MINNESOTA DEPARTMENT OF HEALTH 2008 GASTROENTERITIS OUTBREAK SUMMARY

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

Compiled by:

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

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

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

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MINNESOTA DEPARTMENT OF HEALTH
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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 (note: for botulism, marine toxins, and chemical exposures, even a single case is classified as an outbreak). 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

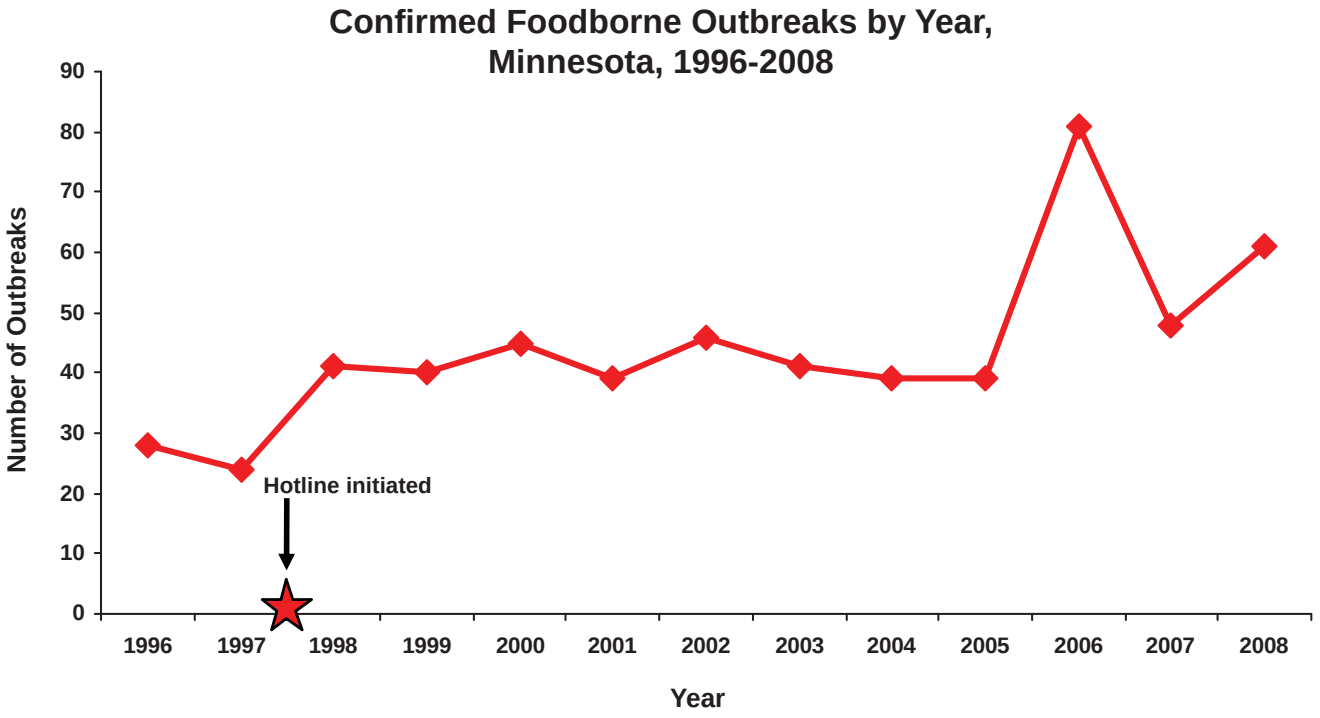
These are similar to foodborne outbreaks, except epidemiologic evaluation implicates water as the source of illness. Waterborne outbreaks may be associated with drinking water or with recreational water.

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 2008, the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section identified a total of 148 outbreaks of gastroenteritis involving at least 3,050 cases of illness. The 148 outbreaks were classified as follows: 61 confirmed foodborne outbreaks, 16 probable foodborne outbreaks, 4 confirmed waterborne outbreaks, and 67 outbreaks with other or unknown routes of transmission (see page 1 for definitions). The median annual number of confirmed foodborne outbreaks from 1996-2007 was 41 (range, 24 to 81). The median number of cases identified per confirmed foodborne outbreak in 2008 was 8 (range, 1 to 46).



In 2008, 50 (82%) of the 61 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via complaint calls from the public. Ten (16%) outbreaks were identified through routine laboratory-based surveillance of reportable bacterial pathogens, and one (2%) was identified through a report from Poison Control.

Of the 61 confirmed foodborne outbreaks, 43 (70%) were either laboratory-confirmed (n=38) or epidemiologically defined (n=5) outbreaks of norovirus gastroenteritis. There were nine (15%) confirmed foodborne outbreaks caused by *Salmonella*, two (3%) by *Campylobacter jejuni*, and one (2%) by *Clostridium perfringens*. The remaining six (10%) confirmed foodborne outbreaks were classified as suspected bacterial intoxications (most likely caused by *Clostridium perfringens* or *Bacillus cereus*).

The predominance of norovirus as a cause of foodborne disease outbreaks in 2008 continues a pattern that has been observed for over two decades in Minnesota. During 1981-2008, 411 (53%) of 776 confirmed outbreaks of foodborne disease were due to norovirus, while 157 (20%) 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 food items, minimizing environmental contamination, and excluding ill employees from work until 72 hours after recovery.

There were nine confirmed foodborne outbreaks caused by *Salmonella* in 2008; this equals the highest number of salmonellosis outbreaks identified in Minnesota in a single year (along with 2006). In 2008, two salmonellosis outbreaks were associated with single food service establishments, and one was associated with privately prepared homemade ice cream. There were six salmonellosis outbreaks involving commercially distributed products, including cereal, breaded and stuffed chicken products (two outbreaks), jalapeño peppers, raw turkey, and peanut butter. 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.

There were two outbreaks of campylobacteriosis identified in 2008, both associated with consumption of raw milk.

Seven of the confirmed foodborne outbreaks identified in Minnesota in 2008 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 2008; two were cryptosporidiosis outbreaks, one was an outbreak of both cryptosporidiosis and giardiasis, and one was a norovirus outbreak. The cryptosporidiosis outbreaks were associated with a fitness center swimming pool and a hotel water park, respectively. The outbreak of both cryptosporidiosis and giardiasis was associated with a fitness center pool, and the norovirus outbreak was associated with a swimming beach at a campground.

There were 67 outbreaks with other or unknown routes of transmission in 2008. 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. Three of these outbreaks were due to animal contact: *Salmonella* Montevideo infections associated with contact with chicks and ducklings, *Salmonella* Enteritidis infections associated with contact with mice, and *E. coli* O157:H7 infections likely associated with a farm.

Confirmed Foodborne Outbreaks

(1)
Norovirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 8, 2008, the Minneapolis Division of Environmental Health (MDEH) received a call from a restaurant reporting two complaints of gastrointestinal illness from separate dining parties that had eaten meals on January 4. On January 10, the Minnesota Department of Health (MDH) received two additional complaints of gastrointestinal illness among two other parties that had eaten meals at the restaurant on January 4 and 5, respectively. On January 10, after interviewing people in the two additional parties, MDH notified Hennepin County Public Health Department (HSPHD) epidemiology and MDEH, and an investigation was initiated.

MDH and HSPHD epidemiology staff interviewed members of three of the complainant groups (the fourth dining party chose to report their illness anonymously and did not provide specific symptom details). A list of credit card receipts from patrons who ate at the restaurant on January 4 and 5 was obtained from the restaurant; HSPHD epidemiologists called patrons from this list to collect illness and food consumption histories. A case was defined as a person who ate at the restaurant on January 4 or 5 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). On January 11, MDEH sanitarians inspected the restaurant and interviewed employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and storage procedures.

Each of the three original complainant groups consisted of individuals from separate households who had no other recent meals or events in common. No information was available for the number of households involved in the fourth group. Three of the four (75%) patrons in Group A were interviewed, four of the five (80%) patrons in Group B were interviewed, and both patrons in Group C were interviewed. Nine additional patrons who ate on January 4 or 5 were also interviewed; one identified from the credit card receipt list reported gastrointestinal illness meeting the case definition.

Of the 18 patrons interviewed, nine (50%) met the case definition. All nine reported diarrhea, six (67%) vomiting, four (44%) cramping, and one (11%) bloody diarrhea. The median incubation period was 34.5 hours (range, 12 to 42 hours). The median duration of illness was 43 hours (range, 4 to 72 hours). Five of the ill patrons were male and four were female, ages 33 to 68 years (median age, 41 years). The ill patron with bloody diarrhea saw his healthcare provider who requested a stool sample for bacterial culture; this sample tested negative for *E. coli* and *Salmonella*. A stool sample was submitted by another ill patron to the MDH Public Health Laboratory and was positive for norovirus.

The patrons interviewed consumed a variety of food items, with some dining parties sharing salads or entrees. Both ill and non-ill patrons reported eating various lettuce salads, pasta entrees, main entrées (veal and fish), and desserts (crème brulée and chocolate cake). Beverages included ice water and wine. No specific food items were statistically associated with illness.

MDEH staff inspected the restaurant on January 11 and began interviewing employees. All of the 27 employees were interviewed, and three reported recent gastrointestinal symptoms. A line cook reported that he had diarrhea on January 4 and 5 and had worked during his illness. This particular employee prepared salads, desserts, panini sandwiches, and soups while he was ill. Two additional employees reported illness beginning on January 6. The first employee (a server) ate a panini sandwich prepared by the ill food handler on January 4 and became ill with vomiting and diarrhea on January 6. This employee's boyfriend ate the panini sandwich leftovers on January 5 and became ill with gastrointestinal symptoms on January 6. The second employee (a host) reported vomiting beginning on January 6. This ill employee also mentioned that her father had been ill with similar symptoms previous to her onset. Stool samples submitted by the ill line cook and server both tested positive for norovirus. Nucleic acid sequencing was conducted on one positive norovirus sample from the patron and one from a food worker; the nucleic acid sequences were identical.

The MDEH sanitarians noted overall compliance with food code requirements for food preparation. The facility was scrupulously clean, all temperatures were adequate, and all food handlers were wearing gloves. 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. All ill employees were excluded from working at the restaurant for 72 hours following recovery from gastrointestinal symptoms.

This was an outbreak of norovirus gastroenteritis associated with consuming a meal at a Minneapolis restaurant. While no specific food item was implicated as a vehicle, it is likely that several food items were contaminated by an ill food worker.

(2)
Salmonella Agona Infections Associated with Packaged Cereals

January Multiple states

On April 5, 2008, Company A issued a recall of unsweetened Puffed Rice cereals and unsweetened Puffed Wheat cereals because routine testing detected the presence of *Salmonella* in its Northfield, Minnesota plant that produces and packages dry cereals. On April 7, PulseNet identified a cluster of human *Salmonella* Agona isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns in multiple states, including one isolate in Minnesota. On April 10, the Centers for Disease Control and Prevention (CDC) was informed by several state health departments that patients infected with *S.* Agona with the outbreak PFGE pattern had eaten company A cereal products. A multi-state investigation was initiated.

Company A submitted the plant *Salmonella* isolate to the Minnesota Department of Health Public Health Laboratory (MDH PHL) for serotyping and PFGE subtyping.

A case was defined as a person who had a *S*. Agona isolate that matched the outbreak PFGE pattern (CDC Xbal designation JABX01.0001 and Bln1 designation JABA26.0001) and who had illness onset from January 1 to May 31, 2008. The Minnesota case was interviewed with a broad-based exposure questionnaire.

On April 11, the MDH PHL confirmed that the *Salmonella* isolate isolated from the Minnesota plant was Agona and had the same indistinguishable PFGE pattern as the isolates from ill humans. Additionally, both the Delaware and New York State Public Health Laboratories isolated Agona with matching PFGE patterns from two bags of Puffed Rice cereal produced by Company A.

Twenty-eight cases were identified from the following 15 states: Colorado (n=1), Delaware (n=2), Illinois (n=1), Maine (n=4), Massachusetts (n=2), Michigan (n=1), Minnesota (n=1), North Dakota (n=1), New Hampshire (n=2), New Jersey (n=5), New York (n=3), Ohio (n=1), Pennsylvania (n=2), Rhode Island (n=1), and Vermont (n=1). Onset dates were known for 23 cases and ranged from January 1 to April 10, 2008. The median age of cases was 65 years (range, 4 months to 95 years). Eight hospitalizations and no deaths were reported.

The one Minnesota case was a 96 year-old female with illness onset on January 4, 2008. The case reported diarrhea, vomiting, and fever. The duration of illness was 7 days, and the case was hospitalized for 1 day. She reported consumption of an unknown brand of puffed wheat that was from a large generic plastic bag.

This was a multi-state outbreak of *S*. Agona infections associated with consumption of puffed cereal. The implicated cereal products were recalled and the public was alerted through a press release.

(3)
Norovirus Gastroenteritis Associated with a Wedding Reception

January Washington County

On January 15, 2008, the Washington County Department of Public Health & Environment (WCPHE) received a complaint about two people developing vomiting and diarrhea following a wedding reception in Forest Lake, Minnesota on January 12. Events included a groom's dinner on January 11 (with limited guest attendance) and the reception on January 12. Foods served at the reception included lasagna, fettuccine alfredo, spaghetti, meatballs, bread sticks, Caesar salad, and wedding cake. The food was prepared by a restaurant in Forest Lake and the cake was made by an unknown, external business.

A list of reception attendees was accumulated from the stepfather of the bride and from subsequent calls. Guests were interviewed by phone about 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 attending the reception dinner. Stool kits were sent to ill persons who consented to submitting a stool sample. An environmental health specialist from WCPHE visited the restaurant and assessed food preparation and handling procedures and interviewed staff regarding recent illness.

A total of 165 guests attended the wedding reception. A total of 75 attendees were interviewed; 30 (40%) met the case definition, 39 (52%) reported no symptoms, and six (8%) reported mild symptoms that did not meet the case definition. Two of the 30 cases were removed because they were considered secondary cases by definition of a case with the same address having an onset of illness at least 24 hours after another household member. Twenty (71%) of 28 cases had vomiting, 25 (89%) of 28 cases had diarrhea, 13 (50%) of 26 cases had abdominal pain, and 9 (35%) of 26 cases had a fever. The median incubation period was 40 hours (range, 5 to 64 hours). The median duration of illness was 28 hours (range, 17 to 52 hours). Three stool kits were sent to ill cases; all three kits were returned to the Minnesota Department

of Health (MDH). All three stool samples received by the MDH Public Health Laboratory tested positive for norovirus, genogroup II. No restaurant food workers reported illness and foodborne illness risk factors were not observed in the restaurant setting.

Of the foods served at the reception, only Caesar salad came back statistically associated with illness (23 of 28 cases vs. 23 of 39 controls; odds ratio, 3.2; 95% confidence interval, 1.0 to 10.2; $p = 0.04$). No other events were associated with illness.

Food preparation for this event was handled primarily by one employee, but four wait staff assisted in the preparation of salads and olive trays. All restaurant employees were interviewed and none reported recent gastrointestinal illness. The restaurant did not receive any additional reports of illness during this time. Risk factors for foodborne illness transmission were not observed in the restaurant during the environmental health inspection.

This was an outbreak of norovirus gastroenteritis among guests at a wedding reception. Caesar salad was identified as the vehicle of transmission. The source of contamination of the Caesar salad was not identified.

(4)
Norovirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 24, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among two members from separate households who had eaten at a restaurant in the Mall of America on January 18. The City of Bloomington Environmental Health (CBEH) was notified and an outbreak investigation was initiated.

On January 24, CBEH conducted an inspection of the restaurant focusing on employee hygiene, food handling, and equipment sanitation. On January 25, CBEH staff interviewed restaurant employees that worked on January 18 using a standard questionnaire about recent illness history and job duties.

A list of patrons from January 18 was obtained from the restaurant. On January 28 and 29, CBEH interviewed 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 the two original complainant patrons and submitted to MDH Public Health Laboratory for bacterial and viral testing.

Illness histories and exposure information were obtained from 21 patrons. Seven (33%) cases were identified. All seven cases reported diarrhea, five (71%) cramps, four (57%) fever, and two (29%) vomiting. The median incubation period was 24 hours (range, 9 to 37 hours). The median duration of illness was 42 hours (range, 8 to 105 hours). 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. Cases reported eating a variety of salads, side dishes, and entrees. No food item was statistically associated with illness.

The environmental health investigation revealed no critical violations or non-compliant risk factors. Twelve restaurant employees were interviewed; one employee reported onset of vomiting and diarrhea the evening of January 16. The employee did not return to work until January 19. The ill employee tested positive for norovirus genogroup II. Attempts at nucleic acid sequencing on the employee's positive stool sample were unsuccessful.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. A specific food vehicle was not identified. An employee who was ill prior to the implicated meal date was identified; norovirus was identified from this employee. The most plausible source of the outbreak was an unrecognized infected food worker who had contact with one or more ready-to-eat food items.

(5)
Norovirus Gastroenteritis Associated with a Restaurant

January Carver County

On January 22, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint from a group of patrons who had eaten food from a restaurant in Chanhassen on January 19. Three of the five group members had become ill after taking hamburgers, fries, and sodas to go. The food was consumed in the home of one of the complainants. MDH initiated an investigation on January 22.

On January 23, an MDH Environmental Health sanitarian completed a full facility inspection and began interviewing food workers at the facility. 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 Chanhassen. The restaurant provided a list of patron names from credit card receipts from the January 19 meal date. Stool samples were collected from the three ill complainants and one ill food worker and submitted to MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Three of the complainants met the case definition. Phone interviews were completed for 17 additional patrons identified through credit card receipts. Of these, two patrons reported gastrointestinal illness symptoms but did not meet the case definition; therefore, they were excluded from further analyses. The median incubation period for cases was 24 hours (range, 24 to 33 hours). All three cases reported diarrhea, vomiting, and fever, two (67%) cramps, and none reported bloody diarrhea. Duration of illness information was not available for any of the cases because their illness was ongoing at the time of interview. None of the cases were hospitalized. All three stool specimens tested positive for norovirus. No food items were statistically associated with illness.

Interviews were completed for all 35 employees at the restaurant. Three employees reported gastrointestinal symptoms. One reported having diarrhea that began on January 22 and lasted for 3 hours. The employee had eaten various foods (including a hamburger, a salad, and a sandwich) at the restaurant prior to his illness. One employee reported vomiting once on January 21 and one reported mild gastrointestinal symptoms (nausea and cramps) with an unclear onset date. The environmental health investigation report indicated that gloves were not being used for tasks such as cutting tomatoes and onions, and dressing sandwiches. The report also noted that the dish machine was not properly sanitizing dishware and that plastic silverware was not stored in a manner that minimized contamination

by employee hand contact. The employee stool specimen tested positive for norovirus; however, viral sequencing could not be performed on it.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Chanhassen. Mildly ill food workers were identified, and one tested positive for norovirus. A specific food vehicle was not identified. However, the source of the outbreak likely was an infected food worker that contaminated ready-to-eat foods.

(6)
Norovirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 31, 2008, the Hennepin County Public Health Department (HSPHD) epidemiology unit received a complaint of gastrointestinal illness among a group of patrons who had eaten box lunches at a staff meeting catered from a restaurant in Eden Prairie on January 25. HSPHD notified the Minnesota Department of Health (MDH) and the HSPHD environmental health unit, and an investigation was initiated.

HSPHD epidemiology staff interviewed members of the original complainant group. A list of other groups who ordered box lunches on January 25 was obtained from the restaurant; HSPHD epidemiologists called patrons from this list to assess illness. A case was defined as a person who ate food from the restaurant on January 25 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool kits were sent to complainants and tested for bacterial and viral pathogens at the MDH Public Health Laboratory (PHL).

On January 31, HSPHD sanitarians inspected the restaurant and interviewed 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. Stool kits were also given to ill employees for testing at the MDH PHL.

The original complainant group consisted of work colleagues who had no other meals or events in common. Nine of the 12 work colleagues who attended the lunch meeting were reached for interview. Of those, three (33%) met the case definition, as did a meeting attendee's spouse who did not attend the meeting but ate sandwich leftovers on January 26. The meeting attendee whose spouse became ill ate one half of the box lunch sandwich, but removed all of the toppings and vegetables and had no illness; her spouse ate the other half of the leftover sandwich with all of the toppings and vegetables and subsequently became ill.

All four cases had diarrhea, three (75%) vomiting, and three (75%) cramps. The median incubation period was 22.5 hours (range, 15 to 31.5 hours). The median duration of illness was 50 hours (range, 0.5 to 96 hours). A stool sample submitted to the MDH PHL by one case was positive for norovirus.

The box lunches contained pre-made turkey, roast beef, or Italian combo sandwiches with lettuce, tomato, cheese, other vegetables (depending on the type of sandwich), and dressing. Also included were a pickle, pre-packaged potato chips, and a cookie. The restaurant provided bottled water and cans of soda. No specific sandwich or other item was statistically associated with illness.

Representatives from seven additional patron groups who ordered box lunches from the restaurant on January 25 were also interviewed. The HSPHD epidemiologist contacted the member of each group who had placed the order and none were aware of any illness among the various groups (ranging in size from 3 to 50 people). Several group representatives agreed to pass the HSPHD epidemiology telephone number on to members of their group to call in if they had had any gastrointestinal symptoms. HSPHD epidemiology did not receive any calls from group members.

HSPHD environmental health staff inspected the restaurant on January 31 and began interviewing employees. Thirty-nine (93%) of the 42 employees were interviewed; nine (23%) reported recent gastrointestinal symptoms. Seven of the ill employees had symptoms previous to or on the implicated meal date. One of these was a staff person who prepared vegetables and sandwiches and who reported vomiting January 1 through January 4; this employee also reported having an ill infant in his home with vomiting and diarrhea from January 10 through January 24. Another was a staff person who assisted in preparing the sandwiches in the box lunches and who reported vomiting and diarrhea on January 23 and 24. Two additional employees had illness after the implicated meal date: a shift manager reported vomiting beginning on January 26 and diarrhea beginning on January 27, and a bus staff person had vomiting and diarrhea beginning on January 29. A stool sample submitted by the ill food worker who prepared vegetables and sandwiches tested positive for norovirus with a nucleic acid sequence that matched the positive patron.

The HSPHD sanitarians noted several violations. There was no chlorine sanitizer in the dishwasher, no hand soap at the hand sink in the meat slicing and vegetable preparation area, no disposable gloves near the meat and vegetable preparation area, and no employee illness log. The sanitarians also noted that the restaurant's hand sinks were not equipped with a foot pedal, knee pedal, sensor, or any other method for hands free operation. The sanitarians 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 all ill employees were excluded from working at the restaurant for 72 hours following their last gastrointestinal symptom. All violations were corrected by February 5.

This was an outbreak of norovirus gastroenteritis associated with consuming a box lunch from a restaurant. Sandwiches were contaminated by one or more infected food workers who had prepared the ingredients (bread, sliced vegetables, and other toppings) and/or assembled the sandwiches.

(7)
Norovirus Gastroenteritis Associated With a Restaurant

January Ramsey County

On February 8, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from three people from a group of 10 who ate lunch at a restaurant in St. Paul on January 30. These 10 people were part of a larger group of 12 who also participated in a non-food-related activity together after the meal. Upon following up with the restaurant manager, the sanitarian from St. Paul Environmental Health learned of two cases of illness among food workers there. An outbreak investigation was initiated on February 8.

A list of all 12 members of the complainant group was obtained. In addition, a partial list of credit card names from the January 30 meal date was obtained from the restaurant, and MDH attempted to interview additional patrons. A case was defined as a person with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) following a meal at the restaurant. Stool samples were collected from two ill complainants and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing. Interviews were completed for all food workers at the restaurant to assess gastrointestinal symptoms experienced since January 16, as well as job duties and work history. One ill food worker submitted a stool specimen to the MDH PHL.

Illness histories and exposure information were obtained for 11 of the 12 members of the complainant group. No additional patrons were able to be contacted through credit card receipts. Three people met the case definition; one additional person reported gastrointestinal symptoms but did not meet the case definition and was therefore excluded from further analysis. Of the seven patrons who did not report any symptoms, two did not eat at the restaurant (but did attend the event afterwards). All cases reported vomiting and cramps, two (67%) diarrhea, one (33%) fever, and none reported bloody diarrhea. The median incubation period was 31 hours (range, 9 to 39 hours). The median duration of illness was approximately 6 days (range, 72 hours to 7.5 days).

The three cases all ate tomato basil soup and either a turkey sandwich or a grilled cheese sandwich (both of which had tomatoes on them). The controls ate a variety of soups and salads (but none ate a sandwich). Among those in the group that ate lunch at the restaurant, eating a sandwich was associated with illness (3 of 3 cases vs. 0 of 5 controls; odds ratio, undefined; 95% confidence interval lower limit, 4.1; $p = 0.02$).

All 33 employees were interviewed by MDH and St. Paul Environmental Health staff. Three employees reported gastrointestinal symptoms: one employee reported diarrhea and cramps beginning on January 18, one employee reported cramps with an unclear onset date, and one (Employee A) reported vomiting, diarrhea, and cramps beginning in the evening on January 30. Employee A had limited food preparation responsibilities which included putting salad together with tongs and mixing coleslaw with gloves. Employee A ate a salad from the restaurant on January 30. The spouse of Employee A also ate a salad brought home by Employee A on January 30, and became ill with vomiting and diarrhea on January 31.

Both stool specimens submitted by the cases tested positive for norovirus genogroup II. The employee who was ill beginning on January 30 also tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the employee sample and one case sample; the nucleic acid sequences were identical.

This was a foodborne outbreak of norovirus gastroenteritis associated with consumption of sandwiches at a restaurant in St. Paul. An ill food handler likely contaminated one of the sandwich ingredients.

(8)
Salmonella Enteritidis Infections Associated with a Restaurant

February Hennepin County

On February 25, 2008, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified six isolates of *Salmonella* Enteritidis that were indistinguishable by pulsed-field gel

electrophoresis (PFGE); the isolates were designated PFGE subtype SE1B1. All of the cases resided in Hennepin County. Routine interviews of the cases revealed that five of them had eaten at the same restaurant in Minneapolis during the week before their illness onset. Hennepin County Public Health Protection -- Epidemiology (HCPHP) and the Minneapolis Division of Environmental Health (MDEH) were notified and an investigation was initiated.

All *Salmonella* cases reported to MDH are interviewed about exposures and food consumption as part of foodborne disease surveillance in Minnesota. Epidemiologists reviewed the information gathered during the interviews of *S.* Enteritidis cases to identify other potential cases associated with eating at the restaurant.

Cases were defined as persons who had *S.* Enteritidis SE1B1 isolated from stool cultures or persons who had fever and diarrhea (≥3 or more loose stools in a 24-hour period), and who reported eating at the restaurant since January 28 (and prior to onset of symptoms). Probable cases were those who had diarrhea, but did not report fever, and had eaten at the restaurant since January 28.

After the investigation had been initiated, MDH was notified of illness in individuals that attended a seminar event which received catered sandwiches from the restaurant on February 13. A complete list of attendees was not available, but staff from MDH and HCPHP manually and electronically distributed questionnaires to event attendees.

A case-control study was attempted to evaluate particular food items from the restaurant. Controls were meal companions of cases and probable cases who reported no gastrointestinal symptoms, as well as patrons who had eaten at the restaurant from February 19 to February 24.

On February 25, MDEH sanitarians conducted an inspection of the restaurant and began interviewing employees. An MDH epidemiologist did an environmental assessment which included taking 18 environmental samples. Names of patrons from February 19 to February 24 were obtained from the restaurant. HCPHP epidemiologists called patrons to ascertain illness history and food consumption at the restaurant. Stool samples were required from all food workers.

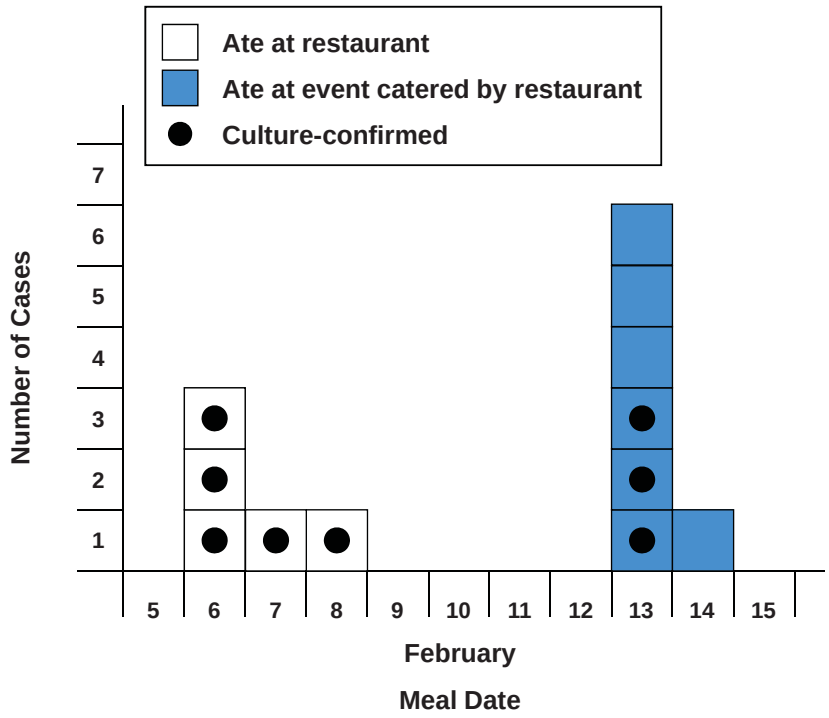
Due to the frequency of the outbreak subtype, all *S.* Enteritidis isolates were subtyped by PFGE using three restriction enzymes and multiple-locus variable-number tandem repeat analysis (MLVA) at the MDH Public Health Laboratory.

Fifteen cases (11 culture-confirmed and four not culture-confirmed) were identified. Of the 15 cases, all reported diarrhea, 13 (87%) cramps, 12 (80%) fever, six (40%) bloody diarrhea, and five (33%) vomiting. None of the cases were hospitalized. Meal dates ranged from January 28 to February 13 (see epidemic curve). The median incubation period was 62 hours (range, 12 to 154 hours), with the earliest onset of illness being February 6. The median duration of illness was 10 days (range, 8 to 18 days) for the five cases who had recovered at the time of interview. Three probable cases were also identified.

Cases had eaten a variety of foods, including salads, appetizers, sandwiches, and soups. Statistical analysis was done on the food items using well meal companions and controls who had eaten at later meal dates. Of the available 37 controls, two were well meal companions, four were seminar attendees, and 31 were patrons with meals dates from February 19 to 24. Sandwiches were statistically significant by univariate analysis (15 of 15 cases vs. 17 of 37 controls; odds ratio, undefined; $p < 0.001$). However,

the value of this comparison is limited because the meal dates for most of the controls were different than meal dates for the cases.

Salmonella Enteritidis Cases Associated with a Restaurant, by Meal Date*



*Meal dates unknown for three culture-confirmed cases

On the February 25 visit, MDEH found that food preparation processes failed to minimize bare-hand contact with ready-to-eat foods. MDEH also observed improper use of a food sink to sanitize utensils, improper refrigerator temperatures, lack of date-marking for cooked meats, and areas underneath equipment in the kitchen that needed to be thoroughly cleaned.

The 18 environmental samples taken from the stove, grill, cooler, cutting boards, knives, scissors, mixer, freezer, fridge, meat cutter, serving pans, ice bin, cash register, and four sinks on February 25 were negative for *Salmonella*.

Two of the food workers at the restaurant tested positive for *S.* Enteritidis. Isolates from these food workers matched isolates from patrons by PFGE and MLVA. None of the six food workers reported symptoms of recent gastrointestinal illness, including the two who tested positive for *Salmonella*. The positive food workers were excluded from work in food service until two consecutive stools collected at least 24 hours apart tested negative for *Salmonella*. One of the positive food workers stopped submitting samples before reaching two consecutive negatives, as this employee was no longer working at the restaurant. The second positive food worker submitted specimens until having two consecutive negative stool samples. The duration of shedding for this employee was 28 days. By April 10, this employee had been cleared to return to work.

One of the positive food workers had started working at this restaurant 2 days prior to the first implicated meal date. The main work duties for this employee were preparation of sandwiches and

spring rolls, the two items most commonly consumed by cases. This employee was also one of two food workers responsible for preparing the sandwiches supplied to the seminar event on February 13. The other positive food worker reportedly only worked at the cash register. The owner of the restaurant owned two additional restaurants in the Minneapolis area. These restaurants share food suppliers, but there is no overlap in employees. During this time period, there were no illnesses reported from patrons that ate at either of the other two restaurants.

This was an outbreak of *S.* Enteritidis infections associated with eating food from a restaurant in Minneapolis. Infected food workers were the source of transmission of *Salmonella* to patrons. This may have been a result of food preparation processes that failed to minimize bare-hand contact with ready-to-eat foods. There was no evidence of ongoing transmission after the infected employees were excluded from working in food service. There were also no illnesses reported from individuals who patronized the other two restaurants that received common ingredients during the time period investigated.

(9)
Norovirus Gastroenteritis Associated with a Restaurant

February Hennepin County

On February 25, 2008, the City of Bloomington Environmental Health (CBEH) received notification from the Minnesota Department of Health (MDH) regarding a restaurant employee who was positive for *Salmonella*. CBEH made a site visit to the restaurant on February 26 to discuss the notification with restaurant management. The duties of the employee who tested positive for *Salmonella* were restricted. In addition, the manager reported to CBEH a patron complaint of possible foodborne illness. The complainant and one other individual had dined together at the restaurant on February 21 and subsequently became ill with vomiting and diarrhea. The initial complainant consumed a salad, bread with butter and olive oil, tomato basil soup, and water. The second patron ate a chicken Caesar salad and had iced tea. On February 27, MDH was notified of another foodborne illness complaint associated with the same restaurant. The complainant and meal companion had also dined at the restaurant on February 21. Both patrons ate salads and shared a calamari appetizer.

On February 27, CBEH obtained copies of the menu, credit card receipts, and the restaurant employee roster. The same day, MDH interviewed patrons who ate at the restaurant on February 21 using a standard questionnaire. A case was defined as a person who had eaten at the restaurant and subsequently developed vomiting and/or diarrhea ($\geq$ 3 loose stools in a 24-hour period) within 60 hours of the meal. Stool kits were delivered to two complainants for bacterial and viral testing at the MDH Public Health Laboratory (PHL).

On February 27, CBEH initiated an environmental health investigation at the restaurant which focused on employee health, food preparation and handling, and equipment. CBEH interviewed restaurant employees about food-handling activities and illness history using a standard questionnaire. Stool kits were delivered to employees by CBEH for bacterial and viral testing at the MDH PHL.

Due to concerns about possible *Salmonella* transmission, CBEH excluded all employees that were ill with vomiting and/or diarrhea during the 3 weeks prior to February 26. All employees that were symptom-free for 72 hours were allowed to return to work on March 3, following the PHL confirmation of a negative norovirus stool test.

On February 28, restaurant management voluntarily closed the restaurant for cleaning and sanitizing. All food preparation surfaces were sanitized with either a 1000 ppm chlorine solution or a viral disinfectant. All ready-to-eat foods were discarded.

Seven (23%) of 31 patrons interviewed met the case definition. Five (71%) cases were female. Five (71%) cases were 20 to 49 years of age. Two (29%) cases declined to provide their age. The median incubation period was 31 hours (range, 22 to 36 hours). The median duration of illness was available for four cases and was 34.5 hours (range, 9 to 80 hours). All seven cases reported diarrhea, six (86%) vomiting, and two (29%) fever. No cases reported bloody stools. Two cases tested positive for norovirus RNA genogroup II by PCR.

A combination variable "any salad" was associated with illness in the univariate analysis (7 of 7 cases vs. 5 of 22 controls; odds ratio, undefined; 95% confidence interval lower limit, 5.0; $p < 0.001$).

Forty-two restaurant employees were interviewed and 11 (26%) reported onset of vomiting and/or diarrhea from February 15 to February 24. One employee who did not have food preparation duties experienced diarrhea on February 15 after completing the work shift. The employee did work the following day and February 19 thru 22. At the time of interview the employee claimed illness was ongoing. On February 18, another employee who did not have food preparation duties experienced diarrhea during their shift. The employee did work February 19 thru 22. According to the General Manager there was an additional employee who was ill with vomiting at the restaurant on February 18, however CBEH was not able to interview this employee. The general manager described the ill employee as a food worker involved with salad preparation. The ill food worker was sent home on February 18. Six employees became ill on February 22. Three of the six who became ill were food workers. One employee became ill on February 23, and one employee became ill on February 24. The median duration of employee illness was 40 hours. Seven employees were experiencing illness symptoms at the time of interview.

Stool kits were submitted by nine employees and eight (89%) were positive for norovirus RNA genogroup II by PCR. Norovirus sequencing was performed on one of the employee stool samples and one of the complainant stool samples; the sequences from these samples were identical.

The environmental health investigation revealed no critical violations or non-compliant risk factors (e.g., bare-hand contact with ready-to-eat foods, hand-hygiene, time/temperature control, cross-contamination, and cleaning and sanitizing).

This was an outbreak of foodborne norovirus gastroenteritis associated with a Bloomington restaurant. Illness was associated with consumption of various salads. The source of contamination was ill food workers. Employee interviews revealed that at least two employees were ill with vomiting and/or diarrhea prior to the meal date, and there appeared to be extensive transmission among employees during the outbreak time period.

(10)
Suspected Norovirus Gastroenteritis Associated with a Restaurant

February Hennepin County

On February 25, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a patron who had eaten dinner at a fast food restaurant in Minneapolis on February 22. On February 28, the foodborne illness hotline received a second complaint of illness from another patron who had also eaten dinner at the same restaurant on February 22. MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units, and an investigation was initiated.

MDH epidemiology staff interviewed the two ill patrons from the original complaints. A list of credit card receipts from patrons who ate at the restaurant on February 22 was requested from the restaurant; however, the credit card company did not provide the restaurant with these data. A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On February 28, MDEH sanitarians inspected the restaurant 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.

The first complainant group consisted of two patrons from the same household (only one became ill). The second complainant group consisted of an ill patron and one well dining companion from a different household. The two complainant groups did not know one another, reported no other common exposures, and had not recently eaten at other common restaurants. Both cases reported vomiting, diarrhea, and nausea. One case reported a fever. The two cases reported incubation periods of 36 and 38 hours, and both were still recovering at the time of interview. No stool specimens were obtained for bacterial or viral testing.

One case reported eating a chicken burrito with rice, lettuce, cheese, and sour cream. The other case reported eating a chicken burrito; however, attempts to obtain detailed information regarding toppings on the burrito were unsuccessful.

All 25 employees were interviewed. No employees reported any recent gastrointestinal illness. The MDEH sanitarian 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 gastroenteritis associated with consuming a meal from a fast food restaurant. The etiologic agent was not identified, but the incubation period and symptoms were characteristic of norovirus gastroenteritis. The vehicle of transmission was not identified; however, the most likely vehicle was one or more ready-to-eat food ingredients of the chicken burrito. The source of contamination was not identified.

(11)
Suspected Norovirus Gastroenteritis Associated with a Hotel Conference

February Hennepin County

On March 3, 2008, the City of Bloomington Environmental Health (CBEH) received a report of illness among 11 of 43 persons who had attended a 2-day conference at a hotel on February 26 and 27. Continental breakfast and boxed-sandwich lunch were served both days with a dinner buffet also served on day 1. An outbreak investigation was initiated.

On March 3, CBEH met with hotel management, obtained a copy of the menu, and requested a list of conference attendees. On March 4, CBEH obtained a list of conference attendees and initiated interviews about illness history and food consumption using a standard questionnaire. A case was defined as a person who had attended the 2-day conference and experienced subsequent onset of vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Two stool kits were delivered to cases by the Minnesota Department of Health (MDH) for bacterial and viral pathogen testing at the Public Health Laboratory (PHL).

An environmental health investigation was initiated on March 3 focusing on employee health and hygiene and food-preparation practices. Hotel employees were interviewed about illness history, work duties, and food consumption using a standard questionnaire.

Twenty-five (58%) of 43 attendees were interviewed and 10 (40%) met the case definition. One case was determined to be not related to the outbreak due to an extended incubation period (five days) and was removed from further analysis. All 9 cases reported diarrhea, 7 (78%) reported vomiting and cramps, 2 (22%) reported fever, and 1 (11%) reported bloody stools. No hospitalizations were reported. Fourteen (58%) cases were male. The median incubation period was 41 hours (range, 35 to 72 hours). The median duration of illness reported from 7 cases was 24 hours (range, 7 to 93 hours). No stool specimens were received by the MDH PHL for bacterial and viral pathogen testing.

By univariate analysis, breakfast served on February 26 was associated with illness (8 of 9 cases vs. 5 of 15 controls; odds ratio [OR], 14.4; 95% confidence interval [95% CI], 1.4 to 150.8; $p = 0.017$). Any croissant, a combination variable including croissants served at breakfast on February 26, was also associated with illness (7 of 8 cases vs. 1 of 5 controls; OR, 28.0; 95% CI, 1.4 to 58.6; $p = 0.032$).

Twenty-seven employees (11 food service, 8 banquet, and 8 housekeeping) were interviewed, including all bakery employees. One housekeeping employee reported onset of diarrhea on February 20, and another housekeeping employee reported onset of vomiting and diarrhea on February 22. All other employees interviewed denied recent illness in themselves or household members.

The environmental health investigation identified no critical food safety or risk factor violations. On March 3, CBEH ordered hotel employees to discard leftover ready-to-eat foods, to exclude ill employees for 72 hours after recovery from vomiting and/or diarrhea, and to clean and disinfect food equipment and utensils.

This was an outbreak of gastroenteritis associated with a hotel conference. Based on clinical characteristics the agent likely responsible for illness was norovirus. Breakfast croissants were implicated as a vehicle of transmission. The source of contamination was not confirmed.

(12)
Norovirus Gastroenteritis Associated with a Restaurant

February Ramsey County

On March 6, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in two of three persons who ate together at a restaurant in Little Canada on February 26. The three persons lived in different households and had no other recent common exposures. The Minnesota Department of Agriculture (MDA) was notified, and an investigation was initiated on March 7.

MDH epidemiology staff interviewed the two ill patrons from the original complaint. A list of catered parties or special orders from February 26 though February 29 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. All persons in groups reporting gastrointestinal illness were subsequently contacted to obtain illness and food consumption histories.

A case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool samples were collected from the original complaint group and from one group that received catering, and were submitted to MDH Public Health Laboratory for bacterial and viral testing.

On March 7, an MDA inspector contacted the establishment, informed them of the complaint of illness in patrons, and inquired about recent employee illness. The manager was instructed to screen all employees for gastrointestinal illness. On March 10 and 11, MDA inspectors conducted an on-site investigation, including walking through the production areas and conducting a review of food safety, employee hygiene, and employee illness reporting. Employee illness logs and work schedules were obtained, and employees were interviewed about illness history and work duties.

The persons listed on the order forms for 12 groups that purchased catered lunches from February 26 through February 29 were called. Eleven of the persons were reached. Ten of the 11 reported not being aware of any gastrointestinal illness in their group. One group reported several persons with gastrointestinal illness following the meal at the restaurant on February 26. Seven of the nine persons in that group were reached and interviewed.

A total of nine persons were interviewed from the initial complaint and the catered group. Two persons reported a history of mild gastrointestinal illness that did not meet the case definition; they were excluded from further analysis. Four of the remaining seven persons (57%) met the case definition. Among the cases, all four reported diarrhea and cramps, three (75%) reported vomiting, and one (33%) of three reported fever. The median incubation was 33 hours (range, 18 to 39 hours). The median duration of illness was 159 hours (range, 144 to 164 hours). One case reported being hospitalized for her illness.

Two stool specimens were collected; one from a case in the initial complaint, and one from a case in the catered group. Both tested positive for norovirus and had identical viral sequences.

Three of the cases ate salads (chef, Greek or lettuce). Two of the cases ate sandwiches with lettuce and tomato (roast beef or turkey). Meaningful statistical analysis to identify a specific food vehicle was not possible due to the small number of persons interviewed.

When initially contacted, the manager reported sending a cook home on February 26 due to feeling ill with gastrointestinal symptoms. Additionally, another employee who lived in the same household also developed gastrointestinal symptoms a day later. The employee illness log listed two employees with gastrointestinal illness in February; one was one of the persons previously mentioned, and the other was an additional employee with illness onset on February 28.

Of the 45 employees, 13 were interviewed by the MDA inspectors. Among the 13, two reported recent illness, with onsets on February 25 (reported by the manager and on the employee log as onset on February 26) and February 27 (the household member). The employee listed on the illness log with onset on February 28 was not interviewed by the inspectors.

The employee with onset of illness on February 25 experienced sharp abdominal cramps as the initial symptom. This employee worked on February 26, prepared box lunches, was not feeling well that day at work, and was sent home at 11 a.m. Vomiting and diarrhea developed later in the evening on February 26. The employee with onset on February 27 did not work while ill. According to the work schedule, the employee listed on the log with onset on February 28 worked on February 25 and 26.

To prevent further transmission to patrons, kitchen and bathroom surfaces at the restaurant were thoroughly cleaned. During the investigation, restaurant management was instructed to monitor employee health much more closely, inquiring about presence of symptoms when employees presented to work. As a result of the outbreak, restaurant management planned to re-train all workers on hand hygiene, food safety, and not working while ill.

After the investigation, MDA conducted a full inspection and found that food handling practices and employee handwashing were satisfactory. Also, employees did not have bare-hand contact with ready-to-eat foods, and were able to answer food safety questions correctly.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Little Canada. Cases were identified among persons that were part of different parties that ate at the establishment or that ate foods from the establishment on February 26. Matching sequences of norovirus from patrons in different groups further implicated the restaurant as the source of the patron's infections. A specific food vehicle was not identified, but a ready-to-eat food item such as lettuce used in salads and sandwiches was suspected. One or more ill employees were the source of contamination. A cook worked while experiencing abdominal cramps and prepared at least some of the foods eaten by patrons. Transmission among employees was also evident. No cases were identified among patrons with meals on other dates, indicating that transmission to patrons was likely limited to 1 day.

(13)

Salmonella Enteritidis Infections Associated with Frozen Chicken Cordon Bleu Entrees

February-April Multiple counties

During 1998-2006, four outbreaks of salmonellosis associated with eating frozen, pre-browned, single-serving, stuffed chicken products were identified in Minnesota. Previously marketed as microwaveable, microwave instructions were removed from the labels of the implicated brands of frozen stuffed chicken products following the previous outbreaks. The producers were also required to verify that the cooking instructions (time and temperature) on the label were sufficient for the product to reach the appropriate internal temperature.

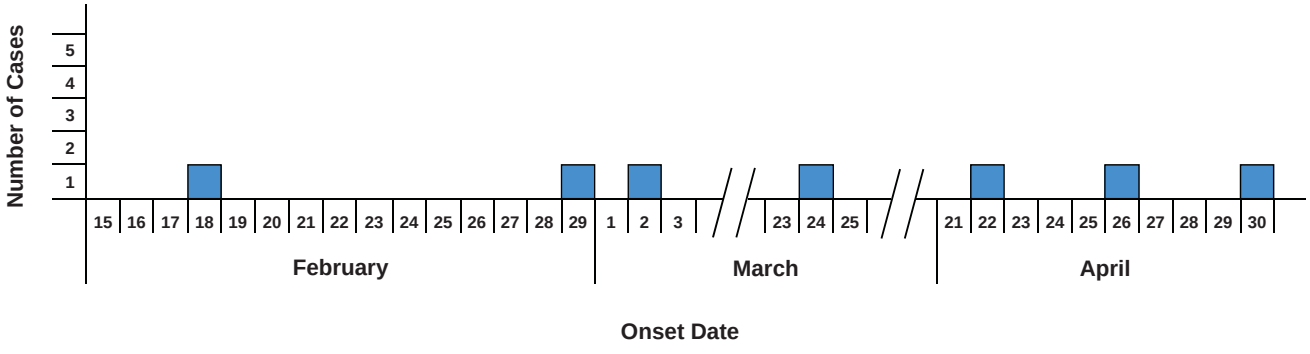
In March 2008, the Minnesota Department of Health (MDH) Public Health Laboratory identified two human-case isolates of *Salmonella* Enteritidis that were indistinguishable by pulsed-field gel electrophoresis (PFGE); the subtype was designated SE43B18. Routine interviews of the cases revealed that they had both eaten the same brand of chicken cordon bleu products in the week prior to illness onset. An outbreak investigation was initiated on March 18.

The Minnesota Department of Agriculture (MDA), the Centers for Disease Control and Prevention, the United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), and other states were notified of the *S.* Enteritidis cases.

The MDA Dairy and Food Inspection Division collected products for testing that one of the cases had purchased at the same time as the products consumed in the week before her illness onset. MDH epidemiologists also purchased products with matching code dates from grocery stores and submitted the products to MDA. The MDA Microbiology Laboratory cultured the products for *Salmonella*, and all isolates were sent to the MDH Public Health Laboratory for PFGE subtyping.

Two cases with *S*. Enteritidis SE43B18 reported eating the same brand of chicken cordon bleu products in the week prior to illness onset; dates of illness onset were February 18 and March 2. *S.* Enteritidis SE43B18 was isolated from a product which one of the cases purchased at the same time as the products she consumed before her illness onset, as well as from three retail samples. The positive products had a production code which represented a January 21, 2008 production date. *S.* Kentucky and *S*. Heidelberg also were isolated from the retail samples.

Salmonella Enteritidis Cases Associated with Consumption of Chicken Cordon Bleu, by Illness Onset Date



One of the cases reported cooking the chicken product in the microwave, and one reported cooking the chicken product in a conventional oven; neither took an internal temperature after cooking.

On March 28, MDH issued a press release notifying Minnesota consumers about the outbreak, and strongly advising against cooking these types of products in a microwave. After the recognition of the outbreak, USDA FSIS issued a consumer alert on March 29. The consumer alert reminded consumers of the "crucial importance of following package instructions for frozen, stuffed raw chicken products and general food safety guidelines when handling and preparing any raw meat or poultry. It is especially important that these products be cooked in a conventional oven."

Following the press release, five additional cases with a matching PFGE subtype to the outbreak strain were identified who also reported eating the same brand of chicken cordon bleu products. Onset dates for these cases ranged from February 29 to April 30 (see epidemic curve). Production code information was available from two of the additional cases. Of the five additional cases, four reported cooking the product in a microwave and one reported cooking the product in a conventional oven; no one took the internal temperature with a thermometer.

Of the seven confirmed cases associated with the outbreak, four (57%) were female. The median age of cases was 19 years (range, 11 to 59 years). All seven (100%) cases reported diarrhea, six (86%) fever, and three (43%) blood in their stool. Three (43%) of the patients were hospitalized.

This was the fifth outbreak of *Salmonella* infections in Minnesota associated with eating frozen, pre-browned, single-serving, stuffed chicken products. Five of the seven cases in this outbreak cooked the product in the microwave, even though microwave instructions had been removed from the packaging. Despite instructions on the label to take an internal temperature to ensure that these products were cooked thoroughly, none of the cases took the internal temperature.

(14)
Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 6, 2008, the City of Bloomington (CBEH) received a complaint of foodborne illness from a group of nine persons who had gathered at a restaurant on March 1 for a birthday celebration. While at the restaurant, the group consumed rice, shrimp, chicken, sushi, egg rolls, dessert items, and refreshments. An outbreak investigation was initiated with the assistance of the Minnesota Department of Health (MDH).

CBEH interviewed the group of patrons about illness history and food consumption. A case was defined as a person who had eaten at the restaurant and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). MDH delivered a stool specimen kit to a patron for bacterial and viral pathogen testing at the MDH Public Health Laboratory (PHL).

On March 6, CBEH inspected the establishment, focusing on employee health/hygiene and food-preparation practices, and obtained a copy of the menu. Food employees were interviewed about work duties and illness history. CBEH did not collect additional contact information for other patrons who had eaten at the establishment on March 1.

Eight (89%) of nine patrons were interviewed, and four (50%) met the case definition. One patron experienced mild illness symptoms, but did not meet the case definition and was therefore removed from further analysis. All four cases reported diarrhea, three (75%) had cramps, two (50%) had vomiting, and none reported fever or bloody stools. There were no hospitalizations. The median incubation period was 31 hours (range, 24 to 33 hours). The median duration of illness was 34 hours (range, 4 to 42 hours). Five (63%) cases were female. The patron stool sample was positive for norovirus.

By univariate analysis, consumption of shrimp (in the shell) was associated with illness (4 of 4 cases vs. 0 of 3 controls; odds ratio, undefined; 95% confidence interval lower limit, 3.3; $p = 0.03$).

Four food employees were interviewed; all denied illness in themselves and household members from February 20 to March 1. The environmental health investigation revealed that no employee illness log was maintained at the establishment, there was no assignment of a person-in-charge as required by the Minnesota food code, and improper handwashing with the use of a common towel for hand drying was taking place.

This was a laboratory confirmed outbreak of norovirus gastroenteritis associated with a restaurant. Peel-and-eat shrimp was implicated as the vehicle of transmission; however, the source of contamination was not identified.

(15)
Norovirus Gastroenteritis Associated with a Restaurant

March Anoka County

On March 6, 2008, a restaurant in Coon Rapids, Minnesota received a complaint of gastrointestinal illness among five members from three separate households who had eaten at the restaurant on March 2. The restaurant forwarded the complaint to the Anoka County Community Health and Environmental Services Department (ACCHES). ACCHES informed the Minnesota Department of Health Acute Disease Investigation and Control Section (MDH) of the complaint, and an outbreak investigation was initiated.

A list of patrons from March 1-3 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 obtained from three patrons were submitted to MDH Public Health Laboratory for bacterial and viral testing.

A sanitarian from ACCHES 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 35 patrons. Five (14%) cases were identified. One person reported illness but did not meet the case definition, and thus was excluded from further analysis. All five cases reported diarrhea, three (60%) vomiting, three (60%) cramps, and two (40%) fever. The median incubation period was 40 hours (range, 32 to 53 hours). The median duration of illness was 59 hours (range, 10 to 81 hours) for the four people who had recovered at the time of

interview. One patron tested positive for norovirus genogroup II. The stool samples submitted by the other two patrons were negative for norovirus, *Campylobacter*, *Salmonella*, *Shigella*, and *E. coli* O157.

Having onions added to a steak was significantly associated with illness (4 of 5 cases vs. 3 of 29 controls; odds ratio, 34.7; 95% confidence interval, 2.2 to 1,226; p = 0.003). Simply consuming a steak (4 of 5 cases vs. 10 of 29 controls) or any other food item was not statistically associated with illness. Upon inspection of the restaurant, ACCHES learned that no additional complaints of illness had been received by the restaurant. No employees reported being recently ill with any gastrointestinal symptoms.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Coon Rapids. The onions that were added to steaks were implicated as the vehicle of transmission. The source of contamination was not identified.

(16)
Norovirus Gastroenteritis Associated with a School

March Redwood County

On March 7, 2008, the Renville-Redwood County Public Health Department and the Minnesota Department of Health (MDH) were contacted regarding an increase in student absenteeism at a K-8 school in Redwood Falls with 81 students. On the day of the report, 24 (30%) students were reportedly sick with symptoms of gastrointestinal illness. An outbreak investigation was initiated on March 7.

A list of students was obtained from the school. Epidemiologists from MDH interviewed parents and/or students to obtain information on student food/beverage consumption, classroom activities, extracurricular activities, and illness history. A case was defined as a student with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were obtained from two students and one food worker and submitted to the MDH Public Health Laboratory for bacterial and viral testing.

A sanitarian from Renville-Redwood County Public Health visited the school to interview staff regarding recent illness and job duties, and to discuss cleaning recommendations.

Illness histories and exposure information were obtained from 59 students. Twenty (34%) cases were identified. Twenty additional students reported illness but did not meet the case definition, and thus were excluded from further analysis. Fourteen (70%) cases reported vomiting, 8 (62%) of 13 cramps, 9 (53%) of 17 diarrhea, and 7 (50%) of 14 fever. Four cases reported onset dates between February 26 and March 5; however, the majority of cases reported onset of illness on either March 6 (n = 9) or March 7 (n = 7). The median duration of illness was 42 hours (range, 17 to 147 hours) for the seven people who had recovered at the time of interview. One student tested positive for norovirus genogroup II. The stool sample submitted by the other student was negative for norovirus, *Campylobacter*, *Salmonella*, *Shigella*, and *E. coli* O157.

Eating school lunch on Thursday, March 6 was associated with illness (20 of 20 cases vs. 15 of 19 controls; odds ratio [OR], undefined; p = 0.05). Specific school lunch items during the week were also associated with illness, including cookies on Tuesday, March 4 (15 of 19 cases vs. 7 of 17 controls; OR, 5.4; 95% confidence interval [CI], 1.2 to 23.2; p = 0.02), cookies on Thursday, March 6 (19 of 20 cases vs. 10 of 18 controls; OR, 15.2; 95% CI, 1.7 to 139.3; p = 0.01), and spaghetti on Thursday,

March 6 (20 of 20 cases vs. 15 of 19 controls; OR, undefined; p = 0.05). Being in the first and second grade classroom was also significantly associated with illness (11 of 20 cases vs. 3 of 19 controls; OR, 6.5; 95% CI, 1.2 to 40.7; p = 0.03); however, no activities or foods unique to this classroom were significantly associated with illness.

Illness histories and exposure information, including job duties and food/beverage consumption, were obtained from two food workers. One food worker reported gastrointestinal illness with an onset date of March 5. The ill food worker was responsible for making the cookies on both Tuesday and Thursday. The stool sample submitted by the food worker (collected March 8) was negative for norovirus, *Campylobacter*, *Salmonella*, *Shigella*, and *E. coli* O157.

This was a foodborne outbreak of norovirus gastroenteritis associated with a school. Cookies served at school lunch were implicated as the most plausible vehicle of transmission. The available evidence indicates that one or more ill (or recently ill) employees were the likely source of contamination of the food item; however, it is possible that an ill or recently ill student could have contaminated the food item. Additional cases occurred prior to the foodborne outbreak that were likely due to person-to-person transmission at the school.

(17)
Suspected Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 21, 2008, the City of Edina Health Department received a complaint that one of two individuals who had eaten at a restaurant in Edina on March 19 became ill with vomiting and diarrhea on March 20. The same day, the Minnesota Department of Health (MDH) received a complaint from another individual who had eaten at the restaurant on March 19 (and possibly also on March 18) and became ill with vomiting and diarrhea during the evening of March 19. The City of Edina health inspector followed up with the restaurant to inquire about other customer complaints and discuss employee illness exclusion policies.

On March 26, the City of Edina received a third complaint from two individuals who had eaten at the restaurant on March 20 and became ill with diarrhea on March 22 and March 24, respectively (secondary transmission was likely involved). An outbreak investigation was initiated on March 26. Subsequently, a fourth complaint of illness was received by the restaurant on March 27. Two individuals had eaten at the restaurant on March 18 and March 19, and one became ill with vomiting and diarrhea on March 20 (illness information was not available for the other individual).

A case was defined as a person with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours of consuming a meal at the restaurant. Stool samples were requested from two cases for bacterial and viral testing. Credit card receipts were not obtained from the restaurant.

An inspection was conducted on March 26. The health inspector advised the restaurant to sanitize all food contact surfaces as well as other surfaces that are frequently handled. MDH and City of Edina staff interviewed all food workers at the restaurant about food consumption and illness history.

Four complainants met the case definition. The incubation periods for two of the cases were 29 and 48

hours, respectively (an incubation period could not be calculated for the other two cases due to multiple meal dates). All cases reported diarrhea, three (75%) vomiting, and two (50%) fever. None reported bloody stools or were hospitalized. Duration of illness information was available for two of the cases; durations were 22 and 38 hours, respectively. One stool sample that was collected 7 days after illness recovery was returned to the MDH Public Health Laboratory; it was negative for bacterial pathogens (*Salmonella*, *Shigella*, *Campylobacter* and *E. coli* O157:H7) and norovirus.

Controls were not available to conduct a case-control study; therefore, no food items were statistically implicated.

The inspection of the food establishment revealed well supplied and accessible handwashing sinks, glove usage and good handwashing procedures by food handlers, and general compliance with food handling requirements. Ready-to-eat foods were prepared daily, so did not need to be discarded. Four food workers reported gastrointestinal illness symptoms during March 19-22. One reported vomiting and diarrhea beginning March 19, and was out of work March 19 through March 21. Two employees reported vomiting and diarrhea beginning in the evening on March 20; one was out of work March 21 through March 23, and the other did not return to work until March 26. The fourth employee reported vomiting and diarrhea beginning in the morning on March 20, and did not work March 20 or 21.

This was a foodborne outbreak of suspected norovirus gastroenteritis associated with a restaurant in Edina. Multiple cases of illness in both patrons and food workers were identified. A specific food vehicle was not identified. The source of contamination of food was likely one or more ill food workers.

(18)
Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 17, 2008, the City of Bloomington Environmental Health (CBEH) and Minnesota Department of Health (MDH) received three independent complaints of illness from persons who had eaten at a restaurant in Richfield on March 11, 12, and 14. On March 19, CBEH received an additional complaint of illness from persons who had eaten at the restaurant on March 12. On March 24, MDH received an additional complaint of illness from persons who had eaten at the restaurant on March 19. The buffet menu features numerous cooked items, green and cold salads, fruit, and desserts for lunch and dinner. CBEH initiated an outbreak investigation with the assistance of MDH on March 17.

Patron interviews were initiated on March 20 by CBEH and MDH using a standard questionnaire. A case was defined as a person who had eaten at the restaurant and experienced subsequent onset of vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours. Stool kits were delivered to six patrons (meal dates of March 11 [n=1], March 12 [n=2], March 14 [n=1], and March 19 [n=2]) and two employees for bacterial and viral pathogen testing at the MDH Public Health Laboratory (PHL).

On March 17, CBEH met with restaurant management, obtained a copy of the menu, and initiated an environmental health investigation focusing on employee health and hygiene. On March 18, the establishment closed for business voluntarily. CBEH initiated employee interviews using a standard questionnaire and requested names of restaurant patrons from sales receipts. On March 19, CBEH received a list of patron contacts from sales receipts on March 12.

Forty-five patrons were interviewed, and 27 (60%) met the case definition. One patron was considered a secondary case and was therefore removed from further analysis. Sixteen (62%) of 26 cases were female. Twenty-four (92%) of 26 cases reported diarrhea, 22 (85%) of 26 vomiting, 17 (68%) of 25 cramps, and 5 (20%) of 25 fever. None reported bloody stools. The median duration of illness was 27 hours (range, 4 to 75 hours). There were no hospitalizations.

Meal dates for identified patron cases included March 11 (n=5), March 12 (n=18), March 14 (n=1), and March 19 (n=2). The median incubation period was 33 hours (range, 5 to 60 hours).

The following foods, consumed by patrons on March 12, were associated with illness by univariate analysis: any green salad, a combination variable including iceberg, romaine, mixed lettuce, and spinach (15 of 18 cases vs. 8 of 17 controls; odds ratio [OR], 5.6; 95% confidence interval [CI], 1.2 to 26.8; p = 0.03); mashed potatoes (11 of 18 cases vs. 3 of 17 controls; OR, 7.3; 95% CI, 1.5 to 35.1; p = 0.01); cut melon (11 of 18 cases vs. 4 of 17 controls; OR, 5.1; 95% CI, 1.2 to 22.2; p = 0.03); peaches (7 of 18 cases vs. 0 of 17 controls; OR, undefined; Fisher exact p = 0.005); bread pudding (6 of 18 cases vs. 0 of 16 controls; OR, undefined; Fisher exact p = 0.01); any cold salad, a combination variable including broccoli cheese, carrot raisin, three bean and seafood (12 of 17 cases vs. 6 of 17 controls; OR, 4.4; 95% CI, 1.04 to 18.6, p = 0.04); and shredded cheese (9 of 18 cases vs. 3 of 17 controls; OR, 4.7; 95% CI, 0.99 to 22.0; p = 0.05).

Any green salad, mashed potatoes, cut melon, any cold salad, and shredded cheese were entered into a unconditional logistic regression model; mashed potatoes (adjusted OR, 11.2; 95% CI, 1.8 to 69.9; p = 0.009) and any cold salad (adjusted OR, 6.1; 95% CI, 1.04 to 36.1; p = 0.045) remained independently associated with illness.

Five of six patron stool specimens were received by the MDH PHL. Of these, four were positive for norovirus genogroup II. Nucleic acid sequencing was conducted on three of the positive samples; two of the sequences were identical.

Twenty-six (48%) of 54 employees were interviewed. Four reported recent illness involving vomiting and/or diarrhea. A food worker who reported illness onset and recovery on March 11 worked on March 12, 13, and 14. A second employee reported illness onset on March 15 (with patron cases) and was off from work until March 18. A third employee reported illness onset on March 18 and worked on March 19. An employee who did not handle food reported illness onset on March 13 (with patron cases) and was off from work through March 16.

One of two employee stool specimens was received by the MDH PHL and it tested positive for norovirus genogroup II, with a nucleic acid sequence that was identical to that of two patron cases.

On March 18, CBEH issued corrective notices to the establishment to exclude ill employees for 72 hours (post vomiting/diarrhea), to discard leftover ready-to-eat food, and to clean and disinfect food-contact surfaces of equipment and utensils.

This was an outbreak of norovirus gastroenteritis associated with a restaurant. A number of foods, including mashed potatoes and ready-to-eat foods such as cold salads, were implicated as vehicles of transmission on March 12. The source of contamination was likely infected food workers. Transmission of norovirus occurred over a minimum of 9 days. During this period, three food employees reported

onset of vomiting and diarrhea, and two of these returned to work within 24 hours post vomiting and/or diarrhea. This outbreak supports the importance of effectively identifying and excluding food employees for at least 24 hours after recovery from vomiting and/or diarrhea.

(19)
Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 21, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received complaints of illness from two separate patron groups who had eaten a late night meal at a Minneapolis restaurant on March 17. After interviewing the patrons, MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units, and an investigation was initiated.

MDH epidemiology staff interviewed one ill patron from each of the two original complainant groups, and also interviewed two other ill patrons from a third dining party who reported illness to MDH on March 25. A list of credit card receipts from patrons who ate at the restaurant on March 17 was obtained from the restaurant; HSPHD epidemiologists called patrons from this list to identify additional cases and controls. A case was defined as a person who ate at the restaurant on March 17 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On March 21 and 22, MDEH sanitarians inspected the restaurant and interviewed employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and storage procedures.

The first complainant group consisted of two patrons who ate shared food items, but only one became ill. The second complainant group consisted of 12 individuals from several different households. One patron from this second group called the foodborne illness hotline to report her symptoms and stated that at least three members of her group had vomiting and/or diarrhea. This patron would not provide MDH with the telephone numbers for others in the group, but did agree to pass the MDH epidemiology telephone number on to members of her group to call in if they had had any gastrointestinal symptoms. MDH epidemiology did not receive any calls from members of this group. After the investigation was underway, MDH received a third complaint from a patron group made up of two ill patrons from separate households who had also eaten at the restaurant on March 17.

HSPHD epidemiologists identified three additional cases and one control from the credit card receipt list. One of the patron cases identified from the credit card receipt list reported eating at the restaurant on both March 17 and March 21, and did not become ill until March 23, which suggested on-going transmission at the restaurant (the incubation period was calculated using March 21 as the meal date).

Overall, seven patron cases were identified; all seven reported cramps, six (86%) reported vomiting, six (86%) reported diarrhea, and two (29%) reported fever. The median incubation was 42 hours (range, 27 to 45 hours). The median duration of illness was 42 hours (range, 18 to 72 hours) for six of the cases, with one case still experiencing symptoms at the time of interview. Five (71%) of the cases were female. The cases ranged in age from 19 to 26 years (median, 24 years). Stool sample collection kits were sent to two of the ill patrons; however, neither submitted samples to MDH.

The patrons interviewed consumed a wide variety of foods, with some dining parties sharing several items. All seven cases and the one control reported eating some type of sushi. The types of sushi consumed by ill patrons included aji (mackerel) rolls (14%), California (crab) rolls (43%), caterpillar (eel) rolls (14%), crunchy (shrimp) rolls (57%), dynamite (assorted fish) rolls (14%), mutsu (super white tuna) rolls (29%), salmon skin rolls (29%), spicy tuna rolls (29%), toro (oily tuna) rolls (14%), and uni (sea urchin) rolls (14%). Other food items consumed included edamame, seaweed salad, tuna tataki, egg rolls, goyza (dumplings), and miso soup. Beverages included ice water, sake, and other alcoholic beverages. A statistical analysis of food items could not be conducted due to the lack of controls (only one control was identified from the credit card receipt list). Five (71%) of the cases ate their meals at 10:00 p.m., the time when the late night happy hour begins; the other two cases ate dinner at 6:00 p.m.

MDEH environmental health staff inspected the restaurant on March 21 and interviewed employees on March 21 and 22. Twenty two (96%) of the 23 employees were interviewed. No employees reported any gastrointestinal symptoms previous to or on the implicated meal date; however, three employees reported illness beginning after March 17. A server reported vomiting on March 19 and March 20, another server reported diarrhea and cramps on March 21 and 22, and a server/bartender reported vomiting and diarrhea beginning on March 22. The last two employees were not allowed to work at the restaurant for 72 hours after the resolution of their last gastrointestinal symptom; however, the first employee with vomiting resolving on March 20 continued to work on March 21, the implicated meal date for the patron who ate at the restaurant twice in one week. This particular server also prepared salads and soups. A stool sample was submitted by the server (who was ill on March 21 and 22) and was positive for norovirus. This server had consumed a veggie sushi roll in the restaurant on March 16.

The MDEH sanitarian noted overall compliance with food code requirements for food preparation. During the inspection, sanitarians noted that there were no towels at the hand sink by the sushi counter and the wiping cloth buckets had no sanitizer in them. 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. Since the sushi is prepared using extensive bare-hand contact, the importance of frequent and thorough handwashing was again reviewed. The restaurant received no additional complaints and no other reports of employee illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with consuming a meal from a Minneapolis restaurant. Sushi was the likely vehicle. The source of contamination for this outbreak was not identified.

(20)
Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 24, 2008, Brooklyn Park Environmental Health (BPEH) staff received a complaint of gastrointestinal illness among three patrons who had eaten at a restaurant in Brooklyn Park on Thursday, March 20. Brooklyn Park environmentalists visited the establishment on March 25 and inquired about employee illness. On March 26, BPEH staff received a second complaint of gastrointestinal illness in a patron who ate at the restaurant on Friday, March 21. On March 27, Minnesota Department of Health (MDH) epidemiology staff were notified and an investigation was initiated.

MDH staff reviewed and the complainants' interviews and contacted them to obtain stool samples. Additional patrons who contacted the BPEH office were identified, and MDH staff called patrons from this list to assess the burden of illness. A case was defined as a person who ate at the restaurant and subsequently became ill with vomiting and/or diarrhea (≥ 3 loose stools in a 24-hour period).

On March 27, BPEH environmentalists inspected the restaurant again and interviewed employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and storage procedures.

Three complainant groups were identified in this outbreak with meal dates on March 20, 21, and 22. Of the 19 patrons interviewed, 11 met the case definition. Ten (91%) of the cases reported vomiting, 10 (91%) of the cases reported diarrhea, nine (82%) reported cramps, and four (36%) reported fever. The median incubation was 37 hours (range, 22 to 87 hours). The median duration of illness was 80 hours (range, 50 to 102 hours) for six of the cases, with five cases still experiencing symptoms or unsure of recovery time at the time of interview. Stool samples were submitted by 2 patrons with meal dates of March 20 and 22; both were positive for norovirus with viral sequence NLV342.

Meals consisted mostly of hamburgers and other sandwiches with various toppings. No particular foods or sandwich items were statistically associated with illness, though various foods were ready-to-eat. Drinking beer was associated with illness (7 of 11 cases vs. 0 of 6 controls; odds ratio, undefined; 95% confidence interval lower limit 1.62; Fisher exact two-tailed p-value, 0.035).

BPEH staff conducted a complete outbreak assessment at the restaurant on March 27 and began interviewing employees. Five (13%) of the 39 employees reported gastrointestinal symptoms. Two of the ill employees had symptoms prior to the implicated meal dates, but were not direct food handlers. Recently ill employees were excluded from work until 72 hours after symptom resolution. Stool samples submitted by two ill employees (one with onset 3 weeks prior to interview and one with recent symptoms) tested positive for norovirus with viral sequence NLV342.

Employees were wearing gloves and had handwashing sinks available, though there was no policy in place for employee illness and exclusion of employees for gastrointestinal illnesses. There appeared to be person-to-person spread of illness among employees with illnesses ranging from early March through late March when the outbreak assessment was conducted.

This was an outbreak of norovirus gastroenteritis associated with eating at a restaurant in Brooklyn Park. Employee illness was the likely route of transmission to patrons, either through ready-to-eat foods, drinks, or handling of dishes or utensils.

(21)
Suspected Norovirus Gastroenteritis Associated with a Restaurant

March Hennepin County

On April 3, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness from a group of four patrons (two separate households) who had eaten dinner at a restaurant in Minneapolis, Minnesota, on March 21. After interviewing the two ill patrons in the group

on April 9, MDH notified the Hennepin County Public Health Department (HSPHD) and Minneapolis Division of Environmental Health (MDEH), and an investigation was initiated.

MDH epidemiology staff interviewed the two ill patrons from the original complainant group. A list of credit card receipts from patrons who ate at the restaurant on March 21 was obtained from the establishment; HSPHD epidemiologists called patrons from this list to identify additional cases and controls. A case was defined as a person who ate at the restaurant on March 21 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On April 10, MDEH sanitarians inspected the restaurant 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 epidemiologists identified two additional cases and 17 controls from the credit card receipt list. Overall, four patron cases were identified; all four reported diarrhea, two (50%) vomiting, one (25%) cramps, and none reported fever. The median incubation was 21 hours (range, 14 to 32 hours). The median duration of illness was 86 hours (range, 24 to 196 hours). The median age of cases was 40 years (range, 34 to 62 years). None of the ill patrons agreed to submit a stool sample to MDH for testing.

The cases and controls interviewed consumed a wide variety of foods, with some dining parties sharing several items. Various appetizers (cheese plate, flatbread, French fries), entrees (grilled bone marrow, fried fish, squash ravioli, duck), and side dishes (Brussels sprouts, broccoli, coleslaw, macaroni and cheese) were consumed. Beverages included ice water, wine, and other alcoholic beverages. The original complainant group consisted of four patrons who all ate macaroni and cheese and fried fish (smelt and blue gill). The two ill patrons in this group (from two separate households) also ate coleslaw. No specific food items were statistically associated with illness.

MDEH environmental health staff inspected the restaurant and began interviewing employees on April 10. All 51 employees currently working at the restaurant were interviewed. Three employees reported gastrointestinal symptoms prior to the implicated meal date. A server reported diarrhea from February 28 to March 12, after returning from a trip to Mexico. Another server reported 2 days of diarrhea sometime during the second week of March but could not recall any specific dates or details about symptoms. A line cook reported 36 hours of vomiting and diarrhea 3-4 weeks prior to his interview date (April 10), but could not provide specific dates. The line cook did not work while having symptoms, but did return to work immediately after symptom resolution.

Four employees also reported gastrointestinal symptoms after the implicated meal date. A server reported 21 hours of diarrhea beginning on March 22, another server reported 36 hours of vomiting and diarrhea beginning on March 23, a host reported 33 hours of vomiting and diarrhea beginning on March 23, and a pastry chef reported 31 hours of vomiting beginning on March 23. Most employees reported eating some food items at the restaurant; however, most were unable to identify what food items were consumed. No employees submitted stool samples to MDH for testing.

The MDEH sanitarian 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 hadn’t received any additional complaints.

This was a foodborne outbreak of gastroenteritis associated with consuming a meal from a restaurant in Minneapolis. No stool samples were submitted, so the etiology was not confirmed. Clinical characteristics are compatible with viral gastroenteritis caused by pathogens such as norovirus. The vehicle and source of contamination for this outbreak were not identified; however, the identification of multiple ill food workers prior to the case meal dates suggests that food workers were the source of contamination.

(22)
Norovirus Gastroenteritis Associated with a Family Gathering

March Dakota County

On April 1, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint from a group of 22 extended family members who had eaten a meal together on March 28. The group had taken out various types of pizza (chicken feta, sausage, vegetable, and cheese) from a restaurant in Eagan and consumed it at a private residence. The meal also included a homemade salad, a store-bought salad, various types of fruit, store-bought brownies and cookies, a homemade chocolate cake, caramel corn, candy, and sodas. Preliminary interviews and restaurant follow-up began on April 2.

A list of event attendees was obtained from the original complainant, and MDH staff interviewed the attendees to obtain food/beverage consumption and illness histories. Based on preliminary analysis of these data, a full outbreak investigation was initiated. A case was defined as an event attendee who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours of the meal. Stool specimens were requested from three cases for submission to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

An MDH sanitarian followed up with restaurant management on April 1 to inquire about additional customer complaints and food worker illness. The sanitarian completed a full inspection on April 2. On April 3, MDH staff began interviewing food workers about illness histories and job duties.

Illness and exposure histories were obtained from 19 event attendees; eight (42%) met the case definition. One attendee reported gastrointestinal symptoms, but was excluded from further analysis because of a long incubation period. Seven (88%) cases reported diarrhea, five (71%) of seven fever, five (63%) vomiting, and four (50%) cramps. No cases reported bloody diarrhea or hospitalization. The median incubation period was 38 hours (range, 27 to 52 hours). The median duration of illness was 55 hours (range, 28 to 72 hours) for the four cases who had recovered at the time of interview. One stool sample was returned to the MDH PHL for testing; it tested positive for norovirus genogroup II.

Chicken feta pizza and cheese pizza were both associated with illness by univariate analysis (6 of 7 cases ate chicken feta pizza vs. 1 of 10 controls; odds ratio [OR], 54.0; 95% confidence interval [CI], 2.0 to 2,744; $p = 0.004$; 6 of 8 cases ate cheese pizza vs. 1 of 10 controls; OR, 27.0; 95% CI, 1.5 to 1,374; $p = 0.013$).

During the inspection of the restaurant, the MDH sanitarian noted four critical violations including the need for an additional hand sink, improper hot-holding temperatures for one food item, and a lack of sanitizer in the dish machines. All employees with food-preparation duties were interviewed. One

employee reported experiencing nausea beginning early in the morning on March 29; however, that employee did not have food-preparation duties.

This was a foodborne outbreak of norovirus gastroenteritis associated with a family gathering. Pizza was identified as the likely vehicle; however, the source of the contamination was not identified. No prior illness was identified in either food workers or event attendees.

(23)
Norovirus Gastroenteritis Associated with a Restaurant

April Ramsey County

On April 4, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among two of three meal companions that ate at a restaurant in Vadnais Heights on April 1. The complainant reported that the ill meal companions were from separate households, and had no other recent meals or events in common. Ramsey County Environmental Health was notified, and an outbreak investigation was initiated.

A list of exposed meal companions was obtained from the original complainant, and staff from MDH interviewed these 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 consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A sanitarian from Ramsey County visited the restaurant to evaluate food-preparation and handling procedures. Credit card receipts from the meal date in question were obtained from the restaurant. MDH staff interviewed all restaurant employees regarding recent illness history and job duties.

Credit card receipts were available only for patrons that spent $25.00 or more at the restaurant. For the meal date in question, there were four receipts that met this criterion. MDH staff were able to contact and conduct interviews for two of these. Illness was not reported for one of these. The other credit card receipt was for an order of seven party subs that catered a meal for an office gathering. The individual identified through the credit card receipt reported that there were illnesses in the group, and distributed MDH contact information to exposed employees.

Illness histories and exposure information were obtained from 24 patrons. Of these, 11 (46%) met the case definition, including two from the original complainant group and nine from the catered office meal. Of the 11 cases, all reported cramps, nine (82%) vomiting, nine (82%) diarrhea, six (55%) fever, and one (9%) bloody diarrhea. The median incubation period was 31.5 hours (range, 7.5 to 49 hours). The median duration of illness was 24 hours (range, 4 to 81.5 hours) for the five people who had recovered at the time of interview.

All four stool samples (two of which were from the original complainants) tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on all of the positive norovirus samples; the nucleic acid sequences were identical.

Cases from the complainant group ordered sandwiches off the menu, while cases from the credit card receipt group only had pre-made sandwiches available. No food item was statistically associated with illness, either within the separate groups or among all patrons.

Initial contact with the restaurant by Ramsey County Environmental Health staff revealed that there were no reports of employee illness during this time period. All employees are required to wear gloves while handling food. Cucumbers, green peppers, and tomatoes are the only food items further altered in the restaurant; restaurant employees are responsible for washing and slicing them. All other food handling involves transferring the item from it's packaging into its respective container from which it is served. No improper food handling practices were observed by the sanitarian. The sanitarian discussed with restaurant staff the importance of handwashing for the prevention of norovirus. Additionally, the restaurant was informed that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms.

All 11 employees were interviewed by MDH staff; no employees reported experiencing gastrointestinal symptoms during this time period. One employee did report having an ill child in the household that experienced vomiting and diarrhea approximately 3 weeks prior to the implicated meal date, but refused to submit a stool specimen. Originally it was reported by restaurant management that this employee was one of two employees who assisted with the preparation of the seven party subs that were delivered to the work event investigated, and was also working during the time period when the original complainants had their meal. However, the restaurant later stated that it was another employee who had prepared the party sub sandwiches.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Vadnais Heights. A specific food vehicle was not identified and the ultimate source of the outbreak was not determined. However, the most plausible source was an infected food worker who had contact with one or more ready-to-eat food items.

(24)
Norovirus Gastroenteritis Associated with a Rehearsal Dinner

April Stearns County

On April 7, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among individuals from a wedding party. The father of the bride reported that at least 16 people had become ill after attending the rehearsal dinner at a restaurant in St. Joseph on April 4. Sanitarians from the Stearns County Environmental Services Department (SCESD) were notified, and an investigation was initiated.

A list of rehearsal dinner attendees was obtained from the bride and groom. Epidemiologists from MDH interviewed attendees 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 SCESD visited the restaurant to evaluate food-preparation and handling procedures and to interview staff regarding recent illness and job duties.

Norovirus Gastroenteritis Cases Associated with a Wedding Rehearsal Meal, by Illness Onset Date

Illness histories and exposure information were obtained from 37 patrons. Eighteen (49%) cases were identified. Four people reported illness but did not meet the case definition, and thus were excluded from further analysis.

Of the 18 cases, 17 (94%) reported diarrhea, 16 (89%) cramps, 14 (78%) vomiting, and three of 13 (23%) fever. The median incubation period was 28 hours (range, 17.5 to 53.5 hours) (see epidemic curve). The median duration of illness was 36 hours (range, 19.5 to 72 hours) for the five people who had recovered 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.

Consuming water (12 of 17 cases vs. 3 of 14 controls; odds ratio [OR], 8.8; 95% confidence interval [CI], 1.3 to 68.3; p = 0.007) or ice (12 of 15 cases vs. 5 of 14 controls; OR, 7.2; 95% CI, 1.1 to 57.5; p = 0.02) were significantly associated with illness. No other food or beverage item was statistically associated with illness.

All restaurant employees were interviewed regarding job duties and illness history. Two employees reported gastrointestinal illness with onset dates of April 4 and April 6. Multiple employees reported having contact with ice and water as part of their normal job duties.

The environmental inspection of the restaurant noted that there was no hot water in any of the restroom faucets.

The restaurant receives its water from the St. Joseph municipal water supply. A District Engineer from the MDH Drinking Water Protection Section visited the restaurant to take water samples and evaluate the restaurant for any major distribution system issues. Coliform indicator bacteria were absent in a

water sample taken from the hand sink in the kitchen. Additionally, the chlorine residual in both the kitchen hand sink and the bar hand sink were within the normal limits for that portion of the St. Joseph distribution system.

This was an outbreak of norovirus gastroenteritis associated with a rehearsal dinner at a restaurant. The ice and water served at the facility were implicated as the vehicles of transmission. One or more ill employees were most likely responsible for contaminating the ice and/or water. The lack of hot water in the restroom facilities could have facilitated the transmission of the virus among restaurant employees.

(25)
Norovirus Gastroenteritis Associated with a Restaurant

April Wadena County

On April 21, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among individuals that attended a seminar at a restaurant in Wadena on April 15. The ill attendees had no other recent meals or events in common. The original complainant called the establishment prior to notifying MDH, and was informed by management that there had been illness among restaurant employees in the week prior to this meal. Wadena County Environmental Health was notified, and an outbreak investigation was initiated.

A list of exposed meal companions was obtained from the original complainant, and staff from MDH interviewed these 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 consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A sanitarian from Wadena County visited the restaurant to evaluate food-preparation and handling procedures. MDH staff interviewed all restaurant employees regarding recent illness history and job duties. Credit card receipts from the meal date in question were not available from the restaurant.

Illness histories and exposure information were obtained from 19 seminar attendees, and 12 (63%) met the case definition. Of the 12 cases, all reported diarrhea, 8 (73%) cramps, 6 (55%) vomiting, and 5 (45%) fever. None of the cases reported bloody diarrhea. The median incubation period was 28.5 hours (range, 7.5 to 60.5 hours). The median duration of illness was 55 hours (range, 5 to 81 hours) for the five people who had recovered at the time of interview.

Two stool samples were collect from patrons that attended this event. Both tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the positive norovirus samples; the nucleic acid sequences were identical.

The meal provided at the seminar was served in a buffet-style manner. Foods served included prime rib with au jus sauce, au gratin potatoes, corn, green beans, rolls, and salad items from a salad bar. No food item was statistically associated with illness.

Initial contact with the restaurant by Wadena County Environmental Health staff revealed that there was employee illness during this time period. The sanitarian discussed with restaurant staff the importance

of handwashing for the prevention of norovirus infection. Additionally, the restaurant was informed that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms. No improper food handling practices were observed by the sanitarian.

All six employees were interviewed by MDH staff; four (67%) employees reported experiencing gastrointestinal symptoms since April 1. Three of these employees had illness onsets earlier in the month, but one employee reported experiencing diarrhea that began on the day prior to the seminar. This employee worked on the implicated meal date, and described general work duties as serving customers, preparing salads, and helping to put dishes away. This employee submitted a stool sample which tested positive for norovirus. Nucleic acid sequencing was conducted on the sample, and the sequence was identical to that identified in the patron samples.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Wadena. A specific food vehicle was not identified. However, the most likely source was an infected food worker who had contact with one or more ready-to-eat food items.

(26)
Norovirus Gastroenteritis Associated with a Restaurant

May Hennepin County

On May 12, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received complaints of illness from two separate parties who had eaten at a restaurant in Plymouth, Minnesota on May 9. MDH notified Hennepin County Public Health Protection (HCPHP) staff of these complaints, and an investigation was initiated on May 12.

Patron names from May 9 were obtained from the restaurant. HCPHP epidemiologists called patrons to ascertain illness history and food consumption at the restaurant. A case was defined as a person who had vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours of eating a meal at the restaurant. Stool specimens from four patrons of different parties were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

On May 12 and 13, HCPHP environmentalists conducted an inspection of the restaurant, focusing on food-preparation practices and employee health and hygiene. Restaurant employees were interviewed on-site regarding their job duties and illness histories. An employee contact list and a work schedule were provided by the restaurant so that additional employees could be interviewed via telephone.

Fifty-seven patrons were interviewed who had eaten at the restaurant on May 9. Twenty-three (40%) patrons met the case definition. Of the 23 cases, 22 (96%) had diarrhea, 18 (78%) vomiting, eight (35%) cramps, and five (22%) fever. The median incubation period was 32.5 hours (range, 24 to 47.5 hours). Duration of illness information was available for 15 cases; the median duration of illness was 48 hours (range, 8 to 124 hours).

Stool specimens from the four patrons tested negative for *Campylobacter*, *E. coli* O157, *Salmonella*, *Shigella*, and *Yersinia*, but three were positive for norovirus. Nucleic acid sequencing was conducted on the positive norovirus samples; all had identical nucleic acid sequencing.

Twenty-one (91%) cases had eaten one of the hibachi dinners which included a shrimp appetizer, soup, salad, rice, grilled vegetables, a choice of meat or fish or a combination of those for the entrée, dessert, and a beverage. The other two had some type of sushi. Statistical analysis was done on the food items using well meal companions as controls. Of the 27 controls, 24 (89%) had eaten a hibachi dinner. None of the food items were statistically significant.

Seventeen (94%) of 18 restaurant employees were interviewed. An interpreter was used to interview two non-English speaking employees who reported gastrointestinal symptoms. However, the employees had a difficult time recalling the exact date and time of onset as well as additional details about their symptoms. The employees did indicate their symptoms started after the patron illnesses dates; estimated onset date was May 12.

On the May 12 visit, HCPHP environmentalists found that food-preparation processes failed to cool rice properly, handwashing supplies were not available, gloves were used inappropriately and were reused, the dish machine was not sanitizing, and employees were eating in the kitchen.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Plymouth. The vehicle and source of contamination were not identified. The establishment was instructed on the importance of handwashing and proper use of gloves, excluding ill food workers from work, and immediately reporting any patron complaints of illness to the health department.

(27)
Norovirus Gastroenteritis Associated with a Restaurant

May Hennepin County

On May 19, 2008, the Minnesota Department of Health (MDH) received an e-mail complaint of illness among members of a work club that ate a meal catered by a restaurant in Minneapolis. The initial report indicated that 8 to 10 of 23 patrons that ate the meal served on May 15 became ill. An additional report of illness involving another patron who had eaten at the restaurant on May 15 was also received by Washington County on May 19. An investigation was initiated on May 19 by Hennepin County Public Health Protection (HCPHP) and the Minneapolis Division of Environmental Health (MDEH).

A case was defined as a person who ate food from the restaurant on May 15 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Patrons were identified by the original complainant, who provided the names and contact information of people that ate the catered meal. Stool specimen kits were delivered to three cases.

Minneapolis Division of Environmental Health (MDEH) sanitarians visited the facility on May 19 to conduct an environmental health assessment that focused on employee health and norovirus prevention education. They conducted employee interviews and collected the list of catering orders served on May 15.

Twenty-one patrons from the catered meal were interviewed by HCPHP epidemiologists. One person was interviewed who had eaten at the restaurant but was not associated with the catered meal. Eleven cases were identified. Of the eleven cases, eight (73%) reported vomiting and cramps, seven (64%) diarrhea, and three (27%) fever. The median incubation period was 36 hours (range, 28 to 58 hours). The

median duration of illness was 48 hours (range, 20 to 67 hours). Two cases submitted a stool specimen; both specimens were positive for norovirus genogroup II.

The catered meal included five varieties of pizza (veggie, pepperoni, sausage, buffalo chicken, and supreme) and a mixed garden salad. The food items were set out buffet-style and individuals served themselves. The second complainant, who was unassociated with the club, had eaten one piece each of sausage and taco pizza purchased directly from the restaurant location. By univariate analysis, the mixed garden salad, eaten by 9 of 11 cases and 2 of 10 controls (odds ratio [OR], 18.0; 95% confidence interval [CI], 2.0 to 159.1; p = 0.005), was significantly associated with illness. Analysis conducted for consumption of any fresh vegetable (including the mixed garden salad and the taco pizza which included fresh vegetables added after baking) increased the association with illness. Fresh vegetables were eaten by 10 of 11 cases and 2 of 10 controls (OR, 40.0; 95% CI, 3.1 to 524.8; p = 0.005).

All nine employees were interviewed by MDEH; no one reported any recent gastrointestinal illness symptoms. With the exception of one employee who makes deliveries exclusively, all employees share duties. This includes taking orders, handling payments, food preparation, and serving. The restaurant had not received any additional reports of illness.

This was an outbreak of norovirus gastroenteritis associated with a restaurant in Minneapolis. Eating the mixed garden salad and the consumption of any fresh vegetable were significantly associated with illness. Although no ill food workers were documented, unidentified infected food workers most likely played a role in transmission of norovirus to patrons. The establishment was instructed on the importance of limiting bare-hand contact of food items, frequent handwashing, and excluding ill food workers for 72 hours following symptom resolution.

(28)
Salmonella Saintpaul Infections Associated with Jalapeño Peppers

June — Multiple counties/Multiple states

On June 3, 2008, the U.S. Food and Drug Administration (FDA) issued a health advisory warning consumers in New Mexico and Texas to avoid consumption of Red Round and Roma tomatoes. This advisory followed a case-control study conducted in these two states in response to a recent increase in *Salmonella* Saintpaul infections of a specific pulsed-field gel electrophoreisis (PFGE) subtype. The subtype was designated by the Centers for Disease Control and Prevention (CDC) as JN6X01.0048. The Minnesota pattern designation for this subtype was STP12. According to the results of this study, the only food item that was significantly associated with illness in a multivariate analysis was raw tomatoes.

On June 7, 2008, the tomato advisory was extended to include all consumers nationwide. At the time of this advisory, there were two Minnesota residents with confirmed *S.* Saintpaul STP12 infection. Both of these cases had travelled out-of-state during their exposure time period. A case outbreak interview form was completed for each case, and the respective states were notified.

From June 23 through June 27, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) received 10 clinical *S.* Saintpaul isolates through routine surveillance. Routine interviews of two cases conducted by MDH on June 29 revealed that both had eaten at a restaurant in Roseville, Minnesota in the week before illness onset. The two cases reported visiting the restaurant on the same date and

consuming the same menu item. On June 30, additional *S.* Saintpaul cases were interviewed and reported eating at the same restaurant in Roseville. The restaurant had a general menu with numerous Mexican dishes. Ramsey County Environmental Health was notified and an investigation was initiated. All *Salmonella* cases reported to MDH are routinely interviewed about exposures and food consumption at home and at restaurants as part of foodborne disease surveillance in Minnesota. Epidemiologists reviewed the information gathered during the interviews of *S.* Saintpaul cases to identify other potential cases associated with eating at the restaurant. *S.* Saintpaul cases were asked specifically about dining at the Roseville restaurant in the week prior to illness onset, and those that reported eating at the restaurant were asked detailed, ingredient-specific questions about foods consumed during their meal.

Confirmed cases were defined as persons from whom *S.* Saintpaul STP12 was isolated and who had illness onset after May 1, 2008. Among cases who reported eating at the restaurant, a case-control study was conducted to evaluate particular menu items or ingredients at the restaurant that may have been associated with illness. Meal companions of confirmed cases and patrons identified through credit card receipts who ate on one of the implicated meal dates but reported no gastrointestinal symptoms served as controls. Menus and recipes were obtained from the restaurant to facilitate ingredient-specific analyses.

All restaurant employees were required to submit two stool specimens to the MDH PHL for *Salmonella* testing. Food workers who tested positive for *Salmonella* were completely restricted from their work duties and required to continue to submit stool samples until two consecutive specimens collected at least 24 hours apart tested negative for *Salmonella*. All food workers were interviewed about their job responsibilities and history of gastrointestinal symptoms since June 1, 2008 using a standard questionnaire. Duration of *Salmonella* shedding in the stool was defined as the number of days from the collection date of the first positive specimen until the collection date of the last positive specimen.

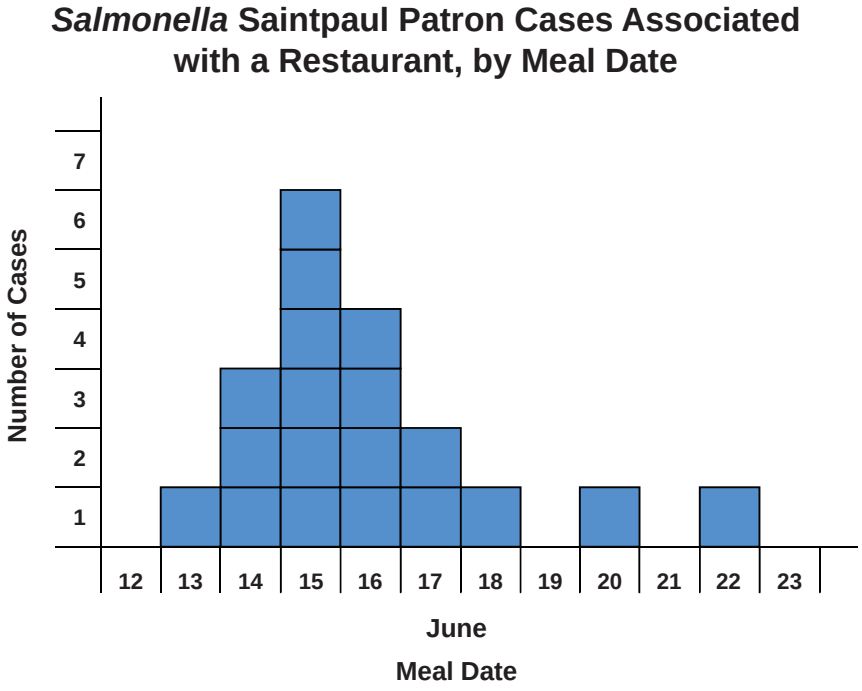
A sanitarian from Ramsey County and an epidemiologist from MDH visited the restaurant on June 30 to initiate an outbreak evaluation. Invoices for ingredients used in the preparation of foods reportedly consumed by cases were collected and forwarded to the Minnesota Department of Agriculture (MDA). Samples of foods that would have been in use during implicated meal dates were also collected by MDH staff and submitted to the MDA laboratory for testing.

Overall, there were 33 culture-confirmed *S.* Saintpaul STP12 cases identified in Minnesota in the outbreak, including cases associated with the restaurant as well as cases not associated with the restaurant. Of the 33 cases, three (9%) were hospitalized. The specimen source was stool for 30 (91%) cases, urine for two (6%), and blood for one (3%). The median age was 33 years (range, 20 to 83 years), and 21 (64%) were female. Onset dates ranged from May 25 to July 24, 2008. The median duration of illness was 8 days (range, 3 to 10 days) for the 11 cases who had recovered at the time of interview.

Of the 33 total cases, 28 (85%) were associated with the restaurant. Of these, 20 were patrons and eight were food workers. One of the confirmed patron cases had an illness onset date 2 weeks after her meal date. However, this case also reported providing care to a family member who was confirmed to be infected with *S.* Saintpaul STP12, and who had eaten at the restaurant on the same date. Therefore, this patron case was defined as a secondary case and not included in further analyses.

Overall, there were 19 cases and 73 controls included in the restaurant analysis. Meal dates for confirmed cases ranged from June 13 to June 22, 2008 (see epidemic curve). Controls included both well meal companions (n=11, 15%) and well restaurant patrons identified through credit card receipts

(n=62, 85%) with meal dates ranging from June 13 to June 17, 2008. A restaurant-specific questionnaire was developed using the menu (supplemented with additional ingredient information) as a template. Multiple food items were significant in the univariate analysis, including red salsa, avocado salsa, diced red peppers, cilantro, Mexican garnish, and diced jalapeño peppers (Table 1). The Mexican garnish consisted of diced jalapeño and dice red bell peppers. In a multivariate model containing all variables significant in the univariate analysis (except the combination "Mexican garnish" variable), diced jalapeño peppers was the only ingredient independently associated with illness (17/19 cases versus 8/73 controls; adjusted odds ratio, 62.0; 95% confidence interval, 12.0 to 321.0; $p < 0.001$) (Table 1).



Illness histories were obtained from 67 of 77 restaurant employees; of these, eight (12%) reported recent or current gastrointestinal illness. *S.* Saintpaul STP12 was isolated from seven (9%) of 75 food worker specimens, including four employees who reported not experiencing gastrointestinal illness. Those with illness reported onset dates compatible with those of patron cases. One food worker was on medical leave until September and wasn't available for testing. Another food worker refused to submit samples, and was in turn forced to quit. Symptomatic and/or positive employees were excluded from working in the restaurant until they had submitted two negative stool samples that had been collected at least 24 hours apart. The median duration of shedding for food workers was 46 days (range, 1 to 119 days). By November 2008, all employees had been cleared to return to work.

Table 1. Univariate and Multivariate Results of Minnesota Case-Control Study Among Patrons of the Outbreak Restaurant

Ingredient	No. cases exposed/total	No. controls exposed/total	OR*	p	aOR*	p
Red salsa	13/18	11/73	14.7	< 0.001		Not significant
Avocado salsa	14/19	10/73	7.5	< 0.001		Not significant
Cilantro	18/19	32/70	21.4	< 0.001		Not significant
Fresh tomatoes	6/19	33/71	0.5	0.2		Not significant
Mexican garnish	17/19	8/73	69	< 0.001	-	-
Red peppers	17/19	12/73	43	< 0.001		Not significant
Jalapeños	17/19	8/73	69	< 0.001	62	< 0.001**

*OR, odds ratio; aOR, adjusted odds ratio
**The multivariate model included red salsa, avocado salsa, cilantro, red peppers, and jalapeños

Staff from Ramsey County EH and MDH visited the restaurant on June 30 to speak with management and the head cooks, as well as collect invoices for the Mexican-style ingredients that would have been in use during the implicated meal dates. These invoices were forwarded to the MDA to determine the origin of the products. The restaurant also had some fresh, whole jalapeño peppers that would have been from the same lot as those used during the implicated meal dates; these were collected and submitted to the MDA laboratory. No pathogens were identified in the whole jalapeño peppers. However, whole jalapeño peppers were used only in the preparation of the red salsa at the restaurant. The restaurant also used pre-diced jalapeño peppers as a garnish for multiple menu items; it was these diced jalapeños that were statistically associated with illness. During the restaurant visit, investigators were also informed that on June 9, prior to the outbreak, the restaurant had pulled all fresh tomatoes and resupplied with cleared tomatoes.

There is another location of the same restaurant in Edina, Minnesota. These restaurants share suppliers, but there is no overlap in employees. During the outbreak time period, there were no illnesses reported among patrons who ate at the Edina location or employees who worked at this facility. The two restaurants were the only establishments to receive the diced jalapeño product from this distributor. However, each location ordered this product on an 'as needed' basis, and did not always follow similar ordering schedules. According to the invoices provided by the restaurant, there was one shipment of diced jalapeños that was unique to the Roseville location. This shipment occurred on June 12, one day prior to the first reported case meal date. The MDA performed a traceback on these jalapeño peppers, and it was determined that the product originated from a broker in Nuevo Leon, Mexico and was imported by a distributor in McAllen, Texas. The product was not traced back to a specific farm in Mexico by MDA.

Of the five *S*. Saintpaul STP12 cases among Minnesota residents that were not linked to the restaurant, two had travelled out-of-state (to New York City and Texas, respectively) during their exposure time periods. While traveling, both of these cases reported dining at a restaurant where other confirmed cases in those states had also eaten; these restaurants served Mexican-style foods. Two other cases were co-workers who had multiple meals in common during their exposure time period. The final case, who also had the latest onset date, did not report consuming any Mexican-style or 'spicy' foods in the week prior to illness onset.

As of August 25, 2008, there were 1,442 cases of *S*. Saintpaul STP12 identified nationwide, with illness onset first documented on April 16, 2008 (MMWR vol. 57, no. 34: 929-934).

Thirty-three *S*. Saintpaul STP12 cases occurred in Minnesota as part of a large nationwide outbreak. Of the Minnesota cases, 28 were associated with a restaurant outbreak. The vehicle for the restaurant outbreak was raw diced jalapeño peppers. The peppers were traced back to Mexico by the Minnesota Department of Agriculture.

The outbreak in Minnesota was identified through routine surveillance at MDH. Ingredient-level analyses were possible as a result of information collected from the restaurant manager and head cooks regarding the specific recipes of various menu items. This information allowed investigators to know exactly what was present in each dish available at the restaurant, even if it wasn't indicated directly on the menu or if patron recall of ingredients in a menu item wasn't complete. Both cases and controls associated with the restaurant were interviewed using this level of detail, and in turn each suspect ingredient could be analyzed separately. There was no evidence of ongoing transmission after the implicated shipment of diced jalapeños had been consumed and infected employees were excluded from working in food service. There were no illnesses reported from individuals who patronized other restaurants that used the same suppliers as the restaurant in Roseville, but had different product delivery dates during the time period investigated.

(29)
Norovirus Gastroenteritis Associated with a Graduation Party

June Anoka County

On June 3, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness following a graduation party held at a golf course in Coon Rapids on June 1. The graduation party was for seven different students, and it was estimated that about 400 people attended. The original complainant knew of approximately 10 illnesses among attendees, with ill individuals reporting symptoms of diarrhea and vomiting that began around 35 hours after the event. The main food items (hamburgers, hot dogs, beans, potato salad, fruit, and chips) were prepared by a catering company. However, each graduate provided their own desserts including cake and cookies. Anoka County Environmental Health was notified, and an outbreak investigation was initiated.

A list of attendees and contact information for each graduate was obtained from the original complainant, and staff from MDH interviewed these individuals to obtain information on food/beverage consumption and illness history. A case was defined as a graduation party 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 Anoka County contacted the caterer to evaluate food preparation and handling procedures. MDH staff also interviewed the caterer regarding recent illness history and job duties.

Illness histories and exposure information were obtained from 57 event attendees. Of these, 11 (19%) met the case definition. Of the cases, nine of 10 (90%) with available information reported diarrhea, seven of eight (88%) fever, seven of nine (78%) cramps, and six of 10 (60%) vomiting. The median incubation period was 37 hours (range, 11 to 45.5 hours). The median duration of illness was 71 hours (range, 24 to 82 hours) for the five people who had recovered at the time of interview.

Two event attendees submitted stool samples to PHL; one sample tested positive for norovirus genogroup II. No other viral or bacterial pathogen was isolated from the samples.

Forty-six controls were interviewed about foods consumed at the event. The only variable significantly associated with illness was consumption of cake (9 of 11 cases vs. 22 of 46 controls; odds ratio, 4.9; 95% confidence interval, 1.01 to 35.6; $p = 0.04$); however, this association no longer existed when each graduate's cake was analyzed separately. Illness appeared to be clustered among guests of certain graduates only; attendees associated with three of the seven graduating students did not report any illness at all. Some of the cases had reported illness in family members prior to the graduation party.

The main food items (hamburgers, hot dogs, beans, potato salad, fruit, and chips) were provided by a catering company and served in a buffet style at the party. The hamburgers and hot dogs remained frozen until cooked onsite. After being grilled, the meats were held on chaffing dishes until served. The buns were purchased at a wholesale grocery store, and were not opened until the event. The majority of the toppings (sauerkraut, relish, mustard, ketchup, sliced cheese, sliced onion, tomato, and mayo) were purchased at the wholesale grocery store. The onion and tomatoes were sliced by the caterer onsite, and these as well as the rest of the toppings were placed in stainless steel containers. All available toppings were self-served. The fruit, including watermelon, pineapple, grapes, cantaloupe, and strawberries, was also purchased at the wholesale grocery store. The fruit was cut at the caterer's home prior to the event. Each fruit was placed in its own container, and once again was self-served. Each graduate then had their own table where they served individual desserts, including nine cakes and various cookie and cupcake options. Initial contact with the caterer by Anoka County Environmental Health staff revealed that there were no reports of employee illness during this time period. All employees are required to wear gloves while handling food. The catering company also supplied similar foods to four additional parties over the same weekend. No illnesses were reported in any of these groups.

This was a foodborne outbreak of norovirus gastroenteritis associated with attendance at a graduation party held at a golf course in Coon Rapids. A specific food vehicle was not identified and the ultimate source of the outbreak was not determined. However, the most plausible source was an infected guest who had contact with one or more ready-to-eat food items.

(30)
Norovirus Gastroenteritis Associated with a Restaurant

June — Washington County

On June 22, 2008, the Minnesota Department of Health (MDH) received a foodborne illness complaint about a catered event at a church in White Bear Lake, Minnesota on June 18. The complainant reported that three members of the complainant's family became ill after consuming a meal at an event fully catered by a restaurant in Lake Elmo. A second, separate complaint about the same event was also reported to MDH on June 23, 2008. Attendees were served a fruit cup, salad, a variety of dressings, and rolls at their tables, then proceeded to a buffet line consisting of a chicken dish with sauce, a beef tips dish with sauce and mushrooms, wild rice, a mixed cooked vegetable dish, and a variety of desserts. Washington County Public Health & Environment (WCPHE) was notified of the complaint, and an investigation was initiated. WCPHE also notified Ramsey County because the church was located in Ramsey County; most of the attendees also resided in Ramsey County. However, since the restaurant is

located in Washington County, WCPHE conducted the patron interviews, food worker interviews, and restaurant inspection while Ramsey County followed up with church.

The church event planner provided WCPHE with a list of event attendees. Seventy-three attendees were interviewed regarding 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 consuming food from the event. Stool specimens were collected from two consenting cases, and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

Restaurant employees were interviewed regarding gastrointestinal symptoms experienced during June 2008, as well as job duties and work history for the week prior to and including the date of the implicated meal. Stool specimens collected from two ill food workers were submitted to MDH PHL for bacterial and viral testing.

Seventy-three people who consumed items from this meal were interviewed. Of these, 34 (47%) met the case definition. The median incubation period was 36 hours (range, 20 to 53 hours). Thirty (41%) cases reported experiencing diarrhea, 18 (25%) vomiting, and 11 (15%) fever. The median duration of illness was unknown because many cases were not fully recovered at the time of the interview. None of the individual foods served during the meal were significantly associated with illness; however, three items had elevated odds ratios. These included carrots (29 of 32 cases vs. 23 of 31 controls; odds ratio [OR], 3.4; 95% confidence interval [CI], 0.8 to 14.1), desserts (32 of 34 cases vs. 25 of 31 controls; OR, 3.8; 95% CI, 0.71 to 20.7), and key lime tart (6 of 31 cases vs. 2 of 28 controls; OR, 3.1; 95% CI, 0.58 to 16.9).

Initial contact with the restaurant revealed a report of one ill employee who worked the day of the catered church event. It is unclear if the ill employee was wearing gloves prior to being sent home the day of the catered church event. The food processes in the establishment were complex and a high volume of food was produced daily. A glove use policy was absent in the establishment, but management reported that gloves are usually worn when preparing salad. Food was transported in the catering vehicle to the church and maintained mechanically hot and/or cold. Some food was re-heated and assembled in the church kitchen. Temperatures were not taken and/or recorded on a regular basis. Some food preparation was done at the church, and it was unclear what facilities were provided in the church kitchen for the event. No temperature violations were noted during the investigation; however, poor handwashing practices and improper glove usage was observed in the restaurant.

Thirty-five restaurant kitchen employees were interviewed, including all those who reportedly prepared or served catered meal items for the church event; four reported experiencing illness in the week prior to this meal. Two employees reported cramps and fatigue, and the other two reported vomiting and diarrhea. One of the employees with vomiting and diarrhea reported having illness onset the day of the event; this individual worked Monday and Tuesday that week with no kitchen or catering involvement. The other employee who reported vomiting and diarrhea had illness onset on June 14 and recovery on June 16. This individual worked June 16 and June 17, doing food preparation and dishwashing. Three of those reporting illness were involved in food preparation, but did not report having prepped food for this event. Preparation records suggested otherwise. Two of these food workers submitted stool samples to the MDH PHL.

Four of the four stool samples received by PHL tested positive for norovirus. Two of the positive samples were from restaurant employees and two from participants of the church event. Nucleic acid sequencing was conducted on all of the positive norovirus samples; the nucleic acid sequences for the two event attendees were identical, while the two samples from the employees could not be sequenced.

This was a foodborne outbreak of norovirus gastroenteritis associated with consumption of food at a church in White Bear Lake that was catered by a restaurant. A specific food vehicle was not identified. Ill restaurant employees were identified, and these individuals had been present at the restaurant in the days before and of the catered event, including during preparation of food for the event. Two employees and two event attendees tested positive for norovirus. Therefore, the most plausible source of this outbreak was one or more ill food workers, and the vehicle was likely one or more ready-to-eat food items contaminated by those food workers.

(31)
Suspected *Clostridium perfringens* Intoxications Associated with a Banquet

June Carver County

On June 23, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from an individual who had attended a banquet for a baseball tournament on June 19 at a ballroom in Chaska. Upon contacting the tournament organizer, MDH learned that there had been approximately 100 players, parents, and coaches that had become ill after attending the banquet. The banquet had been catered by a private caterer. Sanitarians from MDH Environmental Health Services were notified, and an investigation was initiated.

A list of banquet attendees was obtained from the tournament organizer. Epidemiologists from MDH interviewed banquet attendees to obtain information on 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 call to the caterer revealed that she had prepared the food for the banquet at an unlicensed kitchen in a vacant home in Burnsville. Sanitarians from MDH visited the home where the food had been prepared to discuss food preparation procedures with the caterer.

Illness histories and exposure information were obtained from 67 attendees. Twenty-nine (43%) cases were identified. Five people reported illness but did not meet the case definition, and thus were excluded from further analysis.

All cases reported diarrhea, 26 (90%) reported cramps, two (8%) of 26 reported fever, and one (3%) reported vomiting. The median incubation period was 9 hours (range, 4 to 13 hours). The median duration of illness was 14 hours (range, 3 to 77 hours). No stool samples were collected due to the time that had elapsed since the illnesses.

In univariate analysis, consumption of beef loin (28 of 28 cases vs. 23 of 32 controls; odds ratio [OR], undefined; $p = 0.002$), au jus sauce (23 of 27 cases vs. 7 of 31 controls; OR, 19.7; 95% confidence interval [CI], 4.3 to 101.1; $p < 0.001$), and chicken breast (16 of 29 cases vs. 8 of 33 controls; OR, 3.9; CI, 1.1 to 13.3; $p = 0.03$) were significantly associated with illness. Stepwise logistic regression

converged to a model containing only the au jus sauce variable (adjusted OR, 16.6; 95% CI, 4.8 to 57.6; $p < 0.001$).

According to the caterer, 100 pounds of beef was separated into approximately 20 pound portions and cooked in three separate ovens at 350° F. The beef was put in the oven between 7:30 and 8:00 a.m. on June 19, cooked until it had a medium rare appearance, and temped at 145° F with an instant read thermometer. The beef was then put on the counter for approximately 30 minutes before being placed in a hot box. Later that afternoon the beef was transported to the banquet facility in Chaska, approximately a 40-minute car ride without the hot box plugged in. The hot box was plugged in again at the banquet facility. The beef was put in hot holding containers at the facility for serving at 7:00 p.m. that evening. The au jus sauce consisted of the drippings from the beef.

The caterer provided leftover beef and chicken breast that had been frozen following the banquet for testing. Both samples were negative for *Clostridium perfringens, Bacillus cereus,* and *Staphylococcal aureus*.

This was a foodborne outbreak associated with a baseball tournament banquet. The illnesses were consistent with a bacterial intoxication caused by *Clostridium perfringens*; however, since no stool specimens were obtained, the etiology of the outbreak could not be confirmed. The au jus sauce made from the beef drippings was implicated as the outbreak vehicle. The outbreak most likely resulted from improper cooling procedures and improper hot- and cold-holding temperatures which created an environment in which *C. perfringens* proliferated and survived in the au jus sauce.

(32)
Norovirus Gastroenteritis Associated with a Private Gathering

June — Scott County

On July 2, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among attendees of a private event on June 21 in Jordan, Minnesota. There were about 20 attendees at the event; the complainant indicated that some of them experienced diarrhea and vomiting following the meal. Food items included various deli trays purchased at a local grocery store (one meat platter, one cheese platter, and two fruit and cheese platters), cake purchased at a local bakery, a homemade pasta salad, and a homemade green salad. All food was consumed at a private residence. An outbreak investigation was initiated on July 2.

Nineteen members of the party were interviewed about symptoms of gastrointestinal illness and food consumption history. A case was defined as a person with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours of the event. Stool specimen collection kits were provided to five event attendees to be submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing. An environmental health assessment was conducted at the grocery store where the deli trays were purchased, the employee illness log was reviewed, and the employees who prepared the deli trays were interviewed to assess history of gastrointestinal illness.

Three people met the case definition; four people reported gastrointestinal symptoms but did not meet the case definition and were therefore excluded from further analysis. All three cases reported diarrhea, two (100%) of two reported fever, two (67%) reported vomiting, two (67%) reported cramps, and none

reported bloody diarrhea. The median incubation period was 24 hours (range, 9 to 33 hours) and the median duration of illness was 34 hours (range, 34 to 66 hours). Four stool specimens were submitted to the MDH PHL; two were positive for norovirus (one positive specimen was submitted by a case, and the other was submitted by an attendee who reported symptoms but did not meet the case definition).

Various food items were significantly associated with illness, including the mustard sauce from the meat tray (3 of 3 cases vs. 2 of 12 controls; odds ratio [OR], undefined; 95% confidence interval [CI] lower limit, 2.48; p = 0.022), brie cheese (3 of 3 cases vs. 1 of 12 controls; OR, undefined; 95% CI lower limit, 4.24, p = 0.009), cheddar cheese (3 of 3 cases vs. 3 of 12 controls; OR, undefined; 95% CI lower limit, 1.64; p = 0.044), cantaloupe (3 of 3 cases vs. 2 of 10 controls; OR, undefined; 95% CI lower limit, 1.95; p = 0.035), and pineapple (3 of 3 cases vs. 1 of 8 controls; OR, undefined; 95% CI lower limit, 2.62; p = 0.024).

The environmental health assessment at the grocery store where the deli trays were purchased indicated that the facility had not received any other complaints of illness. One employee had been out of work ill 2 days prior to the day the deli trays were prepared (that employee's symptoms were not reported on the illness log). However, that employee was not at work the day the deli trays were prepared, and did not have any food preparation duties related to the deli trays. Two employees prepared all the deli trays that were picked up on June 21; both of these employees were interviewed and neither one reported symptoms of gastrointestinal illness.

This was a foodborne outbreak of norovirus gastroenteritis associated with food consumed during a private event. The specific food vehicle was not identified; it is possible that multiple food items on multiple deli trays were contaminated. The source of contamination was not determined; however, contamination at the event by a previously ill attendee could not be ruled out.

(33)
Salmonella 4, 12:i:- Infections Associated with Frozen Chicken Entrees

June-October Multiple counties

During 1998 – 2006, four outbreaks of salmonellosis associated with eating frozen, pre-browned, single-serving, stuffed chicken products were identified in Minnesota. Previously marketed as microwaveable, microwave instructions were removed from the labels of the implicated brands of frozen stuffed chicken products following the previous outbreaks. The producers were also required to verify that the cooking instructions (time and temperature) on the label were sufficient for the product to reach the appropriate internal temperature. An additional outbreak of *Salmonella* Enteritidis infections associated with these same products was identified in Minnesota in March 2008.

In July and August 2008, the Minnesota Department of Health (MDH) Public Health Laboratory identified six human-case isolates of *Salmonella* 4, 12:i:- that were indistinguishable by pulsed-field gel electrophoresis (PFGE); the subtype was designated TM932. Routine interviews of the cases did not reveal any obvious common exposures. In September 2008, eight additional cases of the matching subtype were identified in Minnesota; seven of the newly identified cases reported during routine interviews that they had eaten the same brand of Chicken Cordon Bleu or Chicken Kiev (Brand A) in the week prior to illness onset. The eighth case reported eating Chicken Cordon Bleu or Chicken Kiev of an unknown brand in the week prior to illness onset. Callback interviews with five of the six cases from

July and August revealed that four had in fact also consumed stuffed chicken products in the week prior to illness onset.

All *Salmonella* cases reported to MDH are routinely interviewed about food consumption and other exposures as part of enteric disease surveillance in Minnesota. The Minnesota Department of Agriculture (MDA), the Centers for Disease Control and Prevention, the United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), and other states were notified of the *S.* 4,12; i: - cases.

The MDA Dairy and Food Inspection Division collected products for testing that two of the cases had purchased at the same time as the products consumed in the week prior to illness onset. MDA Inspectors and MDH Epidemiologists also purchased products with matching code dates from grocery stores and submitted the products to MDA. The MDA Microbiology Laboratory cultured the products for *Salmonella*, and all isolates were sent to the MDH Public Health Laboratory for PFGE subtyping.

Sixteen cases with *S.* 4, 12:i:- isolates of an indistinguishable PFGE subtype (two-enzyme designation TM932TMB44) were reported from July through October 2008. Dates of illness onset ranged from June 24 to October 8, 2008. Of the 16 confirmed cases, 8 (50%) were male. The median age of cases was 17.5 years (range, 2 to 53 years). All 16 (100%) cases reported diarrhea, 11 (69%) reported fever, and 10 (63%) reported blood in their stool. Seven (44%) of the patients were hospitalized.

Nine of the 16 cases reported eating Brand A Chicken Cordon Bleu and/or Chicken Kiev, two cases reported eating Brand B and Brand C Chicken Cordon Bleu, one case reported eating Brand D Chicken Cordon Bleu, one case reported eating Chicken Cordon Bleu of an unknown brand, and three cases denied stuffed chicken product consumption. *S.* 4, 12:i:- TM932TMB44 was isolated from three Brand A Chicken Cordon Bleu products which one of the cases purchased at the same time as the products she consumed before her illness onset, as well as from one retail sample. The products had a May 12, 2008 production date. Additionally, *S*. Enteritidis, *S*. Infantis, *S*. Heidelberg, *S.* Kentucky and *S*. Typhimurium were isolated from Brand A products collected from cases' homes and retail samples.

Of the 12 cases with stuffed chicken product preparation information available, nine reported cooking the chicken in the microwave, and three reported cooking the chicken product in a conventional oven; none of the cases took an internal temperature after cooking.

On October 3, MDH issued a press release notifying Minnesota consumers about the outbreak and strongly advising against cooking these types of products in the microwave. After recognition of the outbreak, USDA FSIS issued a consumer alert on October 3. The consumer alert reminded consumers of the importance of following package instructions and taking the internal temperature of the product with a thermometer.

This was the sixth outbreak of *Salmonella* infections in Minnesota associated with eating frozen, breaded and pre-browned, single-serving stuffed chicken products. Despite instructions on the label to take an internal temperature to ensure that these products were cooked thoroughly, none of the cases took the internal temperature.

(34)

Suspected *Clostridium perfringens* Intoxications Associated with a Festival

June Renville County

On July 14, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline was notified by the Renville County Sanitarian about a report of illness associated with a local festival held on June 28. Upon contacting the people who prepared the food, Renville County learned that there had been 20 reports of illness from multiple households. The festival involved a food booth where "taco-in-a-bag", hamburgers, and hot dogs were available for purchase. These foods were prepared in the home kitchen of a volunteer who then transported the food to the park where the festival was being held. The taco in a bag included ground beef, chips, lettuce, tomatoes, onions, cheese, salsa, and sour cream. The event was open to the general public, and as many as 80 tacos-in-a-bag were sold.

A Redwood-Renville County sanitarian assessed food preparation and handling practices at the home where the taco meat was prepared and at the festival where it was served. The organizers provided MDH with a list of complainants. MDH interviewed eight festival attendees from five households. A case was defined as an individual who attended the festival and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

Interviews were completed for eight festival attendees. All eight individuals met the case definition. All eight cases reported diarrhea, seven (88%) reported cramps, and one (13%) reported vomiting. All eight cases consumed a taco in the bag from the food booth. The median incubation period from taco consumption was 9.75 hours (range, 4 to 15 hours). The median duration was 17.25 hours (range, 13.5 to 29 hours). One visited a health care provider and submitted a stool specimen, which was negative for bacterial pathogens on routine stool culture.

The taco meat was prepared in the home kitchen of a volunteer on Friday, June 27. The ground beef used to prepare the taco meat came in two 10-pound rolls. Each roll was cut into three sections and fried section by section in two frying pans on a stove. The cooked meat was transferred into a roaster when it was done, but the roaster was not turned on right away because of concern that the meat on the bottom would burn. Cooking of the meat began between 3:00 p.m. and 3:30 p.m. on June 27. The roaster was turned on at approximately 4:30-5:00 p.m. Cooking of the meat was completed at approximately 5:30-6:00 p.m. The roaster was set on 250° F. Half of the taco seasoning was added to the ground beef immediately after cooking, and half was added just prior to taking the roaster to the park at 9:30 a.m. on Saturday, June 28. At the park, the roaster was turned completely off at approximately 11:30 a.m. to noon because the bottom kept burning. Later, a complaint was received from a customer that the meat was cold; the timing of this complaint was unknown but was estimated to be 12:30-1:00 p.m.

This was a foodborne outbreak associated with tacos-in-a-bag sold at a local festival. The etiology was not confirmed, but the distribution of incubations, symptoms, and illness durations were characteristic of bacterial foodborne intoxications such as those caused by *Clostridium perfringens*. The potential for temperature violations related to preparation of the taco meat was documented. The outbreak most likely resulted from improper cooling procedures and improper hot- and cold-holding temperatures which created an environment in which *C. perfringens* proliferated and survived in the taco meat.

(35)
Salmonella Hadar Infections Associated with Turkey Products

June-August Multiple states

In June and July 2008, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified two human-case isolates of *Salmonella* Hadar that were indistinguishable by pulsed-field gel electrophoresis (PFGE); the subtype was designated SHD5. In April and May of 2008, the Minnesota Department of Agriculture Laboratory and the MDH PHL had identified two retail ground turkey product isolates that were positive for *Salmonella* Hadar subtype SHD5. An investigation was initiated on July 16.

The Minnesota Department of Agriculture (MDA), the Centers for Disease Control and Prevention, the United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), and other states were notified of the *S.* Hadar cases.
A case was defined as a Minnesota resident with a *S.* Hadar SHD5 isolate identified from June through August, 2008. The two original cases, as well as additional cases with matching isolates identified through surveillance, were interviewed using the standard MDH questionnaire for salmonellosis cases.

The MDA Dairy and Food Inspection Division collected leftover turkey product from one case household and submitted it to the MDA Laboratory for *Salmonella* culture. All isolates were then sent to the MDH Public Health Laboratory (PHL) for PFGE subtyping.

Six human cases were identified. Four (67%) cases were female. The median age of the cases was 65 years (range, 45 to 90 years). Five (83%) cases reported diarrhea, two (50%) of four reported fever, and one (17%) reported blood in the stool. Three (50%) of the cases were hospitalized (for 3, 4, and 11 days, respectively).

Four of the six cases reported turkey consumption in the 7 days prior to illness onset. The fifth case worked at a turkey processing plant during the 7 days prior to illness onset. The sixth case reported probable turkey consumption in the 7 days prior to illness onset. MDA traced back the source of turkey for the three cases that had purchase and labeling information available for the products they consumed. The three products (turkey legs, turkey sausage, and a whole turkey) were processed at two different Company A plants in Minnesota. The turkey processing plant worker worked at a third Company A plant that supplied some products to one of the other two plants.

Two isolates from two packages of Company A brand ground turkey taken as part of the NARMS Retail Food Study in April and May in Minnesota were positive for *S.* Hadar SHD5. In addition, leftover ground turkey patties from the same package as those that were consumed by one of the cases were tested at the MDA Laboratory; isolates from the testing of these patties were positive for *S.* Hadar SHD5.

Thirty-six additional human *S.* Hadar case-isolates that matched by PFGE subtype were identified in other states during June-August. One case was classified as a secondary case. A limited amount of food consumption information was available for 13 of the 35 cases; of those, 10 reported turkey consumption in the week prior to illness onset. In addition, three isolates from ground turkey taken as part of the

NARMS Retail Food Study in New Mexico during July and August were positive for *S.* Hadar that matched the outbreak PFGE subtype.

According to information provided by the USDA FSIS Minneapolis District Office, Company A establishments are tightly integrated (both vertically and horizontally). FSIS indicated that the outbreak strain in the product likely originated from breeding stock, and therefore was likely dispersed throughout the flocks supplying the Company A plants. FSIS conducted an assessment at one of the plants in early 2009; they issued two regulatory noncompliance reports, but concluded that no issues were identified that would create a risk to public health.

This was an outbreak of *Salmonella* Hadar infections associated with turkey products from a single company. Human cases were associated with a variety of turkey products, and positive food isolates were recovered from samples of ground turkey and ground turkey patties. Turkey products consumed by the cases, as well as the NARMS Retail Food Study samples, originated from three different Company A turkey processing plants in Minnesota. One case was employed at a fourth Company A turkey processing plant that supplied product to one of the three plants mentioned above. *S.* Hadar was likely present in multiple flocks used to supply the Company A plants. *Salmonella* is not considered to be an adulterant in poultry or ground poultry; however, this outbreak further illustrates the importance of proper handling and cooking of all raw poultry products.

(36)
Salmonella Heidelberg Infections Associated with a Family Gathering

July Multiple counties

On August 4, 2008, the Minnesota Department of Health (MDH) Public Health Laboratory identified two isolates of *Salmonella* Heidelberg that were indistinguishable by pulsed-field gel electrophoresis (PFGE); the subtype was designated SH79. Routine interviews of the cases revealed that they were siblings who had eaten homemade ice cream made with raw eggs in the week before illness onset at a family gathering in Wisconsin on July 4, 2008. Several other family members reportedly had also become ill. An investigation was initiated.

All *Salmonella* cases reported to MDH are routinely interviewed about food consumption and other exposures as part of enteric disease surveillance in Minnesota. Epidemiologists reviewed the information gathered during the interviews of *S.* Heidelberg SH79 cases. Cases were contacted again and asked specific questions about homemade ice cream and other foods consumed at the gathering on July 4.

A case-control study was conducted to evaluate the association of illness with ice cream. Cases and controls were recruited from other family members from Minnesota who attended the gathering at the cabin; attendees were contacted about recent illness and food consumption at the gathering. Non-culture-confirmed cases were defined as persons who attended the family gathering and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

Among the nine attendees of the family gathering who could be reached for interview, two were confirmed with *S*. Heidelberg, and four additional attendees met the non-culture-confirmed case definition. All six cases had diarrhea, five (83%) had fever, five (83%) had cramps, one (17%) had vomiting, and none had bloody diarrhea. The two confirmed cases were seen by medical providers,

and one of the other four cases went to an emergency room. No cases were hospitalized. The median incubation period for the common meal among attendees was 66 hours (range, 57 to 81 hours). The median duration of illness was 10.6 days (range, 9 to 14 days).

The only food item consumed by all ill attendees was homemade ice cream made with raw, unpasteurized eggs. Three non-ill attendees also ate the ice cream and did not become sick.

This was an outbreak of *S.* Heidelberg infections associated with a family gathering in Spooner, Wisconsin. Though no food items were statistically associated with illness, homemade ice cream made with raw, unpasteurized eggs was a plausible source of the illnesses.

(37)
Salmonella Enteritidis Infections Associated with a Camp Dinner Held at a Hotel

July Crow Wing County

On July 21, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the president of a culture camp held in Baxter, Minnesota. The campers had attended day camp, which included traditional meals, from July 7 through July 11. Many campers also attended a party at a local hotel that included a sandwich buffet on July 8. The camp president had received reports of illness from various attendees, four of whom were confirmed with *Salmonella* infection. The same day, Crow Wing County public health also received a call from the Pennsylvania Department of Health about a positive *Salmonella* case who had attended this camp. All four family members in this person's household had been ill. An MDH environmentalist was contacted and an investigation was initiated immediately.

On July 21, an MDH environmentalist conducted an environmental assessment of the hotel and began interviewing employees about recent gastrointestinal illness. Two food workers submitted stool samples for *Salmonella* testing.

Cases were defined as persons who attended the camp and who subsequently had *S.* Enteritidis isolated from a stool culture or who had diarrhea (≥3 loose stools in a 24-hour period). A case-control study was conducted to evaluate food items at the camp and hotel dinner that may have been associated with illness.

Of the 134 camp attendees, 89 were reached for interview. Forty-six (52%) of these attendees met the case definition. Nine cases were culture-confirmed. Onset dates ranged from July 8 through July 17. All 46 cases reported diarrhea and cramps, 32 (72%) reported fever, nine (20%) reported vomiting, and six (14%) reported bloody diarrhea. One case was hospitalized for 3 days. The median duration of illness was 5 days (range, 0.5 to 11 days).

Cases had eaten a variety of foods from the camp and the hotel. Several families contained multiple cases, some of which may have represented secondary cases. Univariate analysis of all cases, including those who may have been secondary cases, showed that chicken wings (38 of 41 cases vs. 28 of 40 controls; odds ratio [OR], 5.43; 95% confidence interval [CI], 1.23 to 27.3; $p = 0.02$) served on July 8 for lunch at camp, and the ham (32 of 39 cases vs. 10 of 19 controls; OR, 4.11; 95% CI, 1.03 to 16.9;

p = 0.04), turkey (27 of 39 cases vs. 5 of 19 controls; OR, 6.30; 95% CI, 1.59 to 26.5; p = 0.005), buns (40 of 42 cases vs. 13 of 19 controls; OR, 9.23; 95% CI, 1.38 to 77.7; p = 0.009), and pink lemonade (38 of 40 cases vs. 12 of 23 controls; OR, 6.97; 95% CI, 1.73 to 29.7; p = 0.003) served at the hotel dinner on July 8 were all statistically significantly associated with illness. Attending the hotel party was also statistically associated with illness (43 of 45 cases vs. 20 of 43 controls; OR, 24.7; 95% CI, 4.81 to 171.0; p < 0.001). The squid served on July 7 for lunch at camp (25 of 42 cases vs. 14 of 36 controls; OR, 2.31; 95% CI, 0.84 to 6.44; p = 0.07) and chop chae served for lunch at camp on July 8 (33 of 39 cases vs. 25 of 39 controls; OR, 3.08; 95% CI, 0.92 to 10.70; p = 0.07) approached significance.

Since this analysis included possible secondary cases within families, a univariate analysis was also conducted on a subset of attendees. This analysis included only cases with illness onset from July 9 through July 12, and only index cases in household groups. In this analysis, attending the hotel party (19 of 20 cases vs. 20 of 43 controls; OR, 21.9; 95% CI, 2.6 to 485.4; p < 0.001), consuming turkey (12 of 17 cases vs. 5 of 19 controls; OR, 6.72; 95% CI, 1.26 to 39.7; p = 0.02) and pink lemonade (17 of 19 cases vs. 12 of 23 controls; OR, 7.79; 95% CI, 1.22 to 63.3; p = 0.02) served at the hotel were significantly associated with illness. Squid (12 of 17 cases vs. 14 of 36 controls; OR, 3.77; 95% CI, 0.93 to 16.0; p = 0.06) served for lunch on July 7 at camp, chop chae served for lunch on July 8 at camp (14 of 16 cases vs. 25 of 39 controls; OR, 3.92; 95% CI, 0.67 to 29.5; p = 0.10), and the buns (18 of 19 cases vs. 13 of 19 controls; OR, 8.31; 95% CI, 0.78 to 210.3; p = 0.09) approached significance.

In a full logistic model excluding secondary cases in households and cases with onset after July 12, attending the hotel party on July 8 was the only variable that was significantly associated with illness (OR, 14.8; 95% CI, 1.75 to 125.2; p = 0.01) when adjusting for consumption of squid on Monday and chop chae on Tuesday. Among foods served at the hotel buffet, turkey was the only item that remained independently associated with illness after multivariate model selection (OR, 6.7; 95% CI, 1.56 to 28.9; p = 0.01). The median incubation period for all cases from the hotel meal was 4 days (range, 1.5 to 9.5 days). The median incubation period for the subset of attendees (excluding secondary cases) from the hotel meal was 3 days (range, 1 to 4 days).

Only one food worker reportedly set up all the foods and beverages for the hotel party. The turkey and other deli meats were ordered from a supplier and arranged on trays for party attendees to assemble their own sandwiches. This person did not report any recent illness. One hotel employee who rarely does food preparation, but occasionally makes drinks or fills in at the bar area, reported illness with onset on July 4. This employee had vomiting and diarrhea, and was feeling ill until July 9, but returned to work on July 7. Both the ill employee and the food worker who prepared all sandwich trays submitted stool samples to MDH. Both samples were negative.

The MDH environmentalist discussed handwashing and employee illness with hotel management and employees. No other employees reported illness. No other complaints were received at the hotel.

This was an outbreak of *S.* Enteritidis infections associated with consumption of turkey from the sandwich buffet at a hotel in Baxter, Minnesota. The ultimate source of contamination for the turkey was not identified. It is unknown to what extent food worker illness played a part in this outbreak, since food workers who were tested several weeks after the event did not test positive for *Salmonella.*

(38)
Suspected Norovirus Gastroenteritis Associated with a Restaurant

July Hennepin County

On July 31, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness from an employee of Company A who had eaten food catered from a restaurant located in downtown Minneapolis at a company meeting on July 28. On August 4, the MDH foodborne illness hotline received another complaint from a representative of Company B, reporting that several people became ill after eating at a lunch meeting also catered by the same location of the restaurant on July 28. After interviewing these complainants, MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units and an investigation was initiated.

HSPHD contact information was given to the original complainants to distribute to others who attended the catered meal. Exposed individuals were directed to call epidemiologists at HSPHD as a way to identify additional cases and controls. A case was defined as a person who ate food from any of the restaurant's locations between July 25 and July 28 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

Sanitarians from MDEH visited the Minneapolis restaurant location to evaluate food-preparation and handling procedures and interview all employees regarding recent illness history and job duties. Catering lists and credit card receipts from the meal date in question were obtained from the restaurant.

Hennepin County epidemiology staff interviewed several patrons from the Company A and Company B catered meetings, as well as ill patrons identified through contacting other groups that received food items from the original restaurant location on July 28 and July 29. HSPHD epidemiology staff also interviewed ill patrons identified from other restaurant locations, including two ill patrons who had eaten a meal at the Wayzata location on July 25 and one ill patron who had eaten food from the Eden Prairie restaurant on July 28. A list of credit card receipts from patrons who ate at the Minneapolis location on July 28 and July 29 and lists of catering orders from the Minneapolis and Eden Prairie locations for these same dates were obtained from the restaurant.

The first complainant group consisted of five ill patrons from Company A who were part of a group of 15 that attended a catered lunch meeting on July 28. The representative of this patron group would not provide HSPHD epidemiologists with the telephone numbers of others in the group, but did agree to pass the epidemiology telephone number on to meeting attendees. HSPHD only received calls from five of the meeting attendees; therefore, we were unable to obtain control data for this group or assess how many of the meeting attendees experienced illness. Catered food items from the Minneapolis location included a green lettuce salad, a turkey dried cherry pasta salad, various prepared sandwiches, bagged potato chips, cookies, canned soda, and bottled water.

The second complainant group consisted of three ill patrons from Company B who attended a catered lunch meeting on July 28. Fifteen people attended this meeting; however, this group also did not release their telephone numbers to HSPHD epidemiology, and calls were received only from three ill patrons. This group also received a green lettuce salad, a turkey dried cherry pasta salad, various prepared sandwiches, bagged potato chips, cookies, canned soda, and bottled water from the Minneapolis location.

The third complainant group included eight ill patrons who attended a lunch meeting at Company C on July 29. Fifteen people participated in this meeting, but HSPHD epidemiology was unable to reach the remaining seven meeting attendees. This group received a green lettuce salad, a turkey dried cherry pasta salad, a grilled chicken and apple salad, and fruit from the Minneapolis location. Company C also held two additional concurrent lunch meetings catered by the Minneapolis location on July 29. The two additional meetings served some of the same food items: one meeting had five attendees and served a green lettuce salad and various sandwiches, while the other meeting had 35 attendees and served the green lettuce salad, turkey dried cherry pasta salad, chicken gorgonzola salad, and fruit. No illness was reported among attendees of these two meetings. HSPHD expressed interest in speaking with non-ill meeting attendees; however, none called the health department.

The fourth complainant group was identified from catering lists provided by the restaurant. This group consisted of three ill patrons who attended a lunch meeting catered by the Minneapolis location at Company D on July 28. Only three ill patrons out of the 12 employees who attended the meeting called HSPHD epidemiology, so it was not possible to collect control data or determine the actual number of patron cases. This group's catered meal included a green salad, chicken gorgonzola salad, a sandwich sampler platter, bagged potato chips, and dessert bars.

The fifth complainant group was also identified from the catering information provided by the restaurant. Company E had lunch meals catered by the Minneapolis location on both July 28 and July 29. Twenty employees attended the lunch meeting on July 28; the meal consisted of a green salad, turkey dried cherry pasta salad, a sandwich sampler platter, bagged potato chips, dessert bars, cookies, canned soda and bottled water. After this meeting, the leftover food was set in the break room and a Company E representative estimated that 20 people ate various leftovers. The catered lunch meeting on July 29 served the same food items and had 13 attendees. Once again, leftover food was placed in the break room and several people consumed leftover food items. Only six ill patrons who attended one of these meetings contacted the health department.

In addition to the illness complaints associated with catered meals, an ill patron from Company B informed MDH of an acquaintance and her dining companion who both became ill after eating at the Wayzata location. HSPHD epidemiology interviewed both ill patrons who reported sharing a meal on July 25 that included a tomato mozzarella panini and a salad trio made up of turkey dried cherry pasta salad, chicken gorgonzola salad, and tomato cucumber salad. The Eden Prairie location also received a single complaint of illness; HSPHD interviewed this ill patron who reported a meal of grilled vegetable salad with sirloin steak, tarragon chicken salad, and grilled chicken and apple salad on July 28.

HSPHD epidemiologists identified six controls from the credit card receipt and catering lists. In addition to these controls, HSPHD epidemiology also contacted the representatives of 11 catering groups (8 received catered foods from the Minneapolis location and 3 received foods from the Eden Prairie location). The representatives of the various companies sent out emails to meeting attendees inquiring

about illness and asking them to call Hennepin County if anyone had experienced illness. Hennepin County did not receive any phone calls from these groups and the company representatives were not aware of any employee illness subsequent to the catered meal.

Overall, 27 cases were identified; 25 (93%) reported diarrhea, 20 (74%) reported cramps, 20 (74%) reported vomiting, and 13 (48%) reported fever. The median incubation was 35.5 hours (range, 10 to 106 hours). The median duration of illness was 43 hours (range, 18 to 159 hours). Eighteen (67%) of the cases were female. The cases ranged in age from 24 to 62 years (median, 35 years). Stool sample collection kits were sent to three of the ill patrons; however, none submitted samples to MDH.

Common foods consumed by several ill patrons included: turkey dried cherry pasta salad (22 cases, 81%), a sandwich (12 cases, 44%), green salad (10 cases, 37%), and gorgonzola chicken salad (7 cases, 26%). A statistical analysis of food items showed that the turkey dried cherry pasta salad was the only food item significantly associated with illness. Twenty-two of the 27 cases ate the turkey dried cherry pasta salad and 1 of the 8 controls ate this food item (odds ratio, 30.8; 95% confidence interval, 3.1 to 310.1; $p = 0.004$).

MDEH environmental health staff inspected the Minneapolis restaurant and interviewed restaurant employees on August 4. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and food storage procedures. All 18 employees were interviewed; one employee reported vomiting on July 21 and returned to work on July 22. The MDEH sanitarian noted overall compliance with food code requirements for food preparation and no major violations. In the course of investigating the salad preparation process, MDEH learned that salads are made at the restaurant chain's main commissary and delivered to the individual store locations in two parts (main salad components and dressing). Each individual store mixes the main salad components and dressing onsite and then portions the salad for delivery and individual orders. The sanitarian 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 company had completed food service training for over 120 food service employees through the City of Minneapolis. This training included information on food safety, personal hygiene, cross contamination, sanitation, and time/temperature issues.

After HSPHD epidemiology learned of additional ill patrons at other restaurant locations, MDEH environmental health staff inspected the commissary on August 7. The commissary was in compliance with food code requirements and no major violations were observed. Any commissary employee involved in salad preparation was also interviewed to assess recent gastrointestinal illness and job duties; none of the five employees who prepared salads reported any recent or current illness. Since the commissary prepares salads for 10 restaurant locations in various metro area cities, including the Eden Prairie and Wayzata locations where patrons reported illness, the restaurant's Director of Operations alerted these locations to immediately report any patron illness complaints to HSPHD. In addition, an HSPHD sanitarian followed-up with the Eden Prairie location, and the City of Minnetonka Environmental Health sanitarian contacted the Wayzata location to confirm that these restaurants had received no additional patron illness complaints and that no employees were recently ill. The Director of Operations also worked with the company's independent environmental health consultant to provide an employee education session focusing on foodborne illness, norovirus transmission, handwashing and personal hygiene, and cleaning and disinfection.

This was a foodborne outbreak of gastroenteritis associated with consuming a meal from a local restaurant chain. The clinical and epidemiological features of the illnesses are characteristic of norovirus. The turkey dried cherry pasta salad was statistically significantly associated with illness. It is likely that salads served at several restaurant locations were contaminated at the main commissary by an unidentified ill or recently ill food worker.

(39)
Norovirus Gastroenteritis Associated with a Restaurant

July Hennepin County

On August 6, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received complaints of illness from two separate patron groups who had eaten a meal at a Minneapolis restaurant on August 3. After interviewing the patrons, MDH notified Hennepin County Public Health Department (HSPHD) Epidemiology and the Minneapolis Division of Environmental Health (MDEH), and an investigation was initiated. Another complaint of illness was received by the City of Bloomington which included a meal eaten at the same restaurant on August 2. The restaurant also received a complaint of illness directly from a patron served on July 28. A final complaint was received by the MDH foodborne illness hotline on August 11 involving a meal served on August 3. In total, five independent complaints were received regarding meals served at the restaurant on three separate dates.

MDH epidemiology staff interviewed one ill patron from each of the two original complainant groups. HSPHD epidemiologists interviewed other ill patrons from the remaining three complainant groups. A list of names of patrons who ate at the restaurant on August 2 and 3 was obtained from the restaurant from credit card receipts; HSPHD epidemiologists called patrons from this list to identify additional cases and controls. A case was defined as a person who ate at the restaurant on July 28 or later and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On August 7, MDEH sanitarians inspected the restaurant and interviewed employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and storage procedures.

The first complainant group consisted of four patrons who ate shared food items and three later became ill. The second complainant group consisted of eight individuals from several different households. One patron from the second group called the foodborne illness hotline to report her illness. This patron did not return subsequent calls from HSPHD epidemiologists so no information was received about the other dining companions. After the investigation was underway, MDH received a third complaint from a patron who had called the City of Bloomington. The third complaint involved a party of two, both of whom became ill. While they were onsite at the restaurant, MDEH sanitarians were told of a fourth complaint made directly to the restaurant. This complaint involved two patrons who both became ill. The fifth complaint was made to the MDH foodborne illness hotline and again involved a party of two ill patrons, from separate households.

HSPHD epidemiologists identified nine controls from the credit card receipt list. Ten patron cases were identified; all 10 reported vomiting and diarrhea, nine (90%) reported cramps, and three (30%) reported fever. The median incubation was 32 hours (range, 20 to 47 hours). Two cases were treated at an emergency department. The cases ranged in age from 19 to 29 years (median, 25.5 years). Stool sample collection kits were sent to four of the ill patrons; one sample was returned and tested positive for norovirus.

The patrons interviewed consumed a wide variety of foods, with some dining parties sharing several items. Eight cases and eight controls reported eating some type of sushi. The types of sushi consumed by ill patrons included California (crab) rolls (30%), caterpillar (eel) rolls (20%), crunchy (shrimp) rolls (20%), dynamite (assorted fish) rolls (20%), philly (salmon) rolls (20%), rainbow (shrimp, assorted fish) rolls (20%), salmon special maki (crab, salmon) rolls (20%), spider (soft shell crab) rolls (30%), spicy tuna rolls (40%), and unagi maki (eel) rolls (20%). Other food items consumed included rice, peas, shrimp tempura, tako (octopus) sashimi, oysters, pot stickers, and gyoza (dumplings). Beverages included ice water, saki, and other alcoholic beverages. None of the food items were significantly associated with illness.

MDEH environmental health staff inspected the restaurant on August 7 and interviewed employees during August 7-August 12. All 21 employees of the restaurant were interviewed. One employee reported occasional episodes of vomiting that had been occurring for an extended period of time. The employee did not recall the date of the last episode of vomiting and indicated that the symptom was unlikely related to an infectious disease cause. No other employees reported any gastrointestinal symptoms prior to or on the implicated meal dates.

The MDEH sanitarian noted that there were no towels at the hand sink by the sushi counter and that the wiping cloth buckets had no sanitizer in them. 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. Since the sushi is prepared using extensive bare-hand contact, the importance of frequent and thorough handwashing was again reviewed. The restaurant received no additional complaints and no other reports of employee illness.

The facility participated in an onsite food safety training for all staff on August 11 and as an additional follow-up measure a meeting was held in the MDEH office on August 18 to discuss foodborne illness prevention measures.

This was a foodborne outbreak of norovirus associated with eating at a Minneapolis restaurant. A specific food vehicle was not identified. One recently ill food worker was identified, but the cause of the symptoms may not have been an infectious pathogen. Unidentified infected food workers may have played a role in transmission of norovirus to patrons. Conversely, raw seafood items could have been contaminated with norovirus prior to arrival at the restaurant. The establishment was instructed on the importance of limiting bare-hand contact of food items, frequent handwashing, and excluding ill food workers for 72 hours following symptom resolution.

(40)
Norovirus Gastroenteritis Associated with a Restaurant

August Olmsted County

On August 4, 2008, Olmsted County Public Health Services (OCPHS) received a complaint of gastrointestinal illness among guests who attended a wedding reception held at a restaurant in Rochester, Minnesota on August 1. The complainant also reported hearing of illness among a school reunion group that held an event at the restaurant on August 2. The Minnesota Department of Health (MDH) was contacted and an investigation was initiated.

OCPHS Environmental Health sanitarians visited the restaurant on August 4 to conduct an environmental assessment and interview staff. OCPHS staff obtained a menu of the food items served at the reception and contact information for wedding reception attendees. The school reunion event organizers were contacted to determine if illness occurred among the reunion group. Wedding reception attendees were interviewed by OCPHS staff about food consumption and illness history. A case was defined as a wedding reception attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the reception. Stool samples collected from consenting wedding reception attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

School reunion event organizers reported no illnesses among attendees. Seventy-four wedding reception attendees were interviewed, and 24 (32%) met the case definition. Five reported symptoms that did not meet the case definition and were excluded from further analysis. The median age of cases was 49 (range, 2 to 59 years). Twenty-two (92%) cases reported cramps, 21 (88%) reported diarrhea, 16 (67%) reported vomiting, and 10 (42%) reported fever. The median incubation period was 37 hours (range, 8 to 61 hours). The median duration of illness for the 7 cases who had recovered by the time they were interviewed was 25 hours (range, 9 to 52 hours). Two stool samples submitted by ill wedding reception attendees tested negative for *Campylobacter*, Shiga toxin-producing *E. coli*, *Salmonella*, *Shigella*, and *Yersinia*, and both were positive for norovirus genogroup II.

The food at the wedding reception was served buffet style. Several food items, including ice cream toppings, were brought and served by reception organizers. By univariate analysis, eating chips (15 of 24 cases vs. 14 of 44 controls; odds ratio [OR], 3.6; 95% confidence interval [CI], 1.2 to 10.3; $p = 0.01$) was significantly associated with illness; drinking beer (19 of 24 cases vs. 24 of 43 controls; OR, 3.0; 95% CI, 1.0 to 10.4; $p = 0.06$) approached statistical significance. By unconditional multivariate logistic regression only eating chips was independently associated with illness (adjusted OR, 3.4; 95% CI, 1.2 to 9.8; $p = 0.02$).

Eighteen restaurant employees were interviewed. One employee, a bartender, reported illness, but illness onset was after the cases' onsets. Only one employee was involved in food preparation for the wedding reception and the school reunion in which no illnesses were reported. That employee did not report illness and reported using appropriate food preparation and storage techniques. Sanitarians were unable to observe hand hygiene and food preparation practices of the employee at the time of the environmental health evaluation. Sanitarians instructed restaurant staff to implement a series of interventions including discarding all opened ready-to-eat foods, cleaning and sanitizing food contact surfaces, and implementing a "no bare-hand contact" policy.

This was an outbreak of norovirus gastroenteritis associated with a wedding reception held at a restaurant in Rochester. Chips were implicated as the vehicle. The source of contamination was not identified. However, the chips were left on a serving line for a long period of time, providing an opportunity for an unidentified wedding reception attendee to contaminate the chips. No illnesses were reported among employees prior to or at the time of the event, or among attendees of the other group that ate foods prepared by the same employee, indicating that a wedding reception attendee may have been the source of contamination.

(41)
Campylobacter jejuni Infections Associated with Raw Milk Served at a Family Reunion

August Pope County

Routine surveillance interviews of two cases of *Campylobacter jejuni* conducted by the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section in late August and early September 2008 revealed that both cases had consumed raw milk while attending a family reunion in the week prior to illness onset. During the initial interviews both cases reported that approximately 12 of 50 reunion attendees became ill; all reportedly consumed the raw milk.

Follow-up phone calls by an MDH epidemiologist to the two cases were not returned. Because we were unable to obtain a list of individuals who attended the family reunion, no additional case finding was conducted.

Both cases reported diarrhea, cramps, and fever. One case reported bloody stools. Both cases reported incubation periods of 4 days, with illness durations of 9 and 10 days, respectively.

This was an outbreak of campylobacteriosis associated with raw milk consumption at a family reunion. Raw milk is a well-established vehicle of campylobacteriosis. The incubation period of 4 days following the consumption of raw milk is consistent with the typical incubation period for campylobacteriosis.

(42)
Campylobacter jejuni Infections Associated with Raw Milk

August Crow Wing County

On September 4, 2008, a physician from Brainerd, Minnesota contacted the Crow Wing County Health Department about four patients he had seen with bloody diarrhea, right side colonic edema, and severe abdominal pain. The Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section was notified and an outbreak investigation was initiated.

Contact information for the patients was obtained from the treating physician. Epidemiologists from MDH interviewed patients to obtain exposure information and illness histories. A case was defined as a patient presenting to the St. Joseph's Medical Center Emergency Room with acute onset of diarrhea (≥3 loose stools in a 24-hour period) and abdominal cramps between August 30 and September 5, 2008. Stool specimens were obtained from two patients and submitted to MDH for bacterial testing.

An inspector from the Minnesota Department of Agriculture (MDA) Dairy, Meat, Poultry and Egg Inspection Program collected leftover raw milk from a patient's home. The raw milk was submitted to MDA for bacterial testing.

Three patients met the case definition. Illness histories and exposure information were obtained from two patients; MDH was unable to reach the other patient for interview.

Both cases reported diarrhea, abdominal cramps, and fever. One case reported bloody stools. Both cases had ongoing illness at time of interview. Cases were hospitalized for 2 and 4 days, respectively. One case had a stool sample test positive for *Campylobacter jejuni*. The other case's stool sample was negative for *Campylobacter, Salmonella, Shigella*, and *E. coli*; however, she had been started on intravenous antibiotics prior to submitting a stool sample.

Two interviewed cases were from the same household but had limited common exposures. Both cases reported consuming raw milk on multiple occasions in the week prior to onset of illness. The cases purchased raw milk from a local farmer in Crow Wing County 4 days prior to onset.

Yersinia enterocolitica was isolated from the raw milk collected from the case's home; the milk was negative for *Campylobacter*.

This was an outbreak of campylobacteriosis associated with raw milk obtained from a local farm; this exposure was confirmed in the two cases available for interview. Cattle are a common reservoir of *Campylobacter*, and raw milk is a well established vehicle for *Campylobacter* infections in humans. The *Yersinia enterocolitica* isolated was indicative of the presence of fecal bacterial contamination in the raw milk.

(43)
Clostridium perfringens Intoxications Associated with a Private Event

September — Dakota County

On September 7, 2008, the Minnesota Department of Health (MDH) received an illness complaint from Hennepin County Poison Control associated with a taco party held in a private home in Burnsville on Friday September 5. MDH learned that there had been about 70 attendees (high school athletes and some parents), with many subsequently reporting illness. The taco dinner included taco shells, ground beef prepared with taco seasoning, shredded cheese, tomato, lettuce, sour cream, salsa and tortilla chips, cookies, cakes, bottled water and Gatorade. Desserts included cookies and cakes brought by families attending the taco party. The meal time was between 10:00 p.m. to 11:00 p.m.

MDH staff interviewed the event host, team members, and parents of team members. A contact list of all team members was provided by the coach. A case was defined as a taco party attendee who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) following the event. Stool samples were collected from four ill attendees and submitted to the MDH Public Health Laboratory for bacterial, viral, and toxin testing.

Interviews were completed for 25 attendees. Of these, 15 (60%) met the case definition; five (20%) additional individuals reported gastrointestinal illness symptoms but did not meet the case definition and thus were excluded from further analyses. All cases reported diarrhea, 11 (73%) cramps, and one (7%) vomiting; none reported fever or bloody diarrhea. The median incubation period was 8.5 hours (range, 6.5 to 12 hours). Duration of illness information was available for 11 cases; the median duration was 22.0 hours (range, 5 to 50 hours).

Two of the four case stool samples were positive for *Clostridium perfringens* enterotoxin A. *C. perfringens* was isolated from all four stool samples. Two distinct pulsed-field gel electrophoresis (PFGE) patterns of *C. perfringens* were identified, including Perf30 from one case and Perf31 from the other three cases. The two *C. perfringens* enterotoxin-positive samples included the one sample that yielded Perf30 and one of the three samples that yielded Perf31.

Several food items served at the taco party were significantly associated with illness, including taco meat (15 of 15 cases vs. 1 of 4 controls; odds ratio [OR], undefined; $p = 0.004$); taco shells (11 of 19 cases vs. 0 of 5 controls; OR, undefined; $p = 0.04$); lettuce (10 of 15 cases vs. 0 of 5 controls; OR, undefined; $p = 0.03$); cheese (15 of 15 cases vs. 0 of 4 controls; OR, undefined; $p < 0.001$); chips (10 of 15 cases vs. 0 of 5 controls; OR, undefined; $p = 0.03$); and cookies (13 of 15 cases vs. 1 of 5 controls; OR, 26.0; $p = 0.01$).

C. perfringens was cultured from leftover taco meat at a level of 6.6×10^7 organisms per gram. The PFGE pattern of *C. perfringens* identified from the taco meat was Perf30.

Preparation of the taco meat was discussed with the party host. Thirty pounds of ground beef were fried, taken off the stove and mixed with the taco seasoning on Thursday September 4. The prepared taco meat was divided into two containers and refrigerated until the event the following evening. The meat was not divided into smaller containers to facilitate cooling. The taco meat was reheated prior to serving. Temperatures were not taken during the cooking, cooling, or reheating process.

This was a foodborne outbreak of *Clostridium perfringens* intoxications associated with a taco dinner served at a private home for a high school sports team. The prepared taco meat was implicated as the outbreak vehicle. The outbreak resulted from improper cooling procedures and improper reheating of the taco meat. Specifically, too much taco meat was placed into each container, preventing rapid cooling of the food and allowing *C. perfringens* to amplify. The taco meat then had to have been improperly reheated, allowing the vegetative form of *C. perfringens* to survive.

(44)
Norovirus Gastroenteritis Associated with a Restaurant

September — McLeod County

On September 22, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness from a group of eight classmates who had eaten lunch together at a restaurant in Hutchinson, Minnesota on September 18. The original complainant reported onset of diarrhea and vomiting 36 hours after the meal, and indicated that four other people from the group had been ill. MDH Environmental Health Services (EHS) was contacted and an investigation was initiated on September 22.

MDH staff interviewed all eight members of the complainant group about illness and food consumption histories. A case was defined as a person with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) within 60 hours of the meal at the restaurant. Contact information for other patrons was not available. Stool samples were collected from two cases and one employee and submitted to the MDH Public Health Laboratory for bacterial and viral testing. An MDH EHS sanitarian completed a facility inspection on September 23 and interviewed all food workers.

Five of the group of eight classmates met the case definition. One member of the group reported gastrointestinal symptoms but did not meet the case definition and was therefore excluded from further analysis. All five cases reported diarrhea, vomiting, and cramps, two (50%) of four reported a fever, and none reported bloody stools or hospitalization. The median incubation period for cases was 36 hours (range, 13 to 39 hours). Duration of illness information was available for four of the five cases; the median duration of illness was 42 hours (range, 34 to 57 hours). Both stool specimens submitted by cases were positive for norovirus genogroup I; genetic sequencing performed on the two specimens indicated that the sequences were identical.

The five cases reported eating various types of sandwiches with cheese. The two members of the group that did not report illness did not report eating cheese on their sandwiches. Due to the small number of subjects, a meaningful statistical analysis could not be performed.

Interviews were completed for all nine food workers at the restaurant. One employee reported gastrointestinal illness beginning on September 20 in the morning. The employee submitted a stool sample which tested positive for norovirus genogroup I with a sequence that was identical to that of the two patron cases. The environmental health inspection report indicated that the facility was reminded about food worker exclusion policies. No other critical violations were noted.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant in Hutchinson. One ill food worker was identified; however, the illness onset date for the food worker was consistent with those of the cases. A specific food vehicle was not identified. The source of the outbreak was likely a ready-to-eat sandwich ingredient, which could have been contaminated by another unidentified ill food worker.

(45)
Norovirus Gastroenteritis Associated with a Restaurant

October Freeborn County

On October 15, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among a group of seven people from three separate households who ate at a restaurant in Albert Lea, Minnesota on October 12, 2008. The original complainant reported that six of the seven group members had developed a similar illness following the shared meal. An outbreak investigation was initiated on October 15.

A list of all group members was obtained, and each member was contacted and interviewed using a standard questionnaire. In addition, a partial list of credit card names from patrons that had visited the restaurant during October 9-12 was obtained from the restaurant and these individuals were also contacted by MDH staff. A case was defined as a person with vomiting and/or diarrhea (≥3 loose stools

in a 24-hour period) following a meal at the restaurant. A control was defined as a restaurant patron that consumed a meal at the restaurant on October 12 and did not subsequently develop any gastrointestinal illness. A MDH sanitarian visited the restaurant to assess food-handling practices, employee hygiene, and employee illness. Stool samples were collected from ill patrons and restaurant employees and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

All seven members of the initial complainant group were interviewed along with 15 additional restaurant patrons. Six of the seven initial group members met the case definition, as did one additional patron who also ate at the restaurant on October 12 at approximately the same time as the initial complainant group. All cases reported diarrhea, five (71%) vomiting, five (71%) cramps, and three (43%) fever. The median incubation period was 34 hours (range, 31 to 58 hours).

Fourteen restaurant patrons were contacted and interviewed from the list of credit card receipts. Two of these patrons were present at the restaurant at approximately the same time as the cases. No additional illness was detected among the 14 patrons contacted.

All seven cases consumed a lettuce salad. The one complainant group member and the two credit card receipt patrons that dined at the restaurant on October 12 and did not become ill did not consume lettuce salads. Of those that dined at the facility on this meal date, consuming a lettuce salad was statistically associated with illness (7 of 7 cases vs. 0 of 3 controls; odds ratio, undefined; $p = 0.008$).

All 45 employees were interviewed by MDH staff. Seven employees reported recent gastrointestinal illness, and six reported having an ill household member. Illness onsets ranged from October 6 to October 16. Three of the ill employees worked on October 12, but none reported preparing the salads. All ill staff were excluded from working for 72 hours after recovery from their symptoms, and the restaurant performed a thorough cleaning of all food-handling surfaces and restrooms.

Four cases and two ill employees submitted stool samples to MDH for laboratory testing. All were positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the two employee samples and one case sample; the resulting nucleic acid sequences were identical.

This was a foodborne outbreak of norovirus gastroenteritis associated with consumption of lettuce salad at a restaurant in Albert Lea. Multiple ill food workers were found at the restaurant, and were likely the source of contamination.

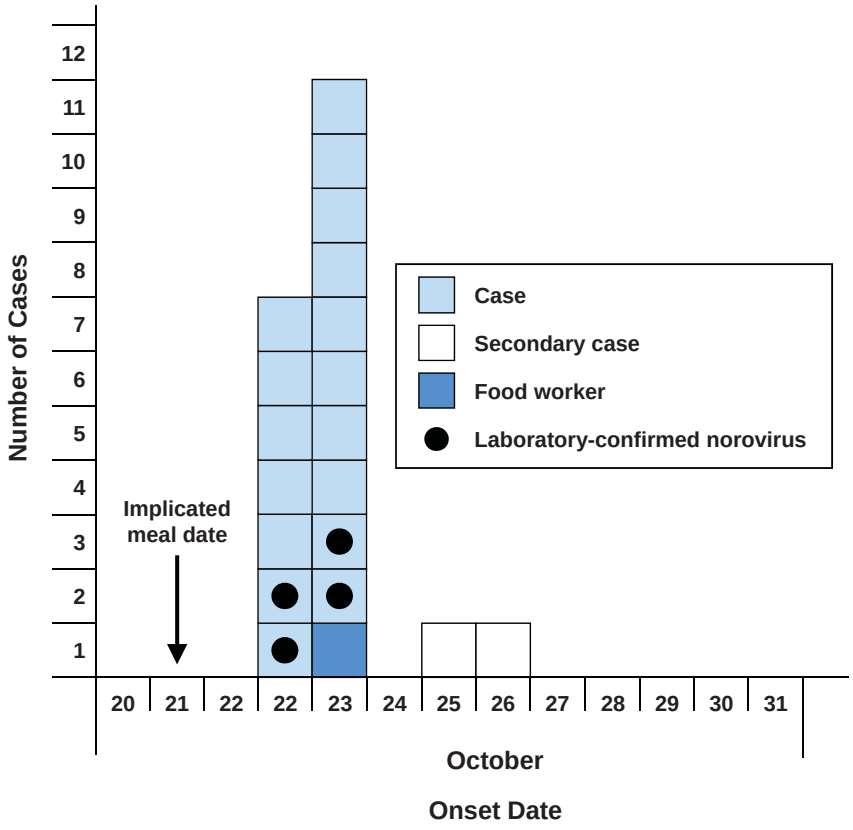
(46)
Norovirus Gastroenteritis Associated with a School

October Cottonwood County

On October 23, 2008, the Minnesota Department of Health (MDH) received a call from an infection control practitioner at Sanford-Westbrook Medical Center reporting that 33 of 84 elementary students at a school in Cottonwood County were out sick that day with gastrointestinal symptoms. A food worker at the school was also out ill that same day. Brown-Nicollet Environmental Health (BNEH) was contacted and an investigation was initiated on October 23.

A list of students and contact information was obtained from the school, and MDH staff interviewed a sample of students to obtain information on food/beverage consumption, special activities at school, and illness history. A case was defined as a student who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) on October 22 or 23. Stool specimens were collected from four cases and submitted to the MDH Public Health Laboratory for bacterial and viral testing. Once a food vehicle was identified, incubation periods were calculated from the implicated meal date and time.

Norovirus Gastroenteritis Cases Associated with a School, by Illness Onset Date



A sanitarian from BNEH conducted an environmental health evaluation in the school kitchen on the morning of October 24 and interviewed all four food workers. The sanitarian also provided school staff with information and tools to prevent further illness transmission and to educate students about proper handwashing.

Illness history and exposure information were obtained for 29 students. Of those, 17 (59%) met the case definition. Two students reported illness beginning on October 25 and 26, respectively, and were therefore considered to be secondary cases and not included in the case definition. A third student was interviewed but reported a separate concurrent illness and was also excluded from the analysis. Among the cases, all 17 reported vomiting, 13 of 16 (81%) reported cramps, seven (41%) reported diarrhea, six (35%) reported fever, and none reported bloody stools or were hospitalized. The median incubation period was 38 hours (range, 24 to 58 hours) and the median duration of illness was 24 hours (range, 4 to 49 hours). All four stool specimens collected from cases tested positive for norovirus genogroup I.

Consumption of chips (14 of 17 cases vs. 2 of 9 controls; odds ratio [OR], 16.3; 95% confidence interval [CI], 1.7 to 208.3; p = 0.009) and salsa (11 of 17 cases vs. 1 of 9 controls; OR, 14.7; 95% CI, 1.3 to 708.2; p = 0.01) served at lunch on October 21 were statistically associated with illness.
One food worker reported vomiting and diarrhea beginning at midnight the morning of October 23. The ill food worker returned to work on October 24, but was instructed by the BNEH sanitarian to remain excluded from work for 72 hours following recovery. Discussion of food-handling practices at the school indicated that the chips and salsa were individually portioned for the students by the school food workers, and that gloves were used for portioning the chips. High school students also ate lunch in the same cafeteria on October 21; however, there was not an increase in gastrointestinal illnesses among the high school students.

This was a foodborne outbreak of norovirus gastroenteritis associated with consuming chips and salsa from a school cafeteria. The source of the contamination was not identified.

(47)
Norovirus Gastroenteritis Associated with a Charity Dinner

October Carver County

On October 29, 2008, the Minnesota Department of Health (MDH) received a complaint of gastrointestinal illness in an attendee of a charity dinner held at a restaurant in Chanhassen, Minnesota on October 26. Meals were prepared in the restaurant kitchen by the staff and served to attendees for dinner on that day. Epidemiologists and environmental health specialists from MDH initiated an investigation.

MDH sanitarians inspected the restaurant's kitchen on October 29. MDH epidemiology staff obtained a menu and a list of attendees from the charity organizer. Attendees were contacted and interviewed to determine if they had gastrointestinal illness following the charity dinner and to identify what food items they had eaten. A case was defined as an attendee who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool samples were requested from persons meeting the case definition and if obtained, tested for bacterial and viral causes of gastrointestinal illness at the MDH Public Health Laboratory.

Restaurant records indicated that dinner was prepared for 176 people. Listings of possible charity dinner attendees were obtained from the organizer and included those who made contributions and bought tickets to the dinner. Of 76 attendees who were interviewed, eight (11%) met the case definition, two (3%) reported illness during or following the charity dinner but did not meet the case definition, and 66 (87%) did not become ill.

Of the eight cases, seven (88%) had diarrhea, six (75%) vomiting, and two (25%) fever. Two cases (25%) sought health care, one of whom visited an emergency room. The median incubation period was 41 hours (range, 12 to 61 hours). The median duration of illness, calculated for the four cases who had recovered by the time of the interview, was 12 hours (range, 5 to 28 hours).

The dinner was served buffet-style and included spaghetti, meat sauce, garlic bread, and mixed lettuce salad with dressing and croutons. A bake sale was held during the event with food items donated by charity dinner attendees.

MDH sanitarians identified numerous violations during their inspection. None of the six food handlers who helped prepare or serve the charity dinner reported illness, although one could not be reached by telephone.

No food items or drinks served for dinner were statistically associated with illness. Purchasing something from the bake sale was not statistically associated with illness, although a higher proportion of cases did purchase an item compared to controls (4 of 8 cases vs. 17 of 66 controls; odds ratio [OR], 2.9; 95% confidence interval [CI], 0.5 to 16, p = 0.15). However, among only persons who purchased and/or ate anything from the bake sale, cases were more likely than controls to have eaten pumpkin cupcakes or muffins (3 of 4 cases vs. 3 of 17 controls; OR, 14.0; 95% CI, 0.69 to 785; p = 0.053). Including all persons who attended the event, eating a pumpkin cupcake or muffin was associated with illness (3 of 8 cases vs. 3 of 66 controls; OR, 12.6; 95% CI, 1.3 to 114; p = 0.01).

One event attendee reported baking six plates of "pumpkin muffins with green candy tops". Although she had no illness, she reported that on October 19 her son had a "flu-like" illness and her daughter had a diarrheal illness.

One case reported attending the charity event for only 40 minutes, eating no dinner or food from the bake sale, and only meeting people and shaking hands.

Four stool samples were submitted for testing at the MDH Public Health Laboratory. Three were negative for *Salmonella, Shigella, Campylobacter*, and *E. coli* O157:H7 but tested positive for norovirus genogroup II.

This was an outbreak of norovirus gastroenteritis associated with a charity event. Pumpkin muffins sold at the bake sale at the event were identified as the likely vehicle. The history of illness during the week prior to the bake sale in family members of the person who baked the pumpkin muffins represents a plausible source of contamination of the pumpkin muffins. Not all cases consumed the implicated muffins. This fact, combined with the report of one attendee who did not eat any food items and only was present for 40 minutes to meet people, indicates that some person-to-person transmission may also have occurred.

(48)
Norovirus Gastroenteritis Associated with a Restaurant

October Washington County

On November 3, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among two individuals from separate households who had eaten at a restaurant in Washington County on October 31. Washington County Public Health & Environment (WCPHE) was notified, and an outbreak investigation was initiated.

A list of patrons from October 31 and November 1 was obtained from the restaurant by WCPHE. Staff from WCPHE interviewed patrons to obtain information on food/beverage consumption, wait staff, and illness history. A case was defined as a person with 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 for bacterial and viral testing.

WCPHE conducted an inspection of the restaurant focusing on employee hygiene, food handling, and equipment sanitation. WCPHE staff interviewed employees that worked on October 31 and/or November 1, using a standard questionnaire about recent illness history and job duties.

Illness histories and exposure information were obtained from 10 patrons. Four (40%) cases were identified including the two individuals from the original complaint. All four cases reported diarrhea and cramps, three (75%) reported vomiting, and one (25%) reported fever. The median incubation period was 37 hours (range, 30 to 44 hours). One case submitted a stool sample for testing, and the sample tested positive for norovirus genogroup II.

Cases reported eating a variety of salads, side dishes, and entrees. No food item was statistically associated with illness.

The environmental health investigation revealed two critical violations or non-compliant risk factors: the handwashing sink in the kitchen was not operating (employees were using a sink in the beverage station to wash hands), and a refrigerator on the cook line was found with product (including shrimp) at 55° F. Written orders were given to repair the sink immediately. Potentially hazardous food items were discarded from the refrigerator, and written orders were given to repair the refrigerator.

Food flow and processes were discussed in detail. Restaurant management was required to re-train employees on handwashing and enforce a strict no bare-hand contact (gloving) policy with all employees. Restaurant management was required to check-in, discuss employee health rules, and re-train employees as they arrived to work. Follow-up inspections were conducted by WCPHE throughout the week.

Twenty-six employees were interviewed. One employee reported onset of vomiting and diarrhea the morning of October 31, but worked that and the following day preparing salads, bread baskets, and waiting tables. This employee was identified as the waiter for the four ill patrons. The employee did not submit a sample for testing. Another employee reported vomiting and diarrhea on November 2 and did not come into work. This ill employee tested positive for norovirus genogroup I.

This was a foodborne outbreak of norovirus gastroenteritis associated with a Washington County restaurant. A specific food vehicle was not identified. A wait staff employee who was ill on the implicated meal date was identified and linked to the ill patrons. The most likely source of the outbreak was this infected wait staff employee, who had direct contact with ready-to-eat food items consumed by the ill patrons.

(49)
Suspected *Clostridium perfringens* Intoxications Associated with a Church Turkey Dinner

November — Anoka County

On November 12, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received complaints of gastrointestinal illness from two individuals from the same household who had attended the Fall Dinner on November 7 at a church in Anoka. On November 13, MDH received a separate complaint of gastrointestinal illness from an individual who also attended the Fall Dinner. Sanitarians

from Anoka County Community Health and Environmental Services (ACCHES) were notified, and an investigation was initiated. Upon contacting the church administrator, ACCHES learned that the church had received complaints of illness from at least 15 additional people. The food for the dinner was prepared in the church kitchen and served by volunteers. The dinner included turkey, mashed potatoes, gravy, cranberries, squash, corn, biscuits, various pies, and beverages. The paid event was open to the public, and approximately 585 people attended the dinner.

A list of church members was obtained from the church. Epidemiologists from MDH interviewed church dinner attendees to obtain information on food/beverage consumption and illness history. A case was defined as a church dinner attendee 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. A sanitarian from ACCHES visited the church kitchen to discuss food preparation procedures.

Illness histories and exposure information were obtained from 143 dinner attendees. Forty-six (32%) cases were identified. Seven people reported illness but did not meet the case definition, and thus were excluded from further analysis.

All 46 cases reported diarrhea, 36 (82%) of 44 reported cramps, two (4%) of 46 reported vomiting, and one (2%) of 41 reported blood in their stools. The median incubation period was 10 hours (range, 1 to 40 hours). The median duration of illness was 22 hours (range, 4 to 142 hours). The stool samples submitted by the two dinner attendees tested negative for norovirus, *Campylobacter*, *Salmonella*, *Shigella*, and *E. coli* O157. Due to the length of time that had elapsed between the cases' illness and stool sample collection, the samples were not tested for bacterial toxins.

Consumption of turkey (46 of 46 cases vs. 81 of 89 controls; odds ratio [OR], undefined; $p = 0.05$) was significantly associated with illness. Eating turkey before 6:30 p.m. also was associated with illness (41 of 44 cases vs. 44 of 69 controls; OR, 7.8; 95% confidence interval, 2.2 to 27.8; $p < 0.001$). No other food/beverage item or time period was significantly associated with illness.

All of the food preparation for the dinner was done by church volunteers in the church kitchen, with the exception of donated and purchased pies. Twenty-six turkeys were delivered to the church on October 28. Each turkey weighed 20+ pounds, for a total of 551 pounds. The turkeys were stored in a commercial refrigerator at the church until 7:00 a.m. on November 6, when they were cleaned and seasoned. At 7:45 a.m. each turkey was placed in an individual domestic roaster and cooked for approximately 3 hours. When the turkeys looked done, the meat was picked off the bones and placed in eight four-inch deep foil pans. Six pans were placed in a commercial refrigerator, and two pans were placed in a domestic refrigerator for cooling; the pans remained in the refrigerators overnight.

Starting at 1:00 p.m. on November 7, two pans of turkey were reheated at a time in each of two ovens for approximately 1 hour. The pans of turkey were then kept either in the oven or a hot holding cabinet until they were served at the dinner between 4:00 p.m. and 7:30 p.m. For serving, the foil pans were placed in wire racks with Sterno cans for heat beneath. Temperatures were not taken at any time after the cooking process to ensure that proper cooling took place or that hot holding requirements were met.

This was a foodborne outbreak associated with a turkey dinner served at a church. Based on the attack rate of 32%, it is estimated that 187 people became ill as a result of the dinner. Illnesses were consistent

with a bacterial intoxication caused by *Clostridium perfringens*; however, due to the time that had elapsed before stool specimens were obtained, the etiology of the outbreak could not be confirmed. The turkey was implicated as the outbreak vehicle. The outbreak most likely resulted from improper cooling procedures and improper hot- and cold-holding temperatures which created an environment in which *C. perfringens* proliferated and survived in the turkey.

(50)
Norovirus Gastroenteritis Associated with a Country Club

November Olmsted County

On November 13, 2008, Olmsted County Public Health Services (OCPHS) received a complaint of gastrointestinal illness among guests who attended a wedding reception held at a country club in Stewartville, Minnesota on November 8. The Minnesota Department of Health (MDH) was contacted and an investigation was initiated on November 13.

OCPHS Environmental Health sanitarians visited the country club on November 17 to conduct an environmental assessment and interview staff. OCPHS staff obtained a menu of the food items served at the reception and contact information for reception attendees. Reception attendees were interviewed by OCPHS staff about food consumption and illness history. A case was defined as a wedding reception attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the reception. Stool samples collected from consenting reception attendees were submitted to the MDH Public Health Laboratory for bacterial and viral testing.

Sixty-nine wedding reception attendees were interviewed. Six were excluded from analysis because they had household members with earlier illness onsets, suggesting secondary transmission. Twenty-one (33%) of the remaining 63 guests met the case definition. The median age of cases was 33 years (range, 2 to 87 years). Twenty (95%) cases reported diarrhea, 18 (86%) reported cramps, 13 (62%) reported vomiting, and 9 (43%) reported fever. The median incubation period was 40 hours (range, 6 to 60 hours). The median duration of illness for the 19 cases who had recovered by the time they were interviewed was 54 hours (range, 14 to 145 hours). Four stool samples were submitted by ill reception attendees. All were negative for *Campylobacter*, Shiga toxin-producing *E. coli*, *Salmonella*, *Shigella*, and *Yersinia*, and two were positive for norovirus genogroup II.

By univariate analysis, eating a child's meal (7 of 21 cases vs. 2 of 41 controls; odds ratio [OR], 9.8; 95% confidence interval [CI], 1.8 to 72.3; $p = 0.005$), chicken strips (5 of 21 cases vs. 1 of 41 controls; OR, 12.5; 95% CI, 1.5 to 304; $p = 0.01$), French fries (6 of 21 cases vs. 2 of 41 controls; OR, 7.8; 95% CI, 1.4 to 59.2; $p = 0.01$), and cookies (4 of 21 cases vs. 1 of 41 controls; OR, 9.4; 95% CI, 1.1 to 238; $p = 0.04$) were significantly associated with illness. By unconditional multivariate logistic regression that included chicken strips, French fries and cookies, only eating chicken strips remained independently associated with illness (adjusted OR, 12.5; 95% CI, 1.4 to 116; $p = 0.03$).

During the environmental health assessment, the management reported that banquet staff routinely washed hands after clearing salad plates and before serving entrée plates; however, it was observed that the sink area in the banquet room was not stocked with paper towels, soap or a nail brush, bringing into question the adherence to this practice. Thirteen country club employees who worked the evening of the wedding reception were interviewed, and none reported recent gastrointestinal illness. Sanitarians

instructed the country club staff to implement a series of interventions including excluding any ill food workers until 72 hours after resolution of symptoms, discarding all opened ready-to-eat foods, cleaning and sanitizing food contact surfaces, implementing a "no bare-hand contact" policy, and monitoring of handwashing and proper glove use.

This was an outbreak of norovirus gastroenteritis associated with a wedding reception held at a country in Stewartville. Chicken strips were implicated as a vehicle. However, chicken strips could explain only 5 of the identified cases. Therefore, there must have been additional contaminated foods. While the source of the contamination was not identified, the lack of required items for proper hand hygiene suggests that an unidentified ill food worker was the most plausible source.

(51)
Suspected Foodborne Bacterial Intoxications Associated with a Banquet

November Dakota County

A complaint of gastrointestinal illness was made to the Minnesota Department of Health (MDH) on November 20, 2008 by an attendee of a high school sports team banquet dinner held at a banquet hall in Eagan, Minnesota on November 18. The banquet meal was prepared by an on-site catering service/ kitchen and served as a buffet.

An MDH Environmental Health Services sanitarian inspected the facility on November 21. A roster of the 35 sports team members was obtained from the coach. A menu was obtained from the catering service. Banquet attendees (team members and their parents) were interviewed and asked if they had gastrointestinal illness during or after the banquet and to identify what food items they had eaten during the banquet. A case was defined as a banquet attendee who developed diarrhea (≥3 loose stools in a 24-hour period) or vomiting after the banquet. Stool samples were requested from persons meeting the case definition and if obtained, tested for bacterial and viral causes of gastrointestinal illness at the MDH Public Health Laboratory.

Fifty-three attendees were contacted. Of these, 21 (40%) met the case definition, 2 (4%) reported gastrointestinal symptoms but did not meet the case definition, and 30 did not become ill. All 21 cases had diarrhea, 15 (71%) had cramps, and one had blood in their stool (5%). No cases reported fever or vomiting. None sought health care. Diarrhea occurred for a median duration of 15 hours (range, 2.5 to 20.5 hours).

The only food item associated with illness was chicken parmesan served with white sauce (21 of 37 [57%] persons who ate the chicken parmesan became sick vs. 0 of 13 [0%] persons who did not eat the chicken parmesan; risk ratio with 0.5 correction to each cell, 15.8; 95% confidence interval, 1.0 to 244; $p < 0.001$).

The one stool sample submitted was negative for *Salmonella*, *Shigella*, *Campylobacter*, *E. coli* O157:H7, and norovirus. The sample was not tested for bacterial toxins because identification would be unlikely after the 5-day delay between the onset of illness and specimen collection.

The chicken product was pulled from the refrigerator and breaded on November 16, cooked on November 17, and stored until it was served on November 18. Although the sanitarian's inspection did not observe problems in temperature control on November 21, past inspections found that this had been a recurrent problem.

This was a confirmed foodborne outbreak associated with consumption of chicken parmesan at a sports banquet. Although the etiology was not confirmed, the symptoms, incubation periods, and vehicle were characteristic of an outbreak of foodborne bacterial intoxications such as that caused by *Clostridium perfringens*.

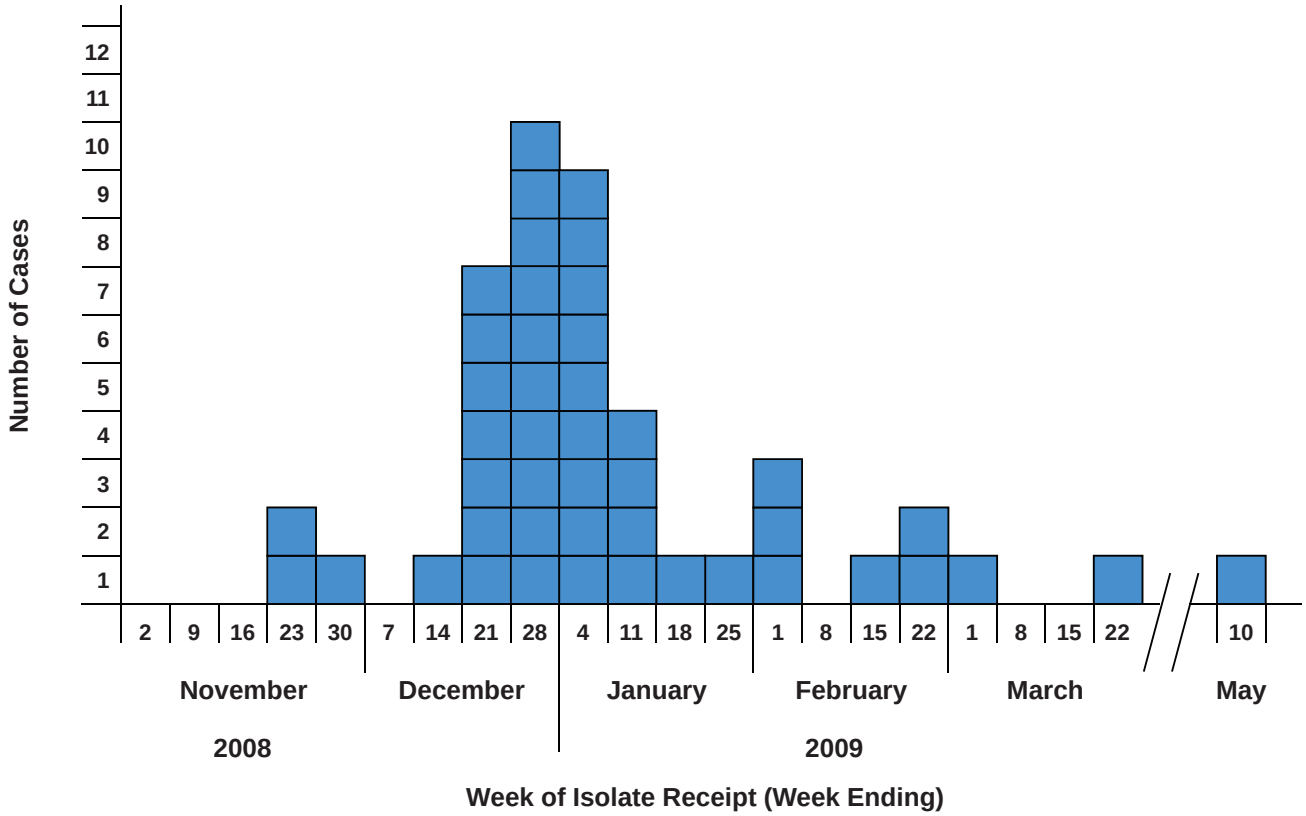
(52)
Outbreak of *Salmonella* Typhimurium TM957/TM958 Infections Associated with Peanut Butter and Peanut-Containing Products

November-May Multiple states

On November 10, 2008, PulseNet staff at the Centers for Disease Control and Prevention (CDC) noted a multi-state cluster of 13 *Salmonella* serotype Typhimurium isolates with one pulsed-field gel electrophoresis (PFGE) pattern (*Xba*I PFGE pattern JPXX01.1818) reported from 12 states. On November 24, a second cluster of 27 *S.* Typhimurium isolates was identified with a similar PFGE pattern (*Xba*I PFGE pattern JPXX01.0459/JPXX01.1825). On November 25, 2008, the CDC's OutbreakNet team began an epidemiological assessment of the first cluster, which had grown to 35 isolates. On December 2, 2008, CDC and state and local partners began an assessment of the second cluster, which had grown to 41 isolates. These PFGE patterns were previously not seen in the PulseNet *S.* Typhimurium database. Testing with a second PFGE enzyme (*Bln*I) showed that isolates from both clusters had the same *Bln*I pattern (JPXA26.0462) and were also indistinguishable by multilocus variable number tandem repeat analysis (MLVA). The clusters were geographically and temporally clustered as well, so the two patterns were grouped together as a single outbreak strain, and the investigations were merged.

From November 17 through November 24, three cases with isolates matching this cluster by PFGE were identified by staff at the Minnesota Department of Health (MDH). The MDH Public Health Laboratory (PHL) identified more cases in December, and interviews of cases continued. On December 22, a medical director of a long-term care facility (LTCF) in northern Minnesota contacted MDH to report confirmed *Salmonella* infections in three patients, with two more likely cases pending. Subtyping of isolates from all five cases at MDH revealed that all were the outbreak strain of *S.* Typhimurium. Also on December 22, an additional outbreak case was reported by a second LTCF in the same city. The outbreak investigation continued throughout December and January.

Salmonella Typhimurium Cases in Minnesota Associated with the PCA Peanut Butter Outbreak, by Week of Isolate Receipt in MDH Lab



A case was defined as a person who had a *S.* Typhimurium isolate that matched the outbreak PFGE patterns (designated in Minnesota as TM957 and TM958). Hypothesis-generating questionnaires were conducted by CDC and other states throughout November and December. In early December, the leading hypothesis in the national investigation was chicken, largely due to a restaurant-associated outbreak in one state. In that outbreak, three PFGE patterns were identified among restaurant patrons; including the two national outbreak patterns. No other states had cases with the third pattern. Tracebacks were conducted by the United States Department of Agriculture (USDA) of chicken products in various states. The Minnesota Department of Agriculture (MDA) conducted tracebacks of chicken from Minnesota cases.

Minnesota cases who could be contacted directly were interviewed with a broad-based exposure questionnaire or the CDC hypothesis-generating questionnaire and re-interviewed several times about various foods consumed. Invoices and menus were obtained from institutions, including LTCFs, schools, cafeterias, and other venues. Tracebacks of peanut butter were conducted by the Minnesota Department of Agriculture (MDA).

Food samples were collected from various facilities or case households by MDA staff. They were tested at the MDA laboratory using an adaptation of the Bacterial Analytical Manual (BAM) methodology for food testing published by the Food and Drug Administration (FDA). Screening was done on both the bioMerieux VIDAS test system and DuPont BAX PCR system. Several other states and FDA also tested food samples, including peanut butter and other peanut-containing products.

In Minnesota, 45 confirmed cases were identified in this outbreak (See epidemic curve). Ages ranged from 4 months to 98 years (median, 44 years). Forty-four (98%) cases had diarrhea, 27 (60%) reported fever, 23 (51%) had cramps, 16 (36%) had bloody diarrhea, and eight (18%) experienced vomiting. Duration of illness ranged from 3 to 19 days (median, 8.5 days). Seventeen (38%) were hospitalized (median duration, 4 days; range, 1 to 10 days) and 3 died.

The sources of chicken among Minnesota cases in the outbreak did not converge in the traceback. It was later determined that the cases in the state with a restaurant outbreak who had isolates with the national PFGE patterns also had other exposures in common and were not part of the restaurant outbreak.

The first eight cases identified in Minnesota had all eaten peanut butter, but there was no single brand reported by all cases. While there was not enough evidence to implicate peanut butter as the cause of the outbreak at this point in the investigation, peanut butter was a common food item that continued to appear throughout the investigation.

From December 26-28, two outbreak cases were interviewed who attended the same elementary school. The menus and invoices for these elementary school cases and the LTCF cases reported on December 22 and were obtained. All three facilities purchased food from the same distributor in Fargo, North Dakota (Distributor A). The only food item in common to all three institutions was Brand A creamy peanut butter. An open 5 lb. tub of Brand A peanut butter was collected from one of the LTCFs by the MDA rapid response team (RRT) on January 5, 2009.

On January 6, an additional outbreak case, a resident in a third LTCF, was reported to MDH. This case died, and in the weeks prior to illness onset had consumed only a limited diet that included peanut butter and toast. This LTCF also served Brand A creamy peanut butter from Distributor A. Distributor A was able to provide a list of all restaurants, institutions, and other facilities that received Brand A peanut butter. By January 9, five additional cases were identified and had links to institutions that received Brand A peanut butter, including two additional LTCFs, two universities, and a local government cafeteria. Also on January 9, MDA identified *Salmonella* in the open tub of peanut butter.

Thirty outbreak cases had been identified in Minnesota by January 9, and 18 of them had a known exposure to Brand A peanut butter. Distributor A also had a distribution center in the Minneapolis-St. Paul metropolitan area. However, no cases were associated with institutions that resided in the distribution area for the metropolitan center. This distribution center did not carry Brand A peanut butter. Based on the available evidence, MDH and MDA staff issued a press release on Friday, January 9 advising Minnesota residents not to serve or consume Brand A peanut butter. Peanut butter isolates were confirmed as *S.* Typhimurium and both outbreak PFGE patterns were identified in four of 10 subsamples from the open tub by Monday, January 12.

Brand A Companies issued a recall of their peanut butter on January 10. Also on January 10, Peanut Corporation of America (PCA) issued a press release about their products since they produced and packaged Brand A peanut butter.

By the week of January 12, various state health departments reported cases consuming Brand B and Brand C peanut butter crackers. The plant in North Carolina that manufactured these crackers was found to use PCA peanut paste. On January 16, Company B issued a recall of Brand B and Brand C peanut butter crackers. The outbreak strain of *S.* Typhimurium was subsequently isolated from Brand B peanut butter crackers by Canada (from crackers purchased in Maine) and Oregon public health officials. All cracker samples tested in Minnesota were negative.

On January 16, Connecticut officials isolated *S.* Typhimurium from an unopened tub of Brand A peanut butter. Six positive subsamples were found in one open and one intact tub of peanut butter. Four isolates were *S.* Typhimurium with the outbreak PFGE patterns and two were *S.* Tennessee.

Among the 45 cases in Minnesota in this outbreak, 24 (53%) had exposure to Brand A peanut butter (14 LTCF residents, 9 at work or school, and 1 at a retail ice cream store). Twelve (27%) additional cases were likely associated with Brand B or Brand C peanut butter crackers (many could not remember specific brand names, but described the packaging). Nine (20%) cases had an undetermined exposure.

The PCA peanut butter outbreak resulted in the largest food recall ever conducted by the FDA, including over 3,000 peanut-containing products.

This was a multi-state outbreak of salmonellosis associated with the consumption of peanut butter and various peanut containing products connected to Peanut Corporation of America. PFGE subtyping and rapid subcluster investigations, particularly the use of informational product tracebacks, were critical in identifying the cause of this ongoing outbreak.

(53)
Norovirus Gastroenteritis Associated with a Hotel

December St. Louis County

On December 9, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from one of a group of 14 people from Thunder Bay, Ontario who traveled to Duluth and stayed at a hotel during December 1-4. The original complainant reported that 12 of 14 group members had developed a similar illness. The group had shared several meals, but one meal, a cocktail party served at the hotel on December 2, was shared among the group and along with two relatives of group members who were from Duluth. The relatives had also reported illness but had not attended any of the other group activities. An outbreak investigation was initiated on December 9.

A list of all group members was obtained, and each member was interviewed using a standard questionnaire. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) following the cocktail party on December 2. A control was defined as a person that consumed food at the cocktail party on December 2 and did not subsequently develop any gastrointestinal illness symptoms. A St. Louis County Public Health (SLCPH) sanitarian visited the hotel banquet facility to assess food-handling practices, employee hygiene, and employee illness. Stool samples were collected from ill patrons and hotel employees and submitted to the MDH Public Health Laboratory (PHL) for viral testing.

All 16 members of the initial complainant group were interviewed. Of these, eight (50%) met the case definition, and four had mild symptoms but did not meet the case definition. Illness onsets ranged from December 3 to December 4. Seven (88%) cases reported diarrhea, seven (88%) reported vomiting, seven (88%) reported cramps, and four (50%) reported fever. The median incubation period was 35 hours (range, 22 to 43 hours). Food served at the cocktail party held at the hotel and were served chicken drummies, Italian meatballs, fresh-cut fruit, cheese and crackers, and drinks. No specific food item was associated with illness. However, consuming cheese (8 of 8 cases vs. 2 of 4 controls; $p = 0.09$) and ice (5 of 8 cases vs. 0 of 4 controls; $p = 0.07$) approached significance.

On December 10, a SLCPH sanitarian visited the banquet facility and found no critical violations but a general lack of knowledge of safe food preparation methods among staff. The hand sink closest to the preparation area did not have soap at the time of inspection. There was no policy at the establishment to wear single use gloves when preparing ready-to-eat foods. In addition, the management did not keep an employee illness log and was not aware that employee illness was required to be documented.

All 11 hotel banquet employees were interviewed by SLCPH and MDH staff. One employee reported recent gastrointestinal illness along with two ill household members. Illness onset for the employee was on December 3 but the ill household members had illness onset on November 29 and December 1. This food worker prepared the foods served at cocktail party. The food worker did not wear gloves when dicing the fruit and the cheese. The same ill food worker had prepared a tossed salad, mint mousse and carved the ham for a banquet with 33 attendees on the same night. MDH staff interviewed 29 of the 33 attendees about food consumption and illness history. Four cases were identified in this group with illness onsets ranging from December 3 to December 6.

Four cases, three from the initial complainant group and one from the banquet, and the ill employee submitted stool samples to MDH for laboratory testing. Two cases, one from each group, were positive for norovirus genogroup II. Nucleic acid sequencing was attempted on the two case samples; however, the laboratory was unable to sequence norovirus nucleic acid from either specimen despite trying three separate regions.

This was a foodborne outbreak of norovirus gastroenteritis associated with a hotel in Duluth. One ill food worker was identified at the restaurant and was responsible for preparing foods for two independent parties. Ill patrons were identified in both parties making this food worker the likely source of contamination. Ready-to-eat foods likely served as the vehicle of transmission.

(54)
Norovirus Gastroenteritis Associated with a Country Club

December Ramsey County

On December 11, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a call from the organizer of a company holiday banquet that took place at a country club on December 5. He reported that approximately 50 of 160 people who attended the event had contacted him with complaints of gastrointestinal illness. Sanitarians from the St. Paul-Ramsey County Department of Public Health Environmental Health Section were notified, and an investigation was initiated.

A list of banquet attendees was obtained from the event organizer; the country club also provided a list of contact information for other events that had been held at the club the same weekend. Epidemiologists from MDH interviewed banquet attendees to obtain information on food/beverage consumption and illness history. A case was defined as a holiday party attendee who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). A stool specimen was obtained from one attendee and submitted to MDH for bacterial and viral testing.

A sanitarian from Ramsey County Environmental Health visited the club 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 71 banquet attendees. Twenty-seven (38%) cases were identified. Seven people reported illness but did not meet the case definition, and thus were excluded from further analysis.

Twenty-four (89%) cases reported diarrhea, 24 (89%) reported cramps, 18 (67%) reported vomiting, and 10 (42%) of 24 reported fever. The median incubation period was 38 hours (range, 3 to 56 hours). The median duration of illness was 42 hours (range, 10 to 167 hours). The stool sample tested positive for norovirus genogroup I.

In univariate analysis, consumption of vegetables from the vegetable tray (19 of 23 cases vs. 15 of 33 controls; odds ratio [OR], 5.7; 95% confidence interval [CI], 1.4 to 25.6; $p = 0.01$), cherry chicken salad tarts (11 of 26 cases vs. 4 of 33 controls; OR, 5.3; 95% CI, 1.2 to 24.6; $p = 0.02$), fresh fruit (20 of 26 cases vs. 17 of 36 controls; OR, 3.7; 95% CI, 1.1 to 13.6; $p = 0.04$) and baked brie (11 of 24 cases vs. 6 of 34 controls; OR, 4.0; 95% CI, 1.0 to 15.8; $p = 0.04$) were significantly associated with illness. Stepwise logistic regression converged to a model containing only the cherry chicken salad tarts (adjusted OR, 4.4; 95% CI, 1.1 to 16.9; $p = 0.03$) and the vegetable variables (adjusted OR, 3.9; 95% CI, 1.0 to 14.8; $p = 0.04$).

Illness histories and job duty information were obtained from 36 employees; five employees reported either being recently ill with gastrointestinal illness (n=3) or having a sick child at home (n=2). Both the vegetable tray and the cherry chicken salad tarts were prepared by employees who either reported being ill or having a sick child at home. One employee submitted a stool sample that tested positive for norovirus genogroup I. Nucleic acid sequencing was conducted on the positive norovirus samples from the banquet attendee and the food worker; the nucleic acid sequences were identical.

This was a foodborne outbreak of norovirus gastroenteritis associated with a holiday banquet served at a country club. Cherry chicken salad tarts and the vegetable tray were implicated as the vehicles of transmission; one or more ill employees were responsible for contaminating the food items. As a result of the outbreak, the restaurant instituted an employee illness log.

(55)
Norovirus Gastroenteritis Associated with a Hotel

December Olmsted County

On December 9, 2008, the food-service manager from a hotel in Rochester forwarded an illness complaint to Olmsted County Public Health Services (OCPHS). The complainant was a representative from the regional office of an insurance company who reported that approximately 14 of 70 staff members from four different regional offices had become ill with gastrointestinal symptoms after attending a staff buffet served in the banquet room on December 5. The food manager also shared that a larger company banquet had been held the same evening, but no illness had been reported by that group. OCPHS staff interviewed several of the ill individuals from the insurance group and determined that further investigation was warranted.

An environmental health team was dispatched to the restaurant shortly after the investigation began on December 9. This team interviewed the manager and available staff to assess food-handling practices and employee health, and collected menus for both large parties. Over the course of two days, all of the employees who had been involved in preparing food for the buffet or who were involved in serving or bartending were interviewed. The restaurant/banquet kitchen was inspected.

A list of buffet attendees was requested from the insurance company representative, and a standard foodborne questionnaire was modified to include the buffet menu. Patron interviews began the morning of December 10, because only office phone numbers were available on the list received from the company and everyone had gone home for the evening. A case was identified as a buffet or banquet patron who subsequently developed vomiting or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were collected from a number of ill patrons and food handlers with recent histories of gastrointestinal illness and submitted to the Minnesota Department of Health Public Health Laboratory for analysis.

OCPHS investigators also called one of the persons who had organized the other large company banquet that occurred on December 5 to determine whether any of their attendees had experienced illness.

The organizer of the other company banquet reported to investigators that although a number of their staff had been absent from work on the Monday following the Friday banquet at the restaurant, none of them complained of gastrointestinal illness.

Thirteen (28%) of the 46 insurance company patrons interviewed met the case definition. An additional person was excluded as a case due to an underlying history of irritable bowel syndrome. When the 28% attack rate is applied to the total number of at risk individuals, an estimated 20 persons who attended the party became ill. Symptoms among the 13 cases included abdominal pain (100%), diarrhea (92%), vomiting (62%), and fever (38%). The median incubation was 34 hours (range, 23 to 52 hours). The median illness duration for the nine persons who had recovered at the time of interview was 62 hours (range, 33 to 99 hours). Stool specimens submitted by three of five patrons were positive for norovirus genogroup II. Nucleic acid sequencing was conducted on all three positive specimens; the nucleic acid sequences were identical.

By univariate analysis, eating cheese (11 of 13 cases vs. 17 of 33 controls; odds ratio [OR], 5.2; 95% confidence interval [CI], 1.0 to 27.1; p = 0.04) and eating fruit (9 of 13 cases vs. 9 of 33 controls; OR, 6.0; 95% CI, 1.47 to 24.5; p = 0.009) were significantly associated with illness. By multivariate logistic regression, only eating fruit was independently associated with illness, and remained significant in a multivariate model selection (adjusted OR, 6.0; 95% CI, 1.5 to 24.5; p = 0.01).

At the December 9 initial assessment of the banquet kitchen, a complete list of norovirus interventions was reviewed with the kitchen manager and control measures initiated. The interventions included:

- Excluding food workers who are ill with vomiting and/or diarrhea until symptoms have been resolved for 3 days;
- Implementing a "no bare-hand contact" policy for ready-to-eat foods, with diligent monitoring of handwashing and proper glove use;
- Discarding all open, ready-to-eat foods, including ice; and,
- Cleaning and sanitizing all food-contact surfaces, including the ice machine/bins.

No banquet food prep was occurring at the time of the assessment (which limited direct observations of food prep, handwashing and other procedures), but the manager described the preparation of the banquet foods. All foods were prepared the day of the banquet. The cheese display, fruit display, and lettuce salad were prepped by various staff (different staff were involved in washing the produce, coring the lettuce, prepping the fruit/cheese/salads, and plating). Gloves were not routinely used by all workers for all foods, but the manager reported frequent glove use by staff.

One food worker reported experiencing vomiting or diarrhea with onset on November 30 and recovery on December 1. This worker tested positive for norovirus genogroup II with a nucleic acid sequence that was identical to that of the positive patron specimens. The worker reported not working while symptomatic, and having a child who had been ill with vomiting and diarrhea several days prior to the worker's onset. This worker reported being involved in certain stages of the prep of a number of the ready-to-eat foods for the buffet, including the fruit display. The worker reported being 95% sure that he had worn gloves.

This was an outbreak of norovirus gastroenteritis associated with eating assorted fresh fruit at an insurance company staff party at a hotel in Rochester. A food worker who prepared the cheese plate and the fruit plate for the party was the likely source of contamination. This food worker had recently been ill and tested positive for norovirus. The food worker had been recovered from a gastrointestinal illness 3 to 4 days prior to preparing the trays. However, a stool specimen delivered by this individual 11 days after the December 5 event was still positive for norovirus, so the food worker likely was still contagious at the time of food prep for the party.

(56)
Norovirus Gastroenteritis Associated with a Restaurant

December Ramsey County

On December 10, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among individuals that ate at a restaurant in St. Paul on December 6. According to the original complainant, all four group members became ill approximately 30 hours after eating at this restaurant. These individuals had no other recent meals in common; however, one was the daycare provider for the children of the other three meal companions. They reported no recent gastrointestinal illness in daycare attendees. The City of St. Paul Environmental Health was notified, and an outbreak investigation was initiated.

Staff from MDH interviewed the individuals in the original complainant's party 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 consenting cases and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

A sanitarian from the City of St. Paul visited the restaurant to evaluate food-preparation and handling procedures. MDH staff interviewed restaurant employees regarding recent illness history and job duties. Food workers reporting recent gastrointestinal illness were also asked to submit stool specimens to MDH PHL for bacterial and viral testing.

Illness histories and exposure information were obtained from three of the four individuals that dined with the original complainant at the restaurant on December 6. MDH staff was unable to contact the fourth individual, but it was later reported from the original complainant that upon further inquiry this individual reported not having any gastrointestinal illness following the meal. The three with available illness histories all met the case definition. Of these, all reported diarrhea and vomiting, two (67%) cramps, and two (67%) fever. None of the cases reported bloody diarrhea. The median incubation period was 32 hours (range, 31 to 42 hours). Illness duration could not be calculated as none of the cases had recovered at the time of interview.

Stool samples were collected from all of the cases. Two of the three tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the positive norovirus samples; the nucleic acid sequences were identical.

The cases reported consuming similar food items at the restaurant: all three had the Caesar pasta salad, a cold sandwich with various meats and toppings, and a dessert. As no control information was available, a specific food vehicle could not be implicated.

No employee illness was identified during initial contact with the restaurant by the City of St. Paul staff on December 10, and no improper food-handling practices were observed by the sanitarian. Glove use is required for employees serving food, but is not implemented in the kitchen during food preparation. Further follow-up with the restaurant on December 11 revealed that there had been some gastrointestinal illness among employees working in the kitchen. Employee phone lists were obtained at that time in order to determine the extent of illness.

Of the 27 employees interviewed, nine (33%) reported experiencing gastrointestinal symptoms since November 22. Two of these employees submitted stool specimens to MDH PHL, one of which tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the sample, and the sequence was identical to that identified in the patron samples. The sanitarian discussed with restaurant staff the importance of handwashing for the prevention of norovirus infection. Additionally, the restaurant was informed 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 a restaurant in St. Paul. A specific food vehicle was not identified. However, the likely source was one or more infected food workers who had contact with ready-to-eat food items.

(57)

Suspected Bacterial Intoxications Associated with a Youth Basketball Tournament

December Dakota County

On December 15, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received an illness complaint associated with a girl's youth basketball tournament held in South St. Paul on December 6. The complainant reported that 9 of 10 teammates developed gastrointestinal illness after eating food purchased from a concession stand at the tournament. MDH Environmental Health (EH) was contacted and an investigation was initiated on December 16.

MHD EH contacted the activity center and event organizers to evaluate food-preparation and handling procedures. The complainant refused to give MDH contact information for other individuals on the team but did agree to e-mail contact information to the team to MDH. Additional team members were interviewed regarding food consumption and illness history if they contacted MDH. A case was defined as a tournament attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating food from the concession stand.

Illness histories and exposure information were obtained from three individuals. All three met the case definition and were from one team. The median incubation period for the cases was 11 hours (range, 8 to 13 hours). The median duration of illness was 10 hours (range, 8 to 16 hours). All three cases reported diarrhea and cramps. No cases reported vomiting, fever, or bloody stools. Due to delayed notification of the outbreak, no stool samples were collected.

Although a lack of non-ill controls prevented a meaningful statistical analysis of specific food exposures, all three cases reported eating "tacos-in-a-bag."

The event organizers reported that the concession stand served hot dogs, candy, doughnuts, muffins, soda, and "tacos-in-a-bag" which were comprised of seasoned ground beef, chips, tomatoes, salsa, and sour cream served in a single-serving chip bag. Event organizers cooked 30 pounds of ground beef using two roaster ovens designed for household use at a commercial kitchen in South St. Paul on December 5. These devices are not typically designed for cooking raw foods such as ground beef, and a food thermometer was not used to ensure that the meat reached the proper temperature as required by the Minnesota Food Code. The ground beef was then allowed to cool at room temperature before being placed in a vehicle overnight. The ambient temperature that night reached 9.3° F, possibly freezing the

cooked ground beef. On December 6, the ground beef was transported to the activity center and reheated using the roaster ovens. Again, a food thermometer was not used to ensure the meat was properly reheated before it was served.

This was an outbreak of suspected bacterial intoxications associated with eating food from a concession stand at a girl's youth basketball tournament. The most likely vehicle was tacos-in-a-bag. The etiology was not confirmed. However, the symptoms, incubation periods, and illness durations were characteristic of *Clostridium perfringens* intoxications. Potential for temperature abuse in the preparation of the ground beef was documented and was likely the primary factor leading to this outbreak.

(58)
Norovirus Gastroenteritis Associated with a Restaurant

December Carver County

On December 15, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among three individuals from the same household who had dined at a restaurant in Chanhassen on December 14. On December 15 the MDH foodborne illness hotline also received an independent complaint from two individuals from separate households who reported eating at the same restaurant on December 12. Since the two complaints did not represent the same type of illness based on the incubation periods and symptoms reported, no further action was taken at that time except for forwarding the complaints to MDH Environmental Health Services (EHS). However, on December 17 the MDH foodborne illness hotline received two additional independent complaints naming the same restaurant. Sanitarians from MDH EHS were contacted on December 17, and an investigation was initiated.

A list of restaurant patrons from December 13-16 was obtained from credit card receipts. Staff from MDH interviewed 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).

Sanitarians from MDH Environmental Health Services visited the restaurant on December 17 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 36 patrons. Eighteen (53%) cases were identified. Five people reported illness but did not meet the case definition, and thus were excluded from further analysis. Patrons reported illness that fit the clinical pictures of two different illnesses, norovirus gastroenteritis and a bacterial intoxication (for information on the bacterial intoxication outbreak, please see confirmed foodborne outbreak report #59). A norovirus case was defined as a restaurant patron who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) >12 hours after consuming food from the restaurant. Stool specimens were obtained from three patrons and submitted to MDH for bacterial and viral testing.

Of the 14 norovirus cases, 13 (93%) reported diarrhea, 10 (71%) reported vomiting, 8 (57%) reported cramps, and 5 (45%) of 11 reported fever. The median incubation period was 32 hours (range, 14 to 94 hours). The median duration of illness was 33 hours (range, 9 to 72 hours) for the seven individuals who had recovered at the time of interview. All three stool samples tested positive for norovirus genogroup II, and negative for *Campylobacter*, *Salmonella*, *Shigella*, *E. coli* O157.

Cases reported eating a variety of foods. No food item was statistically associated with illness.

Upon inspection of the restaurant on December 17, nine critical violations and eight non-critical violations were found. Among the critical violations observed was no measureable sanitizer in the dishwasher. Follow-up inspections of the restaurant on December 19 and 22 continued to find a number of violations. Eleven restaurant employees were interviewed; two employees reported having stomach cramps and working on the same days as the cases' meal dates.

This was a foodborne outbreak of norovirus gastroenteritis associated with a restaurant. A specific food vehicle was not identified. The most plausible source of the outbreak was one or more ill food workers who had contact with one or more ready-to-eat food items. During this time, there was also an outbreak of suspected *Clostridium perfringens* intoxications at the restaurant.

(59)
Suspected *Clostridium perfringens* Intoxications Associated with a Restaurant

December Carver County

On December 15, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness among three individuals from the same household who had dined at a restaurant in Chanhassen on December 14. On December 15 the MDH foodborne illness hotline also received an independent complaint from two individuals from separate households who reported eating at the same restaurant on December 12. Since the two complaints did not represent the same type of illness based on the incubation periods and symptoms reported, no further action was taken at that time except for forwarding the complaints to MDH Environmental Health Services (EHS). However, on December 17 the MDH foodborne illness hotline received two additional independent complaints naming the same restaurant. Sanitarians from MDH EHS were contacted on December 17, and an investigation was initiated.

A list of restaurant patrons from December 13-16 was obtained from credit card receipts. Staff from MDH interviewed 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).

Sanitarians from MDH Environmental Health Services visited the restaurant on December 17 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 36 patrons. Eighteen (53%) cases were identified. Five people reported illness but did not meet the case definition, and thus were excluded from further analysis. Patrons reported illness that fit the clinical pictures of two different illnesses, norovirus gastroenteritis and a bacterial intoxication (For information on the norovirus gastroenteritis outbreak,

please see confirmed foodborne outbreak report #58). A bacterial intoxication case was defined as a restaurant patron who subsequently developed diarrhea (≥3 loose stools in a 24-hour period) ≤12 hours after consuming food from the restaurant. A stool specimen was obtained from one patron and submitted to MDH for bacterial, viral, and toxin testing.

Four bacterial intoxication cases were identified, representing three complainants and one case from the credit card receipts. Of these four toxin cases, all reported diarrhea and cramps, and one (25%) reported fever. The median incubation period was 7.5 hours (range, 7 to 12 hours). Three of the four toxin cases had ongoing illness at the time of interview. The stool specimen submitted by the one patron tested negative for norovirus, *Campylobacter*, *Salmonella*, *Shigella*, *E. coli* O157, and *Clostridium perfringens*.

Upon inspection of the restaurant on December 17, nine critical violations and eight non-critical violations were found. Among the critical violations observed were hot, potentially hazardous foods in the steam table being held below 140° F, and multiple cold, potentially hazardous foods being held at above 41° F. Follow-up inspections of the restaurant on December 19 and 22 continued to find a number of violations.

Consuming ground beef (4 of 4 cases vs. 2 of 13 controls; odds ratio, undefined; $p = 0.006$) was significantly associated with toxin illness. Ground beef was consumed as an ingredient in tacos and burritos.

This was a foodborne outbreak associated with a restaurant. The illnesses were consistent with a bacterial intoxication caused by *Clostridium perfringens*; however, only one stool could be obtained, and the etiology of the outbreak could not be confirmed. Ground beef was implicated as the vehicle of transmission; this most likely resulted from improper cooling procedures and improper hot- and cold-holding temperatures which created an environment in which *C. perfringens* proliferated and survived in the ground beef. During this time, there was also an outbreak of norovirus gastroenteritis at the restaurant.

(60)
Norovirus Gastroenteritis Associated with a Restaurant

December Hennepin County

On January 2, 2009, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness from a group of three people who ate at a restaurant in Minnetonka on December 29, 2008. All three members of the group experienced diarrhea and vomiting after eating lunch at the restaurant and had no other meals in common. City of Minnetonka Environmental Health was contacted and an investigation was initiated on January 2.

A City of Minnetonka sanitarian completed a facility inspection on January 2; food workers were interviewed on January 2 and January 5. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) after eating at the restaurant on December 29. Contact information for other restaurant patrons was not obtained. Stool samples were collected from one patron and two employees and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

All three members of the original complainant group met the case definition. All three cases reported diarrhea, vomiting, and cramps; none reported a fever or bloody stools. The median incubation period for cases was 33 hours (range, 31 to 38 hours). None of the cases had recovered at the time of interview. The stool specimen submitted by one of the cases was negative for bacteria (*Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and *Yersinia*) and positive for norovirus.

Each of the three cases reported eating a different type of salad; two reported eating bread from the bread basket, one ate a flat bread pizza, and one ate a turkey club sandwich. All three reported consuming beverages with lime wedges. Statistical analysis of food items could not be performed because controls could not be recruited.

Interviews were completed by City of Minnetonka sanitarians for all 15 food workers. Two reported gastrointestinal illness symptoms since December 24. One food worker (Employee A) had an onset of diarrhea on December 29 in the early morning and worked that day; food-preparation duties on December 29 included slicing limes. A second food worker (Employee B) reported diarrhea and fever that had been ongoing for 2 weeks; food-preparation duties included work on the prep line with soups and dressings, and slicing limes and bread. City of Minnetonka sanitarians excluded both food workers from the restaurant until 72 hours following recovery. Both ill employees submitted stool specimens and both specimens were positive for norovirus. The norovirus nucleic acid sequence obtained from Employee A's sample was identical to that of the norovirus-positive patron sample. The sequence from Employee B's sample differed slightly (4 base pairs) from the sequences obtained from Employee A and the positive patron.

The inspection reported noted that the soap dispensers in the facility were not operating properly, and that the paper towel dispenser needed repair. Ready-to-eat foods that were prepared on December 31 or earlier were discarded (including sliced lemons and limes).

This was a foodborne outbreak of norovirus associated with a meal at a Minnetonka restaurant. Ill food workers were identified in the restaurant and there was strong evidence that an employee who worked while ill was the source of the outbreak. A food vehicle could not be confirmed statistically; however, transmission likely occurred from ready-to-eat food items. In particular, sliced limes used to garnish drinks were the suspect vehicle.

(61)
Norovirus Gastroenteritis Associated with a Restaurant

December Olmsted County

On January 2, 2009, an Olmsted County Public Health Services (OCPHS) sanitarian received a call from an Olmsted County employee who reported that she and a co-worker had become ill with gastrointestinal symptoms after eating at a restaurant in Rochester on December 30, 2008. A third co-worker who had eaten with them was not ill. Foods consumed by the ill meal companions included crab Rangoon, fried rice, chicken, soup, and wontons. Based upon this report, an investigation was initiated.

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 consenting cases and submitted to the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) for bacterial and viral testing.

An OCPHS sanitarian visited the restaurant to evaluate food-preparation and handling procedures. Credit card receipts for other patrons who had dined at the establishment on December 30 were also collected from the restaurant. OCPHS staff interviewed the restaurant employees regarding recent illness history and job duties. Food workers were also asked to submit stool specimens to MDH PHL for bacterial and viral testing.

Illness histories and exposure information were obtained from 10 individuals who dined at the restaurant on December 30; six (60%) met the case definition. Of these, five (83%) reported vomiting, four (67%) diarrhea, four (67%) cramps, and three (50%) fever. None of the cases reported bloody diarrhea. The median incubation period was 34 hours (range, 23 to 43 hours). Duration of illness was unknown as none of the cases had recovered at the time of interview. Stool samples were collected from two of the cases. Both of the samples tested positive for norovirus genogroup II. No food items were statistically associated with illness, and no one food item was consumed by all ill patrons.

An OCPHS sanitarian visited the restaurant to interview food service staff and review their practices. No improper food-handling practices were observed, and none of the employees interviewed reported experiencing recent gastrointestinal symptoms. Specimen collection kits were distributed to all food workers who worked on the suspect meal date. Three employees submitted a stool specimen to the MDH PHL; two of these tested positive for norovirus genogroup II. Nucleic acid sequencing was conducted on the samples, and the sequence was identical to that identified in the patron samples. The sanitarian and MDH staff discussed with restaurant staff the importance of handwashing for the prevention of norovirus infection, and emphasis was given to limit bare-hand contact with food. Additionally, the restaurant was informed 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 a Rochester restaurant. The food vehicle was not identified. However, the likely source of contamination was an infected food worker who had contact with one or more ready-to-eat food items.

Probable Foodborne Outbreaks

(1)
Suspected Norovirus Gastroenteritis Probably Associated with a Restaurant

February Hennepin County

On February 5, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness among two patrons who had eaten dinner at a restaurant in Plymouth on February 1. After interviewing the patrons, MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and environmental health units, and an investigation was initiated.

HSPHD epidemiology staff re-interviewed members of the original complainant group. A list of credit card receipts from patrons who ate at the restaurant on February 1 was obtained from the restaurant; HSPHD epidemiologists called patrons from this list to collect illness and food consumption histories. A case was defined as a person who ate at the restaurant on February 1 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On February 6, HSPHD sanitarians inspected the restaurant and interviewed employees about illness history and work duties. The environmental health assessment of the restaurant focused on employee illness, flow of food, food preparation, and storage procedures.

The original complainant group consisted of three friends from two separate households. The two ill members of the group were from different households and had no other recent common meals or other exposures. Both ill cases reported vomiting, diarrhea, and cramping. One case had a 31-hour incubation period and was still experiencing symptoms at the time of interview; the other case had a 34-hour incubation period and a 22-hour duration of illness. Both cases were female, ages 33 and 46 years, respectively. Neither of the ill patrons agreed to submit a stool sample to MDH.

Both ill patrons consumed a steak salad and shared chicken nachos. Beverages included ice water, soda, and a mixed drink with a lemon wedge. The non-ill member of the group ate a spinach salad and ice water and arrived about 1 hour after the ill members of the group began their meal.

Eighteen additional patrons, identified from the credit card receipt list for February 1, were also interviewed. None reported gastrointestinal illness. These patrons consumed a wide variety of food items. No food items were significantly associated with illness.

HSPHD environmental health staff inspected the restaurant on February 6 and interviewed employees on this date, as well as on February 8. Twenty-four employees were interviewed, with interviews focusing on contacting the employees who worked on the implicated meal date. No employees reported any gastrointestinal symptoms previous to or on the implicated meal date. The HSPHD sanitarian noted overall compliance with food code requirements for food preparation, but did note that hot water in hand sinks was below the recommended temperature range (110-130° F). 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 probable foodborne outbreak of gastroenteritis associated with consuming a meal from a restaurant in Plymouth. The vehicle of transmission was not identified. The incubation and symptoms were characteristic of norovirus gastroenteritis. However, because only two ill patrons were identified, an association with the meal at the restaurant could not be confirmed.

(2)

Suspected Foodborne Bacterial Intoxications Probably Associated with a Restaurant

February McLeod County

On February 28, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in three of four people from two separate households who ate dinner together at a restaurant in Hutchinson in the evening on February 22. The group ate various meat and fish items including shredded pork, chicken, barbecued ribs, and marlin; the three ill complainants also ate baked beans. An outbreak investigation was initiated on February 28.

The three ill members of the complainant group were interviewed, and credit card receipts were obtained for the meal date to attempt to interview additional patrons. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) following a meal at the restaurant. A stool sample was obtained from one of the complainants and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

An environmental health assessment was conducted at the restaurant. Interviews were completed for five food workers at the restaurant to assess gastrointestinal illness and work history.

Three people met the case definition; four additional patrons were contacted through credit card receipts, but none reported any symptoms. All three cases reported diarrhea, one (33%) reported cramps, and none reported vomiting, fever, or bloody diarrhea. The median incubation period was 12 hours (range, 8 to 13 hours) and the median duration of illness was 29 hours (range, 9 to 32 hours). No food item was significantly associated with illness. The stool specimen submitted by one of the complainants 5 days after recovery was negative for norovirus, bacteria, and bacterial toxins.

None of the five employees interviewed by MDH Environmental Health staff reported symptoms of gastrointestinal illness. The environmental health assessment report indicated that the pulled pork was not being cooled properly.

This was a probable foodborne outbreak of gastroenteritis associated with a meal at a restaurant in Hutchinson. The symptoms, incubation periods, and durations of illness were consistent with a foodborne bacterial intoxication. The vehicle was not identified; however, it was likely a food item that was improperly cooled.

(3)
Norovirus Gastroenteritis Associated with an Event

March Stearns County

On March 20, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a report of suspected foodborne illness resulting from a meal at a restaurant in St. Cloud, Minnesota. The complainant stated that approximately eight of 19 individuals from six separate households became ill after eating food catered from this restaurant on March 15. Foods consumed during this meal included lasagna, pizza, bread, Caesar salad, and cake. The cake was brought in from an outside bakery. These individuals had gathered in St. Cloud for a baptism, and all were staying at a local hotel from March 15 through March 16. The restaurant meal was the only meal that all individuals attended. City of St. Cloud Environmental Health staff was notified, and an investigation was initiated.

The complainant provided MDH staff with names and contact numbers for the 19 individuals who dined together on March 15. Persons in the party were interviewed about food consumption over the 2-day period 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 the beginning of the gathering. A sanitarian from the City of St. Cloud inspected the restaurant and interviewed employees responsible for preparing items served at this meal. The restaurant provided contact and order information for additional groups that received items from the restaurant on March 15. The contacts were questioned by MDH staff about any illness in the group following the meal. Persons meeting the case definition were asked to submit stool samples to MDH Public Health Laboratory (PHL) for bacterial, viral, and toxin testing.

Of the 19 attendees interviewed, seven (37%) met the case definition. Three additional people reported gastrointestinal symptoms but did not meet the case definition, and thus were excluded from further analysis.

All seven cases reported vomiting, six (86%) diarrhea, four (57%) fever, and four (57%) cramps. None of the cases had bloody stools. The median incubation period from the meal at the restaurant was 29 hours (range, 20 to 71 hours). The median duration of illness was 44 hours (range, 13 to 84 hours) for the four cases who had recovered at the time of interview. Stool samples were submitted from two of the cases, and both tested positive for norovirus genogroup II.

One individual in the complainant's group that did not meet the case definition reported onset of mild illness that began one half hour after the meal. Follow-up with the original complainant revealed that there were other family members who were unable to attend this event due to gastrointestinal illness.

No food item was statistically associated with illness. However, three of the items had elevated odds ratios (odds ratio [OR], > 4.0), including the lasagna (5 of 7 cases versus 3 of 9 controls; OR, 5.0; $p = 0.3$), Caesar salad (5 of 7 cases versus 3 of 9 controls; OR, 5.0; $p = 0.3$), and bread (6 of 7 cases versus 4 of 8 controls; OR, 6.0; $p = 0.3$).

Two additional parties received catered items from the restaurant on March 15. One of the groups consisted of approximately 25 people and the other of approximately 200 people. The Caesar salad, lasagna, and pizza were prepared by the same employee and provided to more than one group. According to the contacts, no illnesses were reported in the other two groups.

The sanitarian questioned restaurant staff about preparation methods for the foods served at this meal and about any recent gastrointestinal illness. The Caesar salad was prepackaged and prepared immediately prior to the meal. The pizzas were made the night prior to the meal and then cooked on the meal date. The lasagna was ordered premade from an outside facility and also cooked on the meal date. Two employees were responsible for preparation of all these food items; neither employee reported illness during the week prior to this event. As the initiation of this investigation occurred before a busy holiday weekend, it was requested as a precaution that the restaurant explicitly ask all employees if they had experienced vomiting or diarrhea in past 3 days as they presented to work. Additionally, the restaurant was informed that any employee with vomiting and/or diarrhea must be excluded from working for 72 hours after the resolution of symptoms

This was an outbreak of norovirus gastroenteritis associated with a baptism gathering. The statistical analysis suggested that food served to the group at a restaurant was the vehicle, but this was not confirmed. The source of infection was not identified. No illnesses were identified in employees or other groups that received the same catered food items prepared by the same food workers; therefore, the restaurant was not a likely source of contamination of the food. One or more of the group members who were ill around the time of the meal are a more plausible source of contamination for this outbreak.

(4)
Norovirus Gastroenteritis Probably Associated with a Restaurant

April Hennepin County

On April 23, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of illness among two patrons following a shared meal at a restaurant in Minneapolis on April 20. The patrons did not have any other meals in common. After interviewing the patrons, MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units, and an investigation was initiated.

MDEH sanitarians visited the facility on April 23 to conduct an environmental health assessment of the restaurant that focused on employee health and norovirus prevention education. They conducted employee interviews and collected credit card receipts from the implicated meal date. The restaurant had an up-to-date employee illness log.

HSPHD epidemiologists called patrons who had eaten at the restaurant on April 20 to identify additional cases and controls. A case was defined as a person who ate food from the restaurant on April 20 and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool specimen kits were delivered to both original complainants.

Seventeen patrons were interviewed by HCPHP epidemiologists. No additional cases were identified. Of the original two cases, both reported diarrhea, vomiting, and cramps. Incubation periods were 31 and 32 hours. One case reported illness duration of 28 hours and the other case reported ongoing symptoms at the time of interview. Both cases submitted stool specimens that were positive for norovirus with identical nucleic acid sequences. One restaurant employee submitted a stool specimen that was negative for norovirus.

One case ate a bean and rice burrito, chips and salsa, and drank a tap beer. The other case ate a hamburger with lettuce and tomato, chips and salsa, and drank ice water and a tap beer. The only food item shared between the two patrons was the salsa. No food items were significantly associated with illness.

Thirty-six of thirty-seven employees were interviewed by MDEH. Two reported having recent gastrointestinal illness symptoms. The first, a manager, reported being ill beginning on the evening of April 19. Illness lasted approximately 12 hours; the manager did not work during the time of illness and did not return to work until at least 72 hours after resolution of symptoms. The second ill employee, a server, reported being ill on the morning of April 16. Illness lasted less than 24 hours and the server did not work while symptomatic. However, the employee did return to work the next day (April 17). The employee also worked on April 20, but reported no direct handling of food.

During an onsite inspection of the restaurant, no critical violations were identified by MDEH, and the restaurant was in compliance with food safety regulations. The restaurant had not received any additional reports of illness.

This was a probable foodborne outbreak of norovirus gastroenteritis associated with a Minneapolis restaurant. A specific food vehicle was not identified. Infected food workers may have played a role in transmission of norovirus to patrons. However, as additional ill patrons were not identified, the restaurant could not be confirmed as the source of the illnesses. The establishment was instructed on the importance of limiting bare-hand contact of food items, frequent handwashing, and excluding ill food workers for 72 hours following symptom resolution.

(5)
Hepatitis A Virus Infections Associated with a Church Potluck

May Wabasha County

On May 28, 2008, the Minnesota Department of Health (MDH) received a report of hepatitis A among persons who had attended a potluck at a church in Plainview, Minnesota on April 27. Approximately 100 persons attended the event. An investigation was initiated on May 28.

A confirmed case of hepatitis A was defined as either: 1) a potluck attendee with a positive hepatitis A virus (HAV)-specific IgM antibody test or positive polymerase chain reaction (PCR) test for HAV RNA, discrete onset of symptoms, and jaundice or elevated aminotransferase levels; or 2) an individual with discrete onset of symptoms and jaundice or elevated aminotransferase levels who was epidemiologically-linked to a laboratory-confirmed case.

Three potluck attendees met the case definition. One case, an adult male, had symptom onset 9 days after the event and was likely infectious at the time of the potluck. This case did not prepare food for the potluck, but non-ill members of the same household did prepare food for the event. The two additional cases were female; both were under the age of 10. Both of these cases reported abdominal pain and vomiting, one (50%) reported jaundice, and one (50%) reported diarrhea. None of the cases were hospitalized. Serum specimens from two of the cases (the adult male and one of the female children) were submitted to MDH. Both samples were positive for HAV RNA by PCR, and both shared an identical nucleic acid sequence.

A letter was sent to members of the church informing them of the possible exposure. No additional cases were identified.

This was an outbreak of hepatitis A associated with a church potluck. The most likely explanation for the outbreak was contamination of food in the serving line by an infectious attendee. However, because of the small number of cases, person-to-person transmission could not be ruled out.

(6)
E. coli O157:H7 Infections Associated with an Assisted Living Facility

June Brown County

On June 24, 2008, an Infection Control Practitioner (ICP) from New Ulm Medical Center reported to the Minnesota Department of Health (MDH) an *Escherichia coli* O157:H7 case in a resident of an assisted living facility in New Ulm. She also reported that two additional residents of the same wing of the facility had bloody diarrhea. All three had been hospitalized, and one had died. Brown Nicollet Environmental Health (BNEH) was contacted, and an investigation was initiated.

Names of patients identified by the ICP were obtained. The assisted living facility was contacted, and interviews about illness history and potential exposures of the ill residents were conducted.

Menus foods served at the facility were obtained and reviewed. BNEH conducted an evaluation of food preparation practices at the facility. Facility staff provided information on the number of residents in each wing, gastrointestinal illness history for the residents, and number of staff. All the staff were interviewed by MDH staff about illness history, work duties, and facility wing where they worked.

The MDH Public Health Laboratory (PHL) confirmed *E. coli* O157:H7 results of the patients who submitted stools at a health care provider. Stool samples were collected from all staff that worked in the wing where illness had occurred and all residents of that wing. Stool specimens were submitted to the MDH PHL for *E. coli* O157:H7 testing. Pulsed-field gel electrophoresis (PFGE) subtyping was performed on *E. coli* O157:H7 isolates from the positive specimens.

A confirmed case was defined as a facility resident or staff member who tested positive for *E. coli* O157:H7. A probable case was a facility resident or staff member with a recent history of bloody diarrhea who did not submit a specimen for *E. coli* O157:H7 testing.

All eight living residents of one wing of the facility were tested for *E. coli* O157:H7. Five residents tested positive *E. coli* O157:H7 indistinguishable by PFGE, pattern designation MN1057ECB18, meeting the confirmed case definition. An additional facility resident with a recent history of bloody diarrhea died before the outbreak was identified, was not tested, and was therefore classified as a probable case. Eleven of 12 staff members who had worked in the affected wing of the facility also were tested. None of the staff reported a history of recent gastrointestinal illness and none tested positive. None of the residents or staff from the other wing was reported as having recent gastrointestinal symptoms, and therefore, no additional follow-up was done on those residents or staff. Among the six cases (five confirmed and one probable), two (33%) were male. The median age of cases was 81 years (range, 70 to 84 years). Three (50%) of the cases and probable case were hospitalized, and one died (17%). Two of the cases had no history of recent gastrointestinal symptoms. Among the four

symptomatic cases, two cases had onset on June 18, one on June 20, and one on June 24. All four cases reported diarrhea and blood in their stool, none had vomiting, and none had fever.

The facility had 16 residents in two wings. Each resident had their own room, but some shared a bathroom. All of the illnesses occurred in only one wing of the facility. The residents interacted with each other, but did not leave the facility with each other or by themselves, only with family members. Two dogs were kept as pets, but the residents did not have contact with any other animals. All the meals were prepared and served at the facility by facility staff. The facility did not have a commercial kitchen; rather, it had two residential kitchens, one in each wing. The night staff prepared all the meals for the next day for both wings in one of the kitchens. The next day, the food was reheated in the oven in each of the two kitchens by the day staff. BNEH did a complete evaluation of the kitchen facility and food preparation practices. The facility kept logs of temperatures taken during food preparation, and of the refrigerator and freezer. Different staff members were assigned to meat vs. non-meat preparation. The facility had good preparation, food-handling, and hand hygiene practices. No problems were identified during the evaluation.

The two earliest illness onsets in cases/probable cases occurred on June 18. The menu of foods served showed that on June 14 "chipped beef" was served for supper, and on June 15 pot roast was served for lunch. Other foods served included cooked vegetables, frozen fruits, Jell-O, apple sauce, and cooked desserts. No leafy greens, sprouts or other risky foods were served.

This was an outbreak of *E. coli* O157:H7 infections among residents of an assisted living facility. The earlier part of the outbreak appeared to have a common source. The initial source of *E. coli* O157:H7 was not identified, but it may have been a food source such as chipped beef or pot roast. Subsequent person-to-person transmission resulted in additional cases.

(7)
Suspected Bacterial Intoxications Probably Associated with a Restaurant

July Stearns County

On July 11, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness from a party of eight co-workers who ate dinner at a restaurant in St. Cloud on July 10. The co-workers indicated they had no other recent meals in common. They consumed various menu items at the restaurant; all four ill complainants ate the sour cream dip. An outbreak investigation was initiated on July 11.

Contact information for the party of eight was obtained in order to interview them about their food consumption and illness histories. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) following the meal at the restaurant. Stool kits were provided to two of the ill complainants for bacterial and viral testing at the MDH Public Health Laboratory (PHL).

City of St. Cloud Environmental Health staff reviewed food preparation practices at the restaurant and inquired about employee illness. Credit card receipts were not obtained to attempt to interview additional patrons.

Seven of the group of eight were interviewed; four met the case definition. All four cases reported diarrhea and cramps; none reported vomiting, fever, or bloody stools. The median incubation period was 3 hours (range, 1.5 to 13 hours). None of the cases had recovered at the time of interview. The two stool specimens submitted to the MDH PHL were negative for bacteria, viruses, and bacterial toxins. No food item was significantly associated with illness.

The restaurant did not receive any other complaints of illness, and no employees reported gastrointestinal symptoms.

This was a probable foodborne outbreak associated with eating at a St. Cloud restaurant. The etiology and vehicle in this outbreak were not identified. The short incubation periods suggested bacterial intoxications. However, the lack of vomiting is not characteristic of intoxications caused by pathogens typically associated with incubations this short (e.g., *Staphylococcus aureus* or the emetic form of *Bacillus cereus*). Too much time may have elapsed between illness and stool collection to identify bacterial toxins.

(8)
Suspected Bacterial Intoxications Probably Associated with a Luncheon

July St. Louis County

On August 15, 2008 the St. Louis County Health Department received complaints of gastrointestinal illness in three people from three separate households who had eaten at a funeral luncheon held at a facility in Hibbing on July 30. According to the complaints, at least 12 people were ill out of the more than 100 luncheon attendees. The Minnesota Department of Health was notified on August 20.

An environmental health specialist from St. Louis County visited the establishment to talk with the manager and conduct an inspection. A list of funeral luncheon attendees could not be obtained. Therefore, the only source of illness and food exposure data was the original complaints. A case was defined as a person who attended the funeral luncheon and subsequently developed vomiting or diarrhea (≥3 loose stools in a 24-hour period). Because of the delayed notification of the potential outbreak, stool samples were not collected from ill individuals.

Three cases were identified, all from the original complaints. All three individuals reported vomiting, two (67%) reported fever, two (67%) reported cramps, and one (33%) reported diarrhea. No one reported bloody stools. The median incubation period was 2.5 hours (range, 2 to 6 hours). The median duration of illness was 14 hours (range, 6.5 to 21.5 hours). One individual was hospitalized and treated with intravenous fluids for dehydration.

The complaints indicated that foods served at the luncheon included ham, potato salad, beans, and cake. However, the complaint reports did not contain information on what food items were eaten by the cases.

The environmental health investigation of the establishment revealed three critical violations and one non-critical violation, including the lack of a thermometer in the refrigerator.

This was a probable foodborne outbreak of suspected bacterial intoxications associated with a funeral luncheon. However, the information available was not sufficient to confirm the outbreak or identify an etiology and vehicle.

(9)
Norovirus Gastroenteritis Probably Associated with a Funeral Lunch

August Goodhue County

On August 18, 2008 the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness following a catered funeral lunch served at a church in Kenyon, Minnesota on August 4. The original complainant estimated that 27 of the approximately 80 guests became ill after the event. The complainant reported experiencing diarrhea that began 42 hours after consuming the lunch. The main food item, a chicken pasta salad, was prepared by a local catering company. The catering company also functions as a café where the same salad would have been available for purchase. Additional food items available at the event, including croissants, pickles, and multiple cakes and bars, were prepared or provided by various attendees. Goodhue County Environmental Health was notified, and an outbreak investigation was initiated.

A list of attendees and contact information was obtained from the original complainant, and staff from MDH interviewed these individuals to obtain information on food/beverage consumption and illness history. A case was defined as a funeral lunch 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 Goodhue County contacted the caterer to evaluate food preparation and handling procedures. Credit card receipts for individuals that would have patronized the café on August 4 were collected.

Illness histories and exposure information were obtained from 31 event attendees. Of these, 18 (58%) met the case definition. Among the cases, 17 (94%) reported diarrhea, 13 (72%) vomiting, 10 of 17 (59%) fever, and 10 of 17 (59%) cramps. Two of the 18 cases (11%) reported visiting a medical provider for their illness. The median incubation period was 34 hours (range, 14 to 44.5 hours). The median duration of illness was 69 hours (range, 16.5 to 118.5 hours) for the 15 people who had recovered at the time of interview. No stool samples were collected for bacterial or viral testing based on the delayed report.

No food items were found to be significantly associated with illness. Only a few items were available for consumption at the event, and the majority of attendees consumed every item, including the chicken pasta salad.

Credit card receipts were available for eight patrons who dined at the café on August 4; MDH staff was only able to reach three. None of the credit card patrons interviewed reported experiencing illness after their meal. However, none of these patrons specifically had the chicken pasta salad.

No additional complaints were received by the establishment during this time period. No food workers reported experiencing gastrointestinal illness in the week prior to the catered event. However, one of the food workers who was responsible for preparing the chicken pasta salad reported having children ill with

vomiting the night prior to preparation of the salad. That employee subsequently developed vomiting the day after the implicated meal.

This was a foodborne outbreak of gastroenteritis associated with attendance at a funeral lunch in Kenyon. The clinical and epidemiological features of the illnesses were characteristic of norovirus. A specific food vehicle was not identified and the ultimate source of the outbreak was not confirmed. However, the most plausible vehicle was the chicken pasta salad, because it was prepared by an individual whose children were ill, and who subsequently became ill with symptoms characteristic of norovirus.

(10)
Suspected Bacterial Intoxications Associated with a Conference

August Hennepin County

On August 14, 2008, City of Bloomington Environmental Health (CBEH) received a complaint of gastrointestinal illness associated with a conference held at a hotel in Bloomington from August 11 to 13. On August 15, CBEH received two additional complaints associated with the same conference. Conference attendees also ate dinner on a catered river cruise on August 11. The Minnesota Department of Health (MDH) and Hennepin County Public Health Department (HSPHD) epidemiology were notified and an investigation was initiated.

CBEH sanitarians evaluated food preparation and handling procedures at the hotel on August 14 and interviewed food workers. On August 15, HSPHD sanitarians evaluated food preparation and handling procedures and interviewed food workers at the catering company. The conference organizers provided contact information for additional conference attendees; HSPHD staff interviewed attendees about food consumption and illness history. A case was defined as a conference attendee who developed vomiting or diarrhea (≥3 loose stools in a 24-hour period).

Forty-eight conference attendees were interviewed. Fourteen (29%) met the case definition; two reported illness that did not meet the case definition and were excluded from further analysis. All 14 cases reported diarrhea, 6 (43%) had cramps, and 2 (14%) had fever. No cases reported vomiting or bloody stools. The median incubation period calculated from the river cruise dinner was 15 hours (range, 13 to 21 hours). The median illness duration was 20 hours (range, 12.5 to 32 hours). No stool samples were submitted for testing.

The conference meals consisted of the river cruise dinner on August 11, and breakfast and lunch buffets at the hotel on August 12. Foods served on the cruise included beef, chicken, salad, potatoes, beans, rolls, and a variety of desserts. Foods available at the hotel buffets included scrambled eggs, bacon, sausage, potatoes, and a variety of fruits for breakfast, and beef, chicken, potatoes, vegetables, rolls, and a variety of salads for lunch. By univariate analysis, no meal was significantly associated with illness. Among food items, only eating berries at the hotel breakfast buffet was significantly associated with illness (9 of 12 cases vs. 10 of 25 controls; odds ratio 4.5; 95% confidence interval 1.0 to 24.1, $p = 0.05$).

Eleven hotel employees were interviewed and none reported gastrointestinal illness. No catering company employees reported gastrointestinal illness. HSPHD evaluated food preparation at the catering company. The food items for the cruise were prepared at the caterer's Hopkins facility, put in metal trays

covered with foil, and transported to the cruise in approved food transport containers. Caterer employees were observed following proper food preparation procedures and reported taking food temperatures at the time the food was delivered to the boat, although this was not documented. The caterer reported that the prepared foods were transported out of the caterer in Hopkins at 4:30 p.m. and arrived at the boat at approximately 5:00 or 5:30 p.m. According to the conference organizer, the food arrived at 6:00 p.m. It was reported that the foods were kept covered with foil in chafing dishes. It is unclear if the chafing dishes were electric, or were kept warm using a burner or portable fuel source. Conference attendees started eating at approximately 7:00 p.m.

The caterer provided contact information for two other catered groups; one was contacted and did not report any illness.

This was a probable foodborne outbreak of suspected bacterial intoxications associated with a conference. Although the etiology was not confirmed, the symptoms were characteristic of *Clostridium perfringens* intoxication. The food served at the river cruise dinner had opportunity for temperature abuse. Berries served at the hotel breakfast were statistically associated with illness, but this vehicle is not consistent with a bacterial intoxication outbreak. Based on the clinical characteristics of the illnesses and incubation periods, the most plausible source of the outbreak was the river cruise dinner, but this was not confirmed.

(11)
Suspected Norovirus Gastroenteritis Probably Associated with a Restaurant

August Hennepin County

On August 22, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in two patrons who had eaten lunch at a restaurant in Minneapolis on August 17. MDH notified the Hennepin County Public Health Department (HSPHD) epidemiology and Minneapolis Division of Environmental Health (MDEH) units, and an investigation was initiated.

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 August 17 was requested from the restaurant. A case was defined as a person who ate food from the restaurant and subsequently became ill with vomiting and/or diarrhea (≥3 loose stools in a 24-hour period).

On August 23, MDEH sanitarians inspected the restaurant 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.

The complainant group consisted of two patrons from different households, who had no other reported common meals or exposures prior to their meal at the restaurant. Both cases reported vomiting, diarrhea, and cramps. Reported incubation periods were 32 and 35 hours; the duration of symptoms was 6.5 hours for one patron, and the other patron's duration data was unavailable. No stool specimens were obtained for bacterial or viral testing.

One case reported eating a Reuben sandwich, fresh fruit (orange, pineapple, red grapes, honeydew,

cantaloupe), and a peanut butter and cookie dough malt. The other case reported eating a club sandwich, cottage cheese, and a peanut butter and pecan malt.

HSPHD epidemiologists identified four controls from the credit card receipt list. None of the controls reported gastrointestinal symptoms consistent with the case definition. Controls reported eating various sandwiches, soups, malts, and other beverages.

MDEH environmental health staff inspected the restaurant and interviewed restaurant employees on August 23. Twenty three of the 25 employees were interviewed. One employee reported diarrhea in August; however, the employee could not recall the dates, duration of diarrhea, or any other specific illness details. This employee stated that his duties at the restaurant included line cook, food preparation, and dishwasher. The employee was not working on the implicated meal date (August 17) and reported four shifts of dishwashing in the days preceding the implicated meal date. The MDEH sanitarian noted overall compliance with food code requirements for food-preparation and no major violations; however, one of the refrigerator units was not maintaining proper temperature (55° F) and it was also recommended that the restaurant clean various cooking equipment, ventilation hoods, walls, and floors of the kitchen. The sanitarian 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.

This was a probable foodborne outbreak of gastroenteritis associated with consuming a meal from a Minneapolis restaurant. The etiologic agent was not identified, but the incubation period and symptoms were characteristic of norovirus gastroenteritis. The vehicle of transmission was not identified; however, the most likely vehicle was one or more ready-to-eat food items. The source of contamination was not identified.

(12)
Sapovirus Gastroenteritis Associated with a Cruise

August St. Louis County

On August 29, 2008, St. Louis County public health officials received a complaint of gastrointestinal illness in two passengers who had taken a lunchtime cruise on Lake Superior on August 21, 2008. This complaint was reported to the Minnesota Department of Health (MDH) on August 29, 2008. The cruise left Duluth at noon and served a buffet-style lunch in which passengers were directed to the buffet, table by table. A local catering company provided meals to the cruise. Cruise staff prepared the buffet. Beverages were obtained by the cruise staff. Municipal city water was provided in tanks and served in pitchers set out on the tables. The lunchtime cruise returned to port at 2:00 p.m. St. Louis County public health officials reported that neither cruise staff nor catering staff reported illness prior to the meal.

MDH epidemiology staff obtained a menu from the catering company, and obtained a passenger roster and reservation list from the cruise company. Passengers were contacted and interviewed to determine if they had gastrointestinal illness following the cruise and to identify what food items they had eaten during the cruise. Cases were defined as persons who took the cruise and subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Servers and caterers were interviewed about both food-preparation duties and food consumed during the cruise meal, if any.

Stool samples were obtained from persons meeting the case definition and tested for bacterial and viral causes of gastrointestinal illness at the MDH Public Health Laboratory.

Twenty-three cruise passengers were contacted. Passengers estimated that approximately 50 total passengers were on the lunchtime cruise. Of the 20 passengers who agreed to be interviewed, five met the case definition, four had illness following the cruise but did not meet the case definition, and 11 did not become ill.

None of the six catering employees reported any gastrointestinal symptoms between August 7 and September 30. None of the four cruise crew members reported any illness between August 7 and September 30.

In addition to the two initial complainants, three additional cases were identified. The average age of cases was 57 years (range, 45 to 73 years). All five cases had diarrhea, three (60%) had vomiting, three (60%) had chills, three (60%) had abdominal cramps, two (40%) had nausea, one (20%) had a headache, one (20%) had general aches, and one (20%) had a burning sensation in the stomach. None of the cases reported fever or bloody stool.

Among cases, the median incubation period from the lunch cruise was 56 hours (range, 43 to 77 hours) and the median duration of illness was 105 hours (range, 60 to 220 hours).

One case reported having one episode of explosive diarrhea approximately 2 hours following the cruise. This apparently resolved until the onset of continuous symptoms, which included prolonged diarrhea that required a visit to her medical provider 56 hours after the cruise meal. When visiting her medical provider a stool sample was collected that tested negative for ova and parasites and *Giardia* on August 28.

The lunch included choices of 10 sandwich items, soup, prepared salad, a fruit tray, cookies, and beverages. Passengers were allowed up to the buffet table by table. Beverages were served by a bar, although water was served in pitchers placed on the tables. One case reported that serving dishes did not appear clean and looked as if they had been handled a lot. The two cases stated that they had been the first in line for the buffet lunch.

In the case-control study, consumption of roast beef approached statistical significance (4 of 5 cases vs. 5 of 16 controls, odds ratio [OR], 8.8; 95% confidence interval [CI], 0.8 to 100; $p = 0.06$).

Due to the small number of cases, and because general symptoms did not differ between cases and those with milder illness, persons with any illness (n=9) were compared to non-ill passengers for additional statistical analysis. In this analysis, only one food item, the roast beef, was statistically associated with illness (7 of 9 cases vs. 5 of 16 controls; OR, 7.70; 95% CI, 1.16 to 51.2; $p = 0.04$). No other exposures were identified that could explain the illnesses, including using the restroom on the cruise ship or in the gift shop/waiting area before or after taking the cruise, or sitting together during the cruise. The roast beef, like all meats from the caterer, was sliced by one staff member, and this person did not report any illness.

Three cases submitted stool samples for testing at MDH, all of which were positive for sapovirus RNA (G1) by RT-PCR. Viruses from two passengers had identical nucleic acid sequences, and the sequence of the third passenger differed by two base-pairs. The two passengers with identical sequences were friends who sat and ate together on the cruise but had not seen each other in the days before the cruise. These two were the first two passengers in the buffet line. The other passengers who submitted a stool sample that was also positive for sapovirus did not sit with or know the other laboratory-confirmed cases.

No food workers at the catering company or servers on the cruise reported illness. No one reported illness during the cruise. In one sapovirus-positive case, the onset of sudden, explosive diarrhea several hours after the cruise is unusual and unclear if it represents an opportunity for contamination of the lunch buffet if the case had been shedding sapovirus during the cruise. A 56-hour median incubation period after the meal is longer than what has been previously reported for sapovirus (average, 12 to 24 hours; range, 10 to 50 hours).

This was an outbreak of sapovirus infections associated with a cruise. Transmission was probably foodborne, but person-to-person transmission could not be ruled out.

(13)
Gastroenteritis Associated with a Conference

September Douglas County

On September 14, 2008, the Minnesota Department of Health (MDH) received complaints of gastrointestinal illness among six attendees of a conference held at a resort in Alexandria, Minnesota during September 12-14, 2008. Meals were prepared in the hotel resort kitchen on September 13 and served to conference attendees for breakfast, lunch, and dinner on that day. Several specific complaints were made regarding the quality of the food served during the dinner meal. These complaints were that hamburgers were served too rare to be consumed and that a plate of lettuce and tomatoes contained mold and had to be removed from the serving line. Epidemiologists from MDH contacted the Douglas and Pope Counties Environmental Health Division, and an investigation was initiated.

The Douglas County environmental health sanitarian inspected the conference kitchen and left-over food items on September 15.

MDH epidemiology staff obtained a menu and a list of conference attendees from the conference organizer. Attendees were contacted and interviewed to determine if they had gastrointestinal illness during or following the conference and to identify what food items they had eaten during the conference. A case was defined as a conference attendee who developed diarrhea (≥3 loose stools in a 24-hour period) or vomiting after the first conference meal.

Stool samples were requested from persons meeting the case definition and if obtained, tested for bacterial and viral causes of gastrointestinal illness at the MDH Public Health Laboratory.

Based on the listing of 113 conference attendees and interviews of other attendees, 75 attendees were contacted. Of these, seven (9%) met the case definition, 11 (15%) reported illness during or following the conference but did not meet the case definition, and 57 did not become ill.

All seven cases had diarrhea, three (42%) had cramps, one had fever (11%) and one had blood in their stool (11%). No cases reported vomiting. None sought health care. Diarrhea symptoms occurred for duration of 12.75 hours (range, 5 to 36 hours).

Two cases had onset of illness on September 13. The greatest frequency of cases (n=4) were reported on September 14.

On September 13, the conference meals were a 7:00 a.m. breakfast, a 12:30 p.m. lunch, and a 7:00 p.m. dinner. Several food items consumed at dinner had elevated odds of being associated with illness; however, the small number of cases resulted in few comparisons with statistical significance. Cases were more likely than controls to have consumed the following items: barbeque sauce (2 of 6 cases vs. 0 of 36 controls; logit odds ratio [OR], 39.4; 95% logit confidence interval [CI], 1.6 to 958; p = 0.02); tomato on their burger (4 of 5 cases vs. 10 of 35 controls; logit OR, 10.0; logit 95% CI, 0.80 to 511; p = 0.04); lemonade (4 of 6 cases vs. 6 of 34 controls; logit OR, 9.3; logit 95% CI, 1.37 to 63.2; p = 0.03); potato salad (6 of 6 cases vs. 17 of 35 controls; logit OR, 13.7; logit 95% CI, 0.7 to 263; p = 0.06); buttered corn (6 of 6 cases vs. 20 of 36 controls; logit OR, 10.5; logit 95% CI, 0.54 to 200; p = 0.07). Three individuals (1 case and 2 controls) reported moldy tomatoes, two of whom (both controls) requested that the moldy tomatoes be replaced with fresh tomatoes before eating them.

Cases had an elevated odds of having a hamburger and having lettuce on their burger than controls, although these items had a weaker statistical relationship to being a case: hamburger (6 of 6 cases vs. 24 of 37 controls; logit OR, 7.2; logit 95% CI, 0.4 to 137; p = 0.2; lettuce (3 of 5 cases vs. 8 of 35 controls; logit OR, 5.1; logit 95% CI, 0.7 to 35.7; p = 0.1). Of persons who ate a hamburger, six reported that their burgers were undercooked, and cases more frequently reported that their hamburger was undercooked compared to controls (3 of 6 cases vs. 3 of 21 controls; logit OR, 7.0; logit 95% CI, 0.9 to 52.1; p = 0.04).

Given the low number of cases, and high level of correlation between them, multivariate adjustment or stratification was not possible. Having eaten hamburgers and potato salad were correlated ($R^2 = 0.6$). Having had a burger and burger toppings were also correlated (lettuce, tomato, barbeque sauce) ($R^2 =$ 0.4-0.5). With the correlation between eating potato salad, hamburgers and buttered corn, it was not possible to confirm a specific food item was a cause of illness.

An exploratory factor analysis attempted to rank covariates in their contribution to explaining an unknown factor (i.e., being a case) while allowing for the correlation between the covariates. This analysis confirmed that the food items consumed with each other and most related to being a case were potato salad, hamburger, tomato and corn.

The one stool sample submitted was negative for *Salmonella, Shigella, Campylobacter, E. coli* O157:H7, norovirus, and *Clostridium perfringens* toxin.

This was a probable foodborne outbreak, but the etiology or vehicle was not identified. The small number of cases made statistical conclusions difficult, and one specific food item could not be implicated. However, several items were more likely to be eaten by the cases in comparison to non-ill conference attendees.

Several of the conference attendees commented that hamburgers were undercooked, and this was

associated being a case. One conference attendee commented that they did not eat their hamburger because it was too rare, while others commented that their hamburgers were well-cooked. The role of recall bias can not be ruled out, such that cases were more likely to remember that their hamburgers were undercooked. Other complaints made during the food service resulted in the plate of lettuce and tomatoes being removed from the serving line and replaced during the dinner. It is therefore plausible that corrective action during the course of the dinner resulted in removal of the cause of disease. The time that attendees consumed their dinner was not consistently collected in this investigation to compare times before and after the possible removal of or changes in cooking practices.

Symptoms were mainly diarrhea, nausea, and abdominal cramps. These symptoms and the short incubation period and duration of disease are consistent with a foodborne bacterial intoxication such as that caused by the diarrheal form of *Clostridium perfringens*. Only one sample was collected, and it tested negative for viral and bacterial pathogens. If a toxin was present, the stool specimen may have been submitted too long after illness to identify bacterial toxin.

(14)
Norovirus Gastroenteritis Associated with an Event

October Ramsey County

On October 8, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a report of suspected foodborne illness resulting from a meal served during a wedding reception held at a restaurant in Mounds View, Minnesota on October 4. The complainant stated that approximately 50 of 100 guests became ill after the reception dinner. Foods were served in a buffet style and included wild rice stuffed chicken, bacon wrapped turkey tenderloin, garlic mashed potatoes, green beans, fresh fruit, rolls, garden salad, and cake. The cake was brought in from an outside bakery. Ramsey County Environmental Health staff was notified and an investigation was initiated.

The complainant provided MDH staff with names and contact numbers for wedding attendees. Wedding guests were interviewed about illness history and food consumption at wedding-related events. A case was defined as a wedding attendee who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after the beginning of the reception. Persons meeting the case definition were asked to submit stool samples to the MDH Public Health Laboratory (PHL) for bacterial, viral, and toxin testing.

A sanitarian from Ramsey County inspected the restaurant and interviewed employees responsible for preparing items served at the reception dinner. Contact information for other large groups that had meals prepared at the restaurant during that same weekend was provided by the restaurant. The contacts were questioned by MDH staff about any illness in the group following the meal.

Of the 56 wedding attendees interviewed, 25 (45%) met the case definition. Five additional people reported gastrointestinal symptoms but did not meet the case definition, and thus were excluded from further analysis. All guests were asked about attendance at other wedding events, including two where food items were served. These included the groom's dinner on Thursday, October 2 and the gift opening on Sunday, October 5. Both events were held at the bride's mother's house, and she was responsible for the majority of the food preparation. Neither of these events was associated with illness; only eight (33%) of 24 cases with available information attended the groom's dinner, and only nine (38%) of 24

cases attended the gift opening. The only event that all cases reported attending was the reception dinner at the restaurant on October 4.

Of the 25 cases, 24 (96%) reported diarrhea, 19 (76%) had vomiting, 19 (76%) had cramps, 12 (48%) had fever, and one (4%) had bloody stools. The median incubation period from the wedding reception dinner was 32 hours (range, 5.5 to 77 hours). The median duration of illness was 44 hours (range, 11.5 to 85 hours) for the nine cases who had recovered at the time of interview. Stool samples were submitted from five of the cases; four tested positive for norovirus genogroup II.

One individual in the complainant's group reported onset of illness the morning prior to the reception dinner. This individual was only able to attend the ceremony on October 4, and did not attend the reception dinner at the restaurant. However, this individual did report staying at the hotel affiliated with the restaurant on October 3 and 4, and had a meal at the restaurant the night prior to the wedding.

Two items served at the reception dinner were statistically associated with illness. These were water (19 of 22 cases vs. 11 of 25 controls; odds ratio [OR], 8.6; confidence interval [CI], 1.6 to 45.7; $p = 0.007$) and ice (19 of 22 cases vs. 14 of 25 controls; OR, 5.0; CI, 1.0 to 27.9; $p = 0.05$).

The cake served at this event was not cut by restaurant staff; rather, a guest was responsible for this task. The guest who cut the cake was interviewed, and did not report having any gastrointestinal illness.

Four additional large groups consumed meals at the restaurant during the weekend of October 3 and 4. The groups did not receive the same foods, but there would have been overlap in employees working during the different events. According to the contacts for each of these groups, no illnesses were reported from guests that attended the other events.

The sanitarian questioned restaurant staff about preparation methods for the foods served at this meal and about any recent gastrointestinal illness. Three employees were responsible for the majority of the food preparation for this event; none of these employees reported illness during the week prior. No improper food-handling practices were observed by the sanitarian.

Fifty-one (56%) of the total 91 restaurant employees were interviewed. Of these, three employees interviewed did report experiencing gastrointestinal illness in the time period investigated, two prior to the event in question and one following. Only one of the ill employees reported working for this event. This employee was one of two bartenders, and was responsible for preparing drinks and the fruit that was used as a garnish for the drinks (which included cutting up lemons and limes as well as handling olives and cherries). Gloves were not worn during this process. Ice came from the basement ice machine, and mixes for the drinks came from the upstairs main bar. The ill bartender did not have contact with the ice that was used in the ice waters placed at all the tables. The employee who had illness onset following this event submitted a stool sample which tested negative for norovirus, as well as for bacterial enteric pathogens.

The restaurant had two ice makers: one that served the facilities in the upper level of the restaurant, and one that served the facilities in the lower level. Ice for this event came from the ice maker in the lower level. Banquet servers placed ice in carafes and then filled them with water in the kitchen where the ice maker is located. The water was then brought to the banquet room and placed on the tables. Banquet servers were also responsible for placing napkins in the water glasses located on all of the tables.

According to the restaurant, there were five banquet servers working this event. Three of the five servers were interviewed by Ramsey County staff; none reported experiencing gastrointestinal illness during the week prior to this event.
According to the owner of the restaurant, leftover food from this event was brought home and consumed by staff and some of their household members. Overall, approximately 20 to 30 additional people would have consumed these items. No one reported illness after consumption of this food.

This was an outbreak of norovirus gastroenteritis associated with a wedding reception dinner. The statistical analysis suggested water and/or ice served to the group at a restaurant was the vehicle. A clear source of contamination of the water or ice was not identified. However, an ill food worker could not be ruled out, because not all of the banquet servers were interviewed by public health officials, and other ill food workers were identified at the restaurant. Conversely, no illnesses were identified in other groups. In addition, some wedding group members were ill prior to or shortly after the meal; these individuals are also a plausible source for some of the illnesses in other attendees. Therefore, person-to-person transmission could not be ruled out as a cause of the outbreak.

(15)
Norovirus Gastroenteritis Probably Associated with a Banquet

November Hennepin County

On November 6, 2008, the Minnesota Department of Health (MDH) foodborne illness hotline received a complaint of gastrointestinal illness in an individual who had attended a private breakfast banquet held at a country club in Edina, Minnesota on November 2. Edina Environmental Health was contacted and an investigation was initiated. The Minnesota Department of Agriculture (MDA) was also notified, as bakery items had been prepared externally and delivered to the event.

MDH staff interviewed 38 of 55 banquet attendees about illness history and items consumed at the country club. Thirty persons who had not attended the banquet but who had eaten breakfast in the main dining room of the country club on November 2 were also interviewed. A case was defined as a person who developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period) after dining at the country club. City of Edina sanitarians inspected the country club and conducted employee interviews on November 6 and 7. MDA inspectors visited the bakery and conducted employee interviews on November 7. Three stool specimens were collected from cases for bacterial and viral testing.

Fifteen of 38 (39%) banquet attendees interviewed met the case definition. None of the patrons that had eaten in the main dining room met the case definition. All 15 cases (100%) reported diarrhea, 9 (60%) had vomiting, 4 (27%) had cramps, 3 (20%) had fever, and 1 (7%) reported bloody stool. One case (7%) visited a health care provider. The median incubation period was 35 hours (range, 23 to 45 hours). The median duration of illness was 2 days (range, 1 to 3 days). Stool samples from three of three cases were positive for norovirus. Four additional banquet attendees reported gastrointestinal symptoms, but were excluded from analysis: two attendees reported mild gastrointestinal symptoms that did not meet the case definition and two attendees reported incubation periods of greater than 70 hours, exceeding the expected incubation period for norovirus, and thus were considered secondary cases.

Since no illnesses were identified among patrons who ate in the main dining room, statistical analysis was restricted to banquet attendees. The consumption of pineapple at the banquet was borderline significantly associated with illness (11 of 14 cases vs. 7 of 18 controls; odds ratio, 5.8; 95% confidence interval, 0.93 to 40; p = 0.05). No other food items or drinks were significantly associated with illness.

All foods for the banquet meal were plated and served by country club staff. Interviews of food workers from the country club by City of Edina sanitarians did not identify employee gastrointestinal illnesses prior to or during preparation of food for the banquet. A site visit by MDA to the bakery that had prepared cakes for the event did not identify gastrointestinal illness among employees prior to or during preparation of the cakes.

One banquet attendee reported vomiting and diarrhea during October 29-30, as well as similar illness in their nine-month old baby during October 27-29, who also attended. Neither reported illness following the event.

This was an outbreak of norovirus gastroenteritis associated with attending a private banquet at a country club. Consumption of pineapple had a borderline association with illness. There was no evidence that food workers were a source of illness. A recently ill adult and baby were identified. Because the banquet meal was plated, it was unlikely that these individuals could have been the source of food contamination; however, they could have been a source of illness through person-to-person transmission.

(16)
Sapovirus Gastroenteritis Probably Associated with a Bed and Breakfast

November Ramsey County

On November 12, 2008, the Minnesota Department of Health received a complaint of gastrointestinal illness in a group of eight co-workers who attended a work retreat at a bed and breakfast (B&B) in Saint Paul, Minnesota during November 5-7. Initially, six of eight employees had reported gastrointestinal illness following the retreat. An investigation was initiated on November 12.

A list of all co-workers was obtained, and each member was contacted and interviewed using a standard questionnaire. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) following a meal at the B&B in Saint Paul. A MDH sanitarian visited the B&B to assess food-handling practices, employee hygiene, and employee illness. Stool samples were collected from ill patrons and submitted to the MDH Public Health Laboratory (PHL) for bacterial and viral testing.

All eight co-workers were interviewed. Seven met the case definition. All seven cases reported diarrhea, five (71%) had cramps, two (29%) had vomiting, two (29%) had fever, and one (14%) had bloody stools. Incubations were calculated for each meal. From the first meal, the median incubation was 4 days (range, 2.5 to 5 days); from the second meal, the median incubation was 49 hours (range, 11 to 75 hours). Interviews were conducted within 3-6 days after illness onset, and only two cases had recovered, with durations of 24 and 51 hours.

The group shared meals prepared by the owner of the B&B on November 5 and November 7. The first meal consisted of chicken, potatoes, broccoli, lettuce salad, dressing, cup cakes, coffee, fruit juice, and

water. The second meal consisted of a deli tray with salami, turkey, and several types of cheese (all pre-packaged, purchased at a warehouse-style store), buns, lettuce, mustard, mayo, tomato soup, a fresh fruit salad with watermelon, cantaloupe, strawberry, pineapple, and bananas, cupcakes, fruit juice, and coffee. No foods were implicated, as it was an "everyone ate everything" situation and only one co-worker was not ill. This person only ate the tomato soup on November 7 but ate most of the items served on November 5. No other meals were shared, and all of the workers work in the same office except for the one person who was not ill, who lives in Colorado.

Only one person that works at the group's office did not attend the retreat. This person was interviewed, and reported no recent history of gastrointestinal illness. The owner of the B&B was interviewed by the MDH sanitarian and reported no recent history of gastrointestinal illness. The family that owns the B&B also lives in the facility. No family members or other guests reported illness. No food-handling or storage violations were noted on inspection.

Three cases submitted stool samples. The samples were collected within 5-8 days after symptom onset, but all cases were still symptomatic. The stool samples tested negative for *Campylobacter*, *E. coli* O157, *Salmonella*, *Shigella*, ETEC (LT/ST PCR), STEC (stx PCR), other *E. coli* virulence factors, norovirus, astrovirus, rotavirus, and adenovirus. All three samples tested positive for sapovirus. All three samples belonged to genogroup IV and were identical by nucleic acid sequencing.

This is a probable foodborne outbreak of sapovirus gastroenteritis associated with a B&B in St. Paul. The small number of controls made statistical conclusions difficult, and one meal or specific food item could not be implicated. In addition, there was very limited information about the incubation periods for persons infected with sapovirus; therefore, even though sapovirus was isolated from cases' stool samples, one specific meal could not be implicated. The co-workers also spent multiple days together at the B&B, and again due to the unknown incubation period associated with sapovirus, person-to-person transmission could not be ruled out.

MDH has identified one additional sapovirus outbreak in August, 2008. In this outbreak, five cases were identified out of 21 persons interviewed in a group that had a buffet meal at a lake cruise. The median incubation was 56 hours (range, 43 to 77 hours). The median duration of illness was 105 hours (range, 60 to 220 hours). No food item was statistically associated with illness, and no recent history gastrointestinal illness was reported among the persons that prepared the meal. Using the incubation period calculated from this outbreak, the second meal on November 7 would be implicated in this outbreak. In addition, the only person who did not become ill only consumed tomato soup at this meal while the cases consumed most of the food items served.

Confirmed Waterborne Outbreaks

(1)
Cryptosporidiosis Associated with a Fitness Center Swimming Pool

April Otter Tail County

A routine surveillance interview of a laboratory-confirmed *Cryptosporidium* case conducted by the Minnesota Department of Health (MDH) on April 24, 2008 revealed that the case had swam at a fitness center swimming pool multiple times in the 2 weeks prior to illness onset. The case also reported swimming at the pool while symptomatic. MDH Environmental Health Services was contacted on April 24, and an outbreak investigation was initiated.

On April 24, the pool was voluntarily closed to be superchlorinated at 20 ppm for 12.75 hours, the necessary chlorine level and time needed to inactivate *Cryptosporidium*.

Contact information for swimming lesson participants and aquatics staff was provided to MDH by the pool management. MDH staff interviewed pool users about their illness and exposure histories. Cases of cryptosporidiosis from the Fergus Falls area that were identified through routine surveillance were interviewed to determine if they had exposure to the pool. A case was defined as a pool user who subsequently developed either a laboratory-confirmed *Cryptosporidium* infection, diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days. A stool specimen was obtained from one pool user and submitted to the MDH Public Health Laboratory for *Cryptosporidium* testing.

Illness histories and exposure information were obtained from 72 pool users. Twelve cases were identified, including the initial laboratory-confirmed case. Five pool users reported illness but did not meet the case definition, and thus were excluded from further analysis. The stool sample submitted by the pool user tested negative for *Cryptosporidium*. *Cryptosporidium parvum* subtype BGP3 was identified in the one positive specimen received by MDH.

Ten (100%) of 10 cases reported diarrhea, nine (90%) of 10 reported cramps, four (36%) of 11 reported vomiting, and two (22%) of nine reported fever. The median incubation period could not be determined because cases swam at the pool more than once in the 2 weeks prior to illness onset (see epidemic curve). The median duration of illness was 6 days (range, 3 to 10 days) for the six cases who had recovered at the time of interview. One case reported seeking medical care for their illness. No cases were hospitalized.

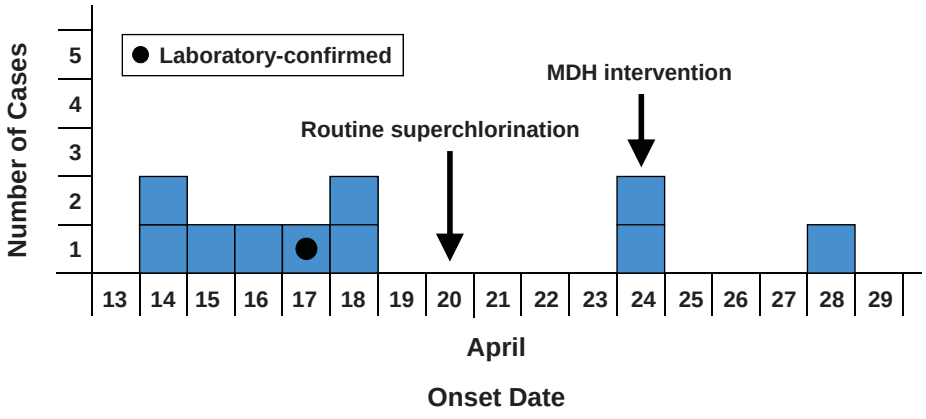
Taking children's swimming lessons was significantly associated with illness (11 of 12 cases vs. 31 of 55 controls; odds ratio [OR], 8.5, 95% confidence interval [CI], 1.1 to 381.5, $p = 0.02$). Putting one's head under water (10 of 10 cases vs. 36 of 55 controls; OR, undefined; $p = 0.03$) and swallowing water (6 of 6 cases vs. 18 of 41 controls; OR, undefined; $p = 0.02$) were also significantly associated with illness.

All pools at the facility were re-opened on April 27; anyone with symptoms of cryptosporidiosis was told not to enter the pool for 2 weeks following the resolution of gastrointestinal symptoms.

An extensive environmental health outbreak investigation survey of the pool was conducted by an MDH Environmental Health sanitarian. The survey included information on the physical description of the

pool, water flow and treatment, associated physical facilities, facility management, recent developments at the facility, a field assessment of the chemical levels, and a review of pool policies. Upon inspection, the pool was found to be operating properly. Review of the chemical log sheets found that the pool had been within state regulatory limits for pH and chlorine levels for the previous month. The survey found that the current fecal incident response plan at the pool was inadequate; however, there is no evidence to indicate that a fecal incident took place prior to the outbreak. The survey also found that the pool is routinely superchlorinated once a month as a preventative measure; this had taken place on April 20.

Cryptosporidiosis Cases Associated with a Pool, by Illness Onset Date*



*Date of illness onset unknown for two cases

This was a waterborne outbreak of cryptosporidiosis associated with an athletic club pool. Although the original source of contamination was not confirmed, an infectious pool user most likely introduced the parasite into the pool. Since *Cryptosporidium* can survive in properly maintained pools, the routine superchlorination of the pool most likely helped prevent additional pool users from becoming ill. As a result of the outbreak, a new fecal incident response plan was enacted.

(2)
Norovirus Gastroenteritis Associated with a Swimming Beach

July Anoka County

On July 28, 2008 the Minnesota Department of Health (MDH) Acute Disease Investigation and Control Section received a call from the manager of a campground reporting that people from at least two separate parties had complained of gastrointestinal illness after swimming at the campground beach. MDH Environmental Health Services was contacted and an outbreak investigation was initiated.

On July 29, a sanitarian from the MDH Noncommunity Public Water Supply Unit collected two well water samples and one beach water sample at the campground.

Contact information for campground patrons was provided to MDH by the campground. MDH staff interviewed campers about their illness and exposure histories. A case was defined as a camper who subsequently developed vomiting and/or diarrhea (≥3 loose stools in a 24-hour period). Stool specimens were obtained from two campers and submitted to MDH for bacterial and viral testing.

Illness histories and exposure information were obtained from 80 campers. Twenty-six cases were identified. Three campers reported illness but did not meet the case definition and thus were excluded from further analysis.

Twenty-one (81%) cases reported vomiting, 17 (71%) reported cramps, 16 (62%) reported diarrhea, and seven (28%) of 25 reported fever. The median incubation period was 46 hours for the 17 cases who only reported swimming once (range, 11 to 71 hours). The median duration of illness was 35 hours (range, 0.5 to 86 hours) for the 13 cases who had recovered at the time of interview. Both stool samples tested positive for norovirus genogroup II.

In univariate analysis, swimming at the campground beach (23 of 26 cases vs. 25 of 51 controls; odds ratio [OR], 8.0; 95% confidence interval [CI], 1.9 to 38.8; $p = 0.02$), getting one's face wet (20 of 25 cases vs. 10 of 50 controls; OR, 16.0; 95% CI, 4.2 to 65.7; $p < 0.001$), and swallowing water (18 of 24 cases vs. 5 of 50 controls; OR, 27.0; 95% CI, 6.2 to 130.4; $p < 0.001$) were significantly associated with illness. Also significantly associated with illness were visiting the petting zoo (20 of 25 cases vs. 13 of 50 controls; OR, 11.4; 95% CI, 3.1 to 44.4; $p < 0.001$), having contact with goats at the petting zoo (12 of 22 cases vs. 6 of 50 controls; OR, 8.8; 95% CI, 2.3 to 35.6; $p < 0.001$), having contact with llamas at the petting zoo (9 of 22 cases vs. 5 of 50 controls; OR, 6.2; 95% CI, 1.5 to 26.9; $p = 0.007$), and having contact with a donkey at the petting zoo (10 of 22 cases vs. 4 of 50 controls; OR, 9.6; 95% CI, 2.2 to 45.6; $p < 0.001$). Stepwise logistic regression converged to a model containing only swallowing water (adjusted OR, 6.1; 95% CI, 1.8 to 20.4; $p = 0.004$) and visiting the petting zoo (adjusted OR, 4.6; 95% CI, 1.4 to 15.5; $p = 0.01$).

The well water samples were absent for bacteria. The initial beach water sample collected on July 29 was over the EPA recommended level of 235 cfu/100 ml for fecal coliforms. Based on the elevated fecal coliform levels and cases of illness, the beach was closed on July 31. Follow-up samples taken on August 4 were also above the recommended level, so the beach remained closed.

MDH sanitarians conducted an inspection to examine the septic systems on the campground. They did not detect any failed systems that would have contributed to the elevated fecal coliform levels in the beach water. However, the high number of geese that occupied the beach during the summer may have contributed to the elevated fecal coliform levels. Water samples taken on August 11 showed that the beach water had returned to within the acceptable limits of fecal coliforms, so the beach was re-opened on August 13.

This was an outbreak of norovirus gastroenteritis associated with swimming at a campground beach. The high correlation between those reporting visiting the petting zoo and those reporting swimming can explain why visiting the petting zoo was also statistically significant, even though it is not biologically plausible since norovirus is strictly a human pathogen. It is unclear how the beach water was initially contaminated; however, the water was most likely contaminated by an ill swimmer.

(3)
Cryptosporidiosis Associated with a Hotel Water Park

August Wright County

In accordance with the state communicable disease rule, all specimens that test positive for *Cryptosporidium* at a clinical laboratory are forwarded to the Minnesota Department of Health Public Health Laboratory (MDH PHL) for additional testing. In September 2008, two positive specimens were received by the MDH PHL, and *Cryptosporidium hominis* subtype HGP13 was identified in both. HGP13 had not been identified in *Cryptosporidium* specimens received at the MDH PHL since 2005. Routine surveillance interviews of the two cases conducted by the MDH Acute Disease Investigation and Control Section in late September and early October revealed that both cases had swam at the same hotel water park in the 2 weeks prior to illness onset. MDH Environmental Health Services was contacted on October 2, and an outbreak investigation was initiated.

A list of names and phone numbers of hotel guests and group reservation lists from August 13 and 14 was obtained from the hotel. Epidemiologists from MDH interviewed water park users to obtain information on water park usage and illness history. A case was defined as a water park 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.

Illness histories and exposure information were obtained from 30 water park guests. Twelve cases were identified, including two with stool specimens that tested positive for *Cryptosporidium*. Two positive specimens were received by the MDH PHL, and C. *hominis* subtype HGP13 was identified in both. Of the 12 cases, all reported diarrhea, 11 (92%) reported fever, 10 (83%) reported vomiting, 10 (83%) reported cramps, and 6 (50%) reported weight loss. The median incubation period was 9 days (range, 3 to 14 days). The median duration of illness was 10 days (range, 3 to 20 days) for the 11 cases that had recovered at the time of interview. Five (42%) cases sought medical care from their health care provider; two (40%) of the five health care providers requested a stool specimen for *Cryptosporidium* testing.

Going on the water slide on August 13 was significantly associated with illness (6 of 10 cases vs. 2 of 18 controls; odds ratio, 12.0; 95% confidence interval, 1.3 to 144.2; $p = 0.01$).

Upon inspection, all three water park pools were found to be operating properly and were within state regulatory limits for pH and chlorine levels. However, *Cryptosporidium* can survive and be transmitted even in properly operated pools. An extensive Environmental Health Outbreak Investigation Survey of the three pools at the hotel water park complex was conducted by an MDH Environmental Health Services sanitarian. The survey included information on the physical description of the pool, water flow and treatment, associated physical facilities, facility management, recent developments at the facility, and a field assessment of the chemical levels.

This was a waterborne outbreak of cryptosporidiosis associated with a hotel water park. Although the original source of contamination was not confirmed, an infectious water park user most likely introduced the parasite into the pool. This was the first outbreak of cryptosporidiosis in Minnesota identified through molecular subtyping.

(4)
Cryptosporidiosis and Giardiasis Associated with Swimming at a Fitness Center

September-November Lyon County

In September 2008, four cryptosporidiosis cases in members of the same family from Lyon County were reported to the Minnesota Department of Health (MDH) through routine surveillance; two of the individuals were also infected with *Giardia*. During routine surveillance interviews the cases reported that they had swam at a local fitness center in the week prior to illness onset. In October, three cases of cryptosporidiosis were reported in another family from Lyon County (two of which were also positive for *Giardia*), and they also reported swimming at the same fitness center. However, the two families also reported attending the same daycare. Follow-up interviews with the four other children in the daycare found that two of these children also had recent gastrointestinal illness; these two children also had been swimming at the fitness center. MDH Environmental Health Services was contacted on November 5, and an outbreak investigation was initiated. On November 5, the pools at the fitness center were voluntarily closed and superchlorinated.

Contact information for swimming lesson participants and aquatics staff was provided to MDH by the fitness center. MDH staff interviewed pool users about their illness and exposure histories. A case was defined as an athletic club pool user who subsequently (within 2 weeks) developed either a laboratory-confirmed *Cryptosporidium* or *Giardia* infection or diarrhea (≥3 loose stools in a 24-hour period) or vomiting lasting 3 or more days. A stool specimen was obtained from one pool user and submitted to the MDH Public Health Laboratory for *Cryptosporidium* and *Giardia* testing.

Illness histories and exposure information were obtained from 94 pool users. Nineteen (20%) cases were identified, including the seven initial laboratory-confirmed cases. Thirteen pool users reported illness but did not meet the case definition, and thus were excluded from further analysis. The stool sample submitted by the pool user tested negative for *Cryptosporidium* and *Giardia*. *Cryptosporidium hominis* subtype HGP21 was identified in seven positive specimens received by MDH (*Giardia intestinalis* was reportedly detected in samples from four of these same individuals at clinical laboratories). Seventeen (89%) of the 19 cases reported diarrhea, 10 (53%) reported cramps, 7 (37%) reported vomiting, and 3 (16%) reported fever. The median incubation period could not be determined because cases swam at the pool more than once in the 2 weeks prior to illness onset (see epidemic curve). The median duration of illness was 4 days (range, 3 to 7 days) for the eight cases who had recovered at the time of interview. Nine cases reported seeking medical care for their illnesses; no cases were hospitalized.

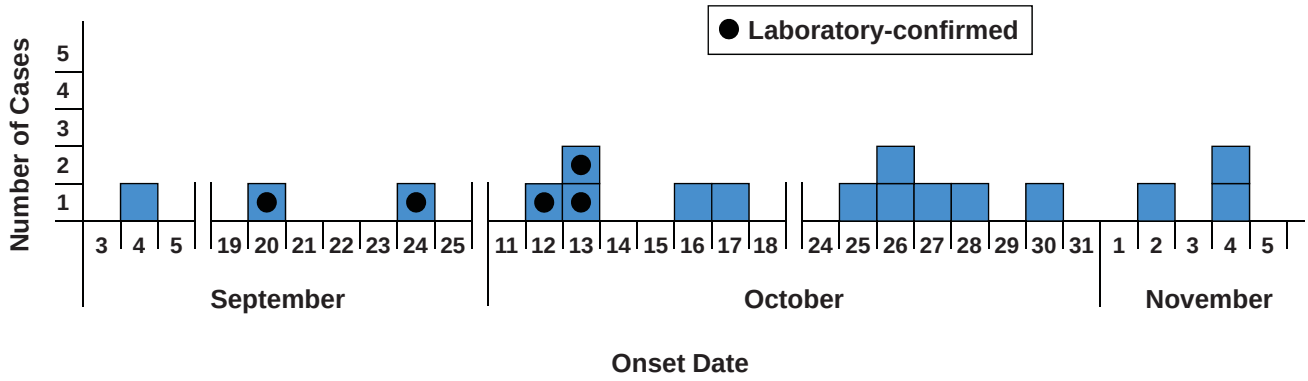
Use of any particular pool was not statistically associated with illness. Going in one of the pools on a particular day of the week or attending a particular class were also not statistically associated with illness.

All pools at the fitness center were re-opened on November 7; anyone with symptoms of gastrointestinal illness was told not to enter the pool for 2 weeks following the resolution of symptoms.

An extensive environmental health outbreak investigation survey of the pool was conducted by an MDH Environmental Health Services sanitarian. The survey included information on the physical description of the pool, water flow and treatment, associated physical facilities, facility management, recent

developments at the facility, a field assessment of the chemical levels, and a review of pool policies. Upon inspection, the pool was found to be operating properly. Review of the chemical log sheets found that the pool had been within state regulatory limits for pH and chlorine levels for the previous month. The survey found that the current fecal incident response plan at the pool was inadequate; however, there is no evidence to indicate that a fecal incident took place prior to the outbreak.

Illnesses Associated with a Fitness Center, by Illness Onset Date



This was a waterborne outbreak of cryptosporidiosis and giardiasis associated with swimming at a fitness center. Although the original source of contamination was not confirmed, an infectious pool user most likely introduced the parasites into the pool. As a result of the outbreak, a new fecal incident response plan was enacted.

Outbreaks with Other Routes of Transmission:
Outbreaks Due to Animal Contact

(1)
Salmonella Montevideo Infections Associated with Chicken and Duckling Contact

March-July Multiple counties

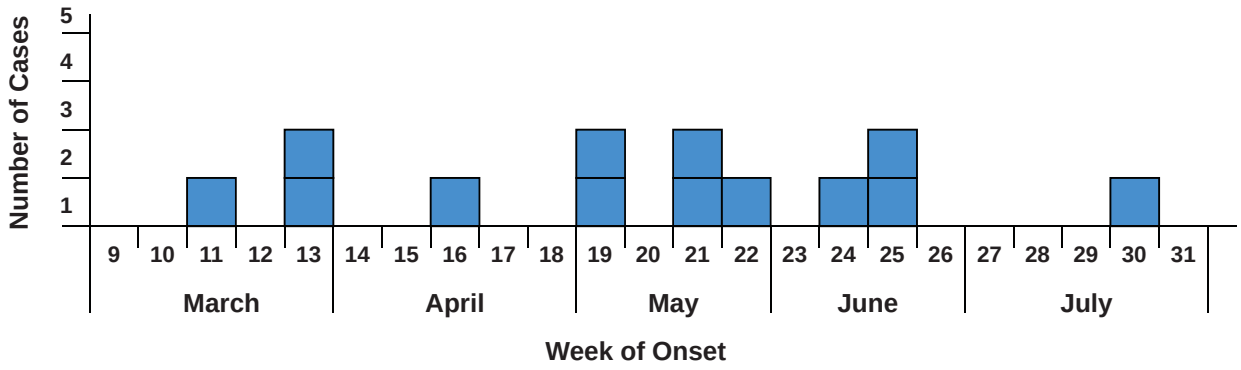
On April 4, 2008, the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) identified two *Salmonella enterica* serotype Montevideo isolates with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns (designated subtype SMON42). The two case-isolates were submitted to MDH from clinical laboratories through routine statewide laboratory-based surveillance. By April 7, initial interviews were completed and revealed that both cases had been exposed to chickens and/or ducklings that originated from the same mail-order hatchery in Iowa. An investigation was initiated.

Cases were identified through routine laboratory surveillance, and were defined as Minnesota residents who had culture-confirmed infection with *S*. Montevideo SMON42 since March 1, 2008, and who reported exposure to chickens and/or ducklings in the week before becoming ill. Interviews about illness history and potential exposures, including animal contact and food consumption, in the 7 days prior to illness were conducted. Cases were also asked where and when they purchased their poultry, the source hatchery of the poultry, and the type and age of the birds they purchased. In addition, cases were asked where the birds were kept and to describe the type of contact they had with them.
On May 15, 2008, employees from MDH visited the homes of the first two cases to obtain cloacal swabs from the chickens and ducks, and dust and litter samples from the poultry environment. One household had purchased 27 chicks and two ducklings, and the other household had purchased four ducklings. Twenty of 24 chickens and one duck were sampled from the first case household; the 20 chicken cloacal swabs were combined into four tubes for testing, and the single duck cloacal swab was tested separately. The four duck cloacal swab samples from the second household were combined into a single tube for testing. Three and two environmental samples were taken at the first and second case-households, respectively. Samples were cultured for *Salmonella* at the Minnesota Board of Animal Health (BAH) laboratory, and *Salmonella* isolates were sent to the MDH PHL for PFGE subtyping. The BAH identified source hatcheries for the feed stores where cases reported purchasing poultry.

From March to July 2008, the MDH PHL identified 20 Minnesota residents with *S.* Montevideo subtype SMON42 infections through routine surveillance. Of these, 14 (70%) reported exposure to chickens and/or ducklings during the 7 days prior to illness onset, and were therefore defined as cases. Ten (71%) cases reported direct contact with poultry. In addition, four (29%) cases (all less than 1 year of age) reported no direct contact with poultry, but a parent reported having direct contact with poultry. The cases resided in multiple counties: three (21%) in Wright, two (14%) each in Kandiyohi and Stearns, and one (7%) each in Douglas, Lincoln, Lyon, Nicollet, Rock, Roseau, and Wadena Counties. The median age of cases was 9.5 years (range, 1 month to 70 years), and seven (50%) cases were male. All 14 of the case isolates were from stool. Illness onset dates ranged from March 24 to July 20, 2008 (see Figure 1); 12 (92%) of 13 cases reported having diarrhea, eight (62%) reported bloody diarrhea, five (38%) reported vomiting, and ten (77%) reported fever. Illness history was not available for one case. Three cases were hospitalized for 1, 2, and 2 days, respectively.

Known purchase dates for the poultry ranged from March to May, 2008. Eight (57%) of 14 cases obtained poultry through farm stores, and three (21%) cases obtained poultry through feed stores; often the order was placed directly with the hatchery for pick up at the farm or feed store. One case (7%) purchased poultry from a local hatchery, and one case (7%) reported handling chicks at a golf club Easter display; the golf club had purchased chicks through a local farm store. Nine cases (64%) purchased a variety of breeds of layer type or broiler chicks, two cases (14%) purchased "assorted ducklings," and three cases (21%) purchased both chicks and "assorted ducklings."

Salmonella Montevideo PFGE Subtype SMON42 Cases Associated with Chick and/or Duckling Contact, by Week of Illness Onset



S. Montevideo SMON42 was cultured from two of four combined chicken cloacal swab samples and all three litter samples collected at the first case-household, and from the combined duck cloacal swab sample and both litter samples collected at the second case-household. No other serotype or subtype of *Salmonella* was isolated from chicken, duck or environmental samples.

On June 5, MDH issued a news release warning of the risk of *Salmonella* infection from handling baby chicks and ducklings; this release was carried by local newspaper and radio media and was posted on the MDH website. The news release described the seven cases that had been identified in Minnesota at the time and provided information about salmonellosis and advice for preventing infection.

One source hatchery was identified in all 14 cases reporting chick exposure (a hatchery located in Iowa). The hatchery was a large mail-order hatchery supplying private individuals, farm stores, feed stores, and other hatcheries throughout the Midwest. The same hatchery was also the source of poultry implicated in *S*. Montevideo outbreaks in Minnesota in 2000 (four cases) and in 2007 (nine cases). Environmental and chicken sampling at case-households in both these outbreaks yielded the outbreak strain of *S.* Montevideo. The PFGE subtype identified in the 2007 outbreak was SMON42; the PFGE subtype identified in the 2000 outbreak was SMON5, which differed by one band from SMON42.

In 2007, MDH notified the Iowa Department of Public Health (IDPH) and the Iowa Department of Agriculture and Land Stewardship (IDALS) of nine human cases of *S.* Montevideo reporting exposure to poultry ordered from the hatchery. At that time, IDALS inspected the hatchery and conducted education with the hatchery owners. IDALS also provided source flock information to Centers for Disease Control and Prevention (CDC) epidemiologists.

In response to additional human cases of *S.* Montevideo reporting exposure to poultry from the hatchery in 2008, environmental sampling was performed in the hatchery. Eighteen of twenty chick trays and environmental locations yielded *S*. Montevideo SMON42. Based on these findings, the hatchery owners voluntarily took significant measures to prevent and control *S.* Montevideo in their production system. They consulted with IDALS and the Iowa State University College of Veterinary Medicine to develop a plan that included flock biosecurity, hatching egg sanitation, hatchery sanitation, cleaning and disinfection, breeder flock control strategies, development of an autogenous bacterin, and vaccination of source flocks. In addition, IDPH modified an education flier created by MDH, to be distributed to all Iowa hatcheries, including the implicated hatchery, for inclusion in poultry shipments. Multiple conference calls between MDH, BAH, IDPH, IDALS, and Iowa State University College of Veterinary Medicine took place from July through September, 2008 to discuss the ongoing investigation, and prevention and control strategies for the implicated hatchery.

This was an outbreak of *S*. Montevideo infections associated with chicks and/or ducklings traced to a single hatchery. Contact with poultry, particularly with young birds, is a well known risk factor for *Salmonella* infection in humans. Reducing morbidity from chick and duckling-associated salmonellosis depends upon *Salmonella* control at every level of the continuum from breeder flock management to consumer education.

(2)
Quinolone-Resistant *Salmonella* Enteritidis Infections Associated with Commercially Distributed Rodents

March-April Multiple states

On April 11, 2008, staff at the Minnesota Department of Health (MDH) interviewed a *Salmonella* Enteritidis case with pulsed-field gel electrophoresis (PFGE) subtype SE74B21 detected through routine surveillance. This case had illness onset on March 27 and reported that a co-worker was also ill at the end of March. On April 17, another *S*. Enteritidis SE74B21 case was interviewed and reported owning a white corn snake. The case fed the snake live mice. The first case was re-interviewed on April 24 and asked about any possible reptile or rodent contact prior to onset. His ill co-worker owned a corn snake and fed it live mice purchased from pet store in Moorhead, Minnesota (Pet Store A). Several attempts were made to contact the ill co-worker, but without success. The second case was contacted again and asked where his mice were purchased and if staff from MDH could sample his snake for *Salmonella.* His mice were purchased from a pet store in Fridley, Minnesota (Pet Store B), and a time was set up for a home visit and *Salmonella* culture. An investigation into the distribution source of the Minnesota rodents was initiated, and MDH PFGE laboratorians searched for other cases with this subtype of *S.* Enteritidis nationwide.

A case was defined as a person with an infection with *S*. Enteritidis PFGE subtype SE74B21 from late 2007 through mid-2008. Cases were further evaluated for snake or mouse exposure; if no direct or indirect exposures to snakes or mice were identified, cases were excluded from further follow up.

The Minnesota Department of Agriculture (MDA) was contacted. On April 24, MDA staff visited Pet Store B. Contact was also made with Pet Store A. A traceback investigation was conducted.

MDH staff sampled the snake from the case's home in Fridley for *Salmonella.* They also collected environmental samples from the home, including swabs of sinks and vacuum cleaner bag dust.

On May 1, the Centers for Disease Control and Prevention (CDC) coordinated the first of a series of conference calls led by MDH staff regarding the potential mouse and snake associations among cases nationally.

Twenty-four cases were identified nationally, including three in Minnesota. Antimicrobial susceptibility testing at the MDH Public Health Laboratory indicated that the three Minnesota case isolates were resistant to nalidixic acid (a quinolone antimicrobial). Isolates from Wisconsin cases were also resistant to nalidixic acid. Information about susceptibility testing in other states was not available at the time of this report.

The Minnesota cases had illness onsets on March 28, April 8, and April 10. All three were male, aged 20, 31, and 41 years. The April cases were a father and son with exposure to the same snake and mice. All three cases experienced vomiting, diarrhea, and cramps. Two cases had fevers of 101º F. One case had bloody diarrhea. Duration of illness was not available as all cases still had symptoms at the time of interview. Two cases were hospitalized, each for 5 days.

Of the 24 cases nationally, 3 could not be reached for interview and 5 did not have identified connections to snakes or mice. The remaining 16 cases, which did have connections to snakes and/or mice were from Iowa (n=1), Indiana (n=2), Michigan (n=2), Minnesota (n=3), North Dakota (n=2), and Wisconsin (n=6). Cases had specimen collection dates or onset dates (whichever was available) ranging from December 14, 2007 through May 1, 2008. Ages ranged from 4 to 60 years, with a median of 15.5 years. Eight of 15 (53%) cases with known gender were male. There were no deaths.

Twelve of the 16 cases had contact with mice purchased live from various stores (many were stores of Chain X, the same national chain as Pet Store B) that received mice from a distributor in Illinois (Distributor A). One Minnesota case had contact with an ill co-worker who purchased mice from a store that also received mice from Distributor A. The remaining three cases had contact with mice from different distributors that could not be directly linked to Distributor A or breeders who supplied mice to Distributor A.

The first national conference call was held on May 1, 2008, though communication between Minnesota and other states had occurred in April. The Illinois Department of Agriculture (IDA) reported that Distributor A was a new distributor that opened in September of 2007. They were willing to let the IDA conduct environmental sampling at their facility and provided invoices and other documentation about their mice.

On May 2, the IDA reported that Distributor A had three suppliers of mice and two suppliers of rats. The suppliers were located in Minnesota, Indiana, and Illinois. Distributor A received 7,000-11,000 mice and 2,000 rats per week. The facility routinely conducted extensive disinfection and steam cleaning in their animal environments, including transport cages. The facility only had one supplier of white rats and mice but the others supplied colored rats and mice; however Chain X did not maintain this separation by color, only by gender, so mouse color was ultimately not helpful in the investigation.

As of May 6, the IDA was planning to conduct testing at Distributor A when the next shipment of mice came in, and the Indiana Department of Health was planning to conduct testing at the Indiana breeder. The Indiana breeder was an Amish facility that had a history of sanitation problems. The Minnesota breeder had been sampled extensively the previous day with results pending. The Michigan Department of Agriculture reported that their pet stores had received mice from Distributor A and specifically had records of dead and weak mice that later died coming in on shipments in early January.

By May 20, laboratory results were available from much of the testing conducted in various states. Several samples from a case household in Minnesota cultured positive for *S*. Enteritidis SE74B21, including samples from the snake cage, vacuum cleaner bag dust, and a swab from the bathroom sink drain. However, all 31 samples from the Minnesota breeder were negative for *Salmonella.* In Indiana, nine samples were taken at the Amish facility, and all tested negative for *Salmonella*. The Illinois Department of Health reported that a dead mouse from Distributor A tested positive for *S*. Enteritidis SE74B21. The mouse was colored, not white, so it came from either the Illinois or Indiana breeder, but the source could not be confirmed. It was not a mouse that was returned from a pet store to Distributor A. Several samples were taken at the Illinois breeder; information about the results was not available at the time of this report.

The Wisconsin Department of Health submitted a mouse from a case household and a mouse purchased at a Chain X store in Wisconsin to MDH for testing. The mouse from the case household was positive for *S*. Enteritidis SE74B21. The Wisconsin Department of Health also tested bedding from this mouse's cage; this bedding was also positive for *S*. Enteritidis SE74B21. The other mouse samples were negative.

The United States Food and Drug Administration did not assess the mouse breeders or the distribution center involved in this investigation.

This was an outbreak of quinolone-resistant *S.* Enteritidis infections associated with commercially distributed mice used both as pets and as food for pet snakes. This was the first *S*. Enteritidis outbreak associated with rodents, and the first outbreak of quinolone-resistant *Salmonella* infections associated with rodents. The primary distributor for the mice was Distributor A, in Illinois. The breeder that supplied the mice to Distributor A was not determined. Transmission likely occurred through contact with the mice, contact with snakes that had been fed the mice, and/or contact with environmental surfaces contaminated by mice or snakes.

Confirmed Foodborne Outbreaks
Minnesota, 2008

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Jan	Restaurant	9	1	Unknown	Norovirus	Infected food worker	Hennepin
2	Jan	Commercial product	1	1	Cereal	*Salmonella* Agona	Contaminated product	Multiple states
3	Jan	Wedding reception	28	3	Caesar salad	Norovirus	Unknown	Washington
4	Jan	Restaurant	7	2	Unknown	Norovirus	Infected food worker	Hennepin
5	Jan	Restaurant	3	3	Unknown	Norovirus	Likely infected food worker	Carver
6	Jan	Catered meal	4	1	Sub-style sandwiches	Norovirus	Infected food worker	Hennepin
7	Jan	Restaurant	3	2	Sandwiches	Norovirus	Infected food worker	Ramsey
8	Feb	Restaurant	15	11	Sandwiches	*Salmonella* Enteritidis	Infected food worker	Hennepin
9	Feb	Restaurant	7	2	Salad	Norovirus	Infected food worker	Hennepin
10	Feb	Restaurant	2	0	Unknown	Suspected norovirus	Unknown	Hennepin
11	Feb	Hotel conference	10	0	Croissant	Suspected norovirus	Unknown	Hennepin
12	Feb	Restaurant	4	2	Unknown	Norovirus	Infected food worker	Ramsey
13	Feb-Apr	Commercial product	7	7	Chicken cordon bleu entrees	*Salmonella* Enteritidis	Contaminated product	Multiple counties
14	Mar	Restaurant	4	1	Shrimp	Norovirus	Unknown	Hennepin
15	Mar	Restaurant	5	1	Onions on steak	Norovirus	Unknown	Anoka

Confirmed Foodborne Outbreaks
Minnesota, 2008 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
16	Mar	School	20	1	Cookies	Norovirus	Infected food worker or student	Redwood
17	Mar	Restaurant	4	0	Unknown	Suspected norovirus	Infected food worker	Hennepin
18	Mar	Restaurant	27	4	Multiple items	Norovirus	Infected food worker	Hennepin
19	Mar	Restaurant	7	0	Sushi	Norovirus	Unknown	Hennepin
20	Mar	Restaurant	11	2	Unknown	Norovirus	Infected food worker	Hennepin
21	Mar	Restaurant	4	0	Unknown	Suspected norovirus	Infected food worker	Hennepin
22	Mar	Family gathering	8	1	Pizza	Norovirus	Unknown	Dakota
23	Apr	Restaurant	11	4	Unknown	Norovirus	Likely infected food worker	Ramsey
24	Apr	Rehearsal dinner	18	2	Water, ice	Norovirus	Infected food worker	Stearns
25	Apr	Restaurant	12	2	Unknown	Norovirus	Likely infected food worker	Wadena
26	May	Restaurant	23	3	Unknown	Norovirus	Unknown	Hennepin
27	May	Restaurant	11	2	Mixed garden salad, fresh vegetables	Norovirus	Likely infected food worker	Hennepin
28	Jun	Commercial product	33	33	Jalapeño peppers	*Salmonella* Saintpaul	Contaminated product	Multiple states
29	Jun	Graduation party	11	1	Unknown	Norovirus	Unknown	Anoka
30	Jun	Restaurant	34	2	Unknown	Norovirus	Infected food worker	Washington

Confirmed Foodborne Outbreaks
Minnesota, 2008 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
31	Jun	Catered banquet	29	0	Au jus sauce	Suspected *Clostridium perfringens*	Time/ temperature abuse	Carver
32	Jun	Private event	3	1	Unknown	Norovirus	Unknown	Scott
33	Jun-Oct	Commercial product	16	16	Stuffed chicken products	*Salmonella* 4, 12:i:-	Contaminated product	Multiple counties
34	Jun	Festival	8	0	Tacos-in-a-bag	Suspected *Clostridium perfringens*	Time/ temperature abuse	Renville
35	Jun-Aug	Commercial product	6	6	Raw turkey products	*Salmonella* Hadar	Contaminated product	Multiple states
36	Jul	Private event	6	2	Likely homemade ice cream	*Salmonella* Heidelberg	Consumption of contaminated raw product	Multiple counties
37	Jul	Hotel buffet	46	9	Turkey	*Salmonella* Enteritidis	Unknown	Crow Wing
38	Jul	Restaurant	27	0	Turkey cherry salad	Suspected norovirus	Likely infected food worker	Hennepin
39	Jul	Restaurant	10	1	Unknown	Norovirus	Unknown	Hennepin
40	Aug	Restaurant	24	2	Chips	Norovirus	Likely infected event attendee	Olmsted
41	Aug	Private event	2	2	Raw milk	*Campylobacter jejuni*	Contaminated product	Pope
42	Aug	Raw milk exposure	3	1	Raw milk	*Campylobacter jejuni*	Contaminated product	Crow Wing
43	Sep	Private event	15	4	Taco meat	*Clostridium perfringens*	Time/ temperature abuse	Dakota

Confirmed Foodborne Outbreaks
Minnesota, 2008 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
44	Sep	Restaurant	5	2	Unknown	Norovirus	Likely infected food worker	McLeod
45	Oct	Restaurant	7	4	Lettuce salad	Norovirus	Infected food worker	Freeborn
46	Oct	School	17	4	Chips and salsa	Norovirus	Unknown	Cottonwood
47	Oct	Charity dinner	8	3	Pumpkin muffins	Norovirus	Likely infected food preparer	Carver
48	Oct	Restaurant	4	1	Ready-to-eat foods	Norovirus	Infected food worker	Washington
49	Nov	Church dinner	46	0	Turkey	Suspected *Clostridium perfringens*	Time/ temperature abuse	Anoka
50	Nov	Country club	21	2	Chicken strips and other foods	Norovirus	Likely infected food worker	Olmsted
51	Nov	Banquet facility	21	0	Chicken parmesan	Suspected bacterial intoxications	Time/ temperature abuse	Dakota
52	Nov-May 2009	Commercial product	45	45	Peanut-containing products	*Salmonella* Typhimurium	Contaminated product	Multiple states
53	Dec	Hotel	8	2	Ready-to-eat foods	Norovirus	Infected food worker	St. Louis
54	Dec	Country club	27	1	Chicken salad tarts and vegetable tray	Norovirus	Infected food worker	Ramsey

Confirmed Foodborne Outbreaks
Minnesota, 2008 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
55	Dec	Hotel	13	3	Fruit	Norovirus	Infected food worker	Olmsted
56	Dec	Restaurant	3	2	Ready-to-eat foods	Norovirus	Infected food workers	Ramsey
57	Dec	Basketball tournament	3	0	Tacos-in-a-bag	Suspected bacterial intoxications	Time/ temperature abuse	Dakota
58	Dec	Restaurant	14	3	Unknown	Norovirus	Likely infected food worker	Carver
59	Dec	Restaurant	4	0	Ground beef	Suspected *Clostridium perfringens*	Time/ temperature abuse	Carver
60	Dec	Restaurant	3	1	Ready-to-eat foods	Norovirus	Infected food worker	Hennepin
61	Dec	Restaurant	6	2	Unknown	Norovirus	Infected food worker	Olmsted

TOTAL: 61

Confirmed Waterborne Outbreaks
Minnesota, 2008

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
1	Apr	Fitness center swimming pool	12	1	Recreational water	*Cryptosporidium parvum*	Likely infectious swimmer	Otter Tail
2	Jul	Swimming beach	26	2	Recreational water	Norovirus	Likely infectious swimmer	Anoka
3	Aug	Hotel water park	12	2	Recreational water	*Cryptosporidium hominis*	Likely infectious swimmer	Wright
4	Sep-Nov	Fitness center swimming pool	19	7	Recreational water	*Cryptosporidium hominis* and *Giardia intestinalis*	Likely infectious swimmer	Lyon

TOTAL: 4

Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2008

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
1	Jan	Nursing home	3	3	Person-to-person (PTP)	*Salmonella* Agona	Wilkin
2	Jan	Nursing home	31	0	PTP	Suspected norovirus	Scott
3	Jan	Nursing home	40	0	PTP	Suspected norovirus	Hennepin
4	Jan	Nursing home	15	0	PTP	Suspected norovirus	Olmsted
5	Jan	Assisted living	32	0	PTP	Suspected norovirus	Ramsey
6	Jan	Nursing home	58	0	PTP	Suspected norovirus	Redwood
7	Jan	Nursing home	47	0	PTP	Suspected norovirus	Dakota
8	Jan	Nursing home	22	0	PTP	Suspected norovirus	Hennepin
9	Jan	Nursing home	11	0	PTP	Suspected norovirus	Hennepin
10	Jan	Nursing home	94	0	PTP	Suspected norovirus	Hennepin
11	Feb	Assisted living	24	0	PTP	Suspected norovirus	Hennepin
12	Feb	College	16	0	PTP	Suspected norovirus	Hennepin
13	Feb	Nursing home	70	0	PTP	Suspected norovirus	Hennepin
14	Feb	Treatment facility	28	0	PTP	Suspected norovirus	Carlton
15	Feb	Shelter	2	2	PTP	*Salmonella* Hadar	Hennepin
16	Feb	School	127	1	PTP	Norovirus	Cottonwood
17	Feb	Private	12	0	PTP	Suspected norovirus	Hennepin
18	Feb	Restaurant	5	1	Unknown	Norovirus	Ramsey
19	Feb	Nursing home	29	0	PTP	Suspected norovirus	Ramsey
20	Mar	Schools/ Community	27	27	PTP	*Shigella sonnei*	Kandiyohi
21	Mar-Jul	Community	14	14	Animal contact	*Salmonella* Montevideo	Multiple counties
22	Mar	Assisted living	Unknown	0	Unknown	Suspected norovirus	Hennepin

Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2008 (continued)

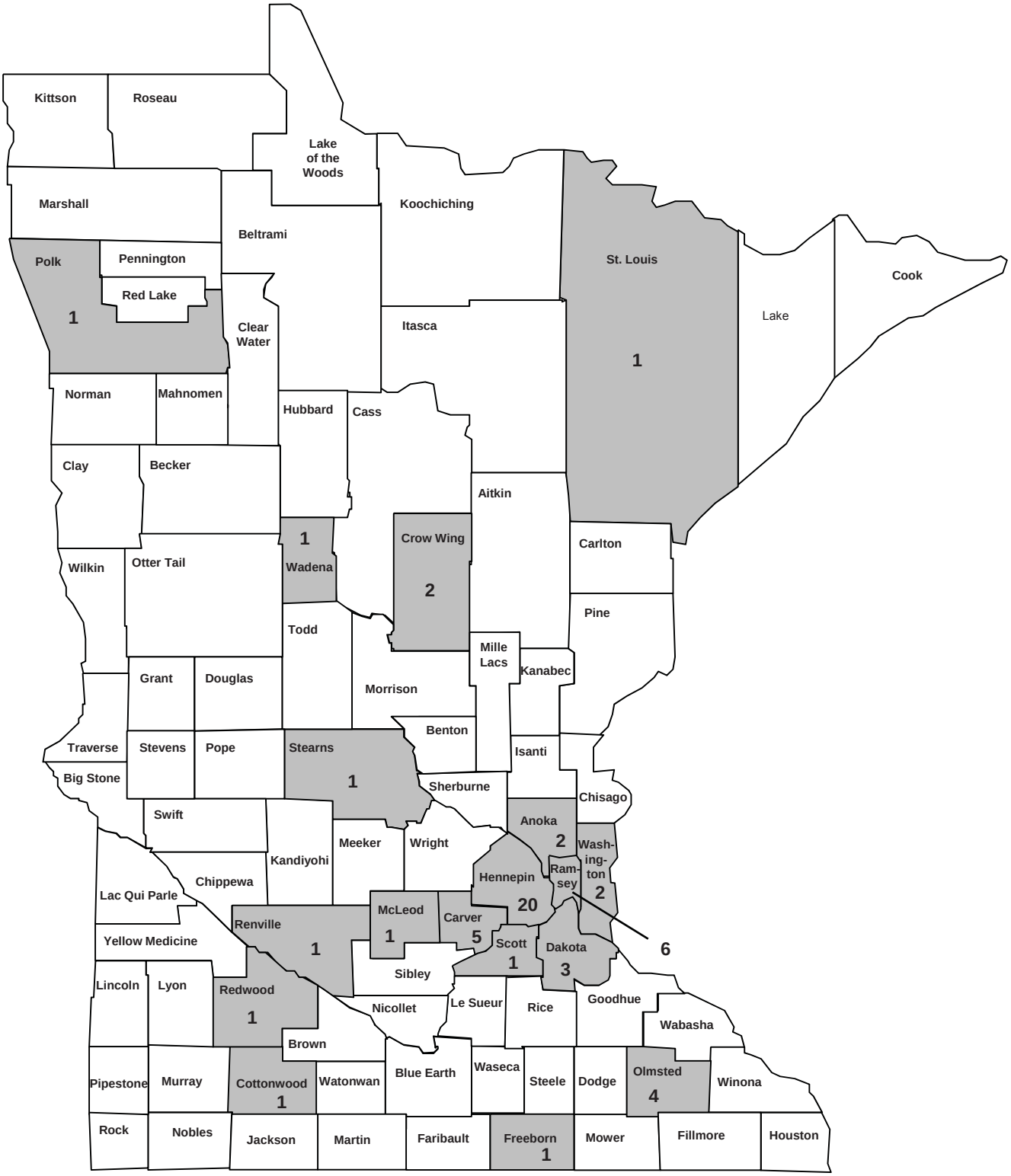
Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
23	Mar	Nursing home	30	0	PTP	Suspected norovirus	Cottonwood
24	Mar	Assisted living	27	0	PTP	Suspected norovirus	Hennepin
25	Mar	Nursing home	83	0	PTP	Suspected norovirus	Hennepin
26	Mar-Apr	Private homes	3	3	Animal contact	*Salmonella* Enteritidis	Multiple states
27	Apr	Daycare/Shelter	4	4	PTP	*Shigella*	Hennepin
28	Apr	Community	2	2	PTP	*Shigella*	Beltrami
29	Apr	Nursing home	139	0	PTP	Suspected norovirus	Ramsey
30	Apr	Assisted living	26	0	PTP	Suspected norovirus	Clay
31	Apr	Shelter	42	0	PTP	Suspected norovirus	Dakota
32	Apr	Nursing home	34	0	PTP	Suspected norovirus	Nobles
33	Apr	Assisted living	20	0	PTP	Suspected norovirus	Ramsey
34	May	Daycare	26	15	PTP	*E. coli* O157:H7	Murray
35	May	School	18	0	Unknown	Unknown	Olmsted
36	May	Nursing home	14	0	PTP	Suspected norovirus	Rock
37	Jun	Private farm	2	2	Animal contact	*E. coli* O157:H7	Multi
38	Jul	Camp	12	0	PTP	Suspected norovirus	Hennepin
39	Aug	Daycare	Unknown	2	PTP	Norovirus	Hennepin
40	Aug	Community	7	3	PTP	*E. coli* O157:H7	Olmsted
41	Aug	Daycare	12	2	PTP	*Shigella sonnei*	Carver
42	Aug	Camp	≥5	0	PTP	Suspected norovirus	Cass
43	Sep	Restaurant	10	0	Unknown	Unknown	Hennepin
44	Sep	Restaurant	3	0	Unknown	Unknown	Mower
45	Sep	Daycare	4	4	PTP	*E. coli* O157:H7	Stearns

Outbreaks with Other or Unknown Routes of Transmission
Minnesota, 2008 (continued)

Outbreak Number	Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
46	Sep	Daycare	6	6	PTP	*E. coli* O157:H7	Washington
47	Sep	Daycare	3	3	PTP	STEC	Dakota
48	Oct	Daycare/School	19	2	PTP	Norovirus	St. Louis
49	Oct	Private	2	0	Unknown	Unknown	Stearns
50	Oct	Nursing home	15	0	PTP	Suspected norovirus	Renville
51	Oct	Nursing home	14	0	PTP	Suspected norovirus	Steele
52	Oct	Nursing home	86	0	PTP	Suspected norovirus	Olmsted
53	Oct	Nursing home	64	0	PTP	Suspected norovirus	Dodge
54	Oct	School	250	0	Unknown	Suspected norovirus	Wabasha
55	Nov	Nursing home	28	0	PTP	Suspected norovirus	Olmsted
56	Nov	Nursing home	48	0	PTP	Suspected norovirus	Wabasha
57	Dec	Nursing home	47	0	PTP	Suspected norovirus	Goodhue
58	Dec	Assisted living	23	0	PTP	Suspected norovirus	Ramsey
59	Dec	Assisted living	24	0	PTP	Suspected norovirus	Olmsted
60	Dec	Nursing home	20	0	PTP	Suspected norovirus	Houston
61	Dec	Nursing home	44	0	PTP	Suspected norovirus	Stearns
62	Dec	Nursing home	22	0	PTP	Suspected norovirus	Stearns
63	Dec	Nursing home	10	0	PTP	Suspected norovirus	Hennepin
64	Dec	Nursing home	12	0	PTP	Suspected norovirus	Carver
65	Dec	Nursing home	28	0	PTP	Suspected norovirus	Hennepin
66	Dec	Nursing home	30	0	PTP	Suspected norovirus	Faribault
67	Dec	Assisted living	40	0	PTP	Suspected norovirus	Hennepin

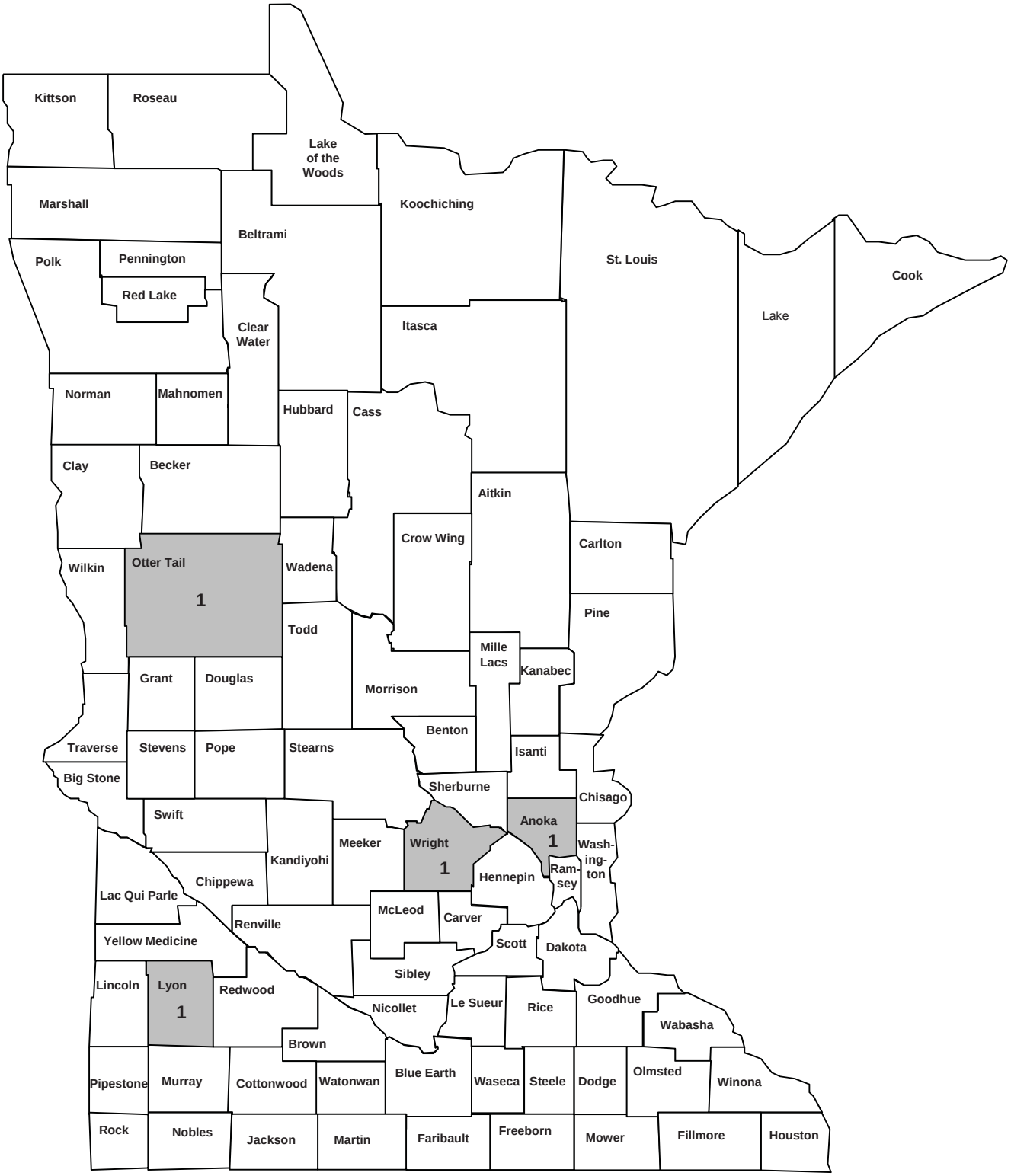
TOTAL: 67

Confirmed Foodborne Outbreaks by County, Minnesota, 2008 (n=61*)

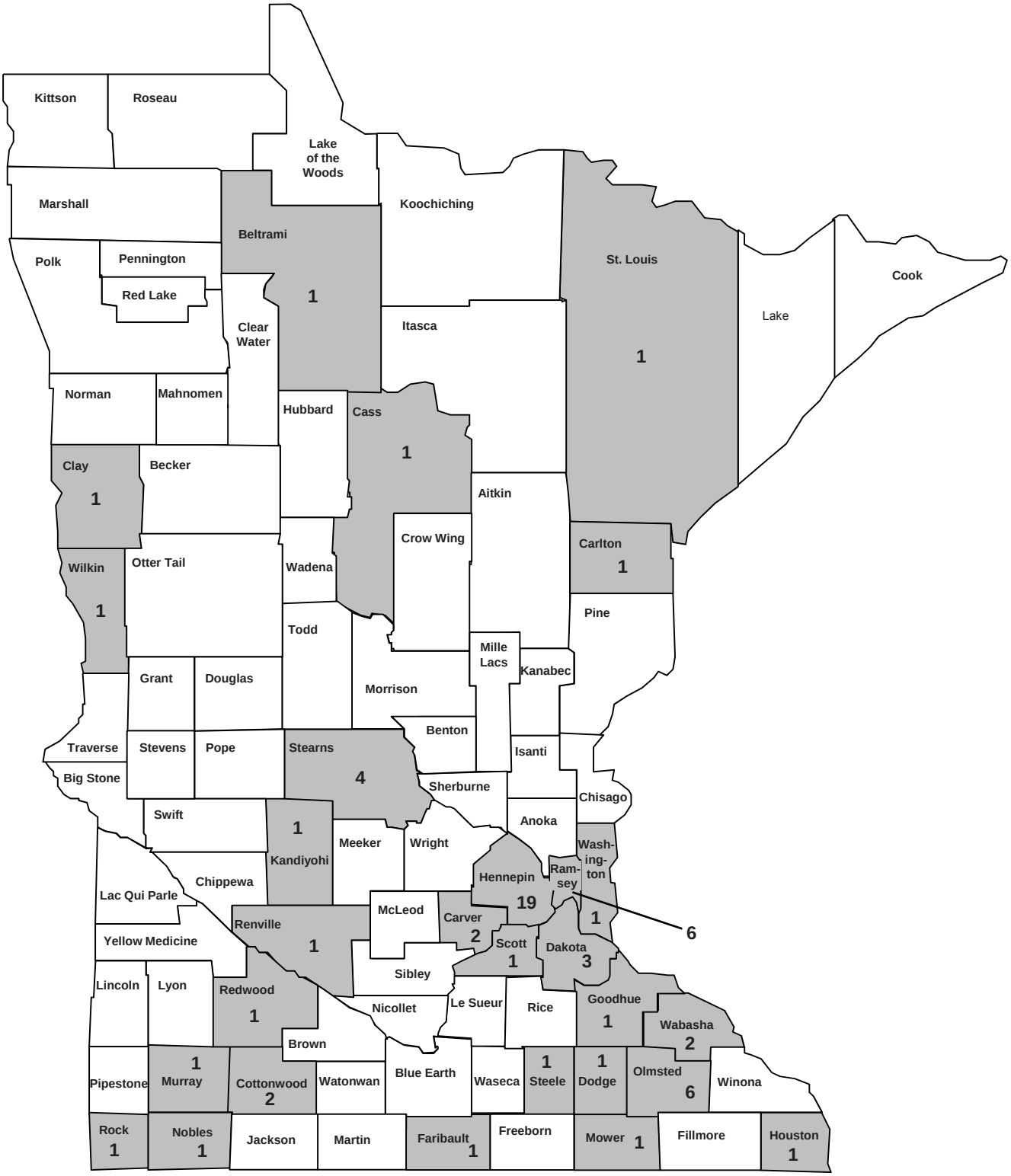


* The total number of confirmed outbreaks in 2008 was 61; however, the numbers on the map add up to 54. The remaining seven outbreaks (#12, #27, #32, #34, #35, #44, and #52) involved multiple counties.

Confirmed Waterborne Outbreaks by County, Minnesota, 2008 (n=4)

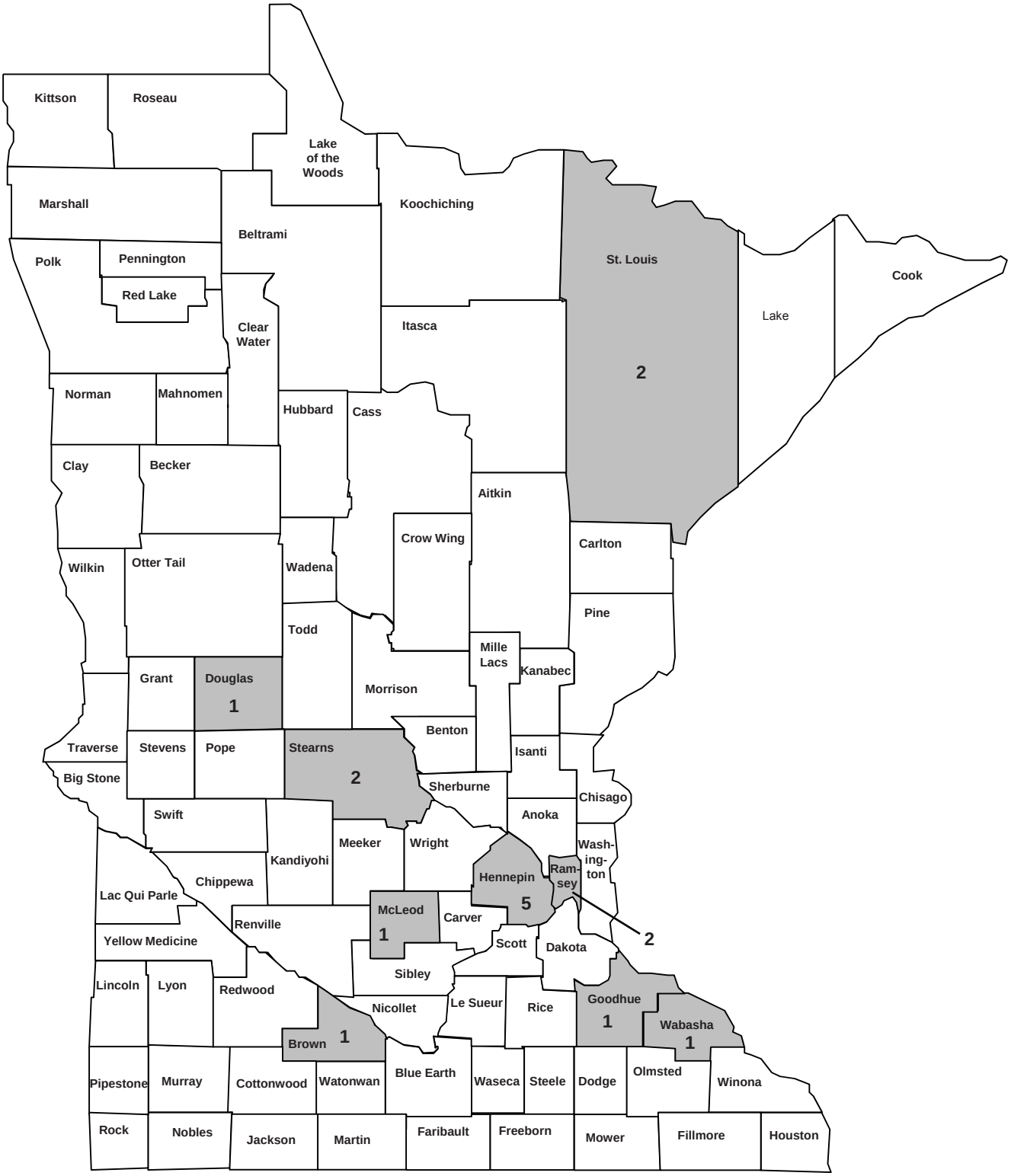


Outbreaks with Other or Unknown Routes of Transmission, Minnesota, 2008 (n=67*)



* The total number of outbreaks with other or unknown routes of transmission in 2008 was 67; however, the numbers on the map add up to 64. The remaining outbreaks (#21, #26 and #37) involved multiple counties.

Probable Foodborne Outbreaks by County, Minnesota, 2008 (n=16)



Foodborne Illness Complaints, Minnesota, 2008

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	0	0	0
Anoka County	21	17	38
* Becker County	1	0	1
* Beltrami County	2	0	2
* Benton County	1	0	1
Big Stone County	0	0	0
Bloomington/Richfield	44	33	77
* Blue Earth County	7	0	7
Brooklyn Park, City of	6	3	9
Brown County	0	0	0
* Carlton County	1	0	1
* Carver County	11	0	11
* Cass County	1	0	1
Chippewa County	2	0	2
* Chisago County	4	0	4
Clay County	0	0	0
* Clearwater County	0	0	0
* Cook County	0	0	0
Cottonwood County	2	0	2
* Crow Wing County	7	0	7
Crystal, City of	2	0	2
* Dakota County	70	0	70
* Dodge County	0	0	0
Douglas County	11	0	11
Edina, City of	17	17	34
Faribault County	0	0	0
* Fillmore County	0	0	0
* Freeborn County	2	0	2
Goodhue County	4	0	4
* Grant County	0	0	0
Hennepin County	70	14	84
Hopkins, City of	4	0	4
* Houston County	1	0	1
* Hubbard County	2	0	2

Foodborne Illness Complaints, Minnesota, 2008 (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
* Isanti County	4	0	4
* Itasca County	1	0	1
* Jackson County	1	0	1
* Kanabec County	1	0	1
Kandiyohi County	1	0	1
* Kittson County	0	0	0
* Koochiching County	0	0	0
Lac Qui Parle County	0	0	0
Lake County	2	1	3
* Lake of the Woods County	0	0	0
Le Sueur County	0	0	0
Lincoln County	0	0	0
* Lyon County	2	0	2
* Mahnomen County	0	0	0
Maplewood, City of	17	0	17
* Marshall County	0	0	0
Martin County	0	0	0
* McLeod County	3	0	3
* Meeker County	1	0	1
* Mille Lacs County	4	0	4
Minneapolis, City of	141	0	141
Minnetonka, City of	13	0	13
Moorhead, City of	1	0	1
Morrison County	0	0	0
* Mower County	7	0	7
Murray County	0	0	0
Nicollet County	4	0	4
Nobles County	1	0	1
* Norman County	0	0	0
Olmsted County	7	63	70
* Otter Tail County	6	0	6
* Pennington County	0	0	0
* Pine County	0	0	0
Pipestone County	0	0	0

Foodborne Illness Complaints, Minnesota, 2008 (continued)

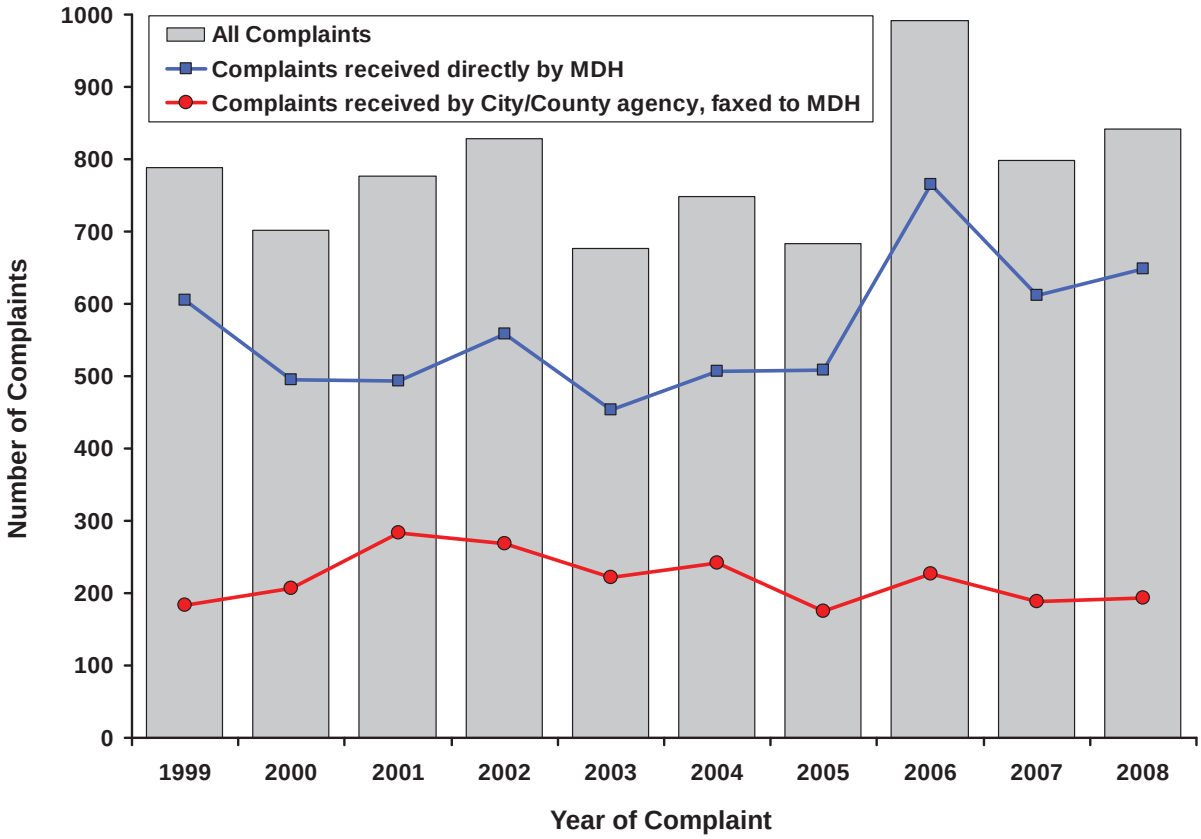
City or County	Foodborne illness complaints faxed from MDH Epi to environmental health agency	Foodborne illness complaints received by MDH Epi from environmental health agency	Total
* Polk County	0	0	0
Pope County	1	0	1
Ramsey County	64	0	64
* Red Lake County	0	0	0
Redwood	1	0	1
Renville	6	3	9
* Rice County	6	0	6
Rock County	0	0	0
* Roseau County	0	0	0
St. Cloud, City of	6	0	6
St. Louis County	5	26	31
St. Louis Park, City of	19	0	19
St. Paul, City of	66	4	70
* Scott County	16	0	16
* Sherburne County	12	0	12
* Sibley County	0	0	0
Stearns County	8	0	8
* Steele County	5	0	5
Swift County	0	0	0
* Stevens County	0	0	0
Todd County	1	0	1
* Traverse County	0	0	0
Wabasha County	1	0	1
Wadena County	2	0	2
Waseca County	0	0	0
Washington County	40	12	52
Watonwan County	1	0	1
Wayzata, City of	3	0	3
Wilkin County	0	0	0
Winona County	7	0	7
* Wright County	14	0	14
Yellow Medicine County	0	0	0
Bureau of Indian Affairs	4	0	4
FDA	0	0	0

Foodborne Illness Complaints, Minnesota, 2008 (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
MN Dept of Agriculture	66	0	66
MDH Environmental Health	3	0	3
U of M	0	0	0
USDA	0	0	0
Total	867	193	1060

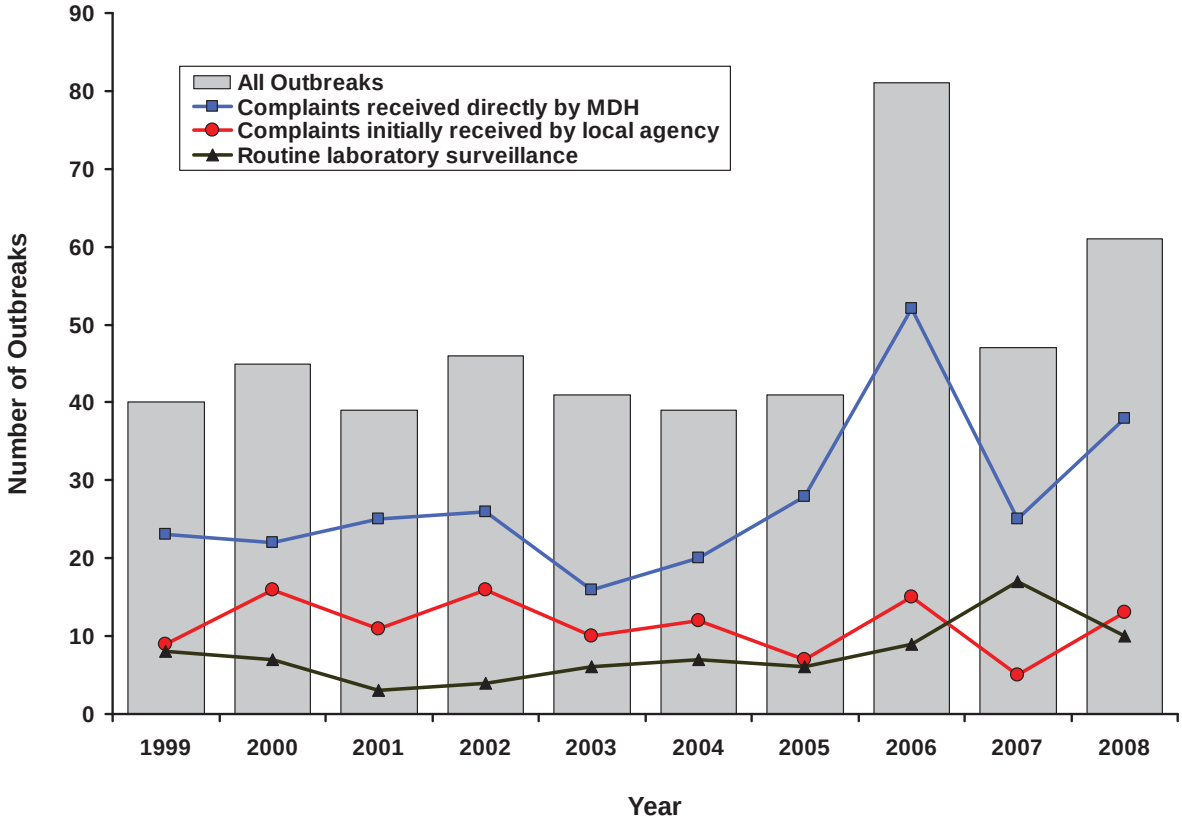
* MDH Environmental Health Services jurisdiction (total number of reports faxed to MDH EHS Metro or District Offices = 193)

Figure 1. Number of Foodborne Illness Complaints per Year, Minnesota, 1999-2008



In 2008, the MDH Acute Disease Investigation and Control Section received 842 foodborne illness complaints. Detailed information on symptoms and a 4-day food history were obtained from each caller (see form on page 137), and the complaint was faxed to the appropriate jurisdiction for each restaurant, deli, grocery store, or other establishment mentioned in the complaint (see complaint table on page 131). Of the 842 complaints received, 649 (77%) were received directly through the MDH foodborne illness hotline (1-877-FOOD ILL) and 193 (23%) were reported to MDH by local public health agencies (Figure 1). In 2008, 51 (84%) of the 61 confirmed foodborne outbreaks were initially reported to MDH or local public health agencies via phone calls from the public; of those, 38 (75%) were reported directly to MDH (Figure 2).

Figure 2. Confirmed Foodborne Outbreaks by Method of Initial Identification, Minnesota, 1999-2008



Revised: 3/2/2009

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

Tennessen Statements

The Tennessen statement is a requirement by the Minnesota Data Practices Act to inform the subject being interviewed of:

- The purpose of the interview
- Who will have access to the information
- The intended use of the information
- Any consequence of providing or not providing the requested information

Patient Information

The following questions capture the essential data needed to assess outbreaks caused by bacterial, viral, and parasitic organisms. The information below should be obtained in every interview.

1) Demographic and locating information on respondent

- Name and address
- Day and evening phone numbers
- Date of birth
- Gender

2) Illness History (verify that controls had no gastrointestinal symptoms)

- Fever (Yes/No) (Try not to ask if the person felt "feverish." Ask only if the person "had a fever.")
- Temperature (highest)
- Diarrhea (Yes/No)
- Date of diarrhea onset
- Time of diarrhea onset, in military time
- Maximum number of stools in a 24-hour period (This is critical information because the definition of diarrhea is **at least 3 loose stools in a 24-hour period**)
- Date of diarrhea onset
- Time of diarrhea onset, in military time
- Date of last episode of diarrhea
- Time of last episode of diarrhea
- Vomiting (Yes/No)
- Date of vomiting onset
- Time of vomiting onset, in military time
- Date of last episode of vomiting
- Time of last episode of vomiting, in military time
- Bloody stools (Yes/No)
- Abdominal cramps (Yes/No)
- First symptom

- Date of onset of first symptom (necessary in order to calculate the incubation period)
- Time of first symptom (The specific hour of onset, in military time, is necessary to calculate the incubation period)
- Date of recovery (necessary in order to calculate the duration of illness)
- Time of recovery (The specific hour of recovery, in military time, is necessary to calculate the duration of illness)
- Was person hospitalized? (Yes/No)
- If yes: where, admission date, discharge date
- Did person visit a physician? If yes, physician's name and phone number.
- Did person submit a stool culture? If yes, when.

3) Exposure History

- Ask about consumption of **every food** available to people involved in the outbreak.
- Ask specifically about **ice and water** consumption at every meal being evaluated.
- Ask specifically about **ice and water** consumed at any time other than at meals.
- Ask about all events associated with the outbreak.

Example: If the outbreak is associated with a wedding, ask about attendance at any showers, pre-wedding parties, the rehearsal dinner and the wedding reception. Occasionally, there may be two case clusters that need to be teased out in the epidemiological investigation. For example, one group may become infected at the bridal shower, and the organism may be transmitted at the wedding reception by a food vehicle such as the wedding cake made by the groom's sister the morning before the wedding.

4) Stool Cultures

Laboratory detection is most sensitive when samples are collected early in the course of illness. Always obtain stool samples as soon as possible when an outbreak is suspected. When this is not possible, samples should still be collected, even from persons whose symptoms have resolved. **Cases may continue to shed the bacteria or viruses for several days after recovery**. Persons with asymptomatic infections may excrete the organism for months.

Ideally, stool samples should be obtained from 4 to 6 cases. Samples should be refrigerated but NOT FROZEN until they are submitted to the laboratory. The exception to this is when a bacterial pathogen is suspected and specimens will not be submitted for several days, samples should be frozen until they are sent to MDH. For example, if stool kits are given to cases in a suspected *E. coli* O157:H7 outbreak on Friday and will not be delivered to MDH before Monday, samples should be frozen.

A viral pathogen (e.g., norovirus) may be suspected when the outbreak is characterized by:

1) Median incubation period of 24-48 hours, and
2) Vomiting in at least 50% of cases or vomiting more frequent than fever, and
3) Median duration ≤2 days

A bacterial pathogen (e.g., *Salmonella*, *E. coli* O157:H7) may be suspected when the outbreak is characterized by:

1) Fever and/or bloody stools
2) Median duration >2 days
3) Median incubation period of 3 days or more (some bacterial pathogens, e.g., *Salmonella*, can have a shorter median incubation)

II. Investigation at the Food Service Establishment – See page 145, "MDH Procedures for Conducting Environmental Investigations of Foodborne Disease Outbreaks"

III. Report Summarizing the Event

The final report will be entered into the statewide outbreak database and included in the state's annual summary of foodborne disease outbreaks. Every report includes the following information:

Background

- Date the investigating agency was notified of the outbreak
- Description of the initial report made to the investigating agency
- Date of the event
- Date of initiation of the investigation

Methods

- Who provided information about event attendees (names and/or phone numbers)
- Other agencies that were notified of the outbreak and investigation
- The number of people who attended the event
- The case definition used for the outbreak (the standard definition is vomiting or diarrhea, ≥ 3 stools in a 24-hour period, following the event)
- The number of people interviewed (at least one control should be interviewed per case, and ideally two or more controls should be interviewed per case)
- The number of stools collected for testing
- The pathogens that were tested for in the stool specimens
- Relevant environmental health measures implemented

Results

- The number of people interviewed who met the case definition
- The number of people interviewed with gastrointestinal symptoms who did not meet the case definition
- The percentage of interviewed cases with each of the following symptoms: diarrhea (≥ 3 stools in a 24-hour period), vomiting, fever, bloody stools, and abdominal cramps. Other symptoms may be listed as appropriate.
- The median incubation period and incubation range
- The median duration of illness and duration range
- Hospitalization status of cases
- Results of the stool testing (including PFGE results, if applicable)
- Food items or events that were statistically associated with illness

- The odds ratio(s), p-values, and confidence intervals of the implicated item(s)
- Results of food worker interviews (the number of ill food workers, any corrective actions taken)
- Results of food worker stool cultures
- All relevant information found in the environmental investigation

Conclusion

- Etiologic agent
- Implicated vehicle(s)
- Discussion of route of transmission
- Contributing factors to contamination and/or transmission (discuss all plausible sources of contamination when necessary)
- Defense of conclusion, if needed (for example, how do the symptoms, incubation period, and duration suggest a particular pathogen?)

MDH Procedures for Conducting Environmental Investigations of Foodborne Disease Outbreaks

I. Introduction

A systematic environmental investigation is a critical aspect of foodborne illness outbreak investigations. The environmental investigation aims to:

- Identify and eliminate the factors that could lead to further transmission;
- Clarify the nature and mechanism of disease transmission; and
- Provide information needed to design effective strategies to prevent future outbreaks.

The environmental investigation should be initiated as soon as notice of a suspect foodborne disease outbreak is received, but no later than 24 hours after being notified. The investigation of a suspect foodborne disease outbreak is different from a routine inspection. Such an investigation requires a systematic assessment of critical food handling procedures, focusing as much as possible on procedures suggested by preliminary epidemiological and/or laboratory information. The environmental investigation will be coordinated by an Environmental Health Specialist/ Sanitarian with involvement of laboratory and epidemiology staff. Any information gathered during the environmental investigation will be done in a manner that is consistent with the Data Practices Act.

II. Information Sharing

EHS personnel involved in the environmental investigation of the implicated FSE will be the main point of contact between the FSE and MDH. Regular communication with ADIC/LPH staff throughout the investigation is necessary to know of the status of the epidemiologic and laboratory investigations. In addition, the following persons should be updated on the progress of the environmental investigation on an on-going basis:

- EHS Outbreak Coordinator, if the outbreak is in MDH jurisdiction
- Your supervisor
- The principal epidemiologist (epidemiologist working on the outbreak).

Note: Media requests for information should be directed to the MDH communications office or the LPH PIO.

III. Conducting the Investigation

A. **Conference Call**: In most cases, a conference call between ADIC and EHS/LPH staff will be held during the initial phase of foodborne disease outbreak investigations. Pay special attention to any working hypotheses that are developed during the conference call. If a conference call is not held or is delayed, consult key staff from each program (ADIC, EHS, and PHL) regarding likely explanations for the outbreak, sample/specimen collection options and strategies, and enforcement options. Key information obtained during this call might include:

- Demographic information about cases
- Illness history for cases
- Number of cases
- Food consumption history
- Name and address of implicated establishment
- How the outbreak was identified
- Information about any suspect food vehicles
- Information regarding the suspected agent(s)
- Recent inspection reports (covering at least 2 inspections)

  This information is helpful in developing hypotheses regarding the likely agent, the likely vehicle, how and where the vehicle became contaminated and could suggest actions needed to reduce or eliminate the risk of further transmission.

B. **Contact the Establishment**: Contact the implicated establishment and request that the manager(s) or senior staff member(s) be available for a meeting with the on-site investigation team at the facility at a specified time. Also, when necessary, request information about:

- Menus
- Customer receipts or credit card receipts
- Employee work schedules
- Employee illness

In some situations, the facility's management may be instructed to fax/e-mail information to designated individuals in ADIC or LPH.

C. **Select Tools for the On-site Investigation**: Certain items are needed to facilitate collection of information and/or samples during an outbreak. It may be helpful to prepare an outbreak "kit" containing the following items for the on-site investigation:

- MDH foodborne outbreak investigation manual
- Food worker interview forms
- Fact sheets about suspected agents
- Information about handwashing and food worker illness
- Sterile sampling containers
- Specimen containers (stool kits)
- Appropriate media (transport or enrichment)
- Disinfection and sterilizing agents
- Cooler and ice packs
- Sterile implements for sample collection (e.g. scoops, spoons, tongs, tongue depressors, swabs)
- Telephone/pager numbers of key MDH/LPH personnel (including after hours contact numbers)
- Thermometers and data loggers
- pH meter
- Water activity meter
- Enforcement guide
- Camera

IV. On-site Investigation

A. **Management Meeting:** Upon arriving at the implicated establishment, introduce yourself to the FSE management and explain the purpose of your visit.

(1) Provide an overview of the investigation process, including a brief description of the roles of ADIC, LPH, and PHL.

(2) Answer questions and provide details regarding what is known about the outbreak up to that point. **Note: under no circumstances should protected information, such as a complainant's name be shared with establishment personnel (consult the data practices guide or your supervisor for further information).**

(3) Request management's assistance in:

a. Arranging employee interviews

b. Providing records for review (food temperature logs, employee illness records, food purchasing records, etc)

c. Providing work space for field team where possible

d. Arranging for sample/specimen collection and submission to PHL, if needed

B. Assess Management Control and Operation:

i. Ask about the training and experience of the manager.

ii. Identify the Person in Charge (PIC) at key times suggested by the initial outbreak information.

iii. Obtain information about the operation such as: days and times of operation, number of staff, number of shifts, staffing needs, etc.

iv. Ask about the duties performed by each staff member (including manager). In particular, ask about the food handling responsibilities of all staff.

v. Ask about the establishment's policy regarding ill workers and ask to view the employee illness logs.

C. Conduct Hazard Analysis:

i. Obtain flow charts of preparation procedures for potentially hazardous foods (PHFs), focusing on items suggested by initial outbreak information.

ii. Identify critical control points (CCP) and likely hazards (consult annex 5 of 2001 FDA Food Code for further information).

iii. Evaluate the establishment's monitoring procedures for CCPs by reviewing records, interviewing staff, or observing practices.

iv. Assess whether critical limits for PHFs are/were met by reviewing records, interviewing staff, taking measurements, and/or observing food preparation activities.

v. Determine if there is an appropriate mechanism for taking corrective actions when critical limits are exceeded. This can be accomplished by reviewing the establishment's records, interviewing staff, or observation.

Note: This approach to hazard analysis is applicable in all outbreaks linked to FSEs. An analysis based on formal HACCP principles should be attempted even in establishments that are not required to have HACCP plans.

D. Review Sanitation Standard Operating Procedures (SSOPs):

i. Observe establishment layout and food flow (look for opportunities for cross-contamination)

ii. Check cleanliness of equipment and utensils

iii. Check cleanliness of floors, walls, and ceilings

iv. Obtain cleaning schedules and procedures (note the use of high pressure sprayers)

v. Review sanitization procedures (type of sanitizer, appropriateness of use, appropriateness of concentration used)

vi. Evaluate water and wastewater systems

E. Collect Environmental and Stool Samples:

i. Collect samples of food remaining from suspect meal (if available and only after consultation with ADIC and PHL)

ii. Collect foods prepared in the same way as the suspect food, if none of the suspect food is available (only after consultation with ADIC and PHL)

iii. Label samples and establish chain of custody

iv. Store samples in a manner appropriate for the agent under suspicion

v. Arrange for collection and submission of stool samples

vi. Arrange delivery of samples to PHL as soon as possible but no later than 12 hours after collection

Note: Use appropriate sampling techniques and collect enough sample to aid identification of suspect agent (contact the PHL for further information).

F. Enforcement:

Enforcement actions against a FSE implicated in a foodborne disease outbreak should focus on operations and behaviors that are the likely cause of the outbreak. All observed critical violations must be noted and orders issued for immediate correction of each (see Minnesota Food Code for definition of critical violations). Enforcement actions may include:

i. Closing the facility;

ii. Issuing a fine;

iii. Excluding or restricting ill workers;

iv. Issuing embargo orders;

v. Condemning food; and/or

vi. Issuing correction orders

Note: some of the above enforcement actions require special considerations to ensure the desired effect. As a general rule, review all enforcement decisions with your supervisor before taking action.

G. Closing a FSE:

Closing a FSE may be necessary to eliminate the risk for further transmission of a foodborne disease agent. The recommendation to close a FSE should only be made after carefully assessing the following factors with your supervisor:

i. Evidence of ongoing transmission or insufficient information regarding whether transmission has been arrested

ii. The overall sanitary status of the establishment (including the availability of safe drinking water, and adequate waste disposal facilities)

iii. The establishment's record related to the correction of critical violations

iv. The availability of a qualified food service manager(s)

v. The number and type of critical violations observed

vi. The likely impact on food safety of mandatory staff exclusions and/or restrictions

vii. The agent involved in the outbreak

viii. The population at risk

Note: orders to close a FSE must be communicated to management in writing. The orders must specify when the facility is to be closed, why the facility is being closed, and the conditions that must be met before the facility is allowed to re-open.

H. Re-opening a FSE

Once it is determined by re-inspection that all conditions specified in the closure orders are met and after consultation with ADIC, the FSE must be permitted to re-open. Permission to re-open must be granted in writing.

I. Report

Upon completing the environmental investigation prepare a summary report containing the following headings and information:

i. Background

- Name and address of the establishment
- Number of ill patrons
- The suspect etiologic agent
- How the outbreak was identified
- How and when EHS was notified

ii. Findings

- Critical violations and repeat critical violations
- Food/surface testing results
- Unusual food preparation procedures
- Employee illness information
- Any other information that could have a bearing on the outbreak

iii. Actions

- Steps taken to confirm the cause of the outbreak
- Steps taken to curtail the outbreak (with dates)
- Education

iv. Conclusions

- Offer some explanation of why the outbreak occurred (based on environmental, epidemiological, and/or laboratory findings).

Note: Copies of summary report and any other documents pertaining to the environmental investigation such as photographs, orders, or video recordings must be submitted to the principal epidemiologist two weeks after completing the environmental investigation. A copy of the final report may be submitted to the FSE, plaintiff's attorneys, or other eligible parties if requested in writing (see data practices policies for further information).

J. Wrap-up (Lessons learned)

Each outbreak provides an opportunity to evaluate the effectiveness of our efforts to prevent foodborne disease outbreaks. At the conclusion of the outbreak investigation, you may be asked to collaborate with ADIC, LPH and PHL staff to identify any lessons learned, and develop fact sheets and other educational materials that could be used to train public health staff and food service workers.

SAMPLE FOODBORNE OUTBREAK INVESTIGATION QUESTIONNAIRE

Name of Outbreak
City, MN
Date

Date: _____

Interviewer: _____

Name:_____ Age _____ Sex: F M

Street:_____ City:_____ County: _____

State: _____ Zip code: _____ Phone (H)_____ (W)_____

Illness Onset: _____/____/_____ Time:_____ Recovery: _____/____/_____ Time:_____

Vomiting □Y □N Onset: ____/____/_____ Time: _____ Recovery: ____/____/_____ Time: _____

Diarrhea □Y □N Onset: ____/____/_____ Time: _____ Recovery: ____/____/_____ Time: _____

Number of stools per 24-hr period (max): _____ Diarrhea duration: _____ days/hours

Bloody stools □Y □N Cramps □Y □N Fever □Y □N Temperature _____◦F

First Symptom: _____ Onset Date: ____/____/_____ Time:_____

Other Symptoms: _____ Onset Date: ____/____/_____ Time:_____

Called Provider: □Y □N Visited Provider: □Y □N Office / ER Date of Visit: ____/____/_____

Provider requested stool sample: □Y □N Stool submitted: □Y □N Hospitalized: □Y □N

Are you willing to submit a stool sample for testing? □Y □N

Meal Date: _____/_____/_____ Meal Time: _____

[sample menu]

Fried chicken	Y	N	U	Soda (type:_____)	Y	N	U
Ham	Y	N	U	Fruit punch	Y	N	U
Au gratin potatoes	Y	N	U	Coffee	Y	N	U
Baked beans	Y	N	U	Water	Y	N	U
Potato salad	Y	N	U	Ice	Y	N	U
Tossed salad	Y	N	U	Other food or drink	Y	N	U
dressing: _____	Y	N	U	List: _____	Y	N	U
Angel food cake	Y	N	U		Y	N	U

Did anyone in your household experience gastrointestinal illness in the week prior to this meal? □Y □N

Name and relationship	Age	Onset date
_____	____	____/____/____
_____	____	____/____/____
_____	____	____/____/____