picnic.

(53)

Suspected Norovirus Gastroenteritis Associated with a Restaurant

September

Hennepin County

On September 22, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received two independent illness complaints associated with a restaurant in Golden Valley. The first complainant reported that three meal companions developed gastrointestinal illness after eating at the restaurant on September 20. The second complainant reported developing gastrointestinal illness after eating at the restaurant on September 20. MDH contacted the Minnesota Department of Agriculture (MDA), and an investigation was initiated.

An MDA inspector visited the restaurant on September 23 to evaluate food preparation and handling procedures and to interview food workers. The complainants and their meal companions were interviewed by MDH staff 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). The restaurant was unable to provide credit card receipts for additional patrons. Stool samples collected from consenting patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from four individuals. All four patrons met the case definition. All four cases reported vomiting, three (75%) reported diarrhea and cramps, one (25%) reported fever, and none reported bloody stools. The median incubation period was 31 hours (range, 29 to 36 hours). The median duration of illness was 6 hours (range, 2 to 9 hours). One stool sample

submitted by an ill patron tested negative for norovirus, *Salmonella*, *Shigella*, *Campylobacter*, *E. coli* O157:H7, and *Vibrio*.

The small number of cases and lack of non-ill controls prevented a statistical analysis of specific food exposures. Cases reported eating a variety of food items including beef brisket, turkey, mashed potatoes, gravy, brussels sprouts, carrots, cake, and chocolate chip cookies. All four cases reported eating mashed potatoes, three (75%) reported turkey, gravy, carrots, and brussels sprouts, two (50%) reported white cake, and one (25%) reported beef brisket and chocolate chip cookies.

MDA and MDH staff interviewed 35 employees. Seven reported recent gastrointestinal illness, including one food worker and one deli employee. All seven reported illness onsets of September 22, matching the cases' illness onsets. Stool specimen kits provided to ill employees were not returned. The restaurant was ordered to maintain an employee illness log for all food employees and MDA inspectors stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, proper handwashing, and exclusion of ill employees.

This was a foodborne illness outbreak associated with a restaurant. The etiology was not confirmed. However, the distribution of incubations and symptoms were characteristic of norovirus gastroenteritis. While a specific vehicle was not identified, the presence of multiple ill employees suggests that contamination of a ready-to-eat food by an unidentified ill food worker was a plausible source of contamination.

(54)

***E. coli* O157:H7 Infections Associated with Unpasteurized Artisanal Cheese**

September-October

Multiple states

In early October 2010, the Minnesota Department of Health (MDH) Public Health Laboratory identified one *E. coli* O157:H7 isolate with MDH pulsed-field gel electrophoresis (PFGE) 2-enzyme pattern designation MN1182ECB304 (PulseNet pattern designation EXHA26.3197/EXHX01.113) that matched an isolate in Washington. A second *E. coli* O157:H7 isolate that matched by PFGE was identified in Minnesota in late October. A new search of the national PulseNet database identified a second matching isolate in Washington, for a total of four matching isolates nationally. The Minnesota cases were interviewed as part of routine surveillance activities, and information about exposure histories was shared with Washington epidemiologists. One of the cases in Washington reported eating home-made goat, cow and sheep cheeses, but the Minnesota cases did not report eating any similar cheeses. No commonalities were identified between the Minnesota cases, or between the Minnesota and Washington cases. In December, an Oregon epidemiologist contacted MDH. Additional cases had been identified in Oregon, Washington and Vermont, and the Vermont case had traveled to Washington before his/her illness onset. The Oregon epidemiologist strongly suspected an artisanal cheese as the outbreak vehicle. Although the Minnesota cases had not reported eating artisanal or raw cheeses, further investigation of the Minnesota cases was initiated.

In Minnesota, a case was defined as a Minnesota resident with laboratory-confirmed infection with *E. coli* O157:H7 with 2-enzyme PFGE subtype MN1182ECB304. Cases were contacted for an interview by phone regarding illness history and potential exposures. A questionnaire with additional questions

about cheeses and restaurants was developed and used to re-interview the Minnesota cases. Cases were contacted several times to gather more detailed information about their food consumption histories.

City of Minneapolis and City of Edina environmental health specialists collected cheese invoices from several restaurants and retailers.

The Minnesota Department of Agriculture (MDA) conducted a trace back investigation of several cheeses consumed by the Minnesota cases. They also identified retailers that received certain cheeses from the implicated distributor.

Information collected in the investigation was shared with other states involved in the investigation, and with the United States Food and Drug Administration (FDA).

Two cases were identified in Minnesota. The two cases had illness onset on September 26 and October 8, respectively. One case was hospitalized for 1 day. Both cases had diarrhea, vomiting, blood in the stool, and cramps with no fever. The incubation period was 1 day for one of the cases; and unknown for the other case. Durations of illness were 4 days and 14 days, respectively. Both cases recovered from their illness.

Nationally, eight cases were identified (Washington-four; Oregon-one; Vermont-one; Minnesota-two). All patients had diarrhea with onset during September through November 2010. Two cases were hospitalized; none died.

On the initial interview of the Minnesota cases, neither case reported eating any raw cheeses. When contacted again, both cases reported eating a variety of artisanal cheeses; however, both cases were unsure about the exact types or brand names. One case reported receiving a 6-month subscription to a monthly cheese club (through which different cheeses were received by mail every month), and eating a lot of cheeses at friend's houses or other places. The case was unable to provide enough detail to trace back the source of any of the cheeses she consumed. The other case reported eating artisanal cheeses at a restaurant in Edina within 7 days of his illness onset. City of Edina staff obtained invoices for cheeses served at that restaurant.

By that time, the epidemiologist in Oregon strongly suspected Brand A raw goat, sheep and/or cow cheeses made in Washington as the outbreak vehicle, and an investigation focusing on that cheese maker was initiated. Investigators obtained a list of distributors of Brand A cheeses across the country. MDH received the list. MDA contacted the main distributor of Brand A cheeses in Minnesota and obtained a list of restaurants and retailers that received any Brand A cheeses. The Edina restaurant was not on the list of places that served that cheese. The invoices from the restaurant confirmed that they did not serve Brand A cheeses.

Both cases were contacted again and specifically asked about cheese purchases and consumption at restaurants and stores listed by the distributor. The case that had previously mentioned eating artisanal cheeses at the restaurant in Edina had indeed eaten an artisanal cheese platter at a Minneapolis restaurant listed as having received Brand A cheese. The case checked bank records and confirmed that the meal date was September 25. A City of Minneapolis environmental health specialist obtained invoices from that restaurant, and it showed that Brand A raw sheep cheese was served on the case's September 25 meal date.

On December 17, 2010 all Brand A cheeses were recalled due to possible *E. coli* O157:H7 contamination. The recall included cheeses made from raw cow, goat and sheep milk. The cheese did not have a production date or production codes; therefore, all cheeses made at the farm were recalled. The cheese maker had failed a recent inspection, and FDA investigators found extensive unsanitary conditions and practices at the Brand A cheese production facility.

On December 20, MDH collected four Brand A sheep and five Brand A goat cheese samples that had been withdrawn from sale from a co-op in Minneapolis due to the recall. The samples tested negative for *E. coli* O157:H7.

This was a multi-state outbreak of *E. coli* O157:H7 infections associated with consumption of Brand A raw milk artisanal cheeses. The outbreak led to a recall of all cheeses made at that cheese maker's farm. Two cases associated with this outbreak were identified in Minnesota.

(55)

Norovirus Gastroenteritis Associated with a Restaurant

October

Hennepin County

On October 18, 2010, Hennepin County Public Health Protection - Environmental Health (PHP-EH) received a report of illness from the manager of a restaurant in Maple Grove, Minnesota. The restaurant had received reports of illness from three people who had attended a private event at the restaurant on October 12 and also from a participant of a private event at the restaurant on October 13. Hennepin County Public Health Protection-Epidemiology (PHP-Epi) contacted the Minnesota Department of Health (MDH) foodborne illness unit to discuss the foodborne illness complaints. An outbreak investigation was initiated on October 18.

On October 18, PHP-Epi spoke with a restaurant manager and requested names from the reservation list for both lunch and dinner on Tuesday, October 12. Also, PHP-Epi contacted the persons who hosted the events on October 12 and 13 to get the list of participants. PHP-Epi 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 on October 12 or 13 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 the MDH Public Health Laboratory for bacterial and viral testing.

An environmentalist from PHP-EH visited the restaurant on October 19 and conducted an inspection of the facility. PHP-EH interviewed the food workers regarding illness history and job duties.

Illness histories and exposure information were obtained from 101 lunch and dinner patrons. Of these, 60 were dinner patrons on October 12 and 13; 17 were lunch patrons on October 12; and 24 were dinner patrons on October 16. Twenty-nine (48%) cases were identified, all among patrons who had eaten dinner at the restaurant on October 12 or 13. Additionally, one patron met the case definition but their incubation period was 72 hours, and six patrons reported mild gastrointestinal symptoms that did not meet the case definition; these seven patrons were excluded from further analyses.

Twenty-four cases (83%) reported diarrhea, 23 (79%) reported vomiting, 11 (38%) reported abdominal cramps, and 9 (31%) reported fever. The median incubation period was 33.5 hours (range, 22.5 to 58

hours). The median duration of illness was 48 hours (range, 13.5 to 84 hours) for the 15 cases who had recovered at the time of interview. All three stool specimens tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on all three of the positive norovirus specimens; the sequences were identical.

Statistical analyses were restricted to patrons who consumed dinner on October 12 or 13. Attending the evening meal on Tuesday was significantly associated with illness (28 of 29 cases vs. 11 of 24 controls; odds ratio [OR], 33.1; 95% confidence interval [CI], 3.8 to 284.1; $p < 0.001$). Cases reported eating a variety of foods, including salads, appetizers, entrées, sides, and desserts. Consuming water with ice was significantly associated with illness (26 of 26 cases vs. 16 of 22 controls; OR, undefined; Fisher's exact $p = 0.006$).

Illness histories and job duty information were obtained from 75 restaurant employees. Three employees reported having had a recent gastrointestinal illness. Two hosts reported having vomiting and diarrhea, with onsets of October 14 and 15. One of the kitchen staff reported cramps but no other symptoms. A fourth employee (wait staff) reported loose stools in a family member from October 13–15; however, the employee did not work during this time period.

During the inspection of the restaurant, numerous critical risk factors were noted. The bartender was observed slicing lemons and limes bare-handed on the bar top. She was directed to obtain a barrier to prevent bare-hand contact with ready-to-eat foods. The handsink in the bar was not equipped with soap, but the bartender stated that she washes her hands at the wait station handsink in the kitchen.

The expeditor was observed using bare-hand contact with the crostini, parsley and garnishments. He was directed to obtain utensils or disposable gloves for handling these items.

A waiter assistant was observed raking glasses through the ice and having bare-hand contact with the ice in the process as he filled water glasses for a table, instead of using an ice scoop that was present on the wall adjacent to the ice bin. The ice was ordered to be discarded and staff was directed to use the scoop.

The majority of the employees utilize paper cone cups to obtain beverages for themselves, without putting ice, lemons, or limes into the cone. The hosts indicated that they would fill a glass with ice and/or lemons or limes for their personal beverages. The lemons and limes were handled with bare hands in preparation and service. Tongs were provided to serve these in the beverages.

No sanitizer concentrate was found in any wiping cloth bucket or in the three compartment ware washing sink. There were two autofills for quaternary ammonium sanitizer available. One was at the janitor sink requiring employees to switch the type of chemical being dispensed. The other was at the sanitizing compartment of the three compartment sink, where a button was pushed and sanitizer was dispensed. No chemical test kits were available and employees were unaware that the button was dispensing only water. A leak in the line below caused the sanitizer not to feed into the sink. This was where all of the wiping cloth buckets were being filled and the sink was used for manual ware washing. No one was able to identify how long they had been operating without the use of sanitizer on surfaces throughout the facility.

Based on the above observations, all open ice and cut lemons and limes were discarded. The facility closed down that night and sanitized all surfaces with a strong bleach solution (5,000 ppm) as recommended by MDH Environmental Health.

Management was very cooperative with all corrections and ensuring that service staff was trained in on “no bare-hand contact of ready-to-eat foods”, including proper handwashing, glove use, tongs, and other measures to protect these items. Ecolab responded that same day to provide additional sanitizer test paper, repair the leak in the sanitizer line; and trained employees to test and measure the concentrations of sanitizer solution.

Follow-up inspections on October 20 and October 26 indicated correction of all critical risk factor violations and orders issued on October 19.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. Ice water was implicated as the vehicle of transmission. The source of contamination was not identified. However, multiple ill employees were identified, suggesting illness transmission among workers at the restaurant. It is likely that food items were contaminated by an ill or recently ill food worker who did not identify their symptoms or the correct onset date of their symptoms during interview.

(56)

Norovirus Gastroenteritis Associated with a Restaurant

October

St. Louis County

On October 19, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of four patrons who ate at a restaurant in Duluth, Minnesota, on October 17. Two of the four persons became ill with diarrhea and vomiting 4 to 21 hours after consuming Belgian waffles with strawberries, blueberries and lemonade at the restaurant. However, the complainants had several other common exposures.

On October 29 the MDH foodborne illness hotline received a second complaint of gastrointestinal illness from a group of eight patrons from four separate households who reported eating at the restaurant on October 24. The complainant reported that four of eight people became ill with diarrhea and vomiting approximately 30 hours after the meal. An investigation was initiated.

MDH Environmental Health Specialists visited the restaurant on October 29 to evaluate food preparation and handling procedures. Restaurant employees were interviewed about recent history of gastrointestinal illness and foods consumed at the restaurant. Employee work schedules and illness log were obtained. Restaurant reservation lists for October 17 to October 24 were obtained.

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

Patrons who ate at the restaurant from October 17 to October 24 were interviewed about food consumption and illness history by MDH staff, A case was defined as a person who ate at the restaurant and subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool

samples collected from consenting restaurant patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from 94 individuals with meal dates from October 17 to October 24. Nine cases were identified. In addition, 10 patrons reported illness but were excluded from analysis; seven did not meet the case definition, one was a probable secondary case, and two had implausibly short incubation periods. Of the nine cases, meal dates included October 17 (n=2), October 21 (n=1), October 23 (n=2), and October 24 (n=4).

MDH collected stool samples from three ill patrons who ate at the restaurant on October 24. All three samples tested positive for norovirus genogroup II.

One of the cases who was part of the initial complaint group had an incubation period that was too short for a norovirus infection (4 hours) for the restaurant meal to be the source of their infection. That complaint group had other common exposures that could have explained the source of their illness. Since the initial complaint group was likely not part of the outbreak, the analysis was restricted to the 70 patrons with meal dates from October 21 to October 24. Seven (10%) ill patrons who had meal dates on or after October 21 met the case definition. One of the seven was excluded from further analysis due to having a 145-hour incubation period, which is too long for norovirus. Of the remaining six, all had diarrhea, four (67%) had fever, four (67%) had cramping, three (50%) had vomiting, and none had bloody stools. The median incubation period was 33 hours (range, 24 to 48 hours). For the three cases who had recovered by the time of interview, the median duration of illness was 78 hours (range, 37 to 102 hours). None of the cases called or visited a medical provider, and none were hospitalized.

By univariate analysis, eating salad (5 of 6 cases vs. 13 of 56 controls; odds ratio [OR], 16.5; 95% confidence interval [CI], 1.96 to 401; $p = 0.006$), Caesar salad (4 of 6 cases vs. 5 of 56 controls; OR, 20.4; 95% CI, 3.04 to 273; $p < 0.001$), dinner meatloaf (3 of 6 cases vs. 3 of 54 controls; OR, 17.0; 95% CI, 2.31 to 35.1; $p = 0.01$), cauliflower fritter (2 of 6 cases vs. 0 of 56 controls; OR, undefined; 95% CI lower limit, 2.99; $p = 0.008$), and Italian cold cuts (3 of 6 cases vs. 7 of 56 controls; OR, 7.0; 95% CI, 0.98 to 46.1; $p = 0.05$), were significantly associated with illness.

Several multivariate analyses were conducted. Cauliflower fritter was excluded in the multivariate analyses because it was not consumed by any of the controls. In a multivariate analysis that included Caesar salad, meatloaf, and cold cuts, only Caesar salad (adjusted OR [aOR], 11.2; 95% CI, 1.2 to 108; $p = 0.04$) remained independently associated with illness. Using stepwise logistic regression model selection, only Caesar salad remained an independent predictor of illness (OR, 19.6; 95% CI, 2.8 to 135; $p = 0.003$). In a multivariate analysis that included any salad, meatloaf and cold cuts, any salad (aOR, 10.1; 95% CI, 0.94 to 108; $p = 0.06$) approached statistical significance.

During the environmental health evaluation, restaurant employee handwashing techniques were observed and deemed to be appropriate; the handwashing station was accessible and well-supplied. Although gloves were available, they were not consistently used, and bare-hand contact with ready-to-eat foods, including salads, was observed. Additional findings included the use of unpasteurized eggs in Caesar salad dressing and aioli, and foods (including the Caesar salad dressing) held at 61° F.

The employee illness log did not have any entries of employee illness in the previous month. Twenty-six food workers were interviewed and none reported a recent history of gastrointestinal illness.

This was an outbreak of norovirus gastroenteritis associated with a restaurant. Transmission to patrons occurred from October 21 to 24. Caesar salad was implicated as the vehicle of transmission. Since none of the restaurant employees reported being ill, the initial source of the outbreak was not identified. However, bare-hand contact with ready-to-eat foods could have played a role in contamination of food.

(57)

Suspected Norovirus Gastroenteritis Associated with a Restaurant

October

Dakota County

On November 5, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received information from Minnesota Poison Control on a complaint they had received about two individuals becoming ill after dining at a restaurant in Apple Valley, Minnesota on October 28. Staff from MDH was able to interview the complainant on November 5. The complainant reported that both he and his dining companion had developed symptoms of gastrointestinal illness after their meal; he reported that they had no other recent meals in common. Sanitarians from MDH Environmental Health Services were notified, and an investigation was initiated.

A list of patrons from October 28 and 29 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 sanitarian from MDH Environmental Health Services 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 42 restaurant patrons. Fourteen (33%) cases were identified. Two people reported illness but did not meet the case definition, and thus were excluded from further analyses.

All fourteen cases reported diarrhea, nine (64%) reported vomiting, nine (64%) reported cramps, and seven (54%) of 13 reported fever. The median incubation period was 35 hours (range, 11 to 88 hours) for the 11 cases with known illness onset times. The median duration of illness was 41 hours (range, 32 to 130 hours) for the 11 cases with known recovery date times.

Consumption of any wrap sandwich (5 of 14 cases vs. 0 of 26 controls; odds ratio [OR], undefined; $p = 0.003$), and specifically the grilled chicken ranch wrap (4 of 13 cases vs. 0 of 26 controls; OR, undefined; $p = 0.009$) were significantly associated with illness. Upon inspection, food workers were observed wearing gloves while handling ready-to-eat foods, including the preparation of the wrap sandwiches.

When contacted by an MDH sanitarian, the restaurant reported that they had received a complaint of illness from a patron on October 30; however, they did not notify MDH as required.

Illness histories and job duty information were obtained from 57 employees; four employees reported recently having a recent gastrointestinal illness, with onset dates from October 30 to November 3.

Employees reporting illness filled a number of different roles at the restaurant, including manager, bartender, and expeditor.

This was a foodborne outbreak of suspected norovirus gastroenteritis associated with restaurant in Apple Valley. Consumption of a wrap sandwich was statistically associated with illness; however, this only explains 36% of the cases, indicative of multiple food items being vehicles of transmission. Multiple ill employees were identified, suggesting illness transmission among workers at the restaurant. It is likely that food items were contaminated by an ill or recently ill food worker who did not identify their symptoms or the correct onset date of their symptoms during interview.

(58)

Suspected Viral Gastroenteritis Associated with a Restaurant

October

Ramsey County

Two separate complaints were made to the Minnesota Department of Health (MDH) foodborne illness hotline regarding a restaurant in St. Paul; one complaint was received on November 2, 2010 and one on November 3. Both parties had consumed lunches from the restaurant on October 29. Ramsey County Environmental Health (RCEH) was contacted and an investigation was initiated.

A Ramsey County Environmental Health (RCEH) sanitarian visited the restaurant on November 4 to evaluate food preparation and handling procedures, interview food workers, and collect credit card receipts from October 29. MDH staff interviewed patrons from both complainant groups and those identified from credit card receipts about food consumption and illness history. A case was defined as a person with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after eating at the restaurant in St. Paul. Stool specimen collection kits were sent to consenting restaurant patrons. Restaurant employees were interviewed regarding job duties and illness.

The first complainant group consisted of two people, both were reached for interview, and both met the case definition. The second complainant group consisted of work colleagues who had no other meals or events in common. Four of the six work colleagues were reached for interview and three met the case definition. Five additional patrons that were identified through credit card receipts were reached for interview and one met the case definition. A total of eleven patrons were interviewed, and six (55%) met the case definition.

All six cases reported diarrhea and cramps, four (67%) reported vomiting, two (33%) reported fever, and none reported bloody stool. The median incubation period was 34.5 hours (range, 32 to 44 hours). The median duration of illness for the four cases who had recovered at the time of the interview was 3.5 days (range, 1 to 5.2 days). No stool specimen collection kits were returned to MDH for bacterial and viral testing.

Cases consumed a variety of sandwich types including: roast beef, ham and salami, turkey, and cheesesteak. Many of these sandwich types included cheese, lettuce, tomato, red onion, green peppers, and mayonnaise. No specific food items were statistically associated with illness.

RCEH sanitarians interviewed eight of nine restaurant employees. No employees reported recent gastrointestinal illness, and the illness log was blank. The sanitarians further stressed the importance

of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness.

This was a foodborne outbreak of gastroenteritis associated with a restaurant in St. Paul. The etiology was not confirmed. The distribution of incubations and symptoms was characteristic of norovirus gastroenteritis; however, illness durations were slightly longer than expected for norovirus. The vehicle of transmission and source of contamination were not identified.

(59)

Norovirus Gastroenteritis Associated with a Restaurant

November

Dakota County

On November 12, 2010, a manager of a restaurant in Eagan called the Minnesota Department of Health (MDH) Environmental Health Services (EHS) to report a number of employees ill with gastrointestinal illness. An investigation was initiated immediately.

MDH EHS sanitarians visited the restaurant on November 12 to evaluate food preparation and handling procedures, interview food workers, and collect a list of group delivery orders. Credit card receipts for additional patrons were not available. MDH staff interviewed patrons identified from the delivery order list 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.

Five delivery order groups were contacted, and one delivery order group reported illness. The group reporting illness consumed food from the restaurant on November 9 while the groups that did not report illness consumed food from the restaurant from November 10 through 12. Illness histories and exposure information were obtained from all six patrons from the November 9 group; of these, three met the case definition. The median incubation period for the cases was 37 hours (range, 35.5 to 46 hours). The median duration of illness was 27 hours (range, 20 to 36 hours). All three cases reported diarrhea, vomiting, and cramps, and none reported fever or bloody stools. One stool sample submitted by a patron tested positive for norovirus genogroup I.

The small number of cases and non-ill controls prevented a meaningful statistical analysis of specific food exposures. All three cases and all three controls reported eating pizza and salad.

MDH EHS sanitarians interviewed all 26 restaurant employees and seven reported recent gastrointestinal illness. Employees reported becoming ill on November 5 (n=1), 6 (n=1), 7 (n=1), 11 (n=1), and 12 (n=3). One employee reported preparing pizza and salads on November 9 while ill with symptoms that included diarrhea. 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 sanitarian also discussed the importance of handwashing for the prevention of norovirus transmission.

This was a foodborne outbreak of norovirus gastroenteritis associated with restaurant in Eagan. No specific food vehicle was identified. The source of the contamination was an infected food worker who reported working while ill.

(60)

Norovirus Gastroenteritis Associated with a Party Facility

November

Dakota County

On November 22, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of individuals who attended a birthday party at a party facility in Burnsville on November 20. An investigation was initiated immediately. The party facility has inflatable slides and bouncy houses for kids. This party was served sandwiches with various toppings and chips, and they also brought a cake.

A Minnesota Department of Agriculture (MDA) inspector visited the establishment on November 23 to discuss food preparation and handling procedures at the facility, inquire about illness among staff, and collect contact information for other groups that had gatherings at the facility on November 20.

MDH staff interviewed individuals from the complainant party and event organizers about food consumption and illness history. A case was defined as a party facility patron who developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after eating at the facility. Stool samples from patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Thirty-four party attendees were interviewed, and 16 (47%) met the case definition. Four additional attendees reported illness that did not meet the case definition and were excluded from analyses. All cases reported vomiting, 10 (63%) reported diarrhea, 7 (44%) had cramps, and 6 (38%) reported fever. No cases reported bloody stools. The median incubation period was 32 hours (range, 23 to 42 hours). The median duration of illness for the two cases who had recovered at the time of interview was 8 hours (range, 7 to 8.5 hours). Four patrons submitted stool samples. All were positive for norovirus; one sample was positive for both genogroups I and II, the other three samples were all positive for genogroup I.

The manager of the facility had contacted organizers of 13 other parties from the same day and did not find any other illnesses. No staff at the facility reported current or recent illness. The manager prepared sandwich toppings at home (except lettuce, which was pre-bagged), put them on a platter, and brought them in to the facility for the parties.

By univariate analysis, consuming a ham and cheese sub sandwich (11 of 16 cases vs. 4 of 14 controls; odds ratio [OR], 5.5; 95% confidence interval [CI], 1.10 to 28.2; $p = 0.03$), and individually bagged chips (15 of 15 cases vs. 10 of 14 controls; OR, undefined; 95% CI, 1.09 to undefined; Fisher's exact 2-tailed $p = 0.04$) were significantly associated with illness. A multivariate analysis was not possible since all cases consumed chips. Sandwich toppings were combined and analyzed (both including and excluding lettuce) as a single variable (i.e., "consumption of any topping"). This was not statistically associated with illness.

The MDA inspector questioned the manager about food preparation and where the food provided to the groups originated. The manager stated that the sandwiches were purchased premade from a grocery store in Scott County with the exception of toppings she prepared at home. MDA staff contacted the grocery store; no employees reported current or recent illness. The party facility was ordered to cease food preparation since they do not operate a licensed kitchen.

This was an outbreak of norovirus gastroenteritis associated with a party at party facility in Burnsville. Sub sandwiches were the likely vehicle; however the source of contamination was not identified.

(61)

Shiga Toxin-Producing *Escherichia coli* Infections Associated with Venison

November

Anoka County

On December 1, 2010, a physician called the Minnesota Department of Health (MDH) to report that two students enrolled in the same physical education/environmental science class at a high school were hospitalized with bloody diarrhea. As part of the class, seven whole deer were processed on school grounds on November 16; in addition, some students from the class provided packages of venison from home. Students grilled and consumed venison kabobs in class on November 23. An investigation was initiated immediately.

MDH staff interviewed the course instructors and the butcher that processed the deer on school grounds. The school district provided names and contact information for students enrolled in the class. MDH staff interviewed students about illness history, food consumption, and venison handling in class. A case was defined as a student enrolled in the class who developed diarrhea (≥ 3 loose stools in a 24-hour period) lasting ≥ 3 days or bloody diarrhea with onset after the November 16 class. Stool samples collected from the two hospitalized students and stool specimen collection kits sent by MDH to additional students were submitted to the MDH Public Health Laboratory. Specimens were tested for *Salmonella*, *Shigella*, and *Campylobacter* by culture and norovirus genogroups I and II by PCR. *Escherichia coli* O157 and non-O157 Shiga toxin-producing *E. coli* (STEC) testing was done by sweep PCR for Shiga toxin genes (*stx1* and *stx2*) and by culture using immunomagnetic separation (IMS). Venison collected from the homes of consenting students was tested for STEC by the Minnesota Department of Agriculture (MDA) using a PCR screen and IMS for isolation as indicated in the United States Food and Drug Administration's Bacteriological Analytical Manual.

One-hundred-seventeen students (52%) were interviewed from the seven sections of the class, and 29 cases were identified (Table 1). Twenty students reported recent gastrointestinal symptoms that did not meet the case definition and were excluded from the analyses. Among cases, one student reported an illness onset 28 hours prior to class on November 23 (see epidemic curve). The median incubation from the November 23 class for the remaining 28 cases was 53.5 hours (range, 22 to 121 hours). The median duration of illness for all cases was 5 days (range, 4 to 12 days). All 29 cases reported diarrhea, 21 (72%) cramps, 5 (17%) vomiting, 5 (17%) bloody stools, and 2 (7%) fever. Two cases were hospitalized, for 2 and 3 days, respectively. No cases developed hemolytic uremic syndrome and no deaths occurred. Twenty (69%) cases were male.

Table 1. Student illness by class period

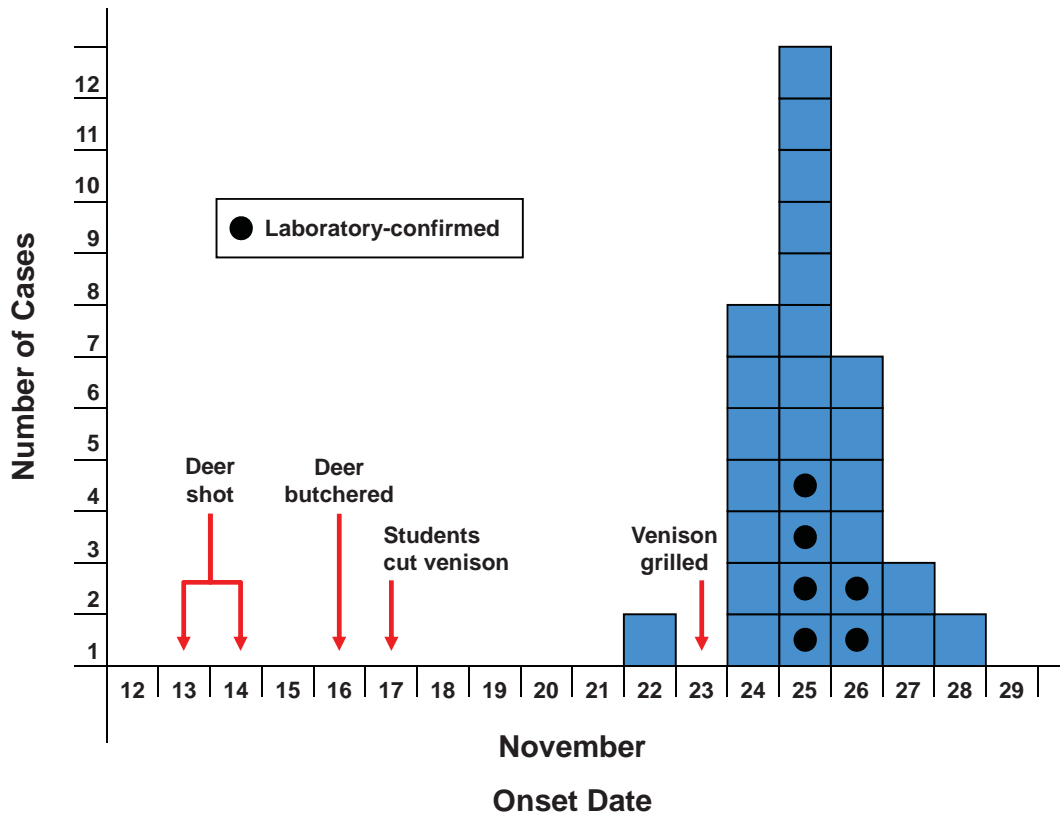
Class Period	No. Cases	No. Controls	No. Excluded*	Percentage of Class Interviewed
1	1	12	5	51%
2**	8	13	8	50%
3**	6	21	2	51%
4	10	7	3	51%
5	4	15	2	57%
Total	29	68	20	52%

* Reported gastrointestinal illness not meeting the case definition

** Two class sections

Stool samples from six students were tested, including the two who were hospitalized, one ill student who submitted a specimen to their clinic, and three ill students who were provided kits by MDH. All six stool samples tested positive for *stx1*. *E. coli* O103:H2 was isolated from two samples and *E. coli* O145:NM was isolated from two samples; one of the samples that yielded *E. coli* O145:NM was also positive for norovirus genogroup II. Both *E. coli* O103:H2 isolates were indistinguishable by pulsed-field gel electrophoresis (PFGE), and both *E. coli* O145:NM isolates were also indistinguishable by

Shiga-Toxin-Producing *E. coli* Cases Associated with Venison by Illness Onset Date



PFGE. Students with laboratory confirmed STEC infections were in class period two (3), three (2), and five (1).

Six deer were shot and field dressed from November 12 through 14. A seventh deer was harvested after being hit by a vehicle. The deer were brought to the school on November 15 and 16 and stored in a shed. Ice was placed in the body cavity and around the hind quarters of each deer. On November 16, the deer were taken from the shed, hung, and butchered under the school's football stadium bleachers.

The butcher skinned, quartered, and deboned each deer using a skinning knife, two boning knives, and a hand saw. These tools were provided by the butcher, were new that season, and had never previously been used to butcher cattle or other domestic ruminants. After each deer was butchered, the tables, cutting boards, and tools were cleaned using a 10% bleach solution. The venison was wrapped in plastic, covered in ice, and stored overnight in the shed. A small number of students reported contact with the deer on November 16. On November 17, students cut a portion of the larger pieces of meat into cubes. The venison cubes were wrapped in butcher paper and placed in the course freezer. The remaining large cuts of venison were returned to the students who had provided the deer. No effort was made to keep venison separated by deer, and families could have received venison from any of the seven deer. Several students provided up to 2 pounds of additional venison that was privately butchered. Cutting boards, knives, and surfaces were cleaned with a 10% bleach solution.

On November 22, the venison was thawed and marinated in 5-gallon buckets. On November 23, several students and teachers used wooden bamboo skewers to make venison kabobs. The kabobs were transported to a gas grill located outside the class room and grilled by students. Students were instructed to wear gloves and wash their hands after having contact with raw venison on November 17, 22, and 23.

By univariate analysis, consuming undercooked or pink venison was significantly associated with illness (11 of 26 cases vs. 11 of 60 controls; odds ratio [OR], 3.27; 95% confidence interval [CI], 1.18 to 9.03; $p = 0.02$). Among students who had contact with raw venison or helped clean up on November 23, students who reported washing their hands afterwards were significantly less likely to become ill (7 of 13 cases vs. 25 of 26 controls; OR, 0.05; 95% CI, 0.00 to 0.52; $p = 0.003$). Wearing gloves during the November 17 class was also protective (18 of 22 cases vs. 54 of 56 controls; OR, 0.15; 95% CI, 0.03 to 0.94; $p = 0.044$). Students who attended the fourth period class were significantly more likely to become ill than students who attended the first period class (10 of 17 period 4 students vs. 1 of 13 period 1 students; OR, 17.1; 95% CI, 1.55 to 442; $p = 0.007$) and students who attended the fifth period class (10 of 17 period 4 students vs. 4 of 19 period 5 students; OR, 5.36; 95% CI, 1.01 to 31.0; $p = 0.048$). After multivariate analysis using logistic regression, consuming undercooked venison (adjusted OR, 3.23; 95% CI, 1.04 to 10.0; $p = 0.04$) and attending the fourth period class (adjusted OR, 16.4; 95% CI, 1.52 to 176; $p = 0.03$) remained independently associated with illness.

Numerous students reported instances of cross-contamination or other food handling errors, including not washing hands after bare-hand contact with raw venison, using the same plate for raw and cooked venison, and using the same tongs to handle raw and cooked venison.

MDH staff interviewed seven students who reported providing venison for the class, including four of the seven students who provided whole deer, and three students who reported providing pre-butchered venison comprised of tenderloins, steaks, and venison sausage. Three samples of venison that was butchered at the school and two samples of venison that were privately butchered were tested by

MDA. Venison from two separate households that was butchered at school cultured positive for *E. coli* O103:H2 with a PFGE pattern indistinguishable from the strains isolated from the two cases. One sample of venison that was butchered at school cultured positive for *E. coli* O145:NM with a PFGE pattern indistinguishable from the strains isolated from the two cases.

There was also evidence of norovirus transmission in the school. A large number of students reported mild gastrointestinal illness that did not meet the case definition and one stool specimen tested positive for norovirus as well as *E. coli* O145:NM. One case reported an onset of vomiting on November 22, one day prior to consuming the venison. However, the case reported only one instance of vomiting and then an onset of diarrhea on November 24. It is plausible that this case was also co-infected with norovirus and STEC.

This was an outbreak of non-O157 STEC infections associated with a high school physical education/environmental science class. Venison was implicated as the vehicle. Samples of venison butchered at the school tested positive for the outbreak strain. Multiple potential routes of transmission to cases were identified. Consuming undercooked venison was associated with illness. In addition, students reported numerous instances of cross-contamination between raw and cooked venison, and students who reported washing their hands after having contact with raw venison or cleaning on November 23 were significantly less likely to become ill. Interviews with the teacher and butcher ruled out cross-contamination from beef to venison during the butchering process as the original source of the outbreak. Instead, it is likely that one or more deer were colonized by non-O157 STEC. The marinade process could have spread fecal contamination to large amounts of venison. This is the first documented foodborne outbreak of non-O157 STEC infections from venison.

(62)

***E. coli* O157:H7 Infections Associated with In-Shell Hazelnuts**

December 2010-March 2011

Multiple states

On February 7, 2011, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *E. coli* O157:H7 isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (Centers for Disease Control and Prevention [CDC] *Xba*1 designation EXHX01.1159, *Bln*1 designation EXHA26.3665). A third Minnesota case matched by *Bln*1 but differed by *Xba*1 by one band. Subsequent PFGE subtyping of additional *E. coli* O157:H7 isolates from this case also revealed the presence of the outbreak *Xba*1 PFGE pattern EXHX01.1159. The cases were interviewed using a standard questionnaire. A review of the national PulseNet database revealed four additional *E. coli* O157:H7 isolates with the outbreak PFGE pattern in two states (three in Wisconsin and one in Michigan). A multi-state investigation was initiated.

A case was defined as a person who had an *E. coli* O157:H7 isolate with the outbreak PFGE pattern (EXHX01.1159, EXHA26.3665) and who had illness onset since December 1, 2010. State specific hypothesis-generating questionnaires were administered by the states. Cases were interviewed with a broad-based exposure questionnaire and re-interviewed several times about consumption of various specific food items.

Food samples were collected from one case household and tested by the Minnesota Department of Agriculture (MDA). MDA, in conjunction with the Wisconsin Department of Agriculture (WDA), Michigan Department of Agriculture, and California Food Emergency Response Team (CAL-FERT)

conducted a traceback investigation of the suspect product. Additional product testing was conducted by the CAL-FERT and WDA.

Eight cases from three states were ultimately identified in this outbreak (Minnesota, 3; Wisconsin, 4; and Michigan, 1). All three Minnesota cases were male and had a median age of 62 years (range, 55 to 64 years). All three cases reported bloody diarrhea and cramps, two (66%) reported fever, one (33%) reported vomiting, and none reported fever. Two cases were hospitalized, each for 3 days. No cases developed hemolytic uremic syndrome and none died.

Upon initial interview, the Minnesota cases all reported consuming ground beef, sausage, lettuce, and nuts during the week prior to illness onset. Specific exposure information (i.e., brand and purchase location) on the ground beef, sausage, and lettuce consumed by the cases indicated they were not from a common source. After re-interviews, all eight cases in the three states reported consuming in-shell hazelnuts. Four reported hazelnuts as part of mixed nuts, and seven purchased them from bulk bins at grocery stores. One Wisconsin case reported purchasing packaged in-shell hazelnuts. However, further investigation at the grocery store where the product was purchased revealed that these hazelnuts were re-packaged at the store after originally being sold from a bulk bin.

A traceback investigation conducted by MDA in conjunction with the Michigan Department of Agriculture, CAL-FERT and WDA found that mixed nuts and in-shell hazelnuts purchased by cases originated from a single distributor in California. On March 4, the distributor issued a voluntary recall of all hazelnuts and mixed nut products distributed from November 2 to December 22, 2010. Recalled product was distributed to stores in seven states (Minnesota, Iowa, Michigan, Montana, North Dakota, South Dakota, and Wisconsin).

MDH and MDA issued a joint press release on March 4 to inform the public. All persons who had recalled in-shell hazelnuts were encouraged to discard them or return them to the store. MDA provided a list of stores where recalled product was sold.

In-shell hazelnuts collected by MDA from a case patient's home tested positive for the outbreak PFGE subtype of *E. coli* O157:H7 on March 3. Additional in-shell hazelnut samples collected from recalled retail product by WDA and from the distributor by CAL-FERT also tested positive for the outbreak PFGE subtype of *E. coli* O157:H7. The distributor received hazelnuts from two companies in Oregon but did not maintain internal product traceability. The United States Food and Drug Administration (FDA) conducted inspections of the two Oregon companies, but information regarding the results of those investigations had not been provided by FDA at the time of this report.

This was a multi-state outbreak of *E. coli* O157:H7 infections associated with eating in-shell hazelnuts grown in Oregon. Rapid collaboration between state health departments and state departments of agriculture were crucial in identifying in-shell hazelnuts as the vehicle. This is the first documented outbreak of *E. coli* O157:H7 infections associated with nuts. At the time of this report, information

regarding a mechanism for contamination with and survival of *E. coli* O157:H7 in the implicated product was not available.

Reference

1. Investigation Update: Multistate Outbreak of *E. coli* O157:H7 Infections Associated with In-shell Hazelnuts, <http://www.cdc.gov/ecoli/2011/hazelnuts0157/index.html>

(63)

Norovirus Gastroenteritis Associated with a Restaurant

December

Hennepin County

On December 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a party of seven individuals who had eaten two lunch meals together. The first occurred on December 6 and was take-out from Restaurant A; the second lunch at Restaurant B occurred on December 7. Both restaurants are located in Minneapolis. MDH notified the Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units on December 8, and an investigation was initiated.

MDH interviewed the original complainant. HSPHD epidemiologists interviewed other members of the complainant's dining group about food consumption and illness history. A case was defined as a Restaurant A or Restaurant B patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after eating at the restaurants. Stool samples collected from consenting complainant group members were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

MDEH sanitarians visited Restaurant A on December 8 to evaluate food preparation and handling procedures and to interview food workers about illness history and work duties. MDEH sanitarians also called Restaurant B to discuss recent employee illness and reports of patron illness.

The original complainant group was comprised of seven people from six households who attended work meetings on two days. In addition to the shared lunches, the group also reported eating cookies during a meeting.

Five of the seven individuals in the group were interviewed, and all five met the case definition. Four cases (80%) reported vomiting, three (60%) reported diarrhea, two (40%) reported cramps, one (20%) reported fever, and none reported bloody stools. The median incubation from the lunch at Restaurant B was 19 hours (range, 7.5 to 36 hours). The median incubation from the lunch at Restaurant A was 43 hours (range, 31 to 60 hours). The case with the longest incubations (36 hours from the Restaurant B meal, 60 hours from the Restaurant A meal) lives in the same household as the case with the shortest incubations (7.5 and 31 hours respectively). Therefore, it is possible that the case with the longest incubation represents a secondary case. Excluding the possible secondary case, median incubations were 16.5 hours from the Restaurant B and 40.5 hours from the Restaurant A lunches, respectively. The median duration of illness was 7.5 hours (range, 15 minutes to 15 hours) for four of the cases; one case was still experiencing symptoms at the time of interview.

Stool specimens collected from three cases tested positive for norovirus genogroup II. Nucleic acid sequences for all three viral samples were identical.

A lack of non-ill controls precluded a statistical analysis of specific food exposures. Four (80%) of the cases ate a wrap sandwich from Restaurant A and one (20%) case ate a salad. Both wrap sandwiches and salads contain ready-to-eat food items, such as tomatoes, cilantro, basil, romaine lettuce, and raw vegetables. No side items or beverages were purchased from Restaurant A. All cases ate a hot sandwich from Restaurant B (fish sandwich, turkey burger, chicken sandwich, or BLT); in addition, four (80%) cases ate French fries, two (20%) ate coleslaw, and all had a beverage (water or soda) with ice.

Based on incubation periods, the lunch meal at Restaurant A was the more likely source of norovirus and was the focus of this investigation. Restaurant A's kitchen is shared with another restaurant (located beneath the Restaurant A location) and all food is prepared in the main floor kitchen and then either stored in the walk-in cooler or transported upstairs to the Restaurant A skyway location. All 12 of the restaurant's employees were interviewed, which included Restaurant A employees, as well as staff working in the shared kitchen who would have prepared food items served at Restaurant A. No employees reported recent gastrointestinal illness.

MDEH sanitarians noted overall compliance with food code requirements for food preparation; however, it was observed that a back hand sink in the kitchen was not stocked with paper towels and was inaccessible for use, as it was blocked by a pair of laundered bags of towels. Also a low temperature chemical dishwasher was noted to not be sanitizing properly. Both problems were corrected while on-site. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with eating at Restaurant A. The vehicle of transmission and source of contamination were not identified.

(64)

Norovirus Gastroenteritis Associated with a Rehearsal Dinner

December

Ramsey County

On December 14, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness following wedding festivities held December 10-11. The rehearsal dinner was held on Friday, December 10 at a church, and the wedding reception was held at a restaurant in Mounds View on Saturday, December 11. The initial complainant reported developing vomiting and diarrhea following the wedding reception and also reported that 31 of 177 wedding reception attendees developed similar symptoms following the reception. The rehearsal dinner was attended by approximately 50 individuals. The foods served at the rehearsal dinner were all prepared by the groom's mother and included roasted pork, scalloped potatoes, broccoli salad, carrots, buns, cake, and brownies. At the church, the mother of the bride prepared a platter of homemade cookies and a party platter of assorted meats and cheeses that were available to the wedding party. The reception meal consisted of lettuce salad, ham, potatoes and green beans prepared by the restaurant, and cake and cupcakes prepared by a grocery store in Elk River. Pizza provided by the restaurant was served later in the evening. MDH

and Ramsey County Environmental Health staff were notified, and an outbreak investigation was initiated.

A list of attendees was obtained from the bride and groom. Staff from MDH interviewed wedding attendees to obtain illness history and food/beverage consumption information for wedding-related events. A case was defined as a wedding event attendee who subsequently developed vomiting and/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 Ramsey County sanitarian contacted the restaurant to evaluate food preparation and handling procedures and employee illness. MDH sanitarians also visited the grocery store and the church.

Illness histories and exposure information were obtained from 127 wedding event attendees. Of these, 23 (18%) met the case definition. Among the cases, 21 (91%) reported diarrhea, 20 (86%) vomiting, 16 (70%) cramps, and 7 (30%) fever. One of the cases visited a medical provider for their illness. The median incubation period from the rehearsal dinner was 33 hours (range, 25 to 49 hours), and the median incubation period from the reception meal was 16 hours (range, 1 to 30 hours). The median duration of illness was 45 hours (range, 36 to 79 hours) for the 8 people who had recovered at the time of interview. Five cases submitted stool samples to the MDH PHL; all tested positive for norovirus genogroup II. Three samples were submitted for sequencing; two were able to be sequenced and were identical.

Attendance at the rehearsal dinner was strongly associated with illness (22 of 23 cases vs. 18 of 104 controls; odds ratio (OR), 105; 95% confidence interval (CI), 13.3 to 830.8; $p < 0.001$). Consuming the broccoli salad at the rehearsal dinner was also associated with illness (19 of 22 cases vs. 8 of 18 controls; OR, 7.9; 95% CI, 1.7 to 36.6; $p = 0.007$). All food items consumed at the rehearsal dinner, including the broccoli salad, were prepared by the groom's mother. She did not report gastrointestinal illness prior to the event. One rehearsal dinner attendee reported developing vomiting and diarrhea on December 7 at 4:00 p.m. and recovered the next day by 12:00 p.m. He and two other wedding attendees shared a meal at another restaurant prior to attending the rehearsal dinner. He reported not consuming any food during the rehearsal dinner but did consume foods from the meat and cheese tray at the church prior to the ceremony. This guest submitted a stool sample that was positive for norovirus, but was unable to be sequenced. One of his companions consumed the broccoli salad at the rehearsal dinner and then developed diarrhea the following morning at 9:00 a.m., approximately 12 hours sooner than the other guests. This guest also submitted a stool sample; however, norovirus was not detected.

Two guests reported illness prior to the wedding events but did not attend the rehearsal dinner. One guest reported developing diarrhea on December 3 at 11:00 p.m. and recovering on December 7 at 3:00 p.m. He did report consuming foods from the meat and cheese tray at the church and at the reception meal. The other guest reported vomiting once on December 9 at 12:00 p.m. and only attended the reception meal.

One other guest who met the case definition but did not attend the rehearsal dinner had onset early on the morning of December 12. He did consume foods from the meat and cheese tray and cookie platter at the church prior to the ceremony in addition to the reception meal.

Ramsey county sanitarians were able to contact all employees from the restaurant, and none reported experiencing recent gastrointestinal illness. MDH sanitarians contacted the grocery store employee who baked the cake and cupcakes. No illness was reported.

This was a foodborne outbreak of norovirus gastroenteritis associated with attendance at a wedding rehearsal dinner held at a church in Elk River. Broccoli salad was identified as the food vehicle. The source of contamination was not identified. A small number of additional cases likely occurred through person-to-person transmission of norovirus from infected rehearsal dinner attendees to other contacts on the day of the wedding and reception meal.

(65)

Norovirus Gastroenteritis Associated with a Restaurant

December

Clay County

On December 14, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of approximately 11 of 25 individuals developing gastrointestinal illness after attending a cast party at a restaurant in Moorhead, Minnesota on December 11. The City of Moorhead Environmental Health was notified of the outbreak, but because they did not currently have a registered sanitarian on staff, sanitarians from Clay-Wilkin County Environmental Health were asked to assist with the investigation.

A list of guests from the cast party was obtained from one of the attendees. Epidemiologists from MDH interviewed guests to obtain information on food/beverage 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). Stool specimens from two patrons and one food worker were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Staff from the City of Moorhead Environmental Health and sanitarians from Clay-Wilkin County Environmental Health 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 20 restaurant patrons. Fourteen (70%) cases were identified. Additionally, one patron met the case definition but their incubation period was 80 hours (and thus represented a likely secondary case), and one patron reported mild gastrointestinal symptoms that did not meet the case definition; both of these patrons were excluded from further analysis.

Thirteen (93%) cases reported vomiting, 11 (79%) reported diarrhea, eight (62%) of 13 reported fever, and seven (50%) reported cramps. The median incubation period was 39 hours (range, 25 to 50 hours). The median duration of illness was 29 hours (range, 13 to 77 hours) for the eight cases with known recovery dates and times.

Food for the party was from a set menu of three different types of sandwiches. Due to the small number of well individuals, no food item was able to be statistically associated with illness.

Illness histories and job duty information were obtained from 39 employees; nine employees reported either recently having a recent gastrointestinal illness (n=7) or having a child with a recent gastrointestinal illness (n=2). Ill employees reported onset dates from December 10-15. Employees reporting illness performed a number of different roles at the restaurant, including food preparation.

Inadequate handwashing and bare-hand contact with ready-to-eat foods was observed by the sanitarians.

One of the two patron stool samples and the one food worker stool sample tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on both of the positive norovirus samples; the nucleic acid sequences were identical.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Moorhead. Multiple ill employees were identified, suggesting illness transmission among workers at the restaurant. No specific food vehicle was identified. It is likely that multiple ready-to-eat food items were contaminated by one or more ill or recently ill food workers. As a result of the outbreak, the restaurant held a mandatory training on handwashing and illness reporting for their employees.

(66)

Norovirus Gastroenteritis Associated with a Casino

December

Pine County

On December 15, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint from a party of military personnel who stayed at a casino during December 12-14. The complainant stated that half of the people in their party had become ill with vomiting or diarrhea after staying at the casino. The casino also received 20 illness complaints on December 15 from various parties who had been snowed in at the casino during the same weekend. MDH initiated an investigation immediately.

The Indian Health Service (IHS) was contacted, and IHS staff assessed food worker illness and food preparation practices at the venues they license at the casino. MDH also licenses a number of restaurants at the casino, and MDH environmentalists began an assessment of those facilities as well. Complaints were forwarded to the MDH foodborne illness hotline, and complainants were asked about companions who stayed with them at the casino to obtain a broader list of patrons for interview. A case was defined as a casino patron with vomiting or diarrhea (≥ 3 loose stools in a 24-hour period) following their stay. Stool samples were collected from two ill patrons and submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Interviews were completed for 35 casino patrons. Of these, 32 (91%) met the case definition. Twenty-seven (84%) cases reported diarrhea, 25 (78%) vomiting, 23 (72%) cramps, 10 (40%) fever, and none reported bloody stools. Casino patrons ate at various restaurants throughout their stays, and no one particular meal was associated with illness; thus definitive incubations could not be calculated. Duration of illness information was available for 18 cases; the median duration was 55 hours (range, 1 hour to 14 days). Two stool samples were positive for norovirus genogroup II.

Analysis of food items associated with illness was attempted, but the paucity of controls prevented a meaningful statistical analysis. Only four cases swam in the pool, and six cases entered the whirlpool.

Twenty-four (75%) cases ate at Restaurant A, 23 (72%) ate at the Restaurant B, and 22 (69%) ate at Restaurant C. Only three (9%) cases ate at Restaurant D, and no cases ate at the Restaurant E.

The IHS environmental health assessment revealed that employees are shared across many of the restaurants, including Restaurant A, the Restaurant B, and Restaurant C. One Restaurant B food worker was ill with gastrointestinal (GI) illness on December 10 and worked on December 11 and 12. Another food worker and a server were ill with GI illness on December 11. A prep cook who worked on December 10-12 was out with GI illness on December 13. Two additional servers were also ill with GI illness on December 13. One employee of Restaurant C was ill with GI symptoms on December 15. It was unclear if these specific food workers had prepared food for any of the complainants, however the first ill employee had been rolling silverware into napkins for the buffet on December 11 for use on December 12. The importance of handwashing and excluding food workers with gastrointestinal symptoms was emphasized.

This was a foodborne outbreak of norovirus gastroenteritis associated with a casino. A specific food vehicle was not identified. The ultimate source of the outbreak likely was one or more infected food workers who contaminated ready-to-eat food items or utensils.

(67)

Norovirus Gastroenteritis Associated with a Restaurant

December

Hennepin County

On December 17, 2010, Minneapolis - Environmental Health (MEH) received a report of illness from the kitchen manager of a restaurant in Minneapolis, Minnesota. The restaurant had received a report of illness from a group who had a breakfast delivered by the restaurant on December 15.

MEH notified Hennepin County Public Health Protection-Epidemiology (PHP-Epi). PHP-Epi reported the complaint to the Minnesota Department of Health (MDH) foodborne illness unit. An outbreak investigation was initiated on December 18.

An environmentalist from MEH visited the restaurant on December 18 and conducted an inspection of the facility. MEH interviewed the food workers regarding illness history and job duties. MEH requested names from the reservation list from Wednesday, December 15. Stool specimens were obtained from four food workers and submitted to MDH for bacterial and viral testing.

MEH worked with the establishment management regarding the implementation of intervention measures to prevent potential expansion of illness cases (e.g., use of gloves/restrict bare-hand contact with ready-to-eat foods, employee screening and exclusion/restriction of ill employees, cleaning and sanitizing).

On December 17, PHP-Epi requested the list of breakfast attendees. The list was received on December 20. PHP-Epi interviewed the breakfast attendees and persons from the reservation list to obtain information on food/beverage consumption and illness history. A case was defined as a person who ate food from the restaurant on December 15 and subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool specimens were obtained from two patrons and submitted to MDH for bacterial and viral testing.

Illness histories and exposure information were obtained from 66 breakfast, lunch and happy hour patrons. Of these, 29 (44%) were attendees of the catered breakfast, and 37 (56%) were breakfast, lunch, or happy hour patrons contacted from the reservation list. Fifteen (47%) cases were identified, all among patrons who had eaten the catered breakfast. Additionally, one attendee reported mild gastrointestinal symptoms that did not meet the case definition; this attendee was excluded from further analyses.

Twelve cases (80%) reported vomiting, 11 (73%) reported diarrhea, 6 (40%) reported abdominal cramps, and 6 (40%) reported fever. The median incubation period was 34.5 hours (range, 27 to 40 hours). The median duration of illness was 55 hours (range, 26.5 to 83.5 hours) for the five cases who had recovered from their symptoms at the time of the interview. Both stool samples tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on both of the positive norovirus samples; the sequences were identical.

The foods served at the catered breakfast were scrambled eggs, bacon, sausage, potatoes, variety of pastries, cut fruit, and packaged yogurt and juice. Statistical analyses of the catered breakfast food items were done. Eating cut fruit was significantly associated with illness (15 of 15 cases ate the cut fruit vs. 9 of 14 controls; (odds ratio, undefined; Fisher's exact $p = 0.017$).

The lunch and happy hour patrons ate a variety of foods, including cheese curds, bruschetta, different varieties of chicken wings, nachos, salad, sandwiches, and baked potatoes; in addition, one person ate breakfast but only had the bacon in common with the catered group.

Illness histories and job duty information were obtained from 31 restaurant employees. Three employees reported having had a recent gastrointestinal illness. One manager reported having vomiting on December 11, prior to the catered event; a server reported having vomiting on December 18; and a bartender/server reported having diarrhea on December 17. None of these employees stated they had job duties associated with food preparation or food handling for the catered meal in question served on the morning of December 15.

A fourth employee who was part of the catering kitchen staff reported having a headache and nausea on December 18. On December 15 this employee reported having unpacked and sanitized the chaffing dishes used for the meal in question but did not prepare or handle the food.

Stool specimens from three food workers with recent gastrointestinal illness were positive for norovirus genogroup II. One positive specimen was able to be sequenced; the sequence was identical to that of the positive patron specimens.

The inspection conducted on December 18 found one violation which the management abated on site during the inspection: "4-601.11A. Equipment food contact surfaces and utensils shall be clean to sight and touch. MN Rule 4626.0840. Orders: Clean beverage dispenser gun holder in the bar at frequency that minimizes contamination and residue buildup".

MEH was onsite daily during December 17-23 conducting the investigation and monitoring outbreak interventions. They continued following up with the facility staff through December 30.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. Five stool specimens (two from patrons and three from food workers) tested positive for norovirus genogroup II.

Genetic sequencing was done on three of the specimens (two patrons and one employee); the nucleic acid sequences were identical. Statistical analysis showed that the vehicle of transmission was the cut fruit. The source of the contamination was not determined; however, the most plausible source of contamination was an infected food worker who had contact with the fruit. Multiple ill employees were identified; this suggests illness transmission among workers at the restaurant. It is likely that contamination could have been by an ill or recently ill food worker who did not identify their symptoms or the correct onset date of their symptoms during the interview.

(68)

Suspected Viral Gastroenteritis Associated with Employees and Volunteers of a Bloodmobile

December

Douglas County

On December 30, 2010, an epidemiologist from the Minnesota Department of Health (MDH) Foodborne, Vectorborne, and Zoonotic Diseases Unit received a phone call from a medical staff member reporting that 11 of 12 employees who had worked at a bloodmobile held at the a church in Alexandria during December 27-28 had called in sick to work on December 29. Food for the employees during the blood drive was provided by volunteers. During the blood drive, there was also a complaint of a sewer gas-like smell, causing the blood drive to close early on December 28. Sanitarians from the Douglas and Pope Counties Environmental Health Department were notified, and an investigation was initiated on December 30.

A list of blood drive employees and volunteers was obtained from the organizers. Epidemiologists from MDH interviewed bloodmobile employees and volunteers to obtain information on food/beverage consumption and illness history. A case was defined as a bloodmobile employee or volunteer who attended the church blood drive and subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

A sanitarian from the Douglas and Pope Counties Environmental Health Department spoke to volunteers to evaluate food preparation and handling procedures.

Illness histories and exposure information were obtained from 15 bloodmobile employees and volunteers. Fourteen (93%) cases were identified.

Thirteen (93%) cases reported diarrhea, 11 (79%) reported vomiting, 6 (43%) reported cramps, and 5 (36%) reported fever. The median incubation period from the December 27 meal times was 26 hours (range, 5.5 to 38 hours). The median duration of illness was 84.5 hours (range, 18 to 137 hours). Six (43%) cases sought medical care for their illness. None of the cases submitted stool samples for testing.

Foods served at the December 27 meal included scalloped potatoes with ham, bread, broccoli and cauliflower salad, sugar cookies, and a cherry surprise dessert. With the exception of the cherry surprise dessert, all food was prepared by one volunteer in her home. The ham was originally prepared on December 25 for a holiday meal. The preparer reported that three extended family members who had visited on December 25 had reportedly been ill with symptoms of gastrointestinal illness. The preparer reported being asymptomatic at the time of food preparation with onset of illness 5 hours after consumption of the December 27 meal.

Due to a lack of non-ill controls, no meaningful statistical analysis could be conducted. Additionally, due to the preconceived notion that illnesses were a result of the sewer gas-like smell, obtaining detailed exposure on food histories was challenging.

This was a foodborne outbreak of suspected viral gastroenteritis associated with food served to employees and volunteers at a blood drive. The etiologic agent was not confirmed; however, the symptoms and incubation periods were compatible with a viral etiology. While reportedly asymptomatic, the food preparer most likely was already infectious at the time of preparation, and contaminated one or more food items.

Probable Foodborne Outbreaks

(1)

Suspected Norovirus Gastroenteritis Probably Associated with a Birthday Party

January

Kanabec County

On January 27, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of 18 of 19 people becoming ill after attending a football party held at a private home in Mora on January 24. The complainant believed that the illnesses were associated with a pizza that had been served at the party. The complainant also reported that they had hosted a January 23 birthday party for the same individuals. Foods served at the birthday party included two types of chili, hot dogs, cornbread, Cheetos, cake, cupcakes, and a cupcake cake. In addition to the pizza, foods served at the January 24 football party included ham, buns, chili cheese dip made from leftover chili from the birthday party, chips, and leftover cake and cupcakes from the birthday party. An outbreak investigation was initiated on January 27.

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 specimen kits were delivered to two party attendees.

Illness histories and exposure information were obtained from 21 attendees. Fifteen (71%) cases were identified. One person reported illness but did not meet the case definition, and thus was excluded from further analysis.

Fourteen (100%) of 14 cases reported cramps, 14 (93%) of 15 reported vomiting, 13 (87%) of 15 reported diarrhea, and 4 (27%) of 15 reported fever. The median incubation period was 35 hours (range, 31 to 86 hours) from the January 23 birthday party. The median duration of illness was 27 hours (range, 5 to 59 hours) for the 10 cases who had recovered at the time of interview. MDH did not receive any stool samples associated with this outbreak.

The party host reported that her young child had been ill with diarrhea and vomiting the 2 days prior to the birthday party. Food served at the birthday party was prepared at the home of the party host.

No food items were statistically associated with illness.

This was a probable foodborne outbreak of suspected norovirus gastroenteritis associated with a birthday party. The etiologic agent was not identified. However, the symptoms and incubation periods were characteristic of norovirus gastroenteritis. The high attack rate suggested foodborne transmission; however, person-to-person transmission could not be ruled out as the sole explanation for the outbreak. The longer incubation periods for two of the cases likely represent cases eating leftover food or secondary transmission. A specific food vehicle was not identified.

(2)

Suspected Norovirus Gastroenteritis Probably Associated with a Church Potluck

January

Redwood County

On February 11, 2010, a case of suspected cryptosporidiosis was reported to the Minnesota Department of Health Foodborne, Vectorborne, and Zoonotic Disease Unit (MDH FVZDU) through routine surveillance. A standard interview was administered by telephone to the case. On February 16, Hennepin County Medical Center reported hospital admission of this case to MDH. Upon this report, the case was contacted in the hospital to get more detailed information. The initial interview had indicated the case was severely immunocompromised and had attended a potluck on January 24. The case disclosed the potluck had occurred at church on Sunday, January 24 after the morning service. Illness onset was 46 hours after the potluck. Symptoms included diarrhea, vomiting, bloody stools, and weight loss. The case refused to provide a list of attendees but offered to give MDH contact information to attendees.

A rapid assay for cryptosporidiosis was done when the case initially became ill on January 26. This assay came back positive, and it was this positive finding that led to the initial report to MDH on February 11. A second rapid assay for cryptosporidiosis was run upon admission to the hospital. This assay was negative. The initial stool sample collected on February 9 was sent to the MDH Public Health Laboratory (PHL) where it tested negative for *Cryptosporidium* by polymerase chain reaction and traditional methods.

MDH epidemiologists interviewed church potluck attendees that contacted MDH about food consumption and illness history. A partial list of foods served at the potluck was developed from these interviews. A case was defined as a person with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period) after attending the church potluck.

Fifteen potluck attendees contacted MDH and were interviewed including the index case described above. Of the attendees, 11 (73%) met the case definition, 2 (13%) reported no symptoms, and 2 (13%) reported illness onsets before the potluck. Eight (73%) cases reported vomiting, seven (64%) reported diarrhea, four (36%) reported cramps, and one (9%) reported bloody stools. No cases reported fever. The median incubation period was 40 hours (range, 19 to 58 hours). The duration of illness was available for five cases with a median duration of 24 hours (range, 19.5 to 86 hours).

Food items served at the potluck included veggie salad; broccoli slaw salad; onion soup; turkey, ham, and potato casserole; carrot cake; lemon meringue pie; sour cream and raisin pie; brownies; and pistachio pudding salad. However, complete symptom and food histories were not able to be collected for most attendees. One potluck attendee interviewed became ill with diarrhea on January 21 and prepared both the broccoli slaw and pistachio pudding salad for the potluck. A child from the family became ill with diarrhea on January 23, and another child from the family became ill with diarrhea at the potluck. Food histories for four potluck attendees who became ill were recorded. Two (50%) reported consuming the broccoli slaw salad and none reported consuming the pistachio pudding salad. A food history for one of the attendees who did not become ill was recorded. This attendee did not consume either the broccoli slaw or pistachio pudding salad.

The rapid cryptosporidiosis assay used on the index case has an overall positive predictive value of 56%, which drops to 34% during the low prevalence season (January through May). The first

rapid assay positive for the index case could not be confirmed at the MDH PHL, and a second rapid assay conducted at the hospital was negative. Therefore the initial positive *Cryptosporidium* assay was likely a false positive. The hospitalized case's incubation period was consistent with norovirus gastroenteritis. Norovirus has previously been shown to be a potential cause of protracted disease in immunocompromised patients and likely was the reason for this case's severe and protracted illness.

This was an outbreak of gastroenteritis associated with a church potluck. Although no etiology was confirmed, the symptoms and incubation periods were characteristic of norovirus gastroenteritis. No specific food vehicle was indentified. However, the most likely explanation for the outbreak is that ready-to-eat foods were contaminated with norovirus by an individual who was ill prior to the potluck.

(3)

Sapovirus Gastroenteritis Probably Associated with a Restaurant

February

Hennepin County

On February 8, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a restaurant in Minnetonka. The complainant reported that one of three meal companions developed vomiting and diarrhea after eating at the restaurant on February 5.

On February 10, the MDH foodborne illness hotline received a second illness complaint associated with the same restaurant. The second complainant reported that two of three meal companions developed vomiting and diarrhea after eating at the restaurant on February 6. The City of Minnetonka Health Division (CMHD) was notified and an investigation was initiated on February 10.

CMHD sanitarians visited the restaurant on February 11 to evaluate food preparation and handling procedures and interview food workers. Sanitarians collected employee contact information and credit card receipt records for additional patrons. The complainants, their meal companions, and additional patrons identified through February 5 credit card receipts were interviewed by MDH staff 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.

Illness histories and exposure information were obtained from 21 individuals. A total of three patrons met the case definition; all three were from the two complaint groups. Three patrons reported illness that did not meet the case definition and were excluded from further analyses. The median incubation period for the cases was 38 hours (range, 8 to 46 hours). Illness durations were a minimum of 48 hours as all three cases were still ill at the time they were interviewed. All three cases reported diarrhea, vomiting, and cramps. No cases reported fever or bloody stools. One stool sample submitted by a case tested positive for sapovirus genogroup II. Additional laboratory testing for adenovirus, astrovirus, norovirus, rotavirus, and aichi virus were negative.

The small number of cases prevented a meaningful statistical analysis of specific food exposures. Cases reported eating a variety of food items including garden salad, a pasta chicken dish, and bread.

CMHD sanitarians and MDH staff interviewed 32 employees. One employee reported developing vomiting and diarrhea on February 5 and worked both days the complainants reported eating at the restaurant. The sanitarian discussed the importance of handwashing, and informed management that any employee with vomiting and/or diarrhea must be excluded from work until 72 hours after the resolution of symptoms.

This was a probable foodborne outbreak of sapovirus gastroenteritis associated with a restaurant. Although no specific food vehicle was identified, an ill food worker was documented and was the likely source of the contamination.

(4)

Norovirus Gastroenteritis Probably Associated with a Restaurant

February

Wright County

On March 10, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among three women who ate at a restaurant in Albertville, Minnesota on February 28. MDH environmental health officers were notified and an investigation was initiated immediately.

MDH staff interviewed complainants and additional restaurant patrons about food consumption and illness history. A case was defined as any person who ate at the restaurant and subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Two stool kits were sent to complainants. Returned kits were tested for bacterial and viral pathogens at the MDH Public Health Laboratory.

MDH environmentalists conducted an environmental health assessment at the restaurant. The manager of the establishment was asked about employee illness since February 1, staff at the restaurant were interviewed, and food preparation practices were observed and discussed.

Only 13 patrons (including the original complainants) could be reached for interview, and only the three complainants (23%) met the case definition. All three cases reported diarrhea and vomiting and two (67%) reported cramps. No cases reported bloody stools or fever. The median incubation period was 17 hours (range, 17 to 21 hours). All three cases were still ill at the time of interview, with durations of 9 days. Two cases submitted stool samples; both tested positive for norovirus genotype II.

Cases ate a variety of foods, including a sandwich, a wrap, pancakes, bacon, and soup. No single food item could be statistically associated with illness due to the low number of identified cases.

Five of the employees at the restaurant reported illness in the month prior to patron illness. Two only had cramps in February, and one had one episode of diarrhea on March 1. One of the other two employees had severe cramps and diarrhea from February 18 through February 20, and one had nausea and vomiting on March 7. The employee with illness onset on February 18 was working as a baker and server when the cases ate at the restaurant on February 28. Two ill employees were tested for norovirus, including the employee with onset on February 18. Both samples were negative, however, they were collected several weeks after recovery from illness. All staff were educated on the importance of handwashing and the proper use of tongs or gloves. The hand sink was not stocked with paper towels at the time of the environmental health assessment. Management and staff were also educated on the

importance of excluding ill food workers and the possibility of transmission of illness from food workers to patrons. The restaurant did not have an employee illness log.

This was an outbreak of norovirus gastroenteritis probably associated with a restaurant in Albertville, Minnesota. The vehicle and source of contamination were not identified, though infected food workers were the most likely source of contamination.

(5)

Norovirus Gastroenteritis Probably Associated with a Restaurant

April

Washington County

On April 13, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in two individuals from separate households who had dined together at a restaurant in Woodbury, Minnesota on April 8 prior to their onsets of illness. The individuals had no other common meals or events in the 9 days prior to illness. Washington County Public Health and Environment (WCPHE) was notified, and an outbreak investigation was initiated.

A WCPHE environmental health specialist conducted interviews with both complainants to obtain information on consumption of foods, beverages, event and social activities, and illness history. A case was defined as a person who ate at the restaurant on April 8 and subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). WCPHE attempted to obtain a list of patrons from the restaurant; however, the restaurant's patrons rarely pay by credit card or check.

On April 14, a WCPHE environmental health specialist inspected the restaurant, focusing on food preparation practices, employee health and hygiene, and managerial compliance with recording employee illness history. Two stool specimens were collected from the ill complainants and submitted to MDH for bacterial and viral testing. An employee list with contact information, work schedules, and duties was obtained from the restaurant. WCPHE staff interviewed employees that worked during April 7-14, using a standard questionnaire about recent illness history (including household members) and job duties.

The original complainants were the only patrons interviewed; both individuals met the case definition. Both cases reported diarrhea, cramps and vomiting. The incubation periods were 33 and 28 hours, and their durations of illness were 15 and 20 hours, respectively. Both stool specimens tested positive for norovirus genogroup II. Nucleic acid sequences of the two viruses were identical. Both patrons had the same food items: double hamburger with lettuce, tomato, cheese, ketchup, mustard and mayonnaise; French fries with ketchup; and a beverage with ice. It was unclear whether both sandwiches were made by the same food worker.

Twelve (41%) of 29 employees of the restaurant were interviewed. One employee reported gastrointestinal symptoms, including diarrhea and vomiting, on March 8 and 9. The employee returned to work on March 10. No employee illness was reported for the month of April. Employees were observed washing hands and using gloves and utensils during food preparation. Handwashing sinks were stocked with soap, single-use towels, and fingernail brushes. The restaurant did not receive any other customer complaints.

This was an outbreak of norovirus gastroenteritis probably associated with a fast food restaurant. The vehicle of transmission and source of contamination were not identified. However, most of the food workers were not interviewed.

(6)
Norovirus Gastroenteritis Probably Associated with a Restaurant

April

Hennepin County

On April 21, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a group of five patrons from different households who had dined at a restaurant in Brooklyn Center on April 17. MDH notified the Hennepin County Public Health Department (HCPHD) epidemiology and environmental health units on April 21, and an investigation was initiated.

MDH interviewed two of the patrons in the complainant group who reported gastrointestinal illness. 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 on April 17. HSPHD epidemiology obtained credit card receipts from the restaurant; however, these receipts only contained the patron's signature and not their printed name. Only 25 receipts had names that could be reliably interpreted. This list of names was used to contact other patrons of the restaurant who ate on April 17 to assess illness and collect food histories.

On April 22, HSPHD sanitarians visited the restaurant to conduct a full inspection and interview all food workers about illness history and work duties. The restaurant had not received any other recent patron illness complaints, and no employees reported recently being ill with gastrointestinal symptoms. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures.

Only two of the patrons in the complainant group were interviewed. The other three patrons did not return calls to MDH or HSPHD; one of these lost-to-follow-up patrons was allegedly ill with gastrointestinal symptoms. Each patron lives in a different household and did not report any other common meals or events.

Both patrons interviewed met the case definition. Both reported diarrhea, cramps and fever; one reported vomiting. Neither reported bloody stools. Incubations were 41 and 54 hours, and durations of illness were 37 and 38 hours. Neither saw a healthcare provider. A stool sample was submitted by one of the cases to the MDH Public Health Laboratory for bacterial and viral testing and was positive for norovirus.

Both patrons reported eating a wide variety of foods. Food items included several chicken dishes, Mongolian barbeque, vegetable lo mein, beef with broccoli and mushrooms, garlic green beans, cream cheese wontons, several types of vegetables, coconut cake, and soda with ice.

Only two additional restaurant patrons were identified and reached through credit card receipts; neither of these two patrons developed illness. These two controls also reported eating a variety of food items from the buffet. No food item was statistically significantly associated with illness.

All 14 restaurant employees were interviewed. None of the employees reported any recent gastrointestinal illness. The restaurant did not keep an employee illness log.

HSPHD sanitarians noted overall compliance with food code requirements for food preparation but did note issues with maintaining buffet dishes at the proper temperature and the potential for cross contamination of vegetables with raw meats. The sanitarians further stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness. HSPHD sanitarians provided norovirus education, reiterated to restaurant management that all patron illness complaints must be reported to HSPHD environmental health, and stated that the restaurant must keep an employee illness log.

This was a probable foodborne outbreak of norovirus gastroenteritis associated with eating at a restaurant. The vehicle of transmission and source of contamination were not identified. However, the most plausible source of contamination was an infected food worker or patron who had contact with ready-to-eat foods.

(7)

Norovirus Gastroenteritis Probably Associated with a Restaurant

May

Hennepin County

On May 4, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of four individuals from different households who had dined at a restaurant in Minneapolis on May 2. The complainants did not report any other common meals or events. MDH notified Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) on May 4 and an investigation was initiated.

MDEH sanitarians inspected the restaurant on May 4 and interviewed food workers about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures. MDH interviewed all four patrons in the complainant group. HSPHD epidemiology received a reservation list from the restaurant and interviewed patrons regarding 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).

Forty-seven restaurant patrons were interviewed. Four (9%) met the case definition; all from the original complaint. All four cases reported vomiting and two (50%) reported diarrhea; cramps, fever, and nausea were reported by one person each (25%). No one reported bloody stools. Illness duration information was unavailable as all four cases were still ill at the time of interview. The median incubation period was 32.5 hours (range, 31 to 33 hours). Three stool samples submitted by cases to the MDH Public Health Laboratory were positive for norovirus genogroup I with identical nucleic acid sequences.

The cases reported consuming halibut, coconut shrimp, tilapia, fish tacos, cobb salad, water, coffee, and soda; all food items were shared among the group. The 43 controls reported eating a wide variety of food items. No food item was significantly associated with illness.

Fifty-seven of the restaurant's 85 employees were interviewed, including nearly all employees that worked on May 2. No employees reported any recent gastrointestinal illness. The restaurant had not received any other recent patron illness complaints.

MDEH sanitarians noted overall compliance with food code requirements for food preparation and sanitation. Kitchen staff were found to be well educated regarding food safety and followed good handwashing practices. The restaurant received no additional complaints and no reports of employee illness. MDEH sanitarians provided norovirus education and reiterated to restaurant management that all patron illness complaints must be reported to MDEH and the importance of continuing to maintain the employee illness log.

This was a probable foodborne outbreak of norovirus gastroenteritis associated with eating at a restaurant. The vehicle of transmission and source of contamination were not identified.

(8)

Foodborne Bacterial Intoxications Probably Associated with a Restaurant

July

Ramsey County

On August 2, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness in four individuals who ate together at a restaurant in St. Paul on July 30. These individuals did not report any other recent common exposures. City of St. Paul sanitarians were notified of the complaint and an investigation was initiated.

The original complainant refused to provide contact information for the meal companions, but instead offered to give MDH's phone number to the meal companions. The meal companions who called MDH were interviewed about food consumption and illness history. City of St. Paul sanitarians visited the restaurant on August 2 to evaluate food preparation and handling procedures, determine if there were any events held at the restaurant on July 30, and collect credit card receipts for July 29 and 30. MDH staff interviewed patrons identified from credit card receipts about food consumption and illness history. Coordinators for events that occurred on July 30 were contacted to determine if anyone from their party was ill. 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.

Two cases were identified, including the original complainant and one meal companion. Both cases reported diarrhea and cramps with incubations of 7 and 19.5 hours, respectively. The duration of illness for the case who had recovered at the time of the interview was 8.5 hours. Both cases ate a variety of items from the lunch buffet, including chicken and steak fajitas, chips and salsa, chicken enchiladas, rice, and refried beans.

Other restaurant patrons were identified from credit card receipts. Nine patrons were interviewed, and none reported illness. However, none of these patrons reported eating items from the lunch buffet. Two events were held on July 30; a wedding reception of 150 people and a birthday party of 100 people. Event organizers were contacted, and no illnesses were reported from either event.

The inspection conducted by the City of St. Paul found that the restaurant was not taking the temperature of food items on the buffet line. They were instructed to begin taking the temperature of all food items.

The buffet runs from 11:00 a.m. to 2:30 p.m. every day, after which all leftovers from the buffet are discarded.

This was a probable outbreak of foodborne illness associated with a restaurant. The two cases that were identified had illnesses consistent with foodborne bacterial intoxications caused either by *Clostridium perfringens* or the diarrheal form of *Bacillus cereus*. No other cases were identified from credit card receipts or from two large parties that occurred on July 30. However, none of these patrons ate food from the lunch buffet. Consequently, the restaurant could not be confirmed as the source of the cases' illnesses.

(9)

Salmonella Newport Infections Probably Associated with a Private Gathering

August

Le Sueur County

On September 10, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified two clinical *Salmonella* Newport isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (designated NEW22). Review of routine surveillance interviews revealed that both had attended the same private gathering on August 18 and reported no other common events or meals.

All *S. Newport* cases are routinely interviewed about potential exposures, including foods consumed at home and at restaurants, as part of routine surveillance. Interviews of *S. Newport* 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. MDH staff contacted the private gathering host to collect information regarding foods served at the meal. A confirmed case was defined as a private gathering attendee from whom *S. Newport* NEW22 was isolated.

Four individuals attended the meal. The host and his/her spouse did not report illness. Both cases reported diarrhea, one reported cramps, and neither reported fever, vomiting, or bloody stool. The median duration of illness was 11 days (range, 7 to 14 days). One case was hospitalized for 4 days.

Foods served at the meal included pan-fried sunfish, tomatoes, cucumbers, green beans, raspberries, angel food cake, and ice cream. The tomatoes, cucumbers, and green beans were all grown in the host's garden.

This was a probable foodborne outbreak of *S. Newport* NEW22 infections associated with a meal in a private household. The outbreak was identified through routine disease surveillance. A vehicle was not identified.

(10)

Suspected Foodborne Bacterial Intoxications Probably Associated with a Restaurant

August

Ramsey County

On August 31, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness in two individuals who ate together at a restaurant in St. Paul on August 30. The two

individuals did not report any other common exposures. City of St. Paul sanitarians were notified of the complaint and an investigation was initiated.

City of St. Paul sanitarians visited the restaurant on September 2 to evaluate food preparation and handling procedures and to collect credit card receipts from August 30. MDH staff interviewed the original complainants and 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.

Both original complaints met the case definition. The incubation periods for the cases were 13.5 and 5.5 hours, respectively. Both cases had diarrhea; one case had cramps. Neither case had vomiting, bloody stool, or fever. Both cases reported ongoing illness at the time of interview. Their meals consisted of a variety of items from the lunch buffet, which included salad bar items, sweet and sour chicken, sesame chicken, chop suey, wontons, egg rolls, egg fu yung, white rice, fried rice, garlic rice, and sautéed mushrooms. Neither case was willing to submit a stool sample.

Other patrons of the restaurant were identified from credit card receipts. Thirty-three patrons were interviewed and three (9%) met the case definition. However, none of the patrons identified through credit card receipts ate items from the lunch buffet. One case had a 5.5-hour incubation period and an illness duration of 17.5 hours. The other two cases were meal companions and both had a 47-hour incubation period. The duration of illness for one case was 48 hours, while the other case was still ill at the time of the interview on September 3. Of the three cases, all reported diarrhea, two reported cramps, one reported a fever, and none reported vomiting or bloody stool.

The case with the 5.5 hour incubation reported consuming a tofu combo, a veggie combo, egg roll, and white rice. The other two cases were meal companions and reported consuming orange chicken, mandarin chicken, sugar biscuits, and white rice. One meal companion also consumed egg rolls. No stool samples were returned to MDH.

The City of St. Paul's restaurant inspection report cited numerous violations including evidence of roaches on the premises, lack of detergent in the dish machine, backed-up water in the kitchen due to clogged floor drains, lack of paper towels at hand sinks, and improper storage of wiping cloths. Additionally, foods were not being cooled using approved methods. Pieces of chicken were being cooled at room temperature, which was above 80° F. A covered tub of rice in the cooler was at 72° F and was stated to have been made the night before and kept in the cooker all night. Cold foods at the salad bar were being kept at temperatures well above the required 41° F. Sesame chicken in the walk-in cooler was at 45° F and pans of sweet and sour chicken in the back room were 78° F and 85° F. Another violation was the improper storage of cooked cream cheese wontons in cardboard boxes that previously held raw chicken.

This was a probable outbreak of foodborne illnesses associated with a restaurant. The epidemiologic and clinical characteristics of three cases were consistent with foodborne bacterial intoxications caused either by *Clostridium perfringens* or the diarrheal form of *Bacillus cereus*. The two cases with 47 hour incubations were not consistent with bacterial intoxications. However, a pathogen was not identified for any of the cases because no stool kits were submitted. Numerous temperature violations found during

the inspection also support the occurrence of foodborne bacterial intoxications. This restaurant had a history of violations and was subsequently closed; their license was revoked in October 2010.

(11)

Suspected Norovirus Gastroenteritis Probably Associated with a Wedding Reception

October

Steele County

On October 14, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint from an individual who attended a wedding held in Owatonna on October 9. The complainant reported several wedding-related events including a rehearsal dinner at a restaurant on October 8, sandwiches catered to the church on October 9, and a reception held at and catered by a hotel on October 9. The complainant reported that approximately 15 of 270 wedding attendees developed gastrointestinal illness. MDH Environmental Health Services (MDH EHS) was notified and an investigation was initiated on October 14.

An MDH EHS sanitarian visited the restaurant on October 15 to evaluate food preparation and handling procedures and interview food workers. An MDH EHS sanitarian contacted hotel management on October 19 to assess employee illness. A limited list of individuals who attended the wedding was provided to MDH by an event organizer. Attendees were interviewed by MDH staff about food consumption and illness history. A case was defined as a wedding attendee who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

Illness histories and exposure information were obtained from 26 wedding attendees. Seven (27%) attendees met the case definition; five reported illness that did not meet the case definition and were excluded from the analysis. The median incubation period for cases from the wedding reception was 16 hours (range, 13 to 44 hours) and from the rehearsal dinner was 41 hours (range, 37 to 70 hours). The median duration of illness was 40 hours (range, 12 to 96 hours). Five (71%) cases reported diarrhea, three (43%) reported vomiting and cramps, two (29%) reported fever, and none reported bloody stools. Stool specimen collection kits provided to two ill wedding attendees were not returned.

The rehearsal dinner held at the restaurant was served buffet-style and included salmon, prime rib, potatoes, green beans, buns, Caesar salad, pineapple, grapes, cantaloupe, and cheesecake. By univariate analysis, neither attending the rehearsal dinner (4 of 7 cases vs. 5 of 14 controls; odds ratio [OR], 2.40; 95% confidence interval [CI], 0.27 to 22.9; Fisher's exact 2-tailed $p = 0.40$) nor consuming sandwiches at the church (3 of 7 cases vs. 6 of 14 controls; OR, 1.00; 95% CI, 0.10 to 8.73; Fisher's exact 2-tailed $p = 1.00$) were associated with illness.

The wedding reception was a plated meal and included turkey, stuffing, mashed potatoes, mixed veggies, tortilini pasta, cranberry sauce, salad, salad dressing, trail mix, chex mix, mints, and cake. Near the end of the reception, sandwiches leftover from the church and pizza prepared by the hotel were served. No food items served at the reception were associated with illness.

MDH EHS sanitarians interviewed seven restaurant employees. None reported recent gastrointestinal illness. The hotel manager reported that no employees were ill prior to or following the reception on October 9. However, employees were not individually interviewed.

This was a probable foodborne outbreak of suspected norovirus gastroenteritis associated with a wedding held in Owatonna. Although the etiology was not confirmed, the distribution of symptoms was characteristic of norovirus. Foodborne transmission was not confirmed, and person-to-person transmission could not be ruled out. The investigation was limited by the small number of attendees with available contact information.

(12)

Norovirus Gastroenteritis Probably Associated with a Restaurant

November

Hennepin County

On November 16, 2010, the Minnesota Department of Health (MDH) foodborne illness unit received a report of illness among a group of 20 people who had eaten at a restaurant in Champlin on November 9. Hennepin County Human Services and Public Health Department (HSPHD) epidemiology and environmental health were notified and an investigation was initiated on November 16.

Epidemiologists from HSPHD obtained a list of individuals in the complaint group and interviewed them to obtain information on consumption of food/beverage items and illness history. A case was defined as a restaurant patron who subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). HSPHD sanitarians visited the restaurant on November 16 to evaluate food preparation and handling procedures and interview food workers regarding recent illness. Stool samples collected from consenting patrons were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Sixteen of the 20 individuals in the original complaint group were interviewed; 6 (38%) met the case definition. All six cases reported vomiting, five (83%) reported diarrhea, three (50%) reported abdominal cramps, and one (17%) reported fever. The median incubation period was 30.5 hours (range, 11 to 34 hours). One stool sample submitted by a patron tested positive for norovirus genogroup II.

Cases reported eating a variety of foods from the lunch buffet, including items from the salad bar, fresh fruit, egg rolls, chicken wings, dumplings, different chicken entrées, fried rice, noodles, and soft serve ice cream, cookies, and donuts. No specific food items were significantly associated with illness.

During the inspection, HSPHD sanitarians discovered that patrons were allowed to serve themselves hard-serve ice cream. The facility was ordered to discontinue this activity. All seven restaurant employees were interviewed; none reported recent gastrointestinal illness.

This was a probable outbreak of norovirus gastroenteritis associated with a restaurant. No specific food vehicle was identified and person-to-person transmission could not be ruled out.

(13)

Norovirus Gastroenteritis Probably Associated with a Restaurant

November

Ramsey County

On November 19, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in two individuals from separate households who ate

lunch together at a restaurant in St. Paul on November 17. This meal was the only recent event the two individuals had in common; however, both individuals were employed by the same company. Sanitarians from St. Paul Environmental Health were notified, and an outbreak investigation was initiated on November 19.

MDH epidemiology staff interviewed the two ill patrons from the original complaint. A list of credit card receipts from patrons who ate at the restaurant on November 17 was requested from the restaurant; however, the receipts did not have patron names on them, so additional patron follow-up could not be performed. A case was defined as an restaurant patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period). Stool specimens were obtained from two patrons and submitted to MDH for bacterial and viral testing.

On November 19, a St. Paul Environmental Health sanitarian visited the restaurant to evaluate food preparation and handling procedures and to assess recent employee illness.

Two cases (the original complainants) were identified. One case reported diarrhea, vomiting, cramps, and fever. The other case reported diarrhea, cramps, and fever. The two cases reported incubation periods of 38 and 39 hours, respectively. Both cases had ongoing illness at the time of interview. Both stool samples tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on both of the positive norovirus samples; the nucleic acid sequences were identical.

Both patrons reported eating a wide variety of foods. Food items included fish, fried chicken, sauerkraut, mashed potatoes, gravy, corn, meatloaf, kielbasa, cornbread, soup, and cake.

Review of the restaurant's employee illness log revealed no recent employee illness. The sanitarian stressed the importance of proper handling of food and beverages, use of gloves when handling ready-to-eat foods, good handwashing, thorough disinfection, and exclusion of ill employees. The restaurant received no additional complaints and no reports of employee illness. Although employees were not interviewed by St. Paul Environmental Health staff, all employees were screened by restaurant management regarding any recent gastrointestinal illness before starting their daily work duties.

This was a probable foodborne outbreak of norovirus gastroenteritis associated with consuming a meal at a restaurant. The vehicle of transmission and source of contamination were not identified. However, the most plausible source of contamination was an infected food worker or patron who had contact with ready-to-eat foods.

(14)

Norovirus Gastroenteritis Probably Associated with a Restaurant

November

Hennepin County

On November 22, 2010, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a family who had dined at a restaurant in Minneapolis on November 21. The complainants did not report any other common meals or events. MDH notified Hennepin County Public Health Department (HSPHD) epidemiology and the Minneapolis Division of Environmental Health (MDEH), and an investigation was initiated.

MDEH sanitarians inspected the restaurant on November 23 and interviewed food workers about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures. MDH interviewed all five patrons in the complainant group. Additional patron contact information was not available. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

Five restaurant patrons were interviewed. Four (80%) met the case definition; all from the original complaint. All four cases reported diarrhea, three (75%) reported diarrhea and cramps, one (25%) reported fever, and none reported bloody stools. Illness duration information was unavailable as all four cases were still ill at the time of interview. The median incubation period was 17.5 hours (range, 9 to 33 hours). Three stool samples submitted by cases to the MDH Public Health Laboratory were positive for norovirus genogroup II with identical nucleic acid sequences.

The cases reported all sharing a sausage pizza, and two cases reported also sharing a burger and fries. The identification of only one non-ill control prevented a meaningful analysis of food exposures.

MDEH sanitarians interviewed all 19 employees who worked on November 21, the complainant's meal date. An employee reported becoming ill with vomiting that evening. The employee's shift started at 5 p.m., 4 hours after the complainants ate at the restaurant. The restaurant received no additional complaints and no reports of employee illness. MDEH sanitarians provided norovirus education and discussed the importance of handwashing for the prevention of norovirus transmission.

This was an outbreak of norovirus gastroenteritis probably associated with eating at a restaurant. The vehicle of transmission was not identified. An infected employee in the late incubation stage of infection was a plausible source of contamination, but this was not confirmed.

Confirmed Waterborne Outbreaks

(1)

Giardiasis Associated with Drinking Water at a Campground

June

St. Louis County

On July 9, 2010, the Minnesota Department of Natural Resources received an e-mail complaint from an individual who had camped at a campground in Side Lake, Minnesota during June 11-13 with five other individuals. The complainant reported that four of the individuals were known to be ill with severe gastrointestinal illness, including one who had a laboratory confirmed *Giardia* infection. On July 12, the Minnesota Department of Health (MDH) Drinking Water Protection (DWP) Section was notified of the complaint; DWP staff immediately notified epidemiologists in the MDH Acute Disease Investigation and Control (ADIC) Section. An outbreak investigation was initiated on July 12.

A list of campground patrons from June 11-13 was obtained from the campground director. Campground patrons were interviewed by MDH staff about illness history and exposures at the campground, including recreational and drinking water sources. A case was defined as a campground patron who subsequently developed either a laboratory-confirmed *Giardia* infection or diarrhea (≥ 3 loose stools in a 24-hour period) lasting 3 or more days.

MDH DWP staff visited the campground to collect water samples and do an environmental assessment of the well and distribution system.

Illness histories and exposure information were obtained from 60 campers. Six (10%) cases were identified, including three with a stool specimen that tested positive for *Giardia*. Seven additional campers reported illness but did not meet the case definition and were excluded from further analysis. All six cases reported diarrhea, four (100%) of four reported cramps, two (50%) of four reported fever, and two (33%) reported vomiting. Incubation periods could not be calculated due to multiple exposures. Duration of illness could not be calculated, as all cases reported ongoing illness at the time of interview. Four (67%) cases were female.

All five cases with available exposure information reported using water from the campground shower house for multiple activities, including brushing teeth, showering and washing hands. Additionally, three of five cases reporting drinking water from taps located around campsites 20 and 26; no controls reported consuming water from these two taps. Two (33%) cases reported going in the lake.

On July 13 a precautionary boil order was issued for the campground well and distribution system. Following the environmental assessment and sample collection by MDH staff, campground staff shock-disinfected the campground well and distribution system the afternoon of July 14. The distribution system was flushed on July 15. The precautionary boil order was lifted on July 16 after water samples collected from the well and distribution system tested negative for coliform bacteria, *Giardia*, and *Cryptosporidium*.

The environmental assessment of the well and distribution system did not reveal any major deficiencies.

This was a waterborne outbreak of giardiasis associated with drinking water at a campground. Consumption of untreated well water is a documented risk factor for *Giardia* infection. The source of contamination was not identified.

(2)

***E. coli* O157:H7 Infections Associated with a Swimming Beach**

July

Beltrami County

Routine surveillance interviews of three laboratory-confirmed *E. coli* O157:H7 cases conducted by the Minnesota Department of Health (MDH) on July 21, 27, and 28 revealed that all three cases had swam in the same lake in Bemidji at the swimming beach during the week prior to illness onset. An investigation was initiated.

Cases of *E. coli* O157:H7 infection and hemolytic uremic syndrome (HUS) that were identified through routine surveillance were interviewed to determine if they had exposure to the swimming beach or the lake. A case was defined as a person who swam in the lake and subsequently developed either a laboratory-confirmed *E. coli* O157 infection or HUS.

Five cases were identified through routine surveillance; four were culture-confirmed *E. coli* O157:H7 cases, one of whom had HUS, and one case had HUS without culture-confirmation of *E. coli* O157:H7. One of the culture-confirmed cases was a Canadian resident. All case isolates of *E. coli* O157:H7 were indistinguishable by pulsed-field gel electrophoresis (subtype MN41ECB10).

Information on symptoms was available for the outbreak cases who reside in the United States. All reported diarrhea, bloody diarrhea, fever, and cramps. Two (50%) of the cases reported vomiting. The median incubation period was 3 days (range, 2 to 4 days) from the most likely swimming exposures. Three cases reported their most recent swimming exposure at the swimming beach to be July 10 (one of these cases also swam on July 8 and 9), one reported July 8 (and also swam July 4), and one reported July 11 (and also swam July 10). Since four of the cases swam on July 10 and that day was the hottest day in that time period (high temperature of 86.6° F), July 10 likely was the primary exposure date. The duration of illness was 8 days for the only case who had recovered at the time of interview. The four cases from the United States were hospitalized. The median duration of hospitalization was 2.5 days (range, 1 to 6 days). Two cases developed HUS.

The swimming beach was closed on July 29 for water testing. Signs were posted in the area about healthy swimming and handwashing. The beach was reopened July 30 after testing showed that water quality was within the normal range.

Four additional cases with *E. coli* O157:H7 PFGE subtype MN41ECB10 had been identified in June. These cases did not have a connection to the beach or swimming and did not travel to and were not from northern Minnesota. A common source for those cases was not identified.

This was a waterborne outbreak of *E. coli* O157 infections associated with a swimming beach. The ultimate source of contamination was not determined.

(3)
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 September 28, 2010 revealed that both cases had swam at the an aquatic center in Red Wing in the 2 weeks prior to illness onset. Sanitarians from MDH Environmental Health Services were contacted on September 29, 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.

The aquatic center had closed for the season at the end 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 were identified through routine surveillance. Both cases had *Cryptosporidium hominis* subtype HGP4 identified in a stool sample.

Both cases reported diarrhea and cramps. One (50%) of the two cases reported weight loss. Neither case reported vomiting or fever. The median incubation period was 10.5 days (range, 7 to 14 days). The median duration of illness was 10 days (range, 8 to 12 days). The cases were 4 and 11 years old, respectively. One case received antiparasitic treatment for his illness.

The two cases reported swimming at the aquatic center on August 4 and on or around August 5, respectively.

The aquatic center pool operator reported that there had been a fecal incident in the zero depth entry end of the aquatic center on the afternoon of August 4. Records indicated that the pool was closed for superchlorination until August 6. However, neither the chlorine concentration nor the length of superchlorination time had been documented.

This was a waterborne outbreak of cryptosporidiosis associated with an aquatic center. Since the outbreak was not detected until after the aquatic center was closed for the season, an extensive investigation was not conducted. The fecal incident on August 4 may have introduced the parasite into the pool water. The immediate superchlorination following the fecal incident most likely prevented additional pool users from becoming infected.

(4)
Cryptosporidiosis Associated with a Lake

August

Blue Earth

Routine surveillance interviews of two laboratory-confirmed *Cryptosporidium* cases conducted by the Minnesota Department of Health (MDH) on September 8, 2010 revealed that both cases had gone swimming in the same lake during the 2 weeks prior to illness onset.

Cases of cryptosporidiosis that were identified through routine surveillance were interviewed to determine if they had exposure to the lake. A case was defined as a person who swam in the lake and 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.

Three cases were identified through routine surveillance; one secondary infection in a family member of a case was also identified through routine surveillance. All four individuals had *Cryptosporidium hominis* subtype HGP4 identified in a stool sample.

All three cases reported diarrhea, fever, and cramps. Two (67%) of the cases reported weight loss. None of the cases reported vomiting. The median incubation period was 9 days (range, 3 to 13 days). The duration of illness was 17 days for the two cases who had recovered at the time of interview. Two (67%) of the cases were treated with nitazoxanide for their illness.

Two cases reported swimming at the lake on August 8 and one on August 14. Two cases reported definitely swallowing water while swimming, while the third case was unsure about whether he had swallowed any water.

This was a waterborne outbreak of cryptosporidiosis associated with a lake. Since the outbreak was not detected until after the beach was closed for the season, a comprehensive investigation could not be conducted.

Outbreaks with Other Transmission Routes

(1)

Cryptosporidiosis Among Veterinary Students Taking a Bovine Obstetrics Class

April

Ramsey County

On April 22, 2010, gastrointestinal illness among second year veterinary students at a College of Veterinary Medicine (CVM) was reported to the Minnesota Department of Health (MDH) by a professor at the CVM. The students had participated in a 2-day bovine obstetrics laboratory prior to becoming ill. An investigation was initiated.

Four, 2-day bovine obstetrics laboratories were scheduled at the CVM on April 1 and 2, April 8 and 9, April 15 and 16, and April 29 and 30. Three of these laboratories had already occurred at the time of the investigation. All students who had already attended a laboratory session were contacted by MDH epidemiologists. Those who consented were interviewed about illness history and activities both inside and outside of the laboratory.

A case was defined as a student who attended an obstetrics laboratory and either: a) had 3 or more days of diarrhea (≥ 3 loose stools in a 24-hour period); or b) had any gastrointestinal illness symptoms and had a stool sample test positive for *Cryptosporidium* spp.

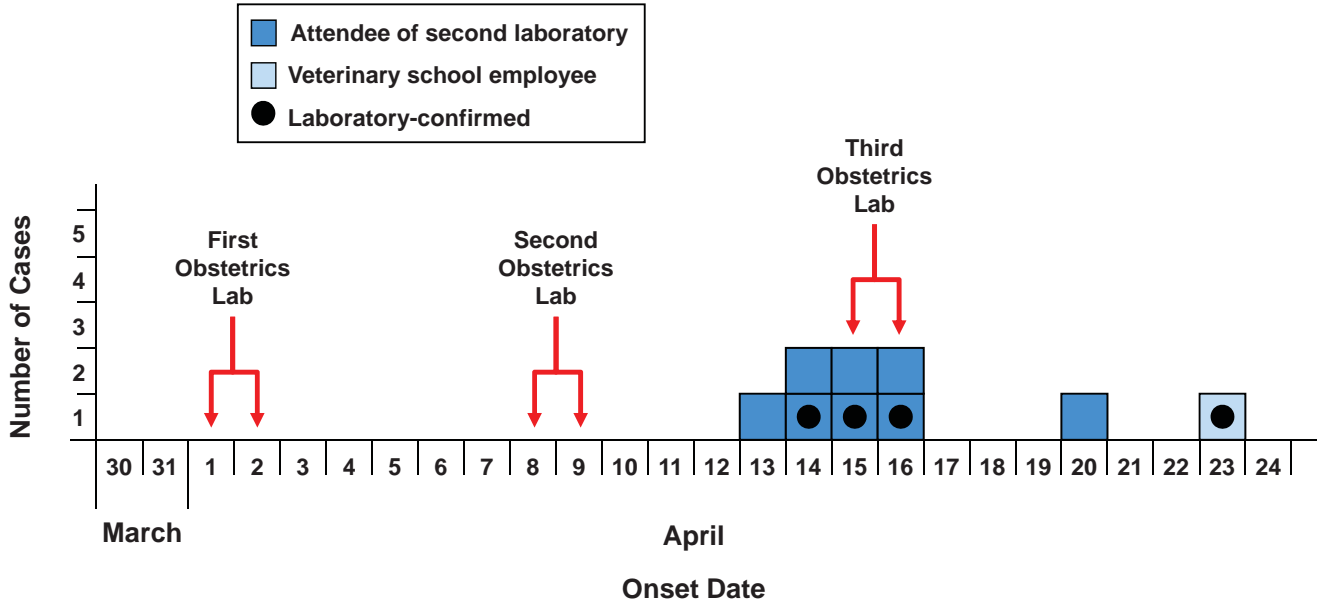
Seven stool samples were collected from students, and nine fecal samples were collected from 3-to-4 week old calves from Dairy Farm A, where the calves used in the laboratories were obtained. The samples were sent to MDH for bacterial and protozoal testing. Fecal samples from the calves used in the obstetrics laboratories were unavailable because they had already been discarded at the time of the investigation.

The CVM's policy for student laboratory classes is to use 48-hour-old healthy bull calves euthanized by captive bolt. However, the calves used in these laboratories were older and were known to have died of a diarrheal illness. On day 1 of the laboratory, students, working in pairs, practiced re-positioning abnormal fetal presentations and manual assistance of what would be difficult births inside a plastic-lined wooden box simulating a cow's uterus. On day 2, students continued practicing these skills along with performing a fetotomy, a procedure in which a dead fetus is cut into multiple sections; this procedure includes a cut through the pelvis, which often results in laceration of the intestines. Cleaning procedures at the end of each laboratory involved spraying down the inside of the boxes, plastic lining, and the floor with water from a garden hose.

Thirty-eight of 41 (93%) students were interviewed, and eight (21%) met the case definition. In addition, eight students (21%) reported symptoms but did not meet the case definition and were excluded from further analyses. All eight cases reported diarrhea and cramps, seven (88%) reported gas, four (50%) reported weight loss, three (38%) reported fever, one (13%) reported bloody diarrhea, and one (13%) reported vomiting. Dates of illness onset for cases ranged from April 13 to April 20 (see figure). The median incubation period, calculated from the first day of the laboratory, was 7 days (range, 5 to 12 days). The median duration of illness for the six cases who had recovered at the time of the interview

was 8.5 days (range, 6.5 to 14 days). Two cases were still ill at the time of the interview (minimum duration, 8 and 14 days).

Cryptosporidiosis Associated with a Bovine Obstetrics Laboratory, by Illness Onset Date, March-April, 2010



An employee of the CVM who was responsible for setting and cleaning up the obstetrics laboratories contacted MDH. This individual reported diarrhea, bloody diarrhea, gas, and cramps with illness onset on April 23. Duration of illness was not calculated because the case was still ill at the time of the interview on April 29. An incubation period was not calculated because the case had contact with calves on several different dates.

Eight of eight cases attended laboratory 2 on April 8 and 9, and no cases were found among attendees of laboratory 1 or laboratory 3. Students were significantly more likely to have been splashed in the face during the laboratory if they attended laboratory 2 than students attending laboratories 1 and 3 (relative risk, 1.95; 95% confidence interval, 1.14 to 3.31; $p = 0.019$). The proportion of students splashed in the face on either day 1 or 2 of the laboratory was: five of 10 (50%) students in laboratory 1, 11 of 12 (92%) students in laboratory 2, and three of seven (43%) students in laboratory 3.

Regarding the use of PPE, every student who participated in one of the laboratories reported wearing both regular exam gloves and shoulder length gloves for both days of laboratory. On day 1 of the laboratory, 28 of 30 (93%) students wore coveralls, and on day 2 of the laboratory, 27 of 28 (96%) students wore coveralls. On day 1 of the laboratory, 29 of 30 (97%) wore boots, and on day 2 of the laboratory, 29 of 29 (100%) wore boots. No students wore rubber aprons, masks, or face shields on either day of the laboratory. Hand hygiene among students was reportedly good, with only one case and no controls skipping handwashing.

Four human stool samples tested positive for *Cryptosporidium parvum* Minnesota subtype 11aA15G2R2. One student who reported mild gastrointestinal symptoms but did not meet the case definition tested positive for *E. coli* virulence factors *eae* and *hlyA*. Three of the nine fecal samples collected from calves

at Dairy Farm A tested positive for *C. parvum* Minnesota subtype 11aA15G2R2, the same subtype which was identified in the four human stool samples. Additionally, three calves were positive for *E. coli* virulence factor *stx1*, three were positive for *eae*, and four were positive for *hlyA*.

Interventions for the final laboratory session included a reminder to students about zoonotic disease transmission and hand hygiene, using euthanized bull calves less than 48 hours old, and providing facial protection to students for procedures that produce spray. After these recommendations were implemented, no cryptosporidiosis or other enteric illnesses were identified in students enrolled in the last laboratory session.

This was an outbreak of cryptosporidiosis among veterinary students who performed fetotomies in a bovine obstetrics laboratory. The calves used in the laboratory sessions were the likely source of infection for the students. The use of facial protection while delivering calves, performing fetotomies, cleaning, and during other activities that generate spray was recommended.

(2)

Campylobacteriosis Associated with a Chicken Processing Plant

August

Pope County

Routine surveillance interviews of two *Campylobacter jejuni* cases conducted by the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section on October 6, 2010 revealed that both cases worked at the same chicken processing plant in Glenwood, Minnesota.

All *Campylobacter* cases reported to MDH are interviewed about occupational exposures as part of foodborne disease surveillance in Minnesota. Epidemiologists reviewed the information gathered during the interviews of the *C. jejuni* cases to identify other potential cases associated with working at the Glenwood processing plant.

Cases were defined as persons who had *C. jejuni* isolated from stool or who had diarrhea (≥ 3 loose stools in a 24-hour period) lasting 3 days and who reported working at the Glenwood processing plant in the week prior to onset of symptoms.

Only the two original cases were identified. Both cases reported diarrhea, vomiting, and cramps, one (50%) reported fever, and one (50%) reported blood in their stools. The incubation period could not be calculated, as cases were exposed on more than one occasion. The median duration of illness was 11.5 days (range, 10 to 13 days). Both cases had a stool specimen test positive for *Campylobacter jejuni*; both isolates were indistinguishable by pulsed-field gel electrophoresis (PFGE). Both isolates were resistant to nalidixic acid.

Cases did not report any common exposures other than working at the processing plant. Cases reported job duties that included handling chickens at multiple steps during processing, including slaughtering, de-feathering, and packaging. Chickens are hand eviscerated at the processing plant.

This was an outbreak of nalidixic acid-resistant *Campylobacter jejuni* infections associated with working at a chicken processing plant. Contact with chickens is a well-established vehicle of campylobacteriosis.

(3)

***Salmonella* Typhimurium Infections Associated with Exposure to an ATCC strain in Clinic and Teaching Microbiology Laboratories**

August 2010-March 2011

Multiple states

On October 29, 2010, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) determined that two clinical *Salmonella* Typhimurium isolates submitted through routine surveillance had indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (MDH designation TM724; Centers for Disease Control and Prevention [CDC] XbaI designation JPXX01.0014). The cases were both interviewed using a standard questionnaire. A review of the national PulseNet database revealed 31 additional *S. Typhimurium* isolates with the outbreak PFGE pattern in 17 states. A multi-state investigation was initiated. From November 2010 through June 2011, the MDH PHL received seven additional matching *S. Typhimurium* isolates.

A case was defined as a person who had a *S. Typhimurium* isolate with the outbreak PFGE pattern (JPXX01.0014) and who had illness onset since August 20, 2010. Minnesota cases were interviewed with a broad-based exposure questionnaire and were re-interviewed regarding microbiology laboratory exposures.

During February-March 2011, a multi-state case-case comparison study, coordinated by CDC was initiated to evaluate exposure to clinical and teaching microbiology laboratories as a possible source of illness. This study included Minnesota cases. Two comparison cases were enrolled per case. Comparison cases were non Typhimurium or 4,[5], 12:i- *Salmonella* cases matched to case-patients by age group (≤ 17 years and ≥ 18 years) and who did not report international travel.

One hundred and nine cases from 38 states were identified in this outbreak (Minnesota, Pennsylvania, 9 each; Georgia, 6; Washington, 5; Alabama, Arizona, Illinois, Kansas, Kentucky, Massachusetts, New York, Utah, Wisconsin, 4 each; California, Maryland, Michigan, New Jersey, New Mexico, Ohio, 3 each; Alaska, Idaho, Indiana, Missouri, Nebraska, South Carolina, Tennessee, 2 each; and Colorado, Florida, Iowa, North Carolina, North Dakota, Nevada, New Hampshire, Oklahoma, Oregon, South Dakota, Texas, Wyoming, 1 each).

The nine Minnesota cases had a median age of 32 years (range, 6 months to 54 years). Seven (78%) cases were female. All nine cases reported diarrhea, fever and cramping, five (56%) bloody diarrhea, and four (44%) vomiting. Two cases were hospitalized for 4 days each.

Upon interview, five (56%) cases reported exposure to either a clinical (n=1) or teaching (n=4) microbiology laboratory. Of these, two reported specifically working with *Salmonella* in the lab, and one case reported working with the implicated ATCC strain. Additionally, one case who did not have direct exposure to a microbiology laboratory did report contact with people who were exposed to a microbiology laboratory. No cases reported exposure to the same microbiology laboratory.

In the national case-case comparison study, exposure to a clinical or teaching microbiology laboratory during the week prior to illness onset was associated with illness (19 of 32 cases vs. 1 of 64 comparison cases; odds ratio, 92.1; 95% confidence interval, 11.8 to 3880; $p < 0.001$).

The CDC investigation update provided advice both to students and employees of microbiology laboratories and to laboratory directors, managers, and faculty involved with microbiology laboratories which included: links to biosafety guidelines and training materials; suggesting using non-pathogenic or attenuated bacterial strains, especially in teaching laboratories; ensuring handwashing; not allowing food, drinks, or personal items in the laboratory; and keeping pens, papers, lab coats from leaving the laboratory.

This was a multi-state outbreak of *S. Typhimurium* infections associated with exposure to ATCC strain in clinic and teaching microbiology laboratories.

Reference

1. Multistate Outbreak of Human *Salmonella* Typhimurium Infections Associated with Exposure to Clinical and Teaching Microbiology Laboratories
<http://www.cdc.gov/salmonella/typhimurium-laboratory/042711/index.html>

**Confirmed Foodborne Outbreaks
Minnesota, 2010**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Jan	Restaurant	10	3	Sushi	Norovirus	Ill food worker	Ramsey
2	Jan	Restaurant	7	2	Salad	Norovirus	Ill food worker	Hennepin
3	Jan	Restaurant	6	4	Unknown	Norovirus	Food worker with ill household member	Le Sueur
4	Jan	Restaurant	20	0	Prime rib	Suspected <i>Clostridium perfringens</i>	Time/temperature abuse	Aitkin
5	Jan	Catered private event	4	1	Unknown	Norovirus	Likely infected food worker	Ramsey
6	Jan	Restaurant	15	0	Ready-to-eat foods	Norovirus	Infected food worker	Olmsted
7	Feb	Restaurant	4	1	Unknown	Norovirus	Unknown	Hennepin
8	Feb	School cafeteria	25	1	Unknown	Norovirus	Unknown	Hennepin
9	Feb	Restaurant	7	3	Unknown	Norovirus	Ill food worker	Dakota
10	Mar	Church dinner	16	3	Unknown	Norovirus	Ill volunteer food worker	Hennepin
11	Mar	Restaurant	6	4	Unknown	Norovirus	Unknown	Hennepin
12	Mar	Entertainment center	10	3	Multiple items	Norovirus	Unknown	Hennepin
13	Mar	Funeral ceremony	2	2	Unknown	<i>Salmonella</i> Typhimurium	Unknown	Ramsey
14	Mar	Catered banquet	19	0	Mashed potatoes	Suspected <i>Clostridium perfringens</i>	Time/temperature abuse	Isanti
15	Apr	Restaurant	17	3	Unknown	Norovirus	Ill food worker	Hennepin
16	Apr	Restaurant	4	2	Unknown	Norovirus	Infected food worker	Ramsey
17	Apr-Jun	Commerical product	3	3	Frozen entrée	<i>Salmonella</i> Chester	Contaminated product	Multiple states

**Confirmed Foodborne Outbreaks
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
18	Apr	Restaurant	7	2	Ready-to-eat foods	Norovirus	Infected food worker	Dakota
19	Apr	Restaurant	12	3	Unknown	Norovirus	Likely infected food worker	Aitkin
20	Apr	Catered banquet	38	2	Seasonal vegetables and greens salad	Norovirus	Unknown	Crow Wing
21	Apr	Commerical product	4	4	Prepackaged salad	<i>Salmonella</i> Typhimurium	Contaminated product	Multiple states
22	May-Jun	Raw milk exposure	8	8	Raw milk	<i>E. coli</i> O157:H7	Contaminated product	Sibley
23	May	Restaurant	7	5	Chili relleños	<i>Salmonella</i> Enteritidis	Cross-contamination	Beltrami
24	May	Restaurant	23	4	Prime rib	<i>Clostridium perfringens</i>	Time/temperature abuse	Washington
25	May	Restaurant	3	3	Eggs	<i>Salmonella</i> Enteritidis	Cross-contamination	Olmsted
26	May	Funeral luncheon	13	0	Unknown	Suspected norovirus	Unknown	Blue Earth
27	May	Restaurant	8	3	Unknown	Norovirus	Unknown	Hennepin
28	May	Restaurant	24	3	Salad	Norovirus	Infected food worker	Anoka
29	Jun	Cooking school	4	0	Unknown	Suspected norovirus	Likely infected food worker	Dakota
30	Jun	Graduation party	7	4	Unknown	<i>Salmonella</i> Muenchen	Unknown	Dakota
31	Jun	Restaurant	4	1	Unknown	Norovirus	Unknown	Washington
32	Jun	Restaurant	8	1	Ready-to-eat foods	Norovirus	Ill food worker	Hennepin

**Confirmed Foodborne Outbreaks
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
33	Jun	Rehearsal dinner	28	7	Unknown	Norovirus	Numerous	Otter Tail
34	Jun	Restaurant	2	1	Raw oysters	<i>Vibrio parahaemolyticus</i>	Likely contaminated harvest site	Hennepin
35	Jun	Wedding reception	15	0	Cake	Suspected norovirus	Unknown	Ramsey
36	Jun	Restaurant	3	0	Unknown	Suspected bacterial intoxications	Time/temperature abuse	Blue Earth
37	Jun-Jul	Restaurant	5	5	Unknown	<i>Salmonella</i> Baildon	Unknown	Multiple states
38	Jun	Restaurant	7	5	Unknown	<i>Salmonella</i> Enteritidis	Cross-contamination	Hennepin
39	Jul	Commerical product	11	9	Pre-packaged wheat snack	<i>E. coli</i> O157:H7	Unknown	Hennepin
40	Jul	Restaurant	4	3	Hollandaise sauce and eggs	<i>Salmonella</i> Enteritidis	Contaminated product	Ramsey
41	Jul-Aug	Commerical product	6	6	Blueberries	<i>Salmonella</i> Newport	Unknown	Multiple counties
42	Jul-Aug	Raw milk exposure	7	7	Raw milk	<i>Campylobacter jejuni</i> and <i>Cryptosporidium parvum</i>	Contaminated product	Multiple counties
43	Aug	Church potluck	21	4	Macaroni salad	<i>Salmonella</i> Infantis	Cross-contamination	Hennepin
44	Aug	Office party	3	2	Unknown	<i>Campylobacter jejuni</i>	Unknown	Ramsey

**Confirmed Foodborne Outbreaks
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
45	Aug	Restaurant	8	0	Multiple items	Unknown	Unknown	Hennepin
46	Aug	Catered lunch	16	3	Sub-style sandwiches	Norovirus	Infected food worker	Olmsted
47	Aug	Catered picnic	5	0	Unknown	Suspected norovirus	Unknown	Ramsey
48	Aug	Group home	2	2	Eggs	<i>Salmonella</i> Enteritidis	Contaminated product	Pope
49	Aug	Restaurant	2	1	Raw oysters	<i>Vibrio parahaemolyticus</i>	Likely contaminated harvest site	Hennepin
50	Aug	Wedding reception	7	4	Unknown	<i>Salmonella</i> Enteritidis	Unknown	Becker
51	Aug	Wedding reception	21	2	Mixed greens salad	Norovirus	Unknown	Itasca
52	Sep	School picnic	18	2	Pulled turkey	<i>Clostridium perfringens</i>	Likely time/temperature abuse	Anoka
53	Sep	Restaurant	4	0	Unknown	Suspected norovirus	Unknown	Hennepin
54	Sep-Oct	Commerical product	2	2	Artisanal cheese	<i>E. coli</i> O157:H7	Contaminated product	Multiple states
55	Oct	Restaurant	29	3	Ice water	Norovirus	Likely infected food worker	Hennepin
56	Oct	Restaurant	9	3	Caesar salad	Norovirus	Unknown	St. Louis
57	Oct	Restaurant	14	0	Multiple items	Suspected norovirus	Likely infected food worker	Dakota
58	Oct	Restaurant	6	0	Unknown	Suspected viral gastroenteritis	Unknown	Ramsey
59	Nov	Restaurant	3	1	Unknown	Norovirus	Infected food worker	Dakota
60	Nov	Entertainment center	16	4	Sub-style sandwiches	Norovirus	Unknown	Dakota

**Confirmed Foodborne Outbreaks
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
61	Nov	High school class	29	6	Venison	STEC	Numerous	Anoka
62	Dec-Mar	Commerical product	3	3	In-shell hazelnuts	<i>E. coli</i> O157:H7	Unknown	Multiple states
63	Dec	Restaurant	5	3	Unknown	Norovirus	Unknown	Hennepin
64	Dec	Rehearsal dinner	23	5	Broccoli salad	Norovirus	Unknown	Ramsey
65	Dec	Restaurant	14	1	Ready-to-eat foods	Norovirus	Infected food worker	Clay
66	Dec	Casino	32	2	Unknown	Norovirus	Ill food worker	Pine
67	Dec	Restaurant	15	2	Cut fruit	Norovirus	Likely infected food worker	Hennepin
68	Dec	Blood drive	14	0	Unknown	Viral gastroenteritis	Likely infected food worker	Douglas

TOTAL: 68

**Confirmed Waterborne Outbreaks
Minnesota, 2010**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Jun	Campground	6	3	Drinking water	<i>Giardia</i>	Untreated well water	St. Louis
2	Jul	Swimming beach	5	4	Recreational water	<i>E. coli</i> O157:H7	Unknown	Beltrami
3	Aug	Aquatic center	2	2	Recreational water	<i>Cryptosporidium hominis</i>	Likely infectious swimmer	Goodhue
4	Aug	Swimming beach	3	3	Recreational water	<i>Cryptosporidium hominis</i>	Likely infectious swimmer	Blue Earth

TOTAL: 4

**Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2010**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
1	Jan	Nursing home	39	0	Person-to-person (PTP)	Suspected norovirus	Meeker
2	Jan	Nursing home	20	0	PTP	Suspected norovirus	Ramsey
3	Jan	Nursing home	60	0	PTP	Suspected norovirus	Olmsted
4	Jan	Nursing home	13	0	PTP	Suspected norovirus	Beltrami
5	Jan	Assisted living	32	0	PTP	Suspected norovirus	Ramsey
6	Jan	Assisted living	209	0	PTP	Suspected norovirus	Hennepin
7	Jan	Dorm	16	1	PTP	Notovirus	Sherburne
8	Feb	Assisted living	15	0	PTP	Suspected norovirus	Olmsted
9	Feb	Nursing home	52	0	PTP	Suspected norovirus	Olmsted
10	Feb	Nursing home	16	0	PTP	Suspected norovirus	Hennepin
11	Feb	Nursing home	6	0	PTP	Suspected norovirus	Ramsey
12	Feb	Nursing home	52	0	PTP	Suspected norovirus	Hennepin
13	Feb	Nursing home	20	0	PTP	Suspected norovirus	Clay
14	Feb	Nursing home	51	0	PTP	Suspected norovirus	Hennepin
15	Feb	Nursing home	34	0	PTP	Suspected norovirus	Otter Tail
16	Mar	Nursing home	16	0	PTP	Suspected norovirus	St. Louis
17	Mar	Nursing home	46	0	PTP	Suspected norovirus	Carver
18	Mar	Nursing home	30	0	Unknown	Suspected norovirus	St. Louis
19	Mar	School	29	0	Unknown	Suspected norovirus	Anoka
20	Mar	School	65	0	Unknown	Suspected norovirus	Scott
21	Mar	Rehabilitation center	27	0	PTP	Suspected norovirus	St. Louis
22	Mar	Nursing home	35	0	PTP	Suspected norovirus	Watonwan
23	Mar	Private party	12	0	Unknown	Unknown	Becker

**Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
24	Mar	Nursing home	42	0	PTP	Suspected norovirus	Lake OfThe Woods
25	Mar	Retirement home	73	0	Unknown	Suspected norovirus	Blue Earth
26	Apr	Nursing home	10	0	PTP	Suspected norovirus	Kandiyohi
27	Apr	Nursing home	21	0	Unknown	Suspected norovirus	Redwood
28	Apr	Nursing home	33	0	PTP	Suspected norovirus	Meeker
29	Apr	Veterinary school	8	4	Calves	<i>Cryptosporidium parvum</i>	Ramsey
30	May	Nursing home	18	0	PTP	Suspected norovirus	Hennepin
31	May	Assisted living	19	0	PTP	Suspected norovirus	Goodhue
32	May	Assisted living	21	0	PTP	Suspected norovirus	Wadena
33	May	Assisted living	7	0	PTP	Suspected norovirus	Beltrami
34	May	Camp	9	0	PTP	Suspected norovirus	Fillmore
35	May	School	69	0	PTP	Suspected norovirus	Renville
36	Jun	Hospital	65	0	Unknown	Suspected norovirus	St. Louis
37	Jul	Nursing home	64	0	PTP	Suspected norovirus	St. Louis
38	Aug	Hospital	11	0	PTP	Suspected norovirus	Ramsey
39	Aug	Chicken processing plant	2	2	Chickens	<i>Campylobacter jejuni</i>	Pope
40	Sep	Private	4	0	Unknown	Suspected norovirus	Hennepin
41	Oct	Nursing home	38	0	PTP	Suspected norovirus	Beltrami
42	Oct	School	32	0	PTP	Suspected norovirus	Kandiyohi
43	Oct	Private	3	0	Unknown	Unknown	Yellow Medicine

**Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2010 (continued)**

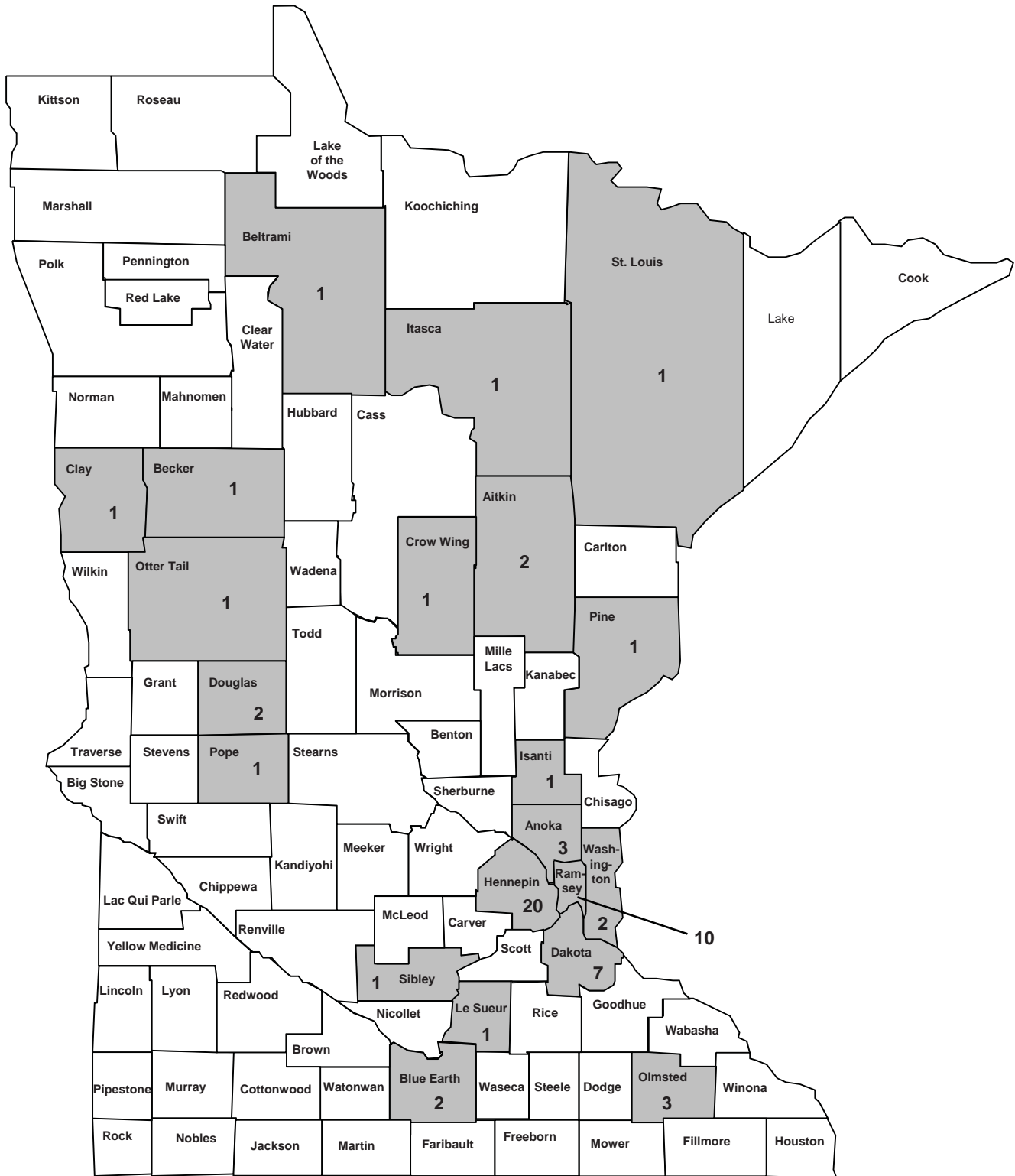
Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
44	Oct-Mar	Laboratory	3	3	Direct exposure to ATCC strain	<i>Salmonella</i> Typhimurium	Multiple states
45	Oct	Private	4	0	Unknown	Unknown	Lake
46	Nov	Group home	7	0	PTP	Suspected norovirus	Nicollet
47	Nov	School	42	0	PTP	Suspected norovirus	Dakota
48	Nov	Nursing home	41	0	PTP	Suspected norovirus	Hennepin
49	Nov	School	100	0	PTP	Suspected norovirus	Hennepin
50	Nov	School	60	0	PTP	Suspected norovirus	Freeborn
51	Nov	Assisted living	17	0	PTP	Suspected norovirus	Dakota
52	Nov	Assisted living	29	0	PTP	Suspected norovirus	Anoka
53	Nov	Private	14	0	Unknown	Unknown	Dakota
54	Nov	School	30	0	PTP	Suspected norovirus	Crow Wing
55	Nov	Assisted living	52	0	PTP	Suspected norovirus	Otter Tail
56	Nov	Private	9	3	PTP	Norovirus	Ramsey
57	Dec	Nursing home	34	0	PTP	Suspected norovirus	Crow Wing
58	Dec	Senior living	9	0	PTP	Suspected norovirus	Brown
59	Dec	Assisted living	9	0	PTP	Suspected norovirus	McLeod
60	Dec	Private	5	0	Unknown	Suspected norovirus	Carver
61	Dec	Restaurant	4	0	Unknown	Suspected norovirus	Hennepin
62	Dec	Private	3	0	Unknown	Unknown	Stearns
63	Dec	School	19	0	PTP	Suspected norovirus	Goodhue
64	Dec	Assisted living	35	0	PTP	Suspected norovirus	Hennepin
65	Dec	Nursing home	22	0	PTP	Suspected norovirus	Hennepin
66	Dec	Assisted living	16	0	PTP	Suspected norovirus	Stearns
67	Dec	Nursing home	30	0	PTP	Suspected norovirus	Ramsey

**Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2010 (continued)**

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
68	Dec	Nursing home	43	0	PTP	Suspected norovirus	Lac Qui Parle
69	Dec	Nursing home	109	0	PTP	Suspected norovirus	Ramsey
70	Dec	Nursing home	25	0	PTP	Unknown	Hennepin
71	Dec	Nursing home	24	0	PTP	Suspected norovirus	Anoka
72	Dec	Assisted living	13	0	PTP	Suspected norovirus	Cass
73	Dec	Nursing home	96	0	PTP	Suspected norovirus	Dakota
74	Dec	Nursing home	11	0	PTP	Suspected norovirus	Chisago
75	Dec	Nursing home	44	0	PTP	Suspected norovirus	Redwood
76	Dec	Nursing home	16	0	PTP	Suspected norovirus	Hennepin
77	Dec	Nursing home	50	0	PTP	Suspected norovirus	Chippewa

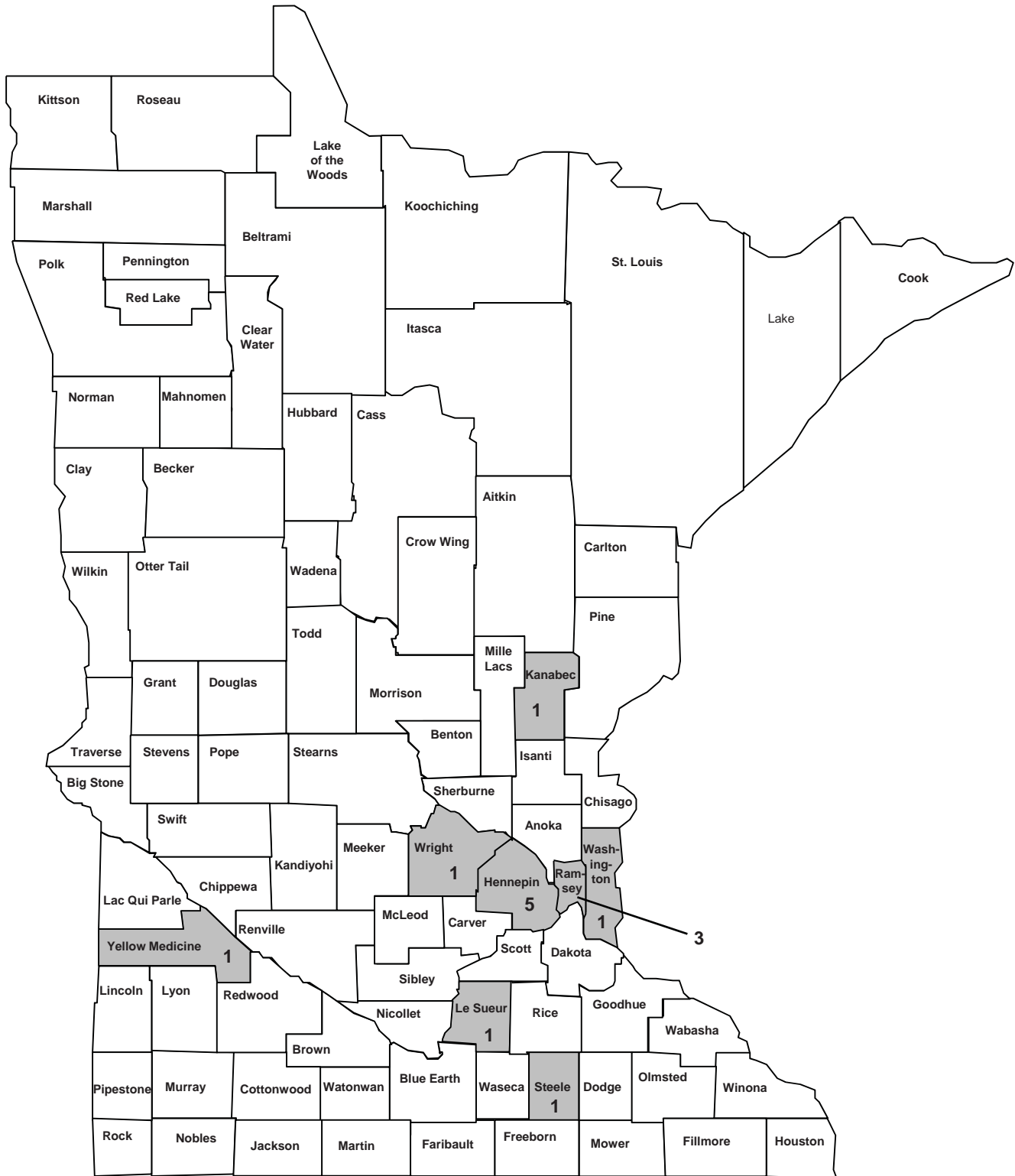
TOTAL: 77

Confirmed Foodborne Outbreaks by County, Minnesota, 2010 (n=68*)

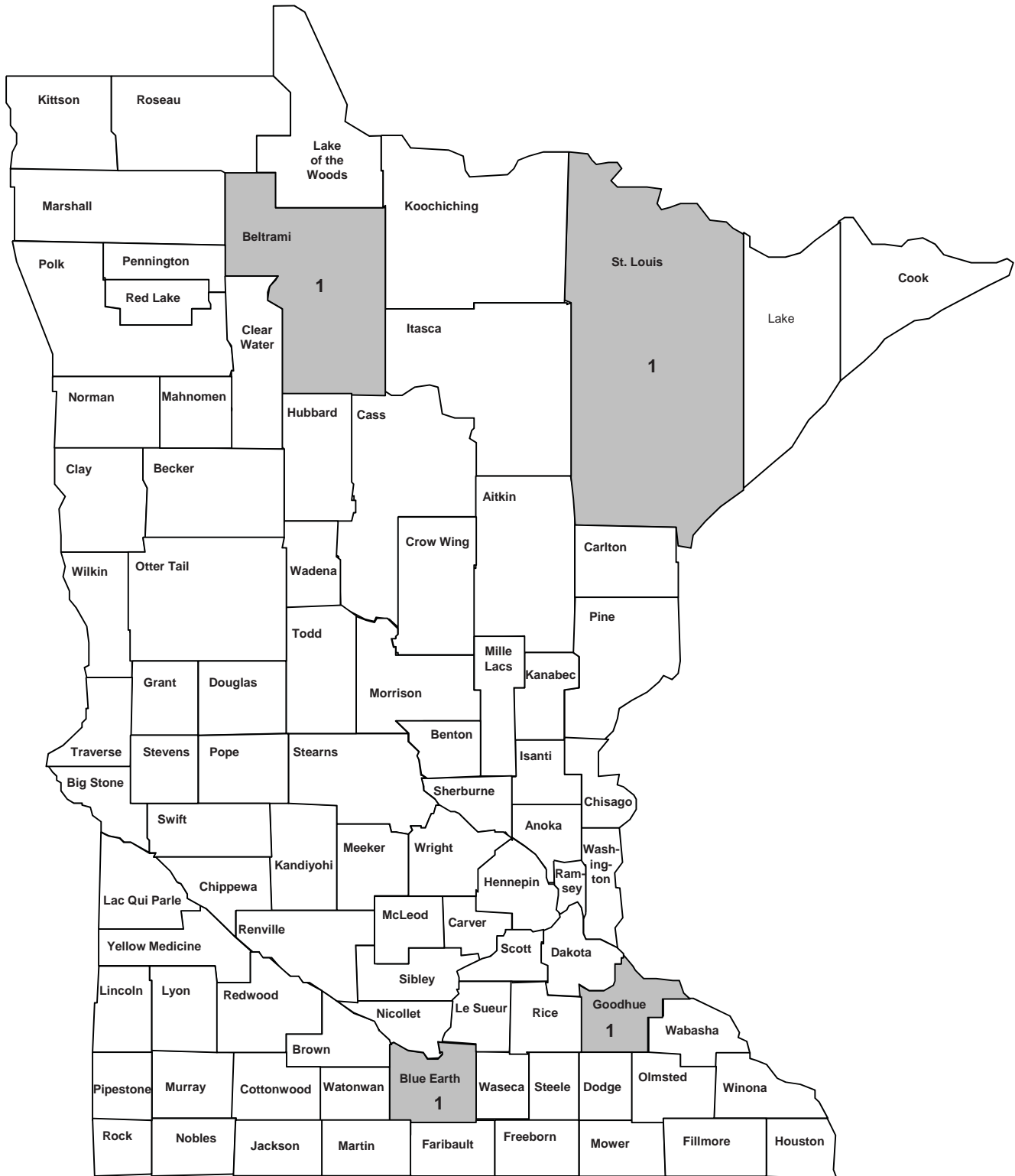


* The total number of confirmed outbreaks in 2010 was 68; however, the numbers on the map add up to 63. The remaining five outbreaks (#17, #20, #37, #42, and #62) involved multiple counties.

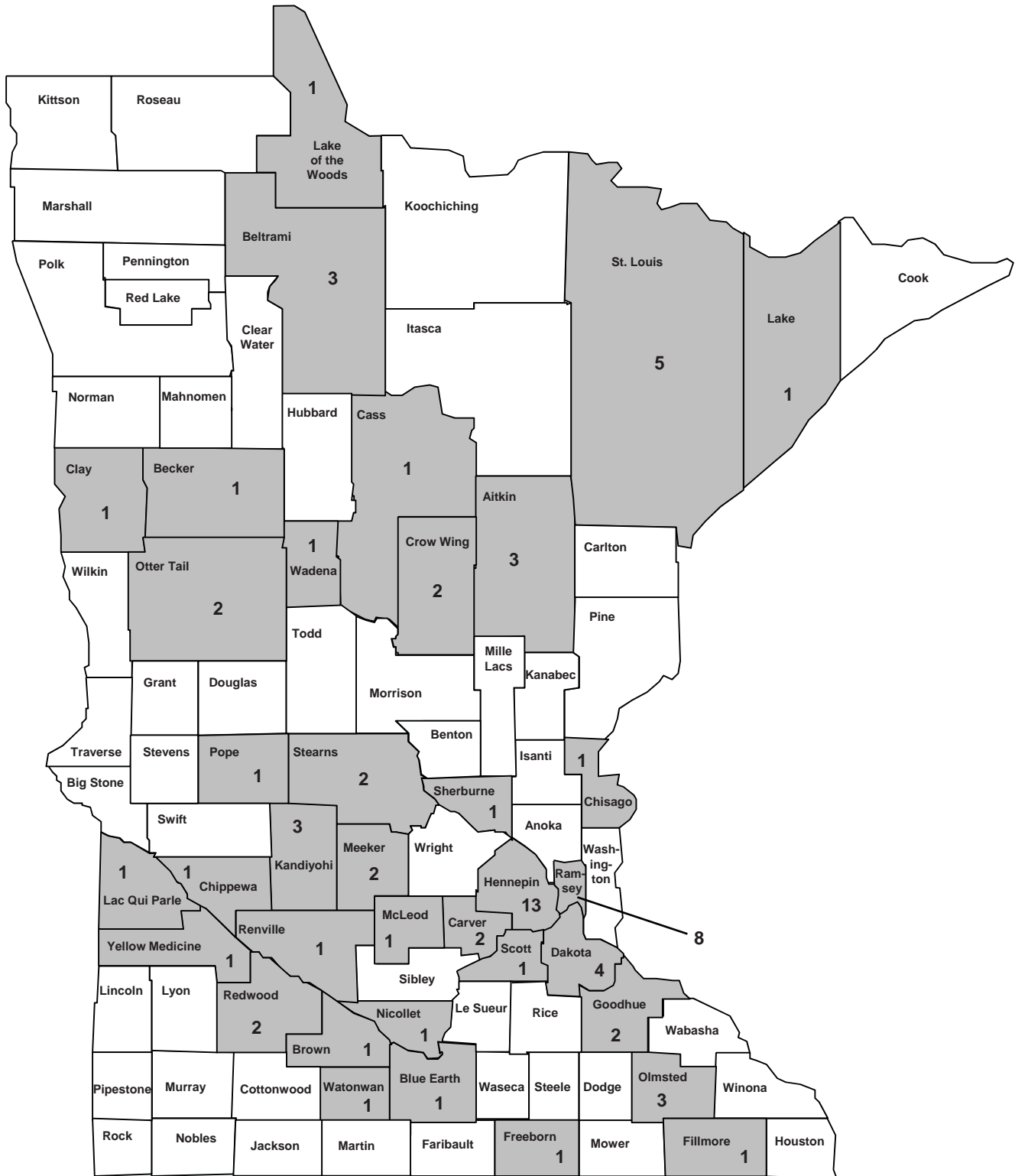
Probable Foodborne Outbreaks by County, Minnesota, 2010 (n=14)



Confirmed Waterborne Outbreaks by County, Minnesota, 2010 (n=4)



Outbreaks with Other or Unknown Routes of Transmission, Minnesota, 2010 (n=77)



Foodborne Illness Complaints, Minnesota, 2010

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
Aitkin County	2	1	3
Anoka County	58	15	53
* Becker County	6	0	6
* Beltrami County	7	1	8
* Benton County	3	0	3
Big Stone County	0	1	1
Bloomington/Richfield, City of	44	27	71
* Blue Earth County	6	0	6
Brooklyn Park, City of	8	0	8
Brown County	7	1	8
* Carlton County	6	0	6
* Carver County	7	0	7
* Cass County	0	0	0
Chippewa County	0	1	1
* Chisago County	5	0	5
Clay County	1	0	1
* Clearwater County	0	0	0
* Cook County	3	0	3
Cottonwood County	0	0	0
* Crow Wing County	8	0	8
Crystal, City of	3	0	3
* Dakota County	66	0	66
* Dodge County	1	0	1
Douglas County	3	0	3
Edina, City of	15	5	20
Faribault County	0	0	0
* Fillmore County	0	0	0
* Freeborn County	4	0	4
Goodhue County	3	0	3
* Grant County	0	0	0
Hennepin County	67	21	88
Hopkins, City of	6	0	6
* Houston County	0	0	0

Foodborne Illness Complaints, Minnesota, 2010 (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	4	0	4
* Itasca County	6	0	6
* Jackson County	0	0	0
* Kanabec County	2	0	2
Kandiyohi County	3	0	3
* Kittson County	0	0	0
* Koochiching County	1	0	1
Lac Qui Parle County	0	0	0
Lake County	6	1	7
* Lake of the Woods County	0	0	0
Le Sueur County	2	0	2
Lincoln County	0	0	0
* Lyon County	1	0	1
* Mahnommen County	0	0	0
Maplewood, City of	17	0	17
* Marshall County	0	0	0
Martin County	0	0	0
* McLeod County	4	0	4
* Meeker County	1	0	1
* Mille Lacs County	4	0	4
Minneapolis, City of	139	0	139
Minnetonka, City of	17	0	17
Moorhead, City of	2	0	2
Morrison County	2	0	2
* Mower County	4	0	4
Murray County	0	0	0
Nicollet County	2	0	2
Nobles County	0	0	0
* Norman County	0	0	0
Olmsted County	11	38	49
* Otter Tail County	7	0	7
* Pennington County	0	0	0
* Pine County	5	0	5

Foodborne Illness Complaints, Minnesota, 2010 (continued)

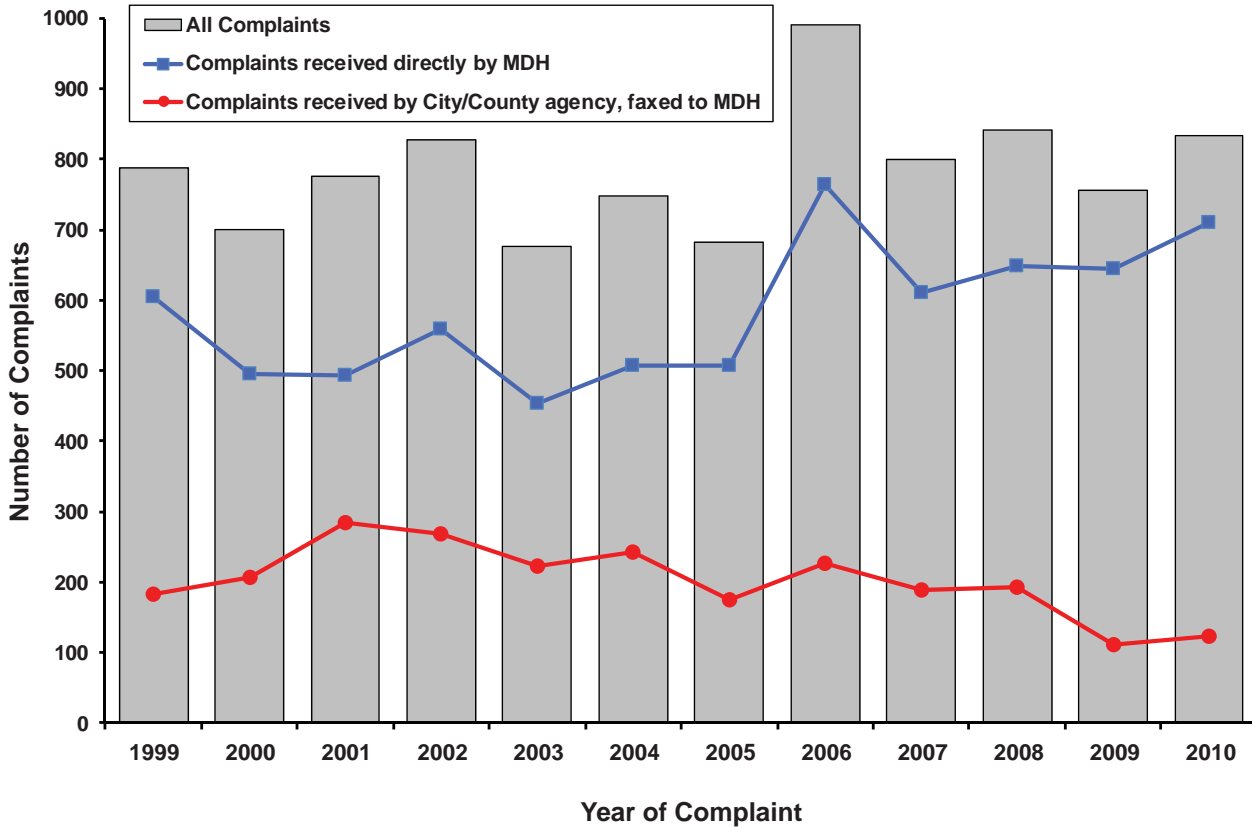
City or County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
Pipestone County	1	0	1
* Polk County	1	0	1
Pope County	1	0	1
Ramsey County	46	0	46
* Red Lake County	0	0	0
Redwood County	1	0	1
Renville County	0	1	1
* Rice County	1	0	1
Rock County	0	0	0
* Roseau County	0	0	0
St. Cloud, City of	15	0	15
St. Louis County	38	0	38
St. Louis Park, City of	8	0	8
St. Paul, City of	82	6	88
* Scott County	9	0	9
* Sherburne County	7	0	7
* Sibley County	0	0	0
Stearns County	10	0	10
* Steele County	5	0	5
Swift County	0	0	0
* Stevens County	0	0	0
Todd County	0	0	0
* Traverse County	0	0	0
Wabasha County	2	0	2
Wadena County	0	0	0
Waseca County	0	0	0
Washington County	32	3	35
Watonwan County	0	0	0
Wayzata, City of	5	0	5
Wilkin County	0	0	0
Winona County	3	0	3
* Wright County	9	0	9
Yellow Medicine County	1	1	2
Bureau of Indian Affairs	13	0	13

Foodborne Illness Complaints, Minnesota, 2010 (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	63	0	63
MDH Environmental Health	0	0	1
U of M	2	0	1
USDA	0	0	0
Total	914	123	1037

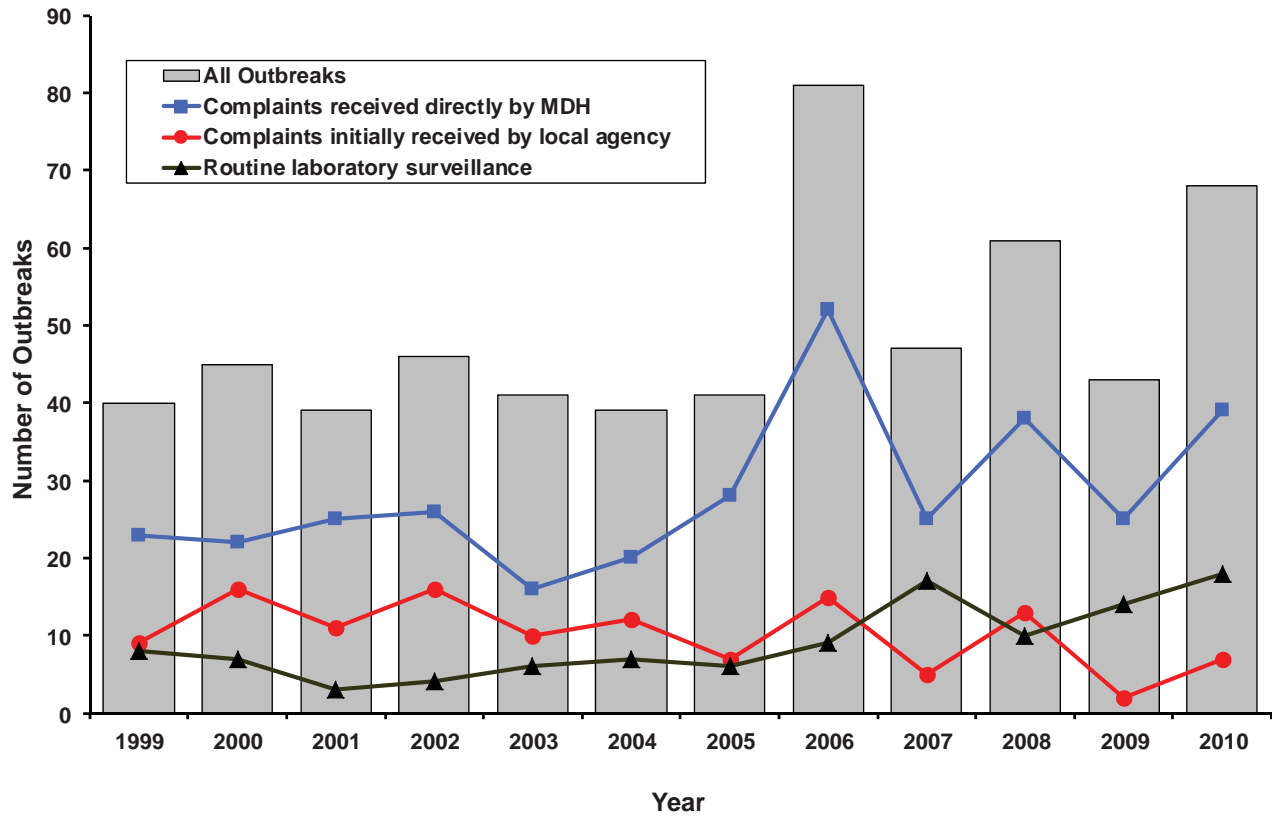
* MDH Environmental Health Services jurisdiction (total number of reports faxed to MDH EHS Metro or District Offices = 192)

Figure 1. Number of Foodborne Illness Complaints per Year, Minnesota, 1999-2010



In 2010, the MDH Acute Disease Investigation and Control Section received 834 foodborne illness complaints. Detailed information on symptoms and a 4-day food history were obtained from each call, and the complaint was faxed to the appropriate jurisdiction for each restaurant, deli, grocery store, or other establishment mentioned in the complaint. Of the 834 complaints received, 711 (85%) were received directly through the MDH foodborne illness hotline (1-877-FOODILL) and 123 (15%) were reported to MDH by local public health agencies (Figure 1). In 2010, 42 (62%) of the 68 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via phone calls from the public; of those, 36 (86%) were reported directly to MDH (Figure 2).

Figure 2. Confirmed Foodborne Outbreaks by Method of Initial Identification, Minnesota, 1999-2010



Foodborne Illness Report
Minnesota Department of Health
Phone: (651) 201-5414 Fax: (651) 201-5082

Stool kit delivered
Daily

Complaint date: ___/___/___ Hotline call: How you got # _____ Tennessen:
Agency: _____ Reporter: _____

First Name: _____ Last Name: _____ Age: _____ Female Male
Address: _____ Zip: _____ Email: _____
Home phone: (____) _____ Work phone: (____) _____ Cell: (____) _____

Establishment that the complainant suspects: _____

Number of persons exposed: _____ Number ill: _____

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: _____ Incubation period from common event (hrs): _____

Foods eaten at common event: _____

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: _____ Incubation period from common event (hrs): _____

Foods eaten at common event: _____

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: _____ Incubation period from common event (hrs): _____

Foods eaten at common event: _____

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

Tennessee Statements

The Tennessee 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**

Date: _____

Name of Outbreak
City, MN
Date

Interviewer: _____

Name: _____ Age _____ Sex: F M
Street: _____ City: _____ County: _____
State: _____ Zip code: _____ Phone (H) _____ (W) _____

Illness Onset: _____/_____/_____	Time: _____	Recovery: _____/_____/_____	Time: _____
Vomiting <input type="checkbox"/> Y <input type="checkbox"/> N	Onset: _____/_____/_____	Time: _____	Recovery: _____/_____/_____
Diarrhea <input type="checkbox"/> Y <input type="checkbox"/> N	Onset: _____/_____/_____	Time: _____	Recovery: _____/_____/_____
Number of stools per 24-hr period (max): _____		Diarrhea duration: _____ days/hours	
Bloody stools <input type="checkbox"/> Y <input type="checkbox"/> N	Cramps <input type="checkbox"/> Y <input type="checkbox"/> N	Fever <input type="checkbox"/> Y <input type="checkbox"/> N	Temperature _____ °F
First Symptom: _____	Onset Date: _____/_____/_____	Time: _____	
Other Symptoms: _____	Onset Date: _____/_____/_____	Time: _____	
Called Provider: <input type="checkbox"/> Y <input type="checkbox"/> N	Visited Provider: <input type="checkbox"/> Y <input type="checkbox"/> N	Office / ER	Date of Visit: _____/_____/_____
Provider requested stool sample: <input type="checkbox"/> Y <input type="checkbox"/> N	Stool submitted: <input type="checkbox"/> Y <input type="checkbox"/> N	Hospitalized: <input type="checkbox"/> Y <input type="checkbox"/> 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
_____	_____	_____/_____/_____
_____	_____	_____/_____/_____
_____	_____	_____/_____/_____