MINNESOTA DEPARTMENT OF HEALTH 2000 GASTROENTERITIS OUTBREAK SUMMARY

Foodborne Outbreaks
Waterborne Outbreaks
Non-Foodborne, Non-Waterborne Outbreaks
Foodborne Illness Complaints
Foodborne Disease Outbreak Investigation Guidelines

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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. 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

Similar to foodborne outbreaks, except epidemiologic analysis implicates water as the source of illness. Waterborne outbreaks may be associated with drinking water or with recreational water.

CONFIRMED AND PROBABLE NON-FOODBORNE, NON-WATERBORNE OUTBREAKS

Non-foodborne, non-waterborne 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.

Summary

In 2000, the Minnesota Department of Health Acute Disease Investigation and Control Section (formerly the Acute Disease Epidemiology Section) identified 45 confirmed foodborne outbreaks, 22 probable foodborne outbreaks, seven confirmed waterborne outbreaks, one probable waterborne outbreak, and 56 non-foodborne, non-waterborne gastroenteritis outbreaks. From these 131 outbreaks of gastroenteritis, 2273 cases of illness were identified. The 45 confirmed foodborne outbreaks represents a 12% increase over the 40 outbreaks in 1999 and the most outbreaks per year in the past 10 years (median, 20 outbreaks, range, 12 to 45). The median number of cases of illness identified per confirmed foodborne outbreak in 2000 was 14 (range, 2 to 71).

Of the 45 confirmed foodborne outbreaks, 23 (51%) were either laboratory-confirmed (n=16) or epidemiologically defined (n=7) outbreaks of Norwalk-like calicivirus gastroenteritis. Eleven (24%) of the confirmed foodborne outbreaks were due to bacterial foodborne pathogens (e.g., *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*). The importance of Norwalk-like caliciviruses as a cause of foodborne disease outbreaks in 2000 continues a pattern that has been observed for two decades in Minnesota. From 1981-2000, 166 (44%) of 380 confirmed outbreaks of foodborne disease were due to Norwalk-like caliciviruses, while 78 (21%) confirmed foodborne outbreaks were caused by the major bacterial foodborne pathogens (*Salmonella*, *Campylobacter*, *E. coli* O157:H7, *Shigella*, and *Listeria*). Therefore, over this 20-year period the combined number of foodborne outbreaks due to bacterial agents was less than half the number of foodborne outbreaks due to Norwalk-like caliciviruses. MDH's ability to understand the epidemiology of Norwalk-like calicivirus gastroenteritis has been improved by advances in the detection and sequencing of this pathogen. For example, in two instances in 2000, sequencing was able to connect apparently unrelated outbreaks.

Two of the 45 foodborne outbreaks were due to hepatitis A virus; both outbreaks were traced to infected restaurant workers. There were two outbreaks of scombroid poisoning associated with tuna products (tuna steaks and tuna burgers, respectively) served in restaurants. One outbreak caused by *Bacillus cereus* emetic toxin was associated with improperly reheated leftover fried rice. Seven outbreaks were of undetermined etiology; some of these may have been due to bacterial intoxications.

There were three confirmed foodborne outbreaks due to *E. coli* O157:H7 in 2000. The first occurred in March in an elementary school; epidemiologic investigation linked the illnesses to a hotdish containing ground beef. The second foodborne outbreak occurred in August and was traced to a retail frozen ground beef patties, which were subsequently recalled. The third and largest foodborne outbreak of *E. coli* O157:H7 infections in 2000 occurred in November, and was also associated with retail ground beef. In addition to these three outbreaks occurring in 2000, another outbreak of *E. coli* O157:H7 due to retail ground beef that began in December 1999 also had cases which occurred in 2000 (see 1999 Gastroenteritis Summary). These outbreaks illustrated the continuing importance of ground beef as a vehicle for *E. coli* O157:H7 infections, as well as the usefulness of pulsed-field gel electrophoresis (PFGE) subtyping for rapidly identifying clusters of illness.

Five foodborne outbreaks of salmonellosis were identified; three were associated with restaurants. The other two outbreaks of salmonellosis were associated with smoked turkey prepared in private homes. These outbreaks serve as reminders of the microbial hazards inherent in the preparation of certain foods.

Commercially prepared foods were responsible for 32 (71%) outbreaks. Of those 32 outbreaks, 21 were

restaurant-associated; six were caterer-associated; three were associated with school cafeterias (an elementary school, high school, and college); and two were associated with nursing homes.

Thirteen (31%) of the 45 foodborne outbreaks did not involve commercially prepared foods. These outbreaks included outbreaks due to contaminated retail ground beef (n=2), unpasteurized milk (n=1), and events with food either prepared by ill persons in private homes or handled by ill persons at the event (n=8).

In 2000, there was one waterborne outbreak due to drinking water; this outbreak was caused by *Giardia* contamination of a drinking water supply. There were six outbreaks associated with swimming; in four of these six recreational water outbreaks, the agent was *Cryptosporidium*; in one, the agent was *Shigella sonnei*, and in another outbreak, both *Cryptosporidium* and *Shigella* were implicated.

There were 56 non-foodborne, non-waterborne outbreaks of gastroenteritis identified in 2000. Three of these outbreaks were due to exposure to animals; calves in two outbreaks (one due to *E. coli* O157:H7, the other due to multiple enteric pathogens) and baby chicks in a third outbreak due to salmonellosis. However, most outbreaks in this category were associated with person-to-person transmission in daycares, schools, nursing homes, and other facilities. There were 36 outbreaks of shigellosis associated with daycares and elementary schools, causing at least 588 illnesses, of which 318 were culture-confirmed. These outbreak-associated *Shigella* cases accounted for 318 (35%) of the 904 *Shigella* infections reported in Minnesota in 2000.

CONFIRMED FOODBORNE OUTBREAKS

(1)
Calicivirus Gastroenteritis Associated with a New Year's Eve Party

January Dakota County

On January 3, 2000 the Minnesota Department of Health (MDH) was notified about gastrointestinal illness occurring among guests who attended a New Year's Eve party on December 31, 1999. The party was held at a restaurant in Burnsville and approximately 100 persons attended. A complete list of guests and food items served at the party were obtained. Party guests were contacted by epidemiologists from MDH and questioned about symptoms and food items eaten at the party. A case was defined as any person who had attended the event and who subsequently became ill with vomiting and/or diarrhea ($\geq$3 loose stools in a 24-hour period). Stool samples were collected from two guests who reported having diarrhea. The samples were tested for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus. On January 12, inspection of the restaurant facilities were initiated by a sanitarian from MDH Environmental Health Services. A list of employees who worked at the event was obtained and employee interviews were completed by MDH to evaluate food handling procedures and illness in employees.

Forty persons who attended the New Year's Eve party were interviewed, and 24 (60%) met the case definition. Of the 24 cases, 22 (92%) had diarrhea, 16 (67%) had vomiting, 18 (75%) had cramps, and 6 (32%) had fever. Dates of illness onset were January 1 through January 4, with the majority (63%) of illness beginning January 2. Incubation periods ranged from 10 to 77 hours, with a median of 31 hours, and duration ranged from 19 to 78 hours, with a median of 32 hours. One out of the two stool samples collected was positive for calicivirus. Univariate analysis showed that multiple foods were associated with illness. Twenty out of 24 cases (83%) and five out of 12 controls (42%) reported eating items off of the meat and cheese tray (odds ratio [OR]=7.0; 95% confidence interval [CI]=1.4-35.8; $p\leq0.02$). Of the individual meat and cheese items served, only ham was associated with illness (OR=7.9; 95% CI=1.0-186.5; $p\leq0.04$). Eating raw celery (OR=undefined; 95% CI=1.4-3.2; $p<0.01$) and eating vegetable dip (OR=7.8; 95% CI=1.1-3.1; $p\leq0.02$) were also associated with illness. Thirteen out of 16 (81%) employees from the restaurant that prepared or served food at the party on December 31 were interviewed. Five employees reported vomiting and/or diarrhea with onsets from December 24 to December 29. Four of the ill employees served food at the party and one ill employee was the kitchen manager who was responsible for preparing the food for the party. The kitchen manager reported not working while symptomatic but did report working within 72 hours after recovery. One server reported having diarrhea while working on December 31. Stool samples could not be obtained from any symptomatic employees.

An outbreak of calicivirus infections occurred among guests who attended a New Year's Eve party held at a restaurant. The outbreak was associated with consumption of ham from a meat and cheese platter and celery and dip from a vegetable platter. Five employees reported illness in the week prior to the event and one employee reported working at the event while symptomatic. Therefore, the source of this outbreak was likely an infected food worker.

(2)

Calicivirus Gastroenteritis Associated with Fruit and Vegetable Trays at a Catered Wedding Reception

January Anoka County

On January 5, 2000 the Minnesota Department of Health (MDH) was notified about gastrointestinal illness occurring among guests who attended a wedding reception in Fridley. The catered wedding reception was held at the hotel on January 1. Approximately 250 persons attended the reception. Complete lists of guests and food items served at the wedding reception were obtained. Guests were contacted by epidemiologists from MDH and questioned about their illness and food items eaten at the reception. A case was defined as any person who attended the event and subsequently became ill with vomiting and/or diarrhea ($\geq$3 loose stools in a 24-hour period). Stool samples were collected from five guests who reported having diarrhea. The samples were tested for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus. On January 6, the catering facilities were inspected by a sanitarian and a public health nurse from the Anoka County Community Health and Environmental Services Department in order evaluate food handling procedures and illness in employees.

Ninety-eight persons who attended the wedding reception were interviewed, and 44 (45%) met the case definition. Of the 44 cases, 36 (82%) had diarrhea, 33 (75%) had vomiting, 27 (61%) had cramps, 13 (30%) had fever, and one (2%) had bloody diarrhea. Dates of illness onset were January 1 through January 5, with the majority (84%) of illnesses beginning on January 2 and January 3. Incubation periods ranged from 0.5 to 84.5 hours, with a median of 37 hours. Duration of illness ranged from 6 to 151 hours, with a median of 30 hours. Four out of the five stool samples collected were positive for calicivirus.

Univariate analysis showed that multiple foods were associated with illness. Thirty-nine of 44 cases (89%) and 20 of 42 controls (48%) reported eating fresh fruit (odds ratio [OR]=8.6; 95% confidence interval [CI]=2.5-31.0; $p<0.001$). Of the fruit served, cantaloupe was associated with illness (23/44 cases vs. 8/41 controls; OR=4.5; 95% CI=1.5-13.6; $p<0.001$) and pineapple had a borderline association (23/44 cases vs. 13/41 controls; OR=2.4; 95% CI=1.0-2.8; p=0.06). Eating raw vegetables was also associated with illness (34/44 cases vs. 23/42 controls; OR=2.8; 95% CI=1.0-8.0; p=0.03); however, specific vegetables were not significant when analyzed separately. Food preparation for the event began on Wednesday, December 29. The vegetables and fruit were both prepared the morning of the event. The fruit was cut and arranged on trays, but the vegetables were precut and packaged and only needed to be arranged on trays. Six (100%) employees of the caterer were interviewed. One employee reported vomiting and diarrhea that started on December 29. The ill employee worked part-time and was responsible for preparation of the fresh fruits and vegetables on the morning of the wedding reception. The employee submitted stool samples on January 9 and January 10; however, the samples tested were negative for bacterial and viral pathogens.

An outbreak of calicivirus occurred among guests who attended a catered wedding reception. The outbreak was associated with consumption of fruit and vegetables prepared by a cook who reported diarrhea and vomiting beginning 3 days prior to the event. Although the employee did not have calicivirus isolated from a stool sample, the sample was submitted approximately 1 week after symptoms ceased, and the individual may have cleared the infection prior to specimen collection.

(3)
Calicivirus Gastroenteritis Associated with a Nursing Home

January Hennepin County

On January 5, 2000 the Minnesota Department of Health (MDH) conducted an investigation of gastrointestinal illness occurring in guests of a wedding reception in Fridley. The catered wedding reception was held at a hotel on January 1. The outbreak was associated with an ill catering employee who prepared food for the reception. On January 6, inspection of the facilities and interviews of the employees of the caterer were initiated by a sanitarian and a public health nurse from the Anoka County Community Health and Environmental Services Department. From this investigation, it was determined that the ill foodhandler also worked during the day as a cook at a nursing home in St. Anthony. When the nursing home was called, they indicated an increase in illness. A complete list of ill residents was obtained from the nursing home. A case was defined as any person who became ill with vomiting and/or diarrhea ($\geq$3 loose stools in a 24-hour period) since January 1, 2000. Stool samples were collected from three residents who had diarrhea. The samples were tested for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus.

The nursing home reported 71 out of 150 residents (47%) with diarrhea or vomiting with onset from January 1 to January 10 with 41% of illnesses beginning on January 5. Two out of three stool specimens obtained from residents with diarrhea were positive for calicivirus. The genetic sequence of the calicivirus isolated from a resident of the nursing home was identical to the sequence of two isolates obtained from the wedding reception outbreak. The food worker reported vomiting and diarrhea that started on December 29 and submitted two stool samples approximately one week after symptoms ceased. These samples tested negative for bacterial and viral pathogens. Although the employee did not have calicivirus isolated from a stool sample, the individual may have cleared the infection prior to specimen collection.

An outbreak of calicivirus occurred among residents of a nursing home. The outbreak was likely due to consumption of food prepared by a cook who reported diarrhea and vomiting prior to illness in nursing home residents.

(4)
Viral Gastroenteritis Associated with Cucumber Sandwiches Served at a Private Party

January Washington County

On Thursday, February 3, 2000 the Minnesota Department of Health received a foodborne illness complaint of gastrointestinal illness among persons who attended birthday parties held at a private home on Saturday, January 29 and Sunday, January 30. A total of 39 individuals attended the two midday birthday parties; 18 on Saturday and 21 on Sunday. The complaint was forwarded to Washington County Department of Public Health and Environment (WCDPHE) the same day and an investigation was initiated. Lists of food items served during the birthday parties and attendees were obtained, and WCDPHE investigators interviewed persons attending the birthday parties about their food consumption and illness history. A case was defined as any person who attended the event and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). One stool specimen was collected and submitted to MDH for bacterial and viral testing.

Thirty of the guests were interviewed and 11 (37%) met the case definition. One symptomatic individual not meeting the case definition and two non-symptomatic individuals, with gastroenteritis prior to the events, were excluded from further analysis. Ten cases (91%) had diarrhea, seven (64%) had vomiting, five (45%) had cramps, and three (27%) had fever. No one reported bloody stools. Dates of illness onset for cases were January

30 through February 2. The two additional cases of illness preceded the event. Incubation periods ranged from 20 to 99.5 hours, with a median of 36 hours, and the duration of illness ranged from 2 to 78 hours, with a median of 24 hours. The stool specimen collected from one case was negative for *Campylobacter, E. coli* O157:H7, *Salmonella, Shigella,* and calicivirus.

Standard univariate analysis of data from the case-control study demonstrated that the cucumber sandwiches were statistically associated with illness (OR = 6.3; $p < 0.05$). The sandwiches were assembled by the hostess 1-2 days prior to the parties. The hostess reported that her two children (ages 1 and 4 years old) had recently been ill with vomiting and diarrhea, but were no longer symptomatic within 2 or 3 days prior to the day the sandwiches were prepared.

The clinical and epidemiologic features of this outbreak were consistent with viral gastroenteritis. Cucumber sandwiches were associated with illness. The likely source of contamination was contamination by the hostess and/or by recently ill household members during sandwich preparation or portioning in their residential kitchen.

(5)
Calicivirus Gastroenteritis at a High School

February Ramsey County

On Wednesday, February 9, 2000 the Minnesota Department of Health (MDH) was notified by the St. Paul-Ramsey County Department of Public Health of a doubling in the absentee rate at a high school in North St. Paul. Several of the students who called in absent complained of gastrointestinal symptoms. Lists of students and food items served in the cafeteria were obtained from the school. Individuals were interviewed by MDH epidemiologists about illness history and food consumption at school in the three previous school days (Friday, February 4, Monday, February 7, and Tuesday, February 8). A case was defined as a person with an onset of vomiting or diarrhea beginning on or after February 1. Diarrhea was defined as three or more loose stools in a 24-hour period. Stool samples from two cases were collected and submitted to MDH for bacterial and viral testing.

Sixty-five students were interviewed and 21 (32%) met the case definition. Seventeen cases (81%) had diarrhea, 16 (76%) had vomiting, and 11 (52%) had fever. Dates of illness onset were February 7, 8, 9, and 10. The majority of illness occurred between noon on February 8 and 6:00 p.m. on February 9. Both stool samples tested were negative for *Campylobacter, E. coli* O157:H7, *Salmonella*, and *Shigella*. One of the two samples was positive for calicivirus.

Eating school lunch on Monday, February 7 was significantly associated with illness (19 of 21 [90%] cases vs. 26 of 39 [67%] controls; odds ratio, 4.8; 95% CI, 1.0 - 33.5; $p = 0.04$). Eating foods served from the main line on Monday was also associated with illness (15 of 21 [71%] cases vs. 13 of 39 [33%] controls; odds ratio, 5.0; 95% CI, 1.4 - 19.2; $p = 0.005$). From the main line, eating chicken nuggets (odds ratio, 4.0; 95% CI, 1.1 - 14.7; $p = 0.01$) and eating french fries (odds ratio, 6.1; 95% CI, 1.6 - 24.4; $p = 0.002$) were associated with illness. Cases were also more likely to have eaten carrots from the salad bar on Monday (4 of 16 cases vs. 1 of 39 controls; odds ratio, 9.5; 95% CI, 1.5 - 4.8; $p = 0.04$). Overall, eating school lunch on Friday, February 4 was not associated with illness, but three salad bar items served that day were statistically associated with illness: lettuce (6 of 17 cases vs. 3 of 31 controls, odds ratio, 5.1; 95% CI, 1.0 - 27.8; $p = 0.04$), cheese (4 of 17 cases vs. none of 31 controls, odds ratio, undefined; $p = 0.01$), and red ranch dressing (4 of 17 cases vs. 1 of 31 controls, odds ratio, 9.2; 95% CI, 1.0 - 235.1; $p < 0.05$). Of note, none of the four cases with onset of vomiting or diarrhea on February 7 reported eating any salad bar items on February 4. The only exposure from Tuesday, February 8 associated with illness was eating an item bought from the school store, which sold bottled sodas, candy, and other snacks (9 of 20 cases vs. 6 of 39 controls; odds ratio, 4.5; 95% CI, 1.1 - 19.0; $p = 0.01$).

St. Paul-Ramsey County Department of Public Health interviewed twelve school cafeteria workers. One worker reported an upset stomach on Thursday, February 3, but no vomiting or diarrhea. One worker reported vomiting and diarrhea with onset on the evening of Monday, February 7 and another worker reported vomiting and diarrhea with onset on the evening of Tuesday, February 8. A review of food service procedures found that hot entrees from the main line and the a la carte line were served by cafeteria workers, but items from the salad bar and certain non-entree items from the main line and the a la carte line were self-service.

This outbreak among high school students was caused by calicivirus. Based on the epidemiologic findings, distribution of onset dates, and known characteristics of this virus, it is likely that person-to-person spread of calicivirus in the community was amplified by foodborne transmission in the school setting. This amplification could have occurred by contamination of cafeteria items by ill or convalescent food servers and/or by contamination by ill students of self-serve items subsequently consumed by other students. The median incubation from lunch on Monday, February 7 was 37 hours with a minimum incubation of 2 hours and a maximum incubation of 83 hours. The predominance of onsets from noon on February 8 to 6:00 p.m. on February 9 corroborates the statistical association of illness with Monday lunch items. The significant association between illness and exposures on Friday, February 4 (salad bar items) and Tuesday, February 8 (consuming items from the school store) could reflect the ongoing person-to-person transmission of calicivirus in the community and school settings.

(6)
Bacillus cereus Intoxications Associated with Leftover Fried Rice

February Hennepin County

On February 16, 2000 the Minnesota Department of Health (MDH) was notified about illness in a group of coworkers who ate leftover take-out food from a restaurant located in St. Paul. The food was initially eaten at 12:00 p.m. on February 15. Leftover food was stored in a refrigerator at the workplace and served again for lunch on February 16. A list of persons and food items served for lunch was obtained. Coworkers were contacted by epidemiologists from MDH and questioned about symptoms and food consumption. A case was defined as any person who had eaten food and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). Vomit samples were collected from two persons who vomited at work. A stool sample was collected from one person. The samples were tested for *Staphylococcus aureus*, *Bacillus cereus*, and *Clostridium perfringens* toxins. A sample of the leftover fried rice was also collected for bacterial analysis.

Thirty-one persons that ate the food were interviewed, and ten (32%) met the case definition. Of the 10 cases, eight (80%) had vomiting, six (60%) had diarrhea, five (50%) had cramps, and one (10%) had fever. Dates of illness onset were February 15 through February 16, with the majority of illness beginning February 16 (90%). Incubation periods ranged from 15 minutes to 3 hours, with a median of 30 minutes, and duration ranged from 3 to 66 hours, with a median of 19 hours. Both vomit samples collected were positive for *B. cereus* and contained emetic toxin. The stool sample was negative.

Univariate analysis showed that eating foods served on February 15 were not associated with illness, however, eating leftover food on February 16 was associated with illness. Nine out of 10 cases (90%) and four out of 14 controls (29%) reported leftover food served on the second day (odds ratio [OR]=31.5; 95% confidence interval [CI]=2.6-1475.0; $p<0.001$). Of the items served on the second day, chicken lo mein (OR=28.0; 95% CI=2.2-1327.4; $p<0.002$) and fried rice (OR=undefined; 95% CI=7.3-undefined; $p<0.001$) were associated with illness. Only fried rice remained statistically significant when using stepwise logistic regression. The sample of leftover fried rice submitted to the laboratory contained *B. cereus* as well as emetic toxin.

This was a workplace outbreak of *B. cereus* intoxication associated with the consumption of leftover fried rice. Both improper or extended cooling at room temperature of fried rice and improper reheating of leftover fried rice at the workplace probably contributed to this incident.

(7)
Viral Gastroenteritis Associated with a Baby Shower

February Hennepin County

On February 28, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among 34 persons who attended a baby shower at a private home in Wayzata on February 26. Guests at the baby shower were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the baby shower. A stool sample was collected from one ill guest.

Thirty-one (91%) of 34 attendees were interviewed, and 17 (55%) met the case definition. One individual was excluded from the analysis because she reported onset of diarrhea and vomiting three days prior to the event. All 17 cases reported diarrhea, 14 (82%) reported vomiting, and three (18%) reported fever. Dates of illness onset ranged from February 27 to March 1. The incubation period ranged from 11 to 97 hours, with a median of 37 hours. Duration of illness was 11 to 65 hours, with a median of 35 hours. The stool sample tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus.

Strawberry shortcake was significantly associated with illness (14/17 cases vs. 6/13 controls; odds ratio [OR] 5.4; 95% confidence interval [CI], 0.8 to 42; p=0.045). The brownies approached significance (8/16 vs. 2/13; OR, 5.5; 95% CI, 0.7 to 52; p=0.058). Both items were prepared by guests who attended the baby shower. The brownies were prepared by an individual who was ill with gastrointestinal symptoms three days prior to the baby shower.

The epidemiologic characteristics of this outbreak were consistent with viral gastroenteritis. Illness was associated with strawberry shortcake served at the shower. The strawberry shortcake and brownies may have been contaminated by guests who prepared food for the shower or by guests who attended the shower.

(8)
Calicivirus Gastroenteritis Associated with a Nursing Home

February Wabasha County

On March 3, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among residents at a care facility in Plainview. The facility housed 61 residents in a nursing home setting, as well as housing residents in assisted living and apartment living. The nursing home staff and infection control practitioner (ICP) compiled a list of all residents and provided information about diarrhea, vomiting, fever and onset of symptoms in residents. A case was defined as a nursing home resident with diarrhea or vomiting from February 29 through March 4 as reported by the ICP. Stool kits were provided to the nursing home by the MDH Southeastern District Epidemiologist. Stool samples were collected from four residents and were tested for bacterial and viral pathogens. The ICP investigated illnesses in nursing home employees, including food workers.

The ICP identified 26 (43%) of 61 residents who became ill with gastrointestinal symptoms during the outbreak period. Diarrhea was reported for 25 (96%) cases, vomiting for 15 (58%), and fever for four (15%). Of the 26 cases, two (8%) had onset of illness on February 29, 15 (58%) on March 1, five (19%) on March 2, and four

(15%) on March 4. Duration of illness ranged from less than 1 day to 5 days, with a median duration of 2 days. All four stool specimens from residents were negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. One specimen was positive for calicivirus. There were no cases of gastrointestinal illnesses among residents in assisted living or apartment living. The ICP ascertained that no gastrointestinal illness was reported among food workers; however, one nursing assistant had been ill with gastrointestinal symptoms on February 27, and returned to work on February 28. The nursing assistant handed out snacks to the nursing home residents as part of her duties on February 28. Based on an exposure date of February 28, the incubation period ranged from less than 1 day to 5 days, with a median of 2 days.

This was an outbreak of calicivirus gastroenteritis. The typical incubation period for calicivirus gastroenteritis is 24 to 48 hours. The distribution of illness onset dates supports foodborne transmission of calicivirus by the recently ill nursing assistant who handed out snacks to the residents.

(9)
Hepatitis A Virus Infections Associated with a Restaurant

March Ramsey County

On March 20, 2000, MDH was notified of a case of hepatitis A virus infection (HAV) in a 29-year-old male resident of Ramsey County. St. Paul-Ramsey County Department of Pubic Health (SPRCPH) determined the case had symptom onset on March 11, was a cook at a bar and grill restaurant, and had worked numerous shifts (9 days in a row) prior to being tested for HAV. Per current guidelines, immune globulin (IG) and HAV vaccine were provided to food preparation staff (cooks and dishwashers). A suspected case of HAV was defined as an individual reporting any of the following symptoms: fever, headache, malaise, fatigue, anorexia, nausea, vomiting, abdominal pain, tea-colored urine or jaundice. A confirmed case of HAV was defined as a positive HAV-specific IgM antibody in an individual with discrete onset of symptoms and jaundice or elevated aminotransferase levels or an individual with discrete onset of symptoms and jaundice or elevated aminotransferase levels who was epidemiologically-linked to a laboratory-confirmed case. Epidemiologists from SPRCPH assessed the staff for additional illnesses, and provided immune globulin (IG) and HAV vaccine to food preparation staff (cooks and dishwashers).

Six additional cases were soon identified (two restaurant staff and two patrons); each case had onset at least 2 weeks after the restaurant cook became symptomatic. Following the identification of the additional cases, MDH, SPRCPH, and Washington County Department of Public Health and Environment (WCDPHE) agreed that the following actions would be taken: 1) all employees should receive IG and vaccine, 2) health care providers in Ramsey and Washington counties would be notified of the outbreak and asked to have a high index of suspicion for HAV in patients presenting with symptoms compatible with HAV, 3) IG was recommended for patrons of the restaurant that had consumed food or beverages with ice within 14 days, 4) a press release would be issued to notify patrons of IG recommendations, and 5) SPRCPH would hold a clinic to provide IG to patrons without medical coverage.

In all, thirty-nine cases (including the initial case, the restaurant cook) of HAV were identified during the outbreak. All cases were confirmed by a positive reaction of HAV-specific IgM antibody. Eight cases were employees of the restaurant, 12 patrons reported multiple exposures to the restaurant ($\geq$2 times per month), 14 patrons reported one exposure to the restaurant, and five patrons reported exposure to the restaurant but dates and frequency were unknown. No common food or beverage was associated with the outbreak; one patron reported exposure only to beverages containing ice. Demographic, exposure, and disease characteristics of cases were analyzed. Cases ranged in age from 20 to 56 years old, and the mean age was 35 years. Three cases (8%) were hospitalized; all cases fully recovered. Twenty-nine of the cases (76%) reported jaundice, seven cases (18%) did not experience jaundice and in two cases, jaundice was unknown. Additional symptom history was obtained for

approximately 50% of the cases. The most common symptom (other than jaundice) reported was fever (34%), followed by tea-colored urine (26%). Over 1,000 individuals received IG through the public health clinic at SPRCPH and an undetermined number of patrons received IG from their health care providers.

This was an outbreak of HAV associated with a bar and grill restaurant. The likely source of the outbreak was an infected food worker.

(10)
E. coli O157:H7 Infections Associated with a Ground Beef Hotdish Served at a School

March Hennepin County

On Friday, March 24, 2000 the Minnesota Department of Health (MDH) was notified by the Hennepin County Community Health Department of a possible outbreak of *E. coli* O157 (O157) infections at a Catholic school in Minneapolis. Hennepin County had been contacted by the school nurse with information that there were two children at that time that were culture-confirmed cases of O157; both case isolates were subsequently submitted to MDH through routine surveillance and confirmed. Additionally, one child was absent from school with bloody diarrhea, and a fourth child had been hospitalized for an appendectomy. An O157 isolate from a fifth child that the nurse was not aware of had already been submitted to the MDH laboratory through normal surveillance. The school had approximately 320 students in third through eighth grade who attended the school's west campus. The school's cook was out of work. As a result, numerous staff members and parents were involved in food preparation and handling during the week of March 13. Lists of students and food items served in the cafeteria were obtained from the school. Individuals were interviewed by MDH epidemiologists about illness history and food consumption at school and home from Monday, March 13 through Friday, March 18. A case was defined as a person with an onset of diarrhea beginning on or after March 13. Diarrhea was defined as three or more loose stools in a 24-hour period. Stool samples from two of the original unconfirmed cases and two additional cases were collected and submitted to MDH for bacterial and viral testing.

One-hundred-sixty-four students were interviewed, and 18 (11%) met the case definition. Of 29 third graders interviewed, seven (24%) met the case definition. Of 48 fourth graders interviewed, 10 (21%) met the case definition. Of 33 fifth graders interviewed, one (3%) met the case definition. No cases were identified in older children. Overall, 18 (16%) of 110 third, fourth and fifth graders met the case definition. Eighteen cases (100%) reported diarrhea, five (28%) reported bloody diarrhea, 17 (94%) reported abdominal cramps, seven (39%) reported vomiting, and seven (39%) reported fever. Eight children (44%) visited their healthcare provider, and two (11%) were hospitalized. Dates of illness onset were March 16 through March 25. The onset of illness for culture confirmed cases occurred from March 16 to March 20. Through routine surveillance and additional testing of students, six culture confirmed cases of O157 were identified, all in third (n=3), fourth (n=2), or fifth (n=1) graders. All six isolates were an identical pulsed-field gel electrophoresis subtype (WI38). The other stool samples tested were negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus.

Analyses of specific food variables were restricted to third, fourth, and fifth graders. On univariate analysis, eating school lunch on each day during the week of March 13 and consumption of several specific foods items were associated with illness. Among the significant items was consumption of a ground beef hotdish served on March 14 (13 of 18 [72%] of cases vs. 22 of 53 [38%] controls; odds ratio (OR), 4.29; 95% confidence interval (CI), 1.16 to 16.63; $p = 0.011$). Multivariate analysis of cases with onset of March 16 through 20 using stepwise regression implicated the ground beef hotdish as the only food item independently associated with illness (adjusted OR, 8.3; 95% CI, 1.6 - 41.5; $p = 0.004$). The median incubation for confirmed cases from lunch on Tuesday, March 14 was 92 hours (range, 54 to 150 hours).

Epidemiologists from the Hennepin County Community Health Department interviewed eight school cafeteria workers. None of the workers reported any gastrointestinal symptoms since March 1. A sanitarian from the Minneapolis Division of Environmental Health inspected the kitchen and reviewed food preparation procedures. The implicated ground beef hotdish was served on Tuesday, March 14. Four nine-pound chubs of ground beef were removed from the freezer to a refrigerator on Friday, March 10. On Monday, March 13 all 36 pounds of ground beef were browned in one kettle, and then refrigerated overnight in the same kettle. On Tuesday, March 14 the ground beef was mixed with pasta and tomato sauce and divided into seven smaller pans. These pans were 12" by 16" and were four inches deep. The hotdish pans were then baked at 375^{N} F for one hour in a convection oven and then removed to a steam holding oven at 170^{N} F. Third graders ate lunch at 11:40 a.m., fourth graders at 12:00 p.m., fifth graders at 12:20 p.m. and sixth through eighth graders at 12:45 p.m. or later. Only one fifth grader, and no older children, became ill suggesting that consuming hotdish from pans left in the warming oven longer did not cause illness. The ground beef handling procedures described above had the potential to have resulted in inadequate thawing, browning, post-browning cooling, and/or cooking of the ground beef. There was no ground beef left over at the school for testing. USDA conducted a search of their records and the records of the distributor that provided the ground beef to the school. They tested retention samples of ground beef that they believe may have been packed on the same day and in the same plant as the ground beef used in the hotdish. None of the meat tested by USDA was positive for *E. coli* O157:H7. However, the plant of origin and packing date for the ground beef used in the hotdish could not be conclusively identified.

This was an outbreak of *E. coli* O157:H7 infections among elementary school students associated with consumption of a ground beef hotdish. Based on the epidemiologic findings, food preparation and handling history, and known sources of this bacteria, it is likely that contaminated ground beef served in a hotdish on March 14 was the source of the outbreak.

(11)
Hepatitis A Virus Infections Associated with a Restaurant

April Mower County

On April 28, 2000 the Minnesota Department of Health (MDH) was notified of two cases of hepatitis A (HAV) in food service workers, a 31 year-old male and a 28 year-old female, who were residents of Mower County. MDH Epidemiology Field Services staff determined the female case had symptom onset on April 10 and the male case had symptom onset on April 20. The male case worked as a cook at a restaurant (Restaurant A) in Austin. The female case worked as a food server at Restaurant A, and additionally had worked two shifts as a cook at another restaurant (Restaurant B) while infectious. Per current guidelines, immune globulin (IG) and HAV vaccine were recommended to food service staff. A suspected case of HAV was defined as an individual reporting any of the following symptoms: fever, headache, malaise, fatigue, anorexia, nausea, vomiting, abdominal pain, tea-colored urine or jaundice. A confirmed case of HAV was defined as a positive HAV-specific IgM antibody or an individual with discrete onset of symptoms and jaundice or elevated aminotransferase levels who was epidemiologically-linked to a laboratory-confirmed case. For cases with serologic evidence of recent HAV infection (i.e., HAV-specific IgM) cases were not required to meet the clinical case definition of discrete onset of symptoms and jaundice or elevated aminotransferase levels because of the prevalence of asymptomatic or sub-clinical cases among children. The field epidemiologist assessed restaurant employees for additional illnesses, and recommended IG and HAV vaccine to food preparation staff at both Restaurant A and Restaurant B.

Area health care providers were contacted by the local public health department and asked to have a high index of suspicion for persons with symptoms compatible with HAV. Three of the four children who were household contacts of the index cases were tested for HAV-specific IgM antibody; all of those tested were positive. Although onset dates for the child-cases were difficult to obtain (due to asymptomatic or mild symptoms), the

children attended multiple daycare centers and foster care homes during the period when they were possibly infectious. IG was recommended for day care and foster care contacts. Demographic, exposure, and disease characteristics of cases were analyzed.

In all, eighteen Austin-associated cases of HAV were reported to MDH during April and May. Cases with a history of eating at Restaurant A or Restaurant B consistent with the infectious period of the index cases were defined as restaurant-associated. Eight restaurant-associated cases, not including the index couple, were identified during the outbreak; two of these cases reported possible exposure to both Restaurant A or Restaurant B. No common food or beverage was associated with restaurant-associated cases. Three cases childcare/foster care cases were identified. Two cases identified during the outbreak could not be linked to other cases. These two cases may have been sporadic cases which were identified due to routine or heightened surveillance, or they may have had contact with asymptomatic or subclinical cases not identified during the outbreak. Cases ranged in age from 3 months to 81 years old, with a mean age of 40 years. Eleven cases (61%) reported jaundice, six cases (33%) did not experience jaundice and in one case jaundice was unknown. One case (6%) were hospitalized; all cases fully recovered. All cases were confirmed by a positive reaction of HAV-specific IgM antibody.

This was likely a community-based outbreak of hepatitis A virus, with subsequent viral transmission from children attending daycares to household contacts who were foodhandlers; eight cases were likely exposed at two restaurants where there were infected foodhandlers.

(12)
Gastroenteritis Associated with Chopped Salad at a Restaurant

April Hennepin County

On April 17, 2000 the manager of a restaurant contacted City of Bloomington Environmental Health. The restaurant owner had received two independent complaint calls from persons who dined in the restaurant around 4:00 p.m. on April 15. Both individuals reported developing gastrointestinal illness after eating at the restaurant. City of Bloomington staff interviewed complainants by phone about food consumption and illness history. No stool samples were collected. On April 17, a City of Bloomington sanitarian visited the restaurant to determine if there were any ill food workers or foodhandling violations at the restaurant. On April 24, City of Bloomington forwarded the two complaints to the Minnesota Department of Health (MDH). In an attempt to initiate an outbreak investigation, on April 27 the City of Bloomington obtained from the restaurant a list of twenty names off credit card receipts for patrons that dined at the restaurant on April 15. One complainant reported diarrhea and cramps with onset 10 hours after eating a chopped salad (lettuce, chicken, pasta, bacon, tomatoes, blue cheese, and scallions) at the restaurant. The duration of illness could not be documented because the patient was still ill when interviewed on April 17. This complainant reported that the other two people she dined with were also ill, but refused to provide their names and phone numbers to City of Bloomington investigators. The other complainant reported onset of diarrhea and vomiting 8 hours after eating a chopped salad at the restaurant. The duration of illness was 1 day. This complainant reported that the other four people in her party did not become ill; these people were not contacted. No case-control study could be conducted because sufficient numbers of additional patrons could not be identified from the credit card receipt list. The City of Bloomington sanitarian did not identify any ill employees or critical foodhandling violations at the restaurant on April 17.

This was an outbreak of gastroenteritis associated with a restaurant. The histories reported by the two cases were consistent with a bacterial toxin-mediated illness such as *Bacillus cereus* or *Clostridium perfringens*; however, the etiology could not be confirmed. The most likely vehicle was the chopped salad.

(13)
Viral Gastroenteritis Associated with a College Salad Bar

April Nicollet County

On Friday, April 28, 2000 the Minnesota Department of Health (MDH) was contacted by an emergency room physician from a community hospital who reported that five students from a local college had sought medical care for gastrointestinal symptoms between 9:00 p.m. April 27 and 5:00 a.m. April 28. Four students were discharged from the ER and one was transferred to another hospital. The four discharged students were interviewed the afternoon of April 28 by MDH epidemiologists about illness history and food consumption in the 3 days before onset of illness. The only food exposures the four students had in common were meals at the college dining service. The dining service served approximately 80% of the college's 2400 students as well as college faculty and staff. Over 100 different food and beverage items are served from 10 different stations in the dining service. The MDH South Central District epidemiologist and a sanitarian from Brown-Nicollet Environmental Health Service inspected the dining service on the afternoon of April 28. It was recommended that dining service management dispose of any ready-to-eat food in open containers and exclude any food service staff with gastrointestinal symptoms from handling food for at least 72 hours after resolution of symptoms. Names and phone numbers of students, lists of dining service food stations and food items, and ill call log sheets for dining service employees were obtained from the college. Students were contacted by phone and interviewed by MDH epidemiologists about illness history and food consumption at the dining service on Tuesday, April 25, Wednesday, April 26, and Thursday, April 27. On Monday, May 1, an email was sent out to the college community requesting that anyone with gastrointestinal illness since April 24 call MDH. A case was defined as a person with an onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) beginning on or after April 24. Stool samples from four cases were collected and submitted to MDH for bacterial and viral testing.

Seventy-four students and five non-student employees of the college were interviewed. Thirty-seven (47%) met the case definition. Thirty-four cases (92%) reported diarrhea, 29 (78%) reported vomiting, and 24 (65%) reported fever. Dates of illness onset ranged from April 25 to May 1. Twenty-five of the 37 cases (68%) had onset of illness on April 27 or April 28. Seven (19%) cases reported visiting an emergency room and two (5%) reported that they were hospitalized. The median duration of illness was 35 hours (range, 10 hours to 120 hours). All four stool samples collected from students tested negative for *Campylobacter, E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus at the MDH Public Health Laboratory. Illness was associated with consuming any cold (non-soup) salad bar items from the dining service on April 25 (20 of 36 [56%] cases vs. 8 of 38 [21%] controls; odds ratio [OR], 4.7; 95% confidence interval [CI], 1.5 - 15.0; $p = 0.002$); April 26 (22 of 34 [65%] cases vs. 8 of 37 [22%] controls; OR, 6.7; 95% CI, 2.0 - 22.4; $p < 0.001$); or April 27 (25 of 35 [71%] cases vs. 7 of 38 [18%] controls; OR, 11.1; 95% CI, 3.2 - 39.9; $p < 0.001$). Eating a salad bar item on any of the above three days was also associated with illness (30 of 36 [83%] of cases vs. 12 of 40 [30%] controls; OR, 11.7; 95% CI, 3.4 - 42.2; $p < 0.001$). In a stepwise logistic regression model, eating a salad bar item on April 25, April 26, or April 27 was independently associated with illness (OR, 8.0; $p < 0.001$).

MDH epidemiologists interviewed dining service employees whose names appeared on an ill call log for the week of April 24. One employee reported developing vomiting and diarrhea on Sunday, April 23 after being exposed to children with vomiting and diarrhea on Saturday, April 22. This employee called in sick to work on Monday, April 24 and reported that gastrointestinal symptoms resolved later that day. The employee returned to work on Tuesday, April 25 and worked the remainder of the week in the salad bar section of the dining service. The employee reported extensive bare-hand contact with salad bar items (e.g., lettuce, salad toppings, and cut fruit) during preparation and stocking of the salad bar.

This outbreak at a college fit the clinical and epidemiologic profile of viral gastroenteritis. The vehicle of the outbreak was contaminated salad bar items. The most likely source of contamination was an ill food worker who

had extensive bare-hand contact with salad bar items during convalescence. Additional cases with onset after the weekend of April 29-30 were likely due to secondary spread of viral infection within dormitories and other campus settings.

(14)
Salmonella Heidelberg Infections Associated with a Restaurant

April Olmsted County

On May 1, 2000 a sanitarian at Olmsted County Public Health Services (OCPHS) received a telephone call from the spouse of a person who had recently been hospitalized with a *Salmonella* infection. The couple ate at four restaurants in Olmsted County between April 23 and April 25. The sanitarian asked the complainant to call the four restaurants directly and also proceeded to follow up with each of the restaurants. On May 3, an OCPHS sanitarian received a telephone call from another person who was hospitalized for 4 days with severe diarrhea. This person reported eating at one of the same restaurants within 2 hours of the first case on April 25, and had onset of diarrhea 4 hours after eating. A stool specimen collected at the hospital was reported to be negative for *Salmonella* and other bacterial pathogens. Based on these two unrelated reports of illness, OCPHS notified the Minnesota Department of Health (MDH) and initiated an outbreak investigation. The local medical laboratory and the MDH laboratory were asked to immediately notify OCPHS about any new *Salmonella* cases. Suspect cases were interviewed to determine the possible source of illness. A case was defined as any patron of the restaurant with a confirmed *Salmonella* infection. On May 3, the restaurant manager was interviewed and asked to provide both a menu that included daily specials served during the last 2 weeks and a list of food workers. All food workers were interviewed to determine job duties and history of illness, and food workers were observed for personal hygiene and food handling practices. Because of the potential for *Salmonella* to be transmitted by restaurant employees, all employees were requested to submit a stool sample to MDH. The restaurant did not take reservations or accept credit cards, and checks from the day of the suspect meal were not available. Therefore, a typical case-control study could not be conducted. A complete assessment of the food preparation of the common foods eaten by cases was made using the principles of Hazard Analysis and Critical Control Points (HACCP). Environmental samples of food debris were collected from grill line equipment and submitted to MDH for testing.

Five cases were identified; all were restaurant patrons with stool specimens positive for *Salmonella* Heidelberg with an indistinguishable pulsed-field gel electrophoresis (PFGE) pattern (SH1). All five cases (100%) had diarrhea, three (60%) had fever, two (40%) had cramps, and two (40%) had vomiting. The median incubation period was 9 hours (range, 1.5 to 102 hours) and the median duration of illness was 11.5 days (range, 11 to 12 days). Three cases (60%) were hospitalized and two cases consulted a physician on an outpatient basis.

On May 9, the MDH lab reported that two stool samples from restaurant workers were positive for *Salmonella*. Due to the potential for disease transmission from asymptomatic food workers (neither worker reported experiencing diarrhea or vomiting), the restaurant was asked to close until all employee stool specimens were tested in order to determine the extent of infection in the workers. In all, three of the 12 food workers (25%) were positive for *Salmonella* Heidelberg with a PFGE subtype indistinguishable from patron isolates. These three workers were all wait staff and were excluded from working in food service until two consecutive stool samples collected at least 24 hours apart were negative for *Salmonella*. The duration of exclusion for these three workers ranged from 5 days to 30 days.

No common foods were consumed by all five patrons. Three of the five (60%) had meatloaf and mashed potatoes in the late afternoon/early evening of April 25; one case ate eggs and pancakes on the morning of April 22; and one case ate pork steak and mashed potatoes on May 5. Conditions identified during the environmental assessment of the restaurant included: meatloaf and mashed potatoes held at inadequate temperatures at a steam

table; soiled grill line equipment, including cutting boards; knives stored in between soiled equipment on the grill line; and no hot water at the handsink or at the two-compartment scullery sink. A food preparation review of the meatloaf identified uncontrolled hazards. The meatloaf was made nearly every day with prep beginning at about 6:00 a.m. Ground beef was thawed in the cooler and then mixed with spices and egg, placed in three small bread pans, and baked until "done" (the manager reported that the final cook temperature was over 155 degrees F). At about 10:00 a.m., the loaf pans of baked meatloaf were sliced, placed on top of a shallow hotel pan, and inserted into the steam table well. Upon order, the meatloaf was plated with mashed potatoes and gravy and microwaved for two minutes (the temperature was not taken by the cook). The meatloaf was discarded at the end of each day if it was not served before the restaurant closed at 7:00 p.m. Hot holding temperatures taken at the steam table at the time of the initial sanitarian visit (4:00 p.m.) ranged form 89 to 121 degrees F. Environmental samples were negative for *Salmonella*. The restaurant reopened on May 12 after environmental cleaning and repairs were completed and negative stool specimens had been confirmed on employees returning to work.

This was an outbreak of *Salmonella* Heidelberg infections associated with a restaurant. Although the exact cause is not known, several factors suggest the outbreak may have been due to an environmental source of *Salmonella* in the grill line area that subsequently cross-contaminated several foods. Factors which support this hypothesis and have been identified in other *Salmonella* outbreaks include the presence of eggs, a known source of *Salmonella*, as a food prepared in high volumes at the grill line; the soiling of the grill line equipment with food debris; the finding that surface temperatures in the grill area were 104 degrees F, an ideal growth temperature for *Salmonella*, the finding that knives were stored between soiled grill line equipment; and the fact that while no one common food was consumed by all of the cases, all foods consumed were made in the grill line area. Food worker transmission was improbable because no employees reported gastrointestinal symptoms; the infected workers were wait staff with limited hand contact with food; and no evidence of illness was found in other restaurants where some of the infected workers were employed. The OCPHS sanitarian recommended that the restaurant hold all hot foods at 140 degrees F or above; that all cutting boards, knives, equipment, and other grill line surfaces were thoroughly cleaned and sanitized; review handwashing procedures with employees; and supply hot water to the handsink and scullery sink.

(15)
Gastroenteritis Associated with a Restaurant

April Hennepin County

On Monday, May 1, 2000 City of Bloomington Environmental Health was contacted by the manager of a restaurant located in the Mall of America and notified of suspected gastrointestinal illness among a group of 15 persons who ate at the restaurant on Friday, April 28. This group met at the restaurant at 7:30 p.m., and food was served beginning at 7:45 p.m. The dinner consisted of plates of appetizers, entrees, desserts, and refreshments brought in succession by wait staff to each of two adjoined tables. Specific food and beverage items served were calamari, mushrooms, bruschetta, caesar salad, ravioli, garlic chicken, tiramisu, cheesecake, crostada, water, and wine. Serving plates were then passed among persons at each tables, who served portions from plates to themselves (“family style" serving). City of Bloomington staff obtained a list of menu items served and a list of names and telephone numbers of attendees. Attendees were interviewed by phone about food consumption and illness history. A case was defined as any person who had attended the dinner and subsequently became ill with diarrhea and/or vomiting, plus one other symptom. No stool samples were collected. On May 2, a City of Bloomington sanitarian inspected the restaurant and interviewed restaurant managers and food workers to ascertain if there were any ill employees.

Twelve of 15 (80%) attendees were interviewed and six (50%) of those interviewed met the case definition. All six (100%) reported diarrhea, four (67%) reported cramps, three (50%) reported vomiting, and none reported fever. The incubation period ranged from 3 hours to 12 hours, with a median incubation of 10 hours. The

duration of illness ranged from 4.5 hours to 30.5 hours, with a median duration of 20 hours. Cheesecake (6 of 6 cases vs. 2 of 6 controls; odds ratio (OR), undefined; p = 0.03) and garlic chicken (5 of 6 cases vs. 2 of 6 controls; OR, 10.0; p = 0.12) were associated with an elevated risk of illness. The sanitarian found no critical food handling violations relating to time-temperature control, cross-contamination, or employee hygiene. No food workers reported illness in the past week.

This was an outbreak of gastroenteritis associated with a restaurant. The clinical and epidemiologic characteristics of this outbreak are consistent with bacterial intoxication such as caused by *Clostridium perfringens* or *Bacillus cereus*. No food vehicle or source of contamination was conclusively identified.

(16)
Viral Gastroenteritis Associated with Ham

April Becker County

On May 2, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among approximately 60 adults who participated in a choir trip to west central Minnesota from April 28 to April 30. Members of the group ate at several fast food establishments on April 28 prior to their first performance. Several members also brought snacks from home to share with others on the bus. The group shared frozen pizza following their evening performance on April 28. Continental breakfast was served to the group on April 29 and 30 at a resort in Detroit Lakes. Lunch on April 29 was at a sandwich bar at the resort. Dinner the evening of April 29 was off the menu at a hotel. Lunch on April 30 was at several fast food establishments in Alexandria. Lists of foods served during the trip, choir members, and food workers were obtained. Persons were interviewed about food consumption during the trip and illness history by MDH epidemiologists. A case was defined as any person who became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24 hour period) on or after April 28. Although two stool kits were delivered, no stool samples were returned to MDH for bacterial and viral pathogen testing.

Forty-one of 62 (66%) attendees were interviewed, and 11 (27%) met the case definition. Eleven cases (100%) reported diarrhea, nine (82%) reported abdominal cramps, two (18%) reported vomiting, and one (11%) reported fever. No cases reported bloody stools. Seven cases had illness onset on April 30, one on May 1, two on May 3, and one on May 6. Thirteen items or meals were significantly associated with illness on univariate analyses. On multivariate analysis, the only food item independently associated with illness was cold sliced ham served on the sandwich bar at the resort on Saturday, April 29 (7 of 11 cases vs. 1 of 29 controls; odds ratio, 49; 95% confidence interval, 4.7 to 509.9; p=0.0001). Incubation periods calculated from the lunch on April 29 ranged from 24 to 161 hours, with a median of 41 hours. Duration of illness ranged from 26 to 120 hours, with a median of 48 hours. No food workers at the resort reported illness within 7 days of the event. However, the manager reported that the "flu" was going around town. No details were available about the source of the ham, or its preparation methods.

The clinical and epidemiologic features of this outbreak were consistent with viral gastroenteritis associated with consumption of ham at a resort.

(17)
***Salmonella* Typhimurium Infections Associated with a Restaurant**

May Hennepin County

In May 2000, the Minnesota Department of Health (MDH) Public Health Laboratory identified five isolates of *Salmonella* Typhimurium submitted through routine statewide surveillance with an indistinguishable pulsed-field

gel electrophoresis (PFGE) subtype pattern (TM14). Interviews of cases by MDH epidemiologists revealed that three of the five TM14 cases reported eating at a common restaurant in Wayzata during the week before onset of illness. A *S.* Typhimurium case with a different PFGE subtype pattern (TM352) also reported eating at the restaurant in the week prior to illness. On June 2, a City of Wayzata sanitarian was notified, and an investigation of the restaurant was initiated. The restaurant was ordered to dispose of any ready-to-eat foods that were in open containers, and temporarily closed for one day (June 3) pending identification of any ill employees. A sanitarian from the City of Wayzata visited the restaurant on June 3 and interviewed restaurant employees about recent gastrointestinal illness and foodhandling duties. All 14 restaurant employees were asked to submit two stool specimens obtained at least 24 hours apart for *Salmonella* testing. Cases identified through routine laboratory-based active surveillance were interviewed by MDH epidemiologists about illness history and food consumption. A confirmed case was defined as any person who had a stool culture positive for *S.* Typhimurium and reported eating or working at the restaurant prior to onset of illness. A ground turkey sample from an unopened chub was collected from the restaurant on June 7 and taken to the MDH Public Health Laboratory for *Salmonella* testing.

There were four confirmed cases of *S.* Typhimurium among restaurant patrons. Three of the four cases had an indistinguishable PFGE subtype pattern (TM14) and one of the four cases had a different PFGE subtype pattern (TM352) that was nine bands different from the TM14 pattern. The cases had a median age of 43 years (range, 28 to 53 years), three of four (75%) were women, and all four were residents of Hennepin County. Onset dates of illness were May 4, May 6, May 7, and May 10. All four (100%) reported diarrhea, fever, and cramps; two of three (67%) reported bloody stools; and one (25%) reported vomiting. One case was hospitalized for 3 days. The median duration of illness was 14 days (range, 10 to 21 days). Two cases could provide the exact date they ate at the restaurant prior to illness; one case ate lunch on April 28 and had onset of illness on May 4, and the other case ate lunch on May 2 and had onset of illness on May 6. Both of these cases reported eating turkey sandwiches.

There were two confirmed cases among the 14 employees of the restaurant. The first case worked as a cook and had onset of diarrhea, vomiting, and fever on May 5 and recovered 2 weeks later. This case denied working while symptomatic. *S.* Typhimurium isolates from this case yielded two different PFGE patterns, TM14 and TM215. The TM215 pattern was nine bands different from TM14 and nine bands different from TM352. The second case worked in food preparation and had onset of diarrhea and fever on May 3, with recovery 10 days later. *S.* Typhimurium isolated from this case had the TM14 PFGE pattern. Both employees were restricted from foodhandling duties until they had two negative stool cultures. The onset dates of illness for these two employees were concurrent with the onset of illness in patrons, and both reported consuming food from the restaurant prior to illness.

Review of the food preparation procedures identified potential for cross-contamination. The restaurant routinely handled raw ground turkey and ready-to-eat food items (e.g., lettuce and other vegetable ingredients of salads and sandwiches) on the same cutting board. Cross-contamination of ready-to-eat items could have occurred when items such as lettuce were prepared on the same cutting surface where ground turkey had been sliced. Improper hand-washing and/or contamination of environmental surfaces with *Salmonella* could have contributed to the contamination of multiple food items. Of note, all four patron-cases reporting eating at the restaurant at lunch time, the only time of day when items containing ground turkey were on the menu. The ground turkey sample collected on June 7 tested negative for *Salmonella* species, but the restaurant manager reported a high turnover in ground turkey and the chub from which the sample was taken was delivered to the restaurant over a month after the outbreak.

This was an outbreak of *S.* Typhimurium infections associated with a restaurant in Wayzata. This outbreak was identified through routine laboratory-based surveillance and PFGE subtyping of isolates. Three different PFGE subtype patterns were identified, including two that were identified from the same case. The most likely source of infection was cross-contamination by raw meat products of ready-to-eat foods such as vegetables, leading to

infection of both food workers and patrons. No single food vehicle was implicated. Ground turkey is a plausible source of *S*. Typhimurium, as approximately 50% of ground turkey samples taken at processing plants are found to be contaminated with *Salmonella*. The plausibility of ground turkey as a source was supported by the fact that illness in patrons occurred in those eating during lunch, when ground turkey was used in several menu items. The sanitarian recommended that the restaurant use separate cutting boards for raw meat and ready-to-eat foods and educated staff about safe food preparation procedures.

(18)
***Shigella sonnei* Infections Associated with a Restaurant**

May Ramsey County

In June 2000, routine interviews of *Shigella sonnei* cases identified by the Minnesota Department of Health (MDH) through routine statewide active laboratory-based surveillance revealed that three cases had all eaten at the same restaurant in Maplewood prior to their onsets of illness. This restaurant served numerous Chinese food items on a buffet. The three *Shigella* isolates were an identical pulsed-field gel electrophoresis subtype (SS1), which was the most common subtype circulating in the Twin Cities metropolitan area at the time. Food workers at the restaurant were interviewed by a sanitarian from the City of Maplewood and an epidemiologist from Saint Paul-Ramsey County Department of Public Health. Eight environmental samples were collected from the kitchen, and stool samples were collected from all 12 food workers. These samples were submitted to the MDH Public Health Laboratory for bacterial culture. There were no credit card receipts or reservation lists available to help in contacting other patrons of the establishment.

All three cases (100%) reported diarrhea, one (33%) reported vomiting, and three (100%) reported fever. Dates of illness onset were May 7 through May 12. Cases ate at the restaurant from May 5 through May 10. Cases ate numerous food items at the restaurant. Incubation periods ranged from 42 to 62 hours, with a median of 51 hours, and duration ranged from 2 to 10 days. No food workers reported illness within 7 days of the event, and all food worker stool samples and environmental samples were negative for *Shigella*.

This was an outbreak of shigellosis associated with eating at a Chinese buffet restaurant. There was no evidence that food workers were involved in this outbreak. It is possible that a patron contaminated buffet items, but this was not confirmed.

(19)
Gastroenteritis Associated with a Restaurant

May Hennepin County

On Monday, May 22, 2000 the Minnesota Department of Health (MDH) was notified through the foodborne illness hotline of gastrointestinal illnesses that occurred in two patrons who dined together at a restaurant in Minneapolis on the evening of Saturday, May 20. The patrons denied any other common meals. The complaint was forwarded to the Minneapolis Division of Environmental Health. A reservation list from May 20 and a menu were obtained from the restaurant manager. Patrons identified from the reservation list were contacted by phone by MDH epidemiologists and interviewed about illness history and food and beverage items consumed. A case was defined as any person who had eaten at the restaurant and who subsequently became ill with vomiting and or diarrhea ($\geq$ 3 loose stools in a 24-hour period). No stool samples were collected. On May 24, a sanitarian from the Minneapolis Division of Environmental Health visited the restaurant and collected food samples (cooked vegetables, smelt eggs, and cucumber salad) to be tested at the Minneapolis Public Health Laboratory.

Thirty-three people from multiple groups who ate at the restaurant on May 20 were interviewed and six (18%) met the case definition. Of the six cases, all six (100%) reported diarrhea, three (50%) reported cramps, two (33%) reported vomiting, and two (33%) reported fever. Dates of illness onset were May 20 and May 21. The median incubation period was 4 hours (range, 2 hours to 13.5 hours). The median duration of illness was 35 hours (range, 16.5 hours to 104 hours). The filet mignon and lobster dinner (2 of 6 [33%] cases vs. 0 of 27 [0%] controls; OR, undefined; lower limit of 95% CI, 1.4; $p < 0.03$) and sushi appetizer (2 of 6 [33%] cases vs. 0 of 23 [0%] controls; OR, undefined; lower limit of 95% CI, 1.2; $p < 0.04$) were associated with illness. White rice was protective (2 of 6 [33%] cases vs. 19 of 23 [83%] controls; odds ratio [OR], 0.11; 95% confidence interval [CI], 0.01 - 0.87; $p = 0.03$). Fried rice had an elevated odds ratio but was not statistically significant (4 of 6 (67%) cases vs. 7 of 23 (30%) controls; OR, 4.6; 95% CI, 0.6 - 40.5; $p = 0.12$). The food samples collected from the restaurant on May 24 were within acceptable limits for coliforms and *Staphylococcus aureus*; however, the food samples tested were not representative of the foods consumed on Saturday, May 20.

This was an outbreak of gastroenteritis of unknown etiology. No food item was conclusively identified as the vehicle of the outbreak.

(20)
Gastroenteritis Associated with a Restaurant

June Hennepin County

On June 15, 2000 a complainant notified the City of Bloomington Environmental Health (CBEH) of gastroenteritis illness among a group of six persons who ate at a restaurant on June 5. On June 21, another complainant notified the CBEH of gastroenteritis illness among a group of three persons who ate at the restaurant on June 1. There was no commonality between the two groups of persons other than the restaurant. According to the complaints, food items eaten included hot artichoke crab dip, various fish and seafood items, crab cakes, Dijon chicken, mashed potatoes, rice, and crème brule.

CBEH staff interviewed complainants about food and illness history. A list of food items eaten was obtained. No other persons who ate at the restaurant on June 1 or June 5 were identified; no other complaints were received. CBEH staff interviewed restaurant employees about illness history. A case of illness was defined as having eaten at the restaurant with subsequent onset of vomiting and/or diarrhea ($\geq$3 loose stools in a 24-hour period), plus one other symptom.

On June 15, a routine environmental health inspection was conducted with an emphasis on handling and storage practices of consumed food items. Samples of artichoke crab dip and crab cake mix (in various stages of preparation) were collected on June 21 and delivered to the Tri-City Public Health Laboratory in Edina for bacteriological analysis. No stool samples were obtained from patrons or restaurant employees.

Five of seven persons interviewed met the case definition of illness. All five cases reported diarrhea, two (40%) reported vomiting, one (20%) reported fever, and none reported bloody stools. Incubation periods ranged from 3 to 12 hours, with a median of 12 hours. Duration of illness ranged from 7 to 62 hours, with a median of 9 hours.

Although no food items were associated with illness in the statistical analysis, crab cakes were eaten by both groups.

The routine environmental inspection identified two issues needing correction: product temperatures were not cool enough due to equipment malfunction, and improper procedures were used for cooling sauces and soups. Results of bacteriological analyses identified presence of coliform and fecal strep indicator organisms on the crab

mix and artichoke crab dip. *Bacillus cereus* and *Clostridium perfringens* were not detected in any of the food samples. None of the employees reported experiencing gastrointestinal illness.

The epidemiologic and clinical characteristics of this outbreak are consistent with a toxin-mediated bacterial gastroenteritis. However, the etiological agent and the vehicle were not determined. Improper cooling procedures and failure to maintain proper holding temperature for chilled foods may have been contributing factors. Results of food sample testing may indicate improper sanitary practices while handling and preparing food.

(21)
Salmonella Typhimurium Infections Associated with Home-Prepared Smoked Turkey Served at a Graduation Party

June Hennepin County

On June 29, 2000 four *Salmonella* Typhimurium isolates of an identical pulsed-field gel electrophoresis (PFGE) subtype (TM3) were reported by the Minnesota Department of Health (MDH) Public Health Laboratory on their daily enteric report to the MDH Acute Disease Epidemiology Section. All four cases were young adult males, who resided in the western Twin Cities suburbs. Interviews were conducted with the original four cases, as well as a fifth case that was reported on July 3. Initial interviews indicated that three of the five cases attended a high school graduation party held at a private residence in Minneapolis on June 10. Lists of foods served during the reception were obtained; however, the host was reluctant to produce a list of other people who attended the reception. Subsequent interviews of the initial PFGE cluster of cases revealed that all five of them had attended the reception.

Five cases (100%) had diarrhea, three (60%) had vomiting, five (100%) had fever, and four (80%) had bloody stools. Dates of illness onset were June 12 through June 19. Incubation periods ranged from 2 to 8 days, with a median of 4 days. Duration of illness ranged from 4 to 19 days, with a median of 5 days. Two culture-confirmed secondary cases occurred among family members of the original cases. The only food in common that all five primary cases reported eating was smoked turkey served at the reception. The smoked turkey had been prepared at a private residence. Additionally, another relative who did not attend the party but who ate only the leftover smoked turkey at a later date became ill with gastroenteritis; however, *Salmonella* was not confirmed by culture.

This was an outbreak of *Salmonella* Typhimurium infections associated with a high school graduation party. Smoked turkey was the most plausible vehicle, but could not be statistically implicated because controls were not available to be interviewed.

(22)
Calicivirus Gastroenteritis Associated with Catered Meals

June Benton County

On Wednesday, June 14, 2000 the St. Cloud City Health Department reported an outbreak of illness among employees of a local medical clinic to the Minnesota Department of Health (MDH) St. Cloud District Office. A noon luncheon catered by a local supermarket deli had been served to clinic staff members on June 12. The clinic's employee health coordinator provided a list of persons who might have attended the luncheon, noting that several workers had called in ill the past few days. An investigation was begun by MDH epidemiologists and the Minnesota Department of Agriculture (MDA), who licenses the facility. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the luncheon. Five stool samples were collected and sent to MDH for bacterial and viral testing. Food service workers were interviewed

by a MDH epidemiologist and establishment procedures were reviewed by a MDA inspector. Investigation revealed that the deli delivered similar noon luncheons to two additional sites on June 12 and to another site on June 13. Telephone interviews were conducted with persons attending the June 12 luncheons, and a self administered food and illness history was obtained from attendees of the June 13 luncheon.

Sixty-eight persons were interviewed, and 33 (49%) met the case definition. Attack rates were 54% (15/28) at luncheon 1, 78% (7/9) at luncheon 2, 10% (1/10) at luncheon 3 and 57% (10/21) at luncheon 4. At all four luncheons combined, the median incubation period from eating until onset of symptoms was 41 hours (range, 6 to 72 hours). The median duration of illness was 28 hours (range, 0 to 135 hours). Twenty-seven (84%) of the cases reported diarrhea, 21 (66%) reported vomiting, and 12 (39%) reported fever.

Multiple food products were statistically associated with illness. On univariate analysis focaccia sandwiches (ham, turkey, cheese, roast beef and veggie) as a combined food category were significantly associated with illness (33/33 cases vs. 29/35 controls; odds ratio [OR] and 95% confidence interval [CI], undefined; p=0.02). Turkey focaccia sandwiches (20/32 vs. 6/33; OR, 7.5; 95% CI, 2.1 to 28.2; p =0.0003), lemon bars (11/24 vs. 2/24; OR, 9.3; 95% CI, 1.5 to 73.6; p =0.003) and cantaloupe (26/31 vs. 17/34; OR, 5.2; 95% CI, 1.4 to 20.2; p =0.004), were also statistically associated with illness. The lemon bars were only served at two of the events.

Five stools samples tested were negative for *E.coli* 0157:H7, *Salmonella, Shigella* and *Campylobacter*. All five were positive for calicivirus genogroup IV by polymerase chain reaction testing. One of the positive stools was from a food service worker who helped prepare food for all four luncheons. Although the ill worker reported onset of symptoms in a similar time frame as those who ate food at the luncheons, the worker had a child at home ill with diarrhea the week prior to the events. The worker reportedly did not eat any of the luncheon foods. Two other workers who helped in the preparation were not ill.

MDA inspection of the facility detected no violations in the areas of food temperatures, cleanliness, employee hand washing facilities, hand washing practices, and equipment or work station sanitation. Critical analysis of specific operations used to produce the luncheon foods found construction of focaccia sandwiches to be a very worker intensive, hands-on task. Handling, slicing, and preparation of breads, meats, cheese, vegetable and fruit garnishes may have offered a means of contaminating multiple cold food items.

This was an outbreak of gastroenteritis caused by calicivirus among attendees at four luncheon sites in a 2-day period. Multiple food items were associated with illness. Three of the four sites were medical clinics where employee (physicians, nurses and support staff) illness after the events caused critical problems for employee staffing and delivery of patient care needs. The exact source and mechanisms of transmission are not clear. The association of illness with multiple cold foods suggest that the items may have been contaminated by an ill food service worker. Of interest, the calicivirus genogroup IV detected in this outbreak was a genogroup rarely seen in the United States and never before seen in Minnesota.

(23)
Gastroenteritis Associated with a Restaurant

June Ramsey County

On June 20, 2000 the Minnesota Department of Health (MDH) received two separate complaint calls on the foodborne illness hotline from persons who developed gastrointestinal illness after eating at a restaurant in White Bear Lake during the weekend of June 17-18. Epidemiologists from MDH interviewed complainants by phone about food consumption and illness history. A case was defined as any person who ate at the restaurant and subsequently developed vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). No stool samples were

collected. On June 21, a St. Paul-Ramsey County Department of Public Health sanitarian inspected the restaurant to determine if there were any ill food workers or foodhandling violations at the restaurant.

The first case reported diarrhea, dizziness, nausea, and vomiting with onset 1 hour after eating from the buffet at the restaurant on June 17. Specific foods eaten were sweet and sour chicken, chicken wings, a beef and vegetable dish, cheese puffs, and fried rice. Duration of illness was 37 hours. This case dined alone at the restaurant. The second case reported onset of nausea 3 hours after eating from the buffet at the restaurant on June 18, with diarrhea, vomiting, and cramps developing 6 hours after the meal. This case was still ill at the time of the complaint call on June 20. Specific foods eaten were sweet and sour chicken, a beef and vegetable dish, chow mein, and white rice. This case ate with another person who also consumed several items from the buffet but did not become ill. The only food item consumed by both cases but not by the non-ill person was a beef and vegetable dish. No case-control study could be conducted because there was no way to identify additional patrons. The St. Paul-Ramsey County Department of Public Health sanitarian did not find any time-temperature violations upon inspecting the restaurant on June 21. The restaurant manager denied any recent employee illnesses or additional complaints from patrons. The sanitarian reviewed proper food preparation procedures with the restaurant manager.

Although the symptoms and incubation periods reported by the two ill persons were consistent with illness caused by a bacterial intoxication, an etiology could not be determined with the number of cases. No vehicle or source of contamination was identified.

(24)
Viral Gastroenteritis Associated with Salad Served at a Restaurant

June St. Louis County

On Monday, June 21, 2000 an individual called the St. Louis County Department of Public Health (SLCDPH) to report that she had become ill after eating at a restaurant in Virginia, MN on the evening of June 16. The caller reported that the other three people she dined with had also been ill with gastrointestinal symptoms. The caller stated that this was the only meal that the party of four had in common. Epidemiologists from SLCDPH obtained food consumption and illness histories for the party of four. A case was defined as a person with onset of diarrhea ($\geq$3 loose stools in a 24-hour period) or vomiting after eating at the restaurant. On June 26, a SLCDPH sanitarian inspected the restaurant. No stool samples were collected.

Of the four persons interviewed, three (75%) met the case definition, and one person had symptoms that did not meet the case definition and was excluded from further analysis. All three cases (100%) reported diarrhea, and two (67%) reported vomiting. Onsets of illness were on June 18. The median incubation period was 37.5 hours (range, 36 to 47 hours). The median duration of illness was 55 hours (range, 14 to 96.5 hours). The small number of cases precluded statistical analysis of the relationship between food items and illness; the only food item common to all the cases was the house salad. The SLCDPH sanitarian found numerous critical foodhandling violations, including refrigerator temperatures of 56 degrees F; preparation of food on improper surfaces; and lack of handwashing facilities. The restaurant employee that prepared the salads was interviewed and denied any illness in the previous two weeks.

This was a foodborne outbreak associated with a restaurant. The clinical and epidemiologic characteristics of the outbreak are consistent with viral gastroenteritis. The vehicle and source of contamination are unknown; however, the salad was a likely vehicle.

(25)
Gastroenteritis Associated with Eggrolls Served at a Restaurant

June Mower County

On June 20, 2000 the Minnesota Department of Health (MDH) was notified through the foodborne illness hotline of an outbreak of gastroenteritis among co-workers at a business in Austin. Twelve people working an evening shift had ordered Chinese food takeout from a restaurant in Austin at approximately 6:00 p.m. on June 19, and it was reported that several of the co-workers subsequently developed gastrointestinal symptoms. They did not report any other common food exposures or any other illnesses in the workplace. A list of names and phone numbers of the co-workers and a menu from the restaurant was provided to MDH by the original complainant. Epidemiologists from MDH interviewed the co-workers by phone about food consumption and illness history. A case was defined as any person who developed vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after eating food from the restaurant on June 19. One stool sample was collected approximately 48 hours after recovery and submitted to MDH for bacterial and bacterial toxin testing. Sanitarians from the MDH Environmental Health Southeastern District Office inspected the restaurant on June 21 and June 26 to determine if there were any ill food workers or foodhandling violations at the restaurant.

Eleven of the twelve co-workers were interviewed; three (27%) met the case definition, four (36%) reported no symptoms, and four (36%) reported symptoms that did not meet the case definition and were excluded from further analysis. All three cases (100%) reported diarrhea, two (67%) reported nausea, two (67%) reported cramps, and one (33%) reported vomiting. The median incubation period was 1 hour (range, 1 to 2 hours), with the first symptom being nausea for two cases and vomiting for the other case. The median incubation period for onset of diarrhea was 6 hours (range, 3 to 10 hours). The median duration of illness was 17 hours (range, 17 to 36 hours). Consumption of eggrolls (3/3 cases vs. 0/4 controls; odds ratio, undefined; lower limit of 95% confidence interval, 1.4; p=0.029) was significantly associated with illness.

An inspection of the restaurant on June 21 found some foods on the buffet to be below the required temperature; poor handwashing practices were also observed. A food preparation review of the eggrolls was conducted on June 26. The review revealed that eggrolls served to patrons on June 19 were made on June 17. Approximately one thousand eggrolls made from ground pork, celery, chopped cabbage, and spices were fried with vegetable oil in a wok and placed in baskets that each held 250 eggrolls. The baskets were then placed in a walk-in cooler. The eggrolls were later refried in a wok and put on the buffet line until serving. The baskets the eggrolls were refrigerated in were too deep to permit proper cooling. The sanitarian advised that the restaurant discard all the eggrolls currently on hand and made recommendations about safe food cooling practices.

The stool specimen collected from one ill person tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, *Bacillus cereus*, *Clostridium perfringens*, and *Staphylococcus aureus*.

This was an outbreak of gastroenteritis associated with a restaurant. The etiology was not determined; however, the clinical and epidemiologic characteristics of this outbreak suggest that the illness was due to a foodborne bacterial intoxication. The vehicle of illness was eggrolls, and improper cooling of pre-cooked eggrolls likely contributed to bacterial growth and toxin production.

(26)
Campylobacteriosis Associated with Malts Made with Unpasteurized Milk

June Kittson County

On July 7, 2000 the Minnesota Department of Health (MDH) was notified by a member of the public of an outbreak of gastrointestinal illness among a group of 14 volunteer firefighters who attended a training session and meal at a dairy farm near Lancaster on June 19. Lists of attendees and foods served were obtained. Persons were interviewed about food consumption at the event and illness history by epidemiologists from MDH. A case was defined as any person who had attended the event and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). Six stool samples were collected by MDH for pathogen testing, and one person submitted a stool specimen at a local hospital. An inspector from the Minnesota Department of Agriculture (MDA) Dairy and Food Inspection Division contacted the dairy farm.

Thirteen (93%) of 14 attendees were interviewed. Two persons were excluded from the analysis because they had mild gastrointestinal illness that did not meet the case definition. Of the 11 persons included in the analysis, eight (73%) met the case definition. Of the eight cases, all reported diarrhea, two (25%) reported fever, one (13%) reported bloody stools, and none reported vomiting. Incubation periods ranged from 37 hours to 7 days, with a median of 61 hours. Duration of illness ranged from 24 hours to 11 days, with a median of 6 days. One person was hospitalized for 2 days. All six stool samples submitted to MDH tested negative for *E. coli* O157:H7, *Shigella, Salmonella, Campylobacter*; however, they were submitted nine to 21 days after illness recovery. The stool specimen submitted to the local hospital tested positive for *Campylobacter*. The isolate was not submitted to the MDH Public Health Laboratory, and the species was not identified.

Barbecue beef, chips, and chocolate and vanilla malts were served at the event. The malts were prepared with unpasteurized milk; this was confirmed by the MDA inspector. Statistical analysis did not implicate any food items because all the attendees ate most of the foods.

This was an outbreak of campylobacteriosis. Cattle are a common reservoir of *Campylobacter*, and unpasteurized milk is a well established vehicle of *Campylobacter* infections for humans. Although not confirmed statistically, malts made with unpasteurized milk were the most likely vehicle.

(27)
Scombroid Poisoning Associated with Tuna Steaks Served at a Restaurant

June Hennepin County

On Thursday, June 29, 2000 the City of Bloomington Environmental Health (CBEH) was notified by the Minnesota Department of Health of a complaint from a person who became ill approximately 45 minutes after eating blackened tuna steak at a restaurant at about noon that same day. Shortly thereafter, the CBEH was notified by the restaurant management of another person who had complained of illness within an hour after eating blackened tuna steak at about noon. The restaurant management voluntarily stopped serving tuna steaks upon becoming aware of the illness complaints. CBEH staff interviewed the complainants about illness history and consumption of menu items from the restaurant. A list of food items served at the restaurant on June 28 and June 29 was obtained. No other persons who ate at the restaurant on June 29 were identified and no other complaints were received. A case was defined as a person who had eaten fish and exhibited symptoms consistent with scombroid fish poisoning (i.e., facial flushing and seating, development of rash, palpitations, headache, vomiting, diarrhea, dizziness, nausea). The two complainants met the case definition of scombroid poisoning.

One reported being diagnosed presumptively with a mild case of scombroid poisoning by a local health care provider.

A routine environmental health inspection of the restaurant was conducted by CBEH on June 29 to assess control of critical food safety issues. Emphasis was placed on the receiving, storage, and preparation practices/procedures for the tuna steak. Tuna steak was removed from the menu pending further investigation. Two samples of tuna steak were collected and sent to the FDA Pacific Regional Laboratory-NW for organoleptic (i.e., look, smell) and tissue histamine analysis. Organoleptic analysis classifies samples into categories of relative decomposition. Histamine analysis measures the amount of tissue histamine in parts per million (ppm). Certain types of spoilage bacteria on the fish convert histadine to histamine (scombrotoxin). The regulatory threshold for tissue histamine is 50 ppm. Usually, levels of 500 ppm or more present a health hazard.

The two samples sent to the FDA laboratory comprised remaining 8-ounce tuna steaks (10 steaks @ 2 steaks per package) of the suspect batch being served (shipped June 21), and 8-ounce tuna steaks (12 steaks @ 1 steak per package) from a batch shipped on June 28. The supplier provided the restaurant with the 8-ounce tuna steaks wholesale from various packing companies. Unfortunately, restaurant workers had discarded packaging/labeling information associated with the suspect batch of tuna steaks. Product traceback was unsuccessful in identifying the packing company of the suspect batch of tuna steaks despite interviews with three possible packing companies. The batch of tuna steaks shipped on June 28 was packed by a Seattle company.

The environmental health inspection revealed that the 8-ounce tuna steaks (vacuum packed) were stored covered in ice with a product temperature of 34 to 36 degrees F. Ambient air temperature in the walk-in cooler was 46 degrees F, with several products at 49 degrees F. Temperature records maintained by restaurant managers showed an ambient air temperature less than 41 degrees F with product temperatures ranging from 38 to 40 degrees F on the morning of June 29. The sanitarian ordered the restaurant to correct the walk-in cooler ambient temperature to below 41 degrees F. Restaurant employees were not consistent in describing thawing procedures for the 8-ounce tuna steaks. Based on discussion, some employees may have allowed tuna steaks to thaw at room temperature from one to several hours prior to storing the steaks on ice in the walk-in cooler. Restaurant managers also expressed concern about employees not practicing a first-in, first-out method of serving tuna steaks stored in the walk-in cooler. The FDA analysis report stated that the 10 tuna steaks from the June 21 shipment were all decomposed, and 2 of 5 packages contained levels of histamines above 50 ppm (120.7 ppm and 153.5 ppm). One of the 12 tuna steaks from the June 28 shipment was decomposed, but none of these 12 steaks had elevated histamine levels.

This was an outbreak of scombroid poisoning associated with blackened tuna steak served at a restaurant. The method of thawing tuna steaks in the restaurant may have contributed to formation of scombrotoxin; however, scombrotoxin formation may have also resulted from the way the tuna was handled prior to reaching the restaurant.

(28)
Gastroenteritis Associated with Rice Served at a Conference

July Ramsey County

On August 3, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among persons who attended a conference on July 27. Conference organizers called MDH to file a complaint because several conference attendees had reported gastrointestinal illness to them. Approximately 175 persons attended. A light breakfast and lunch were served at the conference. Foods were prepared on site by a catering contractor. Lists of foods served during the conference and attendees were obtained. Because of difficulties reaching the catering company's manager, the menu was obtained from the facility director and from

attendees. The conference organizers provided the list of attendees. Persons were interviewed about food consumption at the conference and illness history by epidemiologists from MDH. A case was defined as any person who attended the event and who subsequently became ill with vomiting or diarrhea (≥3 loose stools in a 24-hour period). No stool samples were collected. A sanitarian from the City of Saint Paul Office of License, Inspections and Environmental Protection interviewed the catering company's manager and a cook about foods served and food preparation.

Eighty-nine attendees were interviewed. Eight persons were excluded from the analysis because they had mild gastrointestinal illness that did not meet the case definition. Of the 81 persons included in the analysis, 21 (26%) met the case definition. Of the 21 cases, all had diarrhea, 18 (86%) had cramps, four (19%) had fever, one (5%) had vomiting, and none had bloody stools. Incubation periods ranged from 2 to 25 hours, with a median of 10 hours. Duration of illness ranged from 11 to 261 hours, with a median of 33 hours.

Muffins and coffee were served for breakfast. The lunch included Bombay chicken, African beef, tumeric rice, and white rice with sauteed vegetables. The catering company's manager stated that salads were not served; however, attendees reported eating lettuce salad and a creamy vegetable salad as well. Cookies, coffee, and soda were served as an afternoon snack. The cook and manager were inconsistent in their reports on how the foods were prepared. The Bombay chicken and the African beef were prepared the day prior to the event and kept in either the freezer or the cooler. The rice dishes were prepared the morning of the event. No information was available on when the salads were prepared. There was a power outage the morning of the event. It was reported that power was restored by 8:45 a.m. and that the foods remained chilled at an adequate temperature. Based on univariate analysis, tumeric rice (18/21 cases vs. 30/60 controls; odds ratio [OR] 6.0; 95% confidence interval [CI], 1.5 to 34; p=0.004), creamy vegetable salad (15/20 vs. 27/60; OR, 3.7; 95% CI, 1.1 to 14; p=0.02) and coffee (11/18 vs. 18/53; OR, 3.1; 95% CI, 0.9 to 11; p=0.04) were associated with illness. By multivariate analysis, tumeric rice was independently associated with illness (OR, 6.2; 95% CI, 1.3 to 30; p=0.02).

The epidemiologic and clinical characteristics of this outbreak are consistent with a toxin-mediated bacterial gastroenteritis, such as that caused by *Bacillus cereus* or *Clostridium perfringens*. Tumeric rice was implicated as the vehicle. Rice has commonly been associated with outbreaks of diarrheal illness caused by *Bacillus cereus*, making this the most likely agent in this outbreak.

(29)
Salmonella Heidelberg Infections Associated with Home-Prepared Smoked Turkey Served at a Wedding Reception

July Mille Lacs County

On August 25, 2000 the Minnesota Department of Health (MDH) interviewed a *Salmonella* Heidelberg case that had been detected through routine laboratory-based active surveillance. In the course of the interview, the case stated that she knew of several other people who had become ill with gastrointestinal symptoms after attending a wedding reception. The wedding reception was held at a private home in Princeton on July 29 and was attended by approximately 150 people. Meat, salads, and vegetables served at the reception had been prepared by guests, and cake and fresh fruit had been obtained from local stores. On August 28, another *Salmonella* Heidelberg case detected through surveillance was interviewed and reported attending the same wedding reception. Both cases had the same pulsed-field gel electrophoresis (PFGE) subtype (SH1). A list of attendees and food items served at the reception were obtained from the bride. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea (≥3 loose stools in a 24-hour period) after attending the reception. Because all of the ill persons had recovered by the time of the investigation, no stool samples were collected.

Seventy-six attendees were interviewed. Fourteen attendees (19%) met the case definition, 61 (80%) reported no illness, and one (1%) reported gastrointestinal symptoms that did not meet the case definition and was excluded from further analysis. All 14 cases (100%) had diarrhea, 12 (86%) had cramps, six (43%) had fever, two (14%) had bloody stools, and one (7%) had vomiting. The median incubation period was 23 hours (range, 6.5 hours to 46 hours), and the median duration of illness was 105 hours (range, 16 hours to 168 hours). Four cases (29%) visited a doctor, including the two cases with culture-confirmed *Salmonella* Heidelberg infections. No one was hospitalized. The only food item independently associated with illness was smoked turkey (14 of 14 [100%] cases vs. 40 of 54 [74%] controls; odds ratio, undefined; 95% confidence interval lower bound, 1.3; $p = 0.03$). The smoked turkey had been prepared at a private residence by a wedding guest. Repeated attempts by MDH epidemiologists to contact this guest in order to obtain more information on how the smoked turkey was prepared were unsuccessful. Frozen leftovers of the turkey were submitted to MDH for *Salmonella* testing; *Salmonella* was not detected in the sample tested.

This was an outbreak of *Salmonella* Heidelberg infections associated with a wedding reception. The vehicle of the outbreak was smoked turkey prepared by a guest.

(30)
Shigella sonnei Infections Associated with a Company Picnic

August Ramsey County

On August 31, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among employees who attended a picnic held at a park in Maplewood on August 17. The picnic was catered by a company in Hopkins. After receiving several reports of gastrointestinal illness in employees who attended the picnic, the company's employee health nurse conducted an investigation. She identified 25 persons who developed gastrointestinal symptoms after attending the picnic, including one person who was diagnosed as having a *Shigella* infection. At that point, she called MDH to file a complaint. Lists of foods served at the picnic and company employees were obtained. Persons were interviewed about food consumption at the picnic and illness history by epidemiologists from MDH. A case was defined as any person who attended the event and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period).

A sanitarian from the City of Hopkins Environmental Health inspected the catering company and interviewed the manager about food preparation and illness among food workers. Food workers that prepared and served the picnic foods were interviewed by epidemiologists from MDH about illness history and food preparation. Two other events were catered on the same day with very similar menus prepared by the same food workers. Epidemiologists from MDH contacted the other event organizers to ascertain illness in those groups.

Eighty-two attendees were interviewed. Five persons were excluded from the analysis because they had mild gastrointestinal illness that did not meet the case definition. Of the 77 persons included in the analysis, 24 (31%) met the case definition. Of the 21 cases, all reported diarrhea, 21 (88%) reported fever, 19 (79%) reported cramps, seven (29%) reported vomiting, and five (21%) reported bloody stools. Four (17%) cases visited a health care provider; two submitted specimens for bacterial testing, and both were positive for *Shigella sonnei* pulsed-field gel electrophoresis (PFGE) subtype pattern SS108. Incubation periods ranged from 7 hours to 5 days, with a median of 2 days. Duration of illness ranged from 17 hours to 9 days, with a median of 5 days.

There were no illnesses among attendees of the two other events catered on the same day. The inspection of the caterer did not reveal any problems with food preparation. None of the food workers reported having been ill or having family members with gastrointestinal symptoms.

Based on univariate analysis, fresh fruit (22/24 cases vs. 23/53 controls; odds ratio [OR], 14.0; 95% confidence interval [CI], 2.9 to 134; p<0.001), condiments (22/23 vs. 39/52; OR, 7.3; 95% CI, 0.96 to 326; p=0.05), baked beans (20/24 vs. 31/52; OR, 3.4; 95% CI, 0.93 to 15; p=0.04), raw vegetables (17/24 vs. 24/53; OR, 2.9; 95% CI, 0.95 to 9.7; p=0.04) and onion dip (8/23 vs. 4/53; OR, 6.5; 95% CI, 1.47 to 33; p=0.005) were associated with illness. All individual fruit items were associated with illness: pineapple (16/22 vs. 15/52; OR, 6.6; 95% CI, 1.93 to 24; p<0.001), watermelon (15/23 vs. 12/49; OR, 5.8; 95% CI, 1.74 to 20; p<0.001), honeydew melon (15/23 vs. 15/52; OR, 4.6; 95% CI, 1.45 to 15; p=0.003), and cantaloupe (16/24 vs. 16/50; OR, 4.3; 95% CI, 1.35 to 14; p=0.005). Of the vegetables, only carrots (15/24 vs. 20/53; OR, 2.8; 95% CI, 0.91 to 8.5; p=0.04) were associated with illness. By multivariate analysis, fresh fruit (OR 11; 95%CI, 2.3 to 54; p=0.003) and onion dip (OR 4.9; 95%CI, 1.1 to 21; p=0.04) were independently associated with illness.

This was an outbreak of shigellosis associated with eating fresh fruit and onion dip at the picnic. There were no illnesses reported among food workers, or in attendees of other events catered the same day. These factors, coupled with a very short incubation period in an attendee, suggest that foods may have been contaminated during the event by an infected attendee. Several outbreaks of *Shigella sonnei* SS108 occurred earlier in the year in day care and elementary school settings in the Twin Cities metropolitan area.

(31)

E. coli O157:H7 Infections Associated with Commercially Distributed Frozen Hamburger Patties

August Multi-County

On September 1, 2000 the Minnesota Department of Health (MDH) Public Health Laboratory found that three isolates of *E. coli* O157:H7 had an indistinguishable pulsed-field gel electrophoresis (PFGE) pattern; this PFGE subtype (designated MN501) had not previously been identified. The three isolates had been submitted by clinical laboratories to MDH through routine statewide active laboratory-based surveillance. Two of the cases had stool specimens collected on August 25 and one case had a stool specimen collected on August 26. On September 1, cases were interviewed by MDH epidemiologists about illness history and exposures. One case still had frozen hamburger patties from the same box from which hamburgers were consumed prior to illness; these patties were obtained and submitted to the Minnesota Department of Agriculture (MDA) for testing.

Onsets of illness for the three cases were August 21 and August 23. The ages of cases were 15, 35, and 48 years old, respectively. Two cases were male and one was female. All three cases were residents of Ramsey County. All cases reported diarrhea (≥3 loose stools in a 24-hour period) and cramps, two had bloody stools, one had vomiting, and one had fever. Two cases reported a 7-day duration of illness and one case reported a 10-day duration of illness. None of the cases were hospitalized, and there were no cases of hemolytic uremic syndrome. Two of the three cases reported attending a barbecue held at a private home in Washington County on August 19. These cases reported consuming frozen hamburger patties that were grilled at the event. The third case was unrelated to the barbecue but did consume the same brand of hamburger patties at home in the days prior to illness onset.

MDA isolated *E. coli* O157:H7 from frozen hamburger patties obtained from the third case's home. The bacteria isolated had the same PFGE subtype as did the isolates from the three cases. The company determined that patties from the box obtained from the third case and the patties that were likely served at the barbecue attended by the other two cases were from the same date of production. On Wednesday, September 6, the company voluntarily recalled 30,000 lbs. of product from the implicated date of production. Subsequently, MDA isolated *E. coli* O157:H7 with the MN501 PFGE subtype from unopened packages of product from the same production date. No additional cases were identified.

This was an outbreak of *E. coli* O157:H7 infections associated with commercially distributed hamburger patties. Routine PFGE subtyping of O157 isolates by the MDH Public Health Laboratory was critical to the quick detection and control of this outbreak.

(32)

Salmonella Enteritidis Infections Associated with a Restaurant

September Dakota County

During September 2000, the Minnesota Department of Health (MDH) Public Health Laboratory received an increase in isolates of *Salmonella enterica* serotype Enteritidis with an indistinguishable pulsed-field gel electrophoresis (PFGE) subtype pattern (SE1). Routine interviews of the cases by MDH epidemiologists identified several patrons of a restaurant in Inver Grove Heights. An investigation was initiated on September 27. An MDH team of sanitarians, an epidemiologist and a microbiologist visited the restaurant on September 27. Sanitarians inspected the restaurant, and environmental samples were obtained. Restaurant employees were interviewed about recent gastrointestinal illness. All restaurant employees were asked to submit stool specimens for *Salmonella* testing. Employees who reported any gastrointestinal symptoms within the previous month, or who tested positive for *Salmonella* on their first specimen, were excluded from work until two consecutive stool specimens obtained at least 24 hours apart tested negative for *Salmonella*. On September 29 the restaurant was closed for cleaning, disinfecting, disposal of open and ready-to-eat food items and until illness among workers could be assessed. The restaurant reopened on October 3.

Culture-confirmed cases were defined as persons from whom *S.* Enteritidis SE1 was isolated and who reported eating at the restaurant prior to the onset of their symptoms or who worked at the restaurant. Probable cases were defined as persons who had diarrhea (defined as $\geq$3 loose stools in a 24-hour period) and fever and ate at the restaurant in the 5 days prior to onset of symptoms.

Sixteen cases were identified. Of these, 14 were patrons of the restaurant. Ten patrons had positive *S.* Enteritidis SE1 cultures and were identified through surveillance, one was a dining companion of a culture-confirmed case, and three were identified among persons who called MDH after the outbreak received media attention. In addition to the ill patrons, two of 25 (8%) employees tested were positive for *S.* Enteritidis SE1. Both restaurant employees reported no gastrointestinal symptoms during the 6 weeks prior to the investigation. Among the cases with gastrointestinal symptoms, all reported diarrhea, 12 of 13 (92%) reported fever, seven of 14 (50%) reported vomiting, and six of 14 (43%) reported bloody stools. The incubation period ranged from 8 hours to 6 days (median, 21 hours). Known exposure dates ranged from September 5 to the week of September 18. Duration of illness ranged from 2 days to 14 days (median, 7 days). Twelve (86%) of the 14 patrons visited a health care provider, and one (7%) was hospitalized for 3 days.

Cases had eaten a variety of foods including omelettes, french toast, chef salads with eggs, eggs over easy, basted eggs, hamburgers, club sandwiches, and fish. At least eight (67%) of 12 patrons ate egg-containing dishes.

Five environmental samples were obtained on September 27. All were negative for *Salmonella*. The restaurant inspection identified several critical violations of the Minnesota Food Code. Potentially hazardous foods were held at improper temperatures, cooled improperly, or not date marked. Food contact surfaces were inadequately sanitized. Poor hand washing by food workers was observed.

This was an outbreak of *S.* Enteritidis infections associated with a restaurant in Inver Grove Heights identified during routine surveillance. Multiple foods acted as vehicles for patrons; however, egg-containing dishes predominated. SE1 is the dominant *S.* Enteritidis subtype in Minnesota, and has been previously associated with eggs; contaminated eggs likely were the ultimate source of this outbreak. The extended period of transmission to

patrons coupled with violations in the food preparation procedures suggests that contamination of environmental surfaces and foods in the preparation areas contributed to infection of both patrons and food workers.

(33)
Calicivirus Gastroenteritis Associated with Submarine Sandwiches

October Hennepin County

On October 10, 2000 Hennepin County Community Health Department Epidemiology and Environmental Health (HCCHD) received a foodborne illness complaint from the hostess of a birthday party held in a private home on October 7. She reported that 14 people had become ill after eating a club submarine sandwich purchased from a restaurant in Plymouth. Other food items served at the party included cheese and crackers, salad, macaroni and cheese, french fries, birthday cake, beer, and soda. A list of attendees was obtained from the hostess. Individuals were interviewed by HCCHD epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the party. A sanitarian from HCCHD inspected the restaurant on October 11 and interviewed food workers about job duties and recent gastrointestinal illness in themselves and their family members. Stool samples from four cases were collected and submitted to the Minnesota Department of Health for bacterial and viral testing.

All 24 attendees were interviewed and 14 (58%) met the case definition. Dates of illness onset were October 8, 9, and 10. Twelve cases (86%) had cramps, 10 (71%) had fever, nine (64%) had diarrhea, and eight (57%) had vomiting. The median incubation period was 42.5 hours (range, 8 to 55 hours) and the median duration of illness was 2 days (range, 1 to 5 days). The submarine sandwich was the only food item significantly associated with illness (14 of 14 cases vs. 4 of 10 controls; odds ratio, undefined; 95% confidence interval lower limit, 3.5; $p < 0.002$). All four stool samples obtained from party attendees tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. Two of the four stool samples were positive for calicivirus.

Inspection of the restaurant found two critical foodhandling violations. Knives and tongs used on the sandwich prep line were not routinely washed, rinsed, and sanitized. Cold holding temperatures for chicken breasts and tuna exceeded 41 degrees F. All nine food workers were interviewed, and eight reported no recent gastrointestinal illness in themselves or their households. However, one worker reported experiencing vomiting for 21 days with recovery on October 1. No stool samples were obtained from food workers.

This was an outbreak of calicivirus infection associated with a birthday party held in a private home. The vehicle of illness was submarine sandwiches from a restaurant. The source of contamination is unknown.

(34)
Scombroid Poisoning Associated with Tuna Burgers Served at a Restaurant

October Hennepin County

On October 20, 2000 the Minneapolis Division of Environmental Health (MEH) was contacted by the manager of a restaurant regarding two separate complaints received from patrons. One patron dined on October 10 and contacted the restaurant on October 11; the other patron dined on October 12 and contacted the restaurant on October 17. Both patrons had consumed tuna burgers, and both reported rapid onset of symptoms including rash, heart palpitations, and headache shortly after eating. The Minnesota Department of Health (MDH) was notified of the illnesses on October 24, and an investigation was initiated. The two patrons were interviewed by a MEH sanitarian and an MDH epidemiologist about food consumption and illness history. On October 23, the MEH sanitarian inspected the restaurant. Tuna steak and tuna patty samples were collected and submitted to the

Minnesota Department of Agriculture (MDA) for histamine analysis. The Minneapolis district office of the Food and Drug Administration (FDA) was contacted and conducted a traceback investigation of the tuna product served in the restaurant.

Both patrons had onset of symptoms within 15 minutes of eating. Both experienced heart palpitations, pounding headache and a rash. Both patrons sought care at hospital emergency rooms and were treated with antihistamines. One patron was hospitalized for 2 nights. Although both patrons recovered from most symptoms within a day, they reported that their rashes persisted for a few days.

Inspection of the restaurant revealed critical foodhandling violations including not immediately reporting foodborne illness to a regulatory agency; maintaining hot food at <140 degrees F (cooked onions); maintaining cold foods at >41 degrees F (ginger, pork patty, sliced beef, hamburger, ham, and pork); and lack of a fingernail brush. The manager reported that 91 tuna burgers were sold between October 1 and October 15. A food preparation review of the tuna burgers found that the restaurant received frozen tuna steaks in boxes from a local supplier; the steaks were then thawed in a walk-in cooler, ground, formed into patties, and then refrigerated prior to being cooked. Temperatures of uncooked tuna product were not obtained during the inspection. The sanitarian recommended that the restaurant implement documentation and monitoring procedures for the handling of tuna. The tuna steak and tuna patty samples tested by MDA were negative for elevated histamine levels. The FDA district office conducted a traceback of the tuna product and found that it originated in Seattle. The traceback did not identify any problems with the product.

The clinical and epidemiologic features of this outbreak were consistent with scombroid poisoning. Due to the delay between the illness onset and notification of the health department, timely testing of the tuna product was not conducted. The source of temperature abuse of the tuna was not established.

(35)
Calicivirus Gastroenteritis Associated with a Restaurant

October Hennepin County

On Wednesday, October 18, 2000 the City of Bloomington Environmental Health (CBEH) was notified by the Minnesota Department of Health (MDH) of an outbreak of gastroenteritis illness among eight persons who ate at a restaurant on Sunday, October 15. On Friday, October 20, CBEH received a second complaint call of gastroenteritis illness among another unrelated group of eight persons who also ate at the restaurant during the same date and time as the first group. Menu items reportedly consumed by the two groups included egg products (omelets, scrambled eggs, etc.) pancakes, hash browns, French toast, butter, coffee, and water.

Menu items served to the 16 persons were identified. These 16 persons were interviewed by MDH and CBEH staff about food consumption at the restaurant and illness history. A case was defined as any person who had eaten at the restaurant and who subsequently became ill with vomiting and/or diarrhea, plus one other symptom. Diarrhea was defined as three or more loose stools in a 24-hour period. Four stool samples were collected from the patrons(two from each group of eight) and analyzed at the MDH Public Health Laboratory for bacterial and viral pathogens. CBEH interviewed restaurant food handlers and dishwashers who worked on October 15. CBEH conducted a routine health inspection in the restaurant on October 18 to assess critical food safety issues. Stool sample kits were delivered to the restaurant beginning October 20. Samples were initially requested from employees who worked on October 15. Ultimately, stool samples were requested from all 97 restaurant employees based on results of the initial sample group. The restaurant management collected 30 environmental swab samples from various food-contact and nonfood-contact surfaces in the restaurant on October 20. These samples were sent to a private laboratory for bacteriological analysis.

Twelve of the sixteen (75%) patrons interviewed met the case definition of illness. Eleven (92%) cases reported diarrhea, nine (75%) reported vomiting, eight (67%) reported fever, none reported bloody stools, and five of 10 (50%) visited a health care provider. Incubation periods ranged from 26 hours to 55 hours, with a median of 37 hours. Duration of illness ranged from 7 hours to 53 hours, with a median of 32 hours. Specimens from all four patrons tested positive for calicivirus, and negative for *Salmonella, Shigella, Campylobacter,* and *E. coli* O157:H7. No food items were associated with illness in the statistical analysis.

None of the 26 employees who worked October 15 reported illness symptoms. Restaurant employee stool samples tested negative for calicivirus; however, three specimens were positive for *Salmonella enterica* serotype Thompson with an indistinguishable pulsed-field gel electrophoresis (PFGE) pattern (TMP8). These employees were excluded from the restaurant until an additional two consecutive stool samples submitted tested negative for *Salmonella*. Due to the finding of *Salmonella*, all restaurant employees were required to submit stool samples until two sequential samples tested negative. The 30 environmental swab samples reportedly tested negative for bacterial pathogens.

Two items needing correction were identified during the routine health inspection. Dipper wells on the serving lines were filled with tepid standing water that was periodically replaced. Also, plates were garnished with decorative, ready-to-eat food items (shredded cheese, melon, etc.) using bare hands.

This was an outbreak of calicivirus gastroenteritis associated with a restaurant. The specific food vehicle was not identified. Although three employees tested positive for *Salmonella* Thompson, there was no evidence of transmission of *Salmonella* to patrons.

(36)
Calicivirus Gastroenteritis Associated with a Wedding Reception

October Ramsey County

On November 1, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among 169 persons who attended a wedding reception held at a banquet facility in Vadnais Heights on October 28. Guests at the wedding reception and employees of the banquet facility were interviewed by MDH epidemiologists about food consumption and illness history. Individuals who attended other events held at the banquet facility on October 28 were interviewed about recent illness. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the wedding reception. Seven stool samples were collected from ill guests.

Ninety-five (56%) of 169 attendees were interviewed, and 34 (36%) met the case definition. Three additional individuals who attended the wedding reception were excluded from the analysis because they reported onset of diarrhea or vomiting within 7 days prior to the wedding reception. Thirty-one (91%) cases reported diarrhea, 23 (68%) reported vomiting, and 18 (56%) reported fever. Dates of illness onset were from October 29 to November 2, 2000. The incubation period ranged from 7 to 117 hours, with a median of 34 hours. Duration of illness was 3 to 93 hours, with a median of 48 hours. The stool samples tested negative for *Campylobacter, E. coli* O157:H7, *Salmonella,* and *Shigella*. However, three (50%) stool samples tested positive for calicivirus.

Thirteen banquet facility employees were interviewed. One employee met the case definition, with an incubation period of greater than 24 hours.

By univariate analysis, three food items were significantly associated with illness, including cherry tomatoes from the vegetable tray (5/34 [15%] cases vs. 1/46 [2%] controls; odds ratio [OR], 7.8; 95% confidence interval [CI], 0.79 to 188; p=0.047), vegetable dip (10/34 [29%] vs. 5/46 [11%]; OR, 3.4; 95% CI, 0.91 to 13; p=0.036)

and potato chip dip (8/31 [26%] vs. 3/48 [6%]; OR, 5.2; 95% CI, 1.1 to 28; p=0.02). By multivariate analysis, only the potato chip dip was independently associated with illness (OR, 6.1; 95% CI, 1.7 to 22; p=0.006).

There were no additional reports of illness from individuals who attended other events held at the same location on the same date. A couple hosting a different wedding reception was not aware of any illness among their guests. Another couple hosting a party did not receive any complaints of illness either. Ten of their guests were interviewed, but none reported illness.

This outbreak was caused by calicivirus associated with eating food served at the wedding reception. The cherry tomatoes, vegetable dip and potato chip dip were significantly associated with illness in the univariate model. However, potato chip dip was the only food item that remained significantly associated with illness in the multivariate model. There were no additional reports of illness from individuals who attended other events held at the same location. None of the employees reported illness before or during the time the event took place. However, three wedding guests reported gastrointestinal illness in the 7 days prior to the wedding reception and some guests had a short incubation period (7-18 hours). The implicated food items may have been contaminated by wedding guests who were previously infected with the virus.

(37)
Calicivirus Gastroenteritis Associated with a Party

November Hennepin County

On November 2, 2000 Hennepin County Community Health Department (HCCHD) received a call from a child care provider regarding gastrointestinal illness following a Halloween party. Four family daycare providers and their daycare children met at a park building for a pizza party on October 21. The group had not been together prior to the party. The four daycare providers were contacted to get the names and phone number of parents of their daycare children. Interviews about food consumption and illness history were conducted using a standardized questionnaire. A case was defined as a person with vomiting or diarrhea (≥3 loose stools in a 24-hour period) following the party. Stool samples were collected from three ill children and submitted to the Minnesota Department of Health for bacterial and viral testing.

Interviews were conducted by HCCHD for 22 (78%) of the 28 persons who had attended. Of the 22 persons, 14 (64%) met the case definition. The median incubation period was 30.5 hours (range, 22 to 36 hours). Symptoms reported were vomiting (100%), diarrhea (64%), cramps (50%), fever (36%), nausea (14%), and headache (7%). The median age of the cases was 4 years (range, 2 to 20 years). An additional case of illness was identified in a family member of one of the daycare providers. They had eaten some of the leftover pizza later that evening. Their place of work also had persons with gastrointestinal symptoms, so it wasn't clear whether their illness was from the pizza or possible exposure at work. This person was not included in the analysis. All three stool specimens tested were negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. All three were positive for calicivirus.

Each child's plate at the party contained a slice of pizza, several carrot and celery sticks and a piece of apple. Children were given a box of juice as their beverage. The daycare providers tried to give food histories for the children, but were unable to say with any certainty whether or not a child had eaten a particular item. Consequently, no analysis was done for the food items. A sanitarian from the City of Minneapolis interviewed the three food workers that had prepared and/or delivered the pizzas. No illness was identified in the employees or their families in the week prior to the event. None of the daycare providers reported any illness prior to the event. Each provider brought food to the party.

This was an outbreak of calicivirus gastroenteritis associated with a party. The vehicle and source of contamination were not identified.

(38)
Calicivirus Gastroenteritis Associated with a Catered Lunch

November Hennepin County

On November 6, 2000 a City of Bloomington sanitarian received a foodborne illness complaint concerning a group of 69 employees from a company that attended a meeting held at a facility in the Mall of America in Bloomington on November 3. It was reported that several meeting attendees became ill with gastrointestinal symptoms after the meeting. Boxed lunches served at the meeting were prepared by a catering company in Golden Valley. On November 7, the City of Bloomington faxed the complaint to the Minnesota Department of Health (MDH), and an investigation was initiated with the assistance of a St. Paul-Ramsey County Department of Public Health epidemiologist and a City of Golden Valley sanitarian. An epidemiologist employed by the company interviewed fellow attendees about illness history and food consumption. A case was defined as a person with an onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the meeting. Stool samples were collected from seven cases and submitted to MDH for bacterial and viral testing. Employees of the facility where the meeting was held who had consumed left over food from the meeting were also interviewed by MDH epidemiologists. In addition, a fruit cup left over from the meeting was submitted to MDH for viral testing. On November 8, a sanitarian from the City of Golden Valley visited the catering facility. Food workers at the catering company who were involved in preparing the boxed lunches were interviewed by MDH epidemiologists about job duties, illness history, and food consumption.

All 69 persons that attended the meeting were interviewed; 41 (60%) met the case definition, 16 (23%) had no symptoms, and 12 (17%) had symptoms that did not meet the case definition and were excluded from further analyses. Thirty-four of 41 (83%) had diarrhea, 32 of 39 (82%) had vomiting, 26 of 39 (67%) had cramps, 24 of 39 (61%) had fever, and no one had bloody stools. Dates of illness onset ranged from November 3 to November 6. The median incubation was 35 hours (range, 6 to 73 hours) and the median duration of illness was 43.5 hours (range, 16 to 60 hours). One case reported being hospitalized for 2 days, and 23 cases reported missing work due to illness.

No foods were significantly associated with illness. The fruit cup (41/41 [100%] cases vs. 14 of 16 [88%] controls; odds ratio [OR], undefined; $p = 0.08$) was the only food item that approached a statistically significant association with illness. The fruit cup consisted of grapes, strawberries, cantaloupe, honeydew, and pineapple. The attack rate for consumption of the fruit cup was 75% (41/55). All seven stool samples collected from meeting attendees tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. Six of the seven samples were positive for calicivirus.

Five employees of the facility where the meal was served reported eating items left over from the meeting on November 3. Four (80%) had symptoms that met the case definition and one (20%) did not have symptoms that met the case definition. All four ill persons had vomiting, three had diarrhea, and one had fever. Onsets of illness were November 5. The median incubation was 35 hours (range, 31.5 hours to 42.5 hours) and the median duration of illness was 29 hours (range, 25 to 51 hours). The four ill persons ate the turkey sandwich and the fruit cup; the one well person ate the pasta salad and the fruit cup.

The six food workers from the catering company who were involved in food preparation for the meeting were interviewed. Four food workers denied any gastrointestinal illness in themselves or their household members in the week before or after the event. One food worker who made the pasta salad became ill with vomiting and diarrhea on November 4, 36 hours after eating a turkey sandwich and pasta prepared for the meeting. The

duration of illness was 33 hours. This food worker tested positive for calicivirus. The genetic sequence of the calicivirus isolated from the food worker matched the calicivirus isolates from meeting attendees. Another food worker reported no illness in the week prior to the meeting attendees but did report onset of diarrhea on November 8, five days after the meeting. Contact persons for two other events served by the caterer on November 3 denied any reports of illness among their groups.

No calicivirus was detected in the leftover fruit cup tested. However, standardized methods to detect calicivirus in foods other than shellfish are still being developed.

This was an outbreak of calicivirus infections associated with a catered lunch. The vehicle was not identified and the source of contamination was not determined.

(39)
E. coli O157:H7 Infections Associated with Consumption of Retail Ground Beef

November Multi-County, Multi-State

Background
On November 27 and 28, 2000 the Minnesota Department of Health (MDH) Public Health Laboratory identified seven isolates of *E. coli* O157:H7 with an indistinguishable pulsed-field gel electrophoresis (PFGE) subtype pattern (designated MN9) among isolates submitted through routine statewide active laboratory-based surveillance. An additional 11 isolates with this same PFGE subtype were identified during the next 3 days. Based on this apparent outbreak, an investigation was initiated; the investigation included a case-control study, a general epidemiological investigation following the case-control study, and meat testing and traceback conducted by the Minnesota Department of Agriculture.

Case-Control Study
PFGE testing after digestion with the enzyme *Xba*1 was performed on all *E. coli* O157:H7 isolates received at MDH, and those with the pattern common to this outbreak were designated MN9. All MN9 isolates were also tested by PFGE after digestion with a second enzyme, *Bln*1. All MN9 isolates were indistinguishable by PFGE after digestion with *Bln*1 and were designated as ECB1 (PulseNet patterns EXHX01.0022 and EXHA26.0009, respectively). A case was defined as a Minnesota resident with a culture-confirmed infection with *E. coli* O157:H7 MN9 and onset of illness during November 2000 or later.

A case-control study was initiated on November 28 to determine risk factors for infection with *E. coli* O157:H7 MN9. Two controls per case were selected; controls were matched to cases by age and telephone prefix. Controls were selected by sequentially calling telephone numbers with the same prefix as the case's telephone number and asking if age eligible subjects resided in the household. Once an eligible control was found, and consent obtained, the control was interviewed with the same standardized questionnaire used for cases.

Four pediatric cases had a common daycare exposure; controls were obtained for only the first of those cases reported to MDH. The other three cases were excluded from the case-control study. Another family had three cases among family members. Controls were obtained for only the first of those three cases; thus, potential second generation cases were excluded from the case-control study.

Cases and controls were interviewed using a standardized questionnaire about food consumption and other potential exposures occurring in the 7 days prior to the case's onset of illness. Because initial case interviews suggested a possible ground beef source, the interview included a supplemental standardized questionnaire with specific questions about the source of ground beef consumed or prepared in the home during that time period.

The case-control study ended on Friday, December 1 when the results of the initial investigation were made public.

In the case-control study, eight of nine cases (89%) reported eating ground beef purchased from a Grocery Chain A grocery store during the week prior to onset of illness, compared to five of 16 controls (31%) (matched odds ratio, 10.0; 95% confidence interval, 1.04 - 433.6; p=0.04). If the person interviewed could not conclusively state that they had eaten, or had not eaten, ground beef from Grocery Chain A their data were not included in the statistical analysis (three cases and their controls, plus two additional controls). Consumption of ground beef purchased from a Grocery Chain A store was the only exposure statistically associated with illness. No other foods or other potential exposures on the questionnaires were associated with illness.

General Epidemiologic Investigation

Following the termination of the case-control study, a general epidemiologic investigation of the outbreak continued. This investigation focused on identifying additional cases of illness and describing the exposure history and clinical course of patient illness.

Isolates received at MDH were designated as MN9 as described above. A case was defined as a Minnesota resident with a culture-confirmed infection with *E. coli* O157:H7 MN9 and onset of illness during November 2000 or later. Hemolytic uremic syndrome or hemorrhagic colitis cases that were not culture confirmed were considered cases if they had positive serology for *E. coli* O157:H7 and had a history of consumption of ground beef from Grocery Chain A in the week prior to onset of illness.

All cases whose isolates were received at MDH were interviewed with the standardized questionnaires used in the case-control study. Additional interviewing with an abbreviated questionnaire conducted with people who called MDH complaining of illness following consumption of ground beef.

Forty-two cases were identified, including all the cases that were part of the case-control study. Forty cases were culture confirmed. Four of these cases were identified through persons calling in to MDH with complaints of illness following consumption of ground beef purchased at Grocery Chain A. Thirty-eight cases were identified through routine surveillance, although two of those had also called MDH to report their illness following consumption of ground beef purchased at Grocery Chain A. Two people met the case definition but were not culture confirmed. One of these cases developed diarrhea and HUS following consumption of ground beef purchased at Grocery Chain A. She had a positive serology for the presence of antibodies to *E. coli* O157:H7, and an unopened package of ground beef from her home was positive for the presence of *E. coli* O157:H7 MN 9. The second non-culture confirmed case developed hemorrhagic colitis following consumption of ground beef purchased at a Grocery Chain A grocery store. Acute and convalescent serology demonstrated seroconversion to *E. coli* O157:H7 in this case.

Onsets of illness ranged from November 11, 2000 to February 20, 2001. The median age of cases was 20 years (range, 14 months to 87 years). Cases resided in 14 different counties in Minnesota: Hennepin (11 cases), Ramsey (7), Dakota (7), Anoka (3), Kandiyohi (3), Blue Earth (2), Wright (2), Renville (1), Chippewa (1), Swift (1), Houston (1), Nicollet (1), Lyon (1) and St. Louis (1). Clinical history was obtained from 39 cases. Of those 39 cases, all reported diarrhea, 37 (95%) reported bloody stools, 36 (92%) reported abdominal cramps, 15 (38%) reported fever, and 15 (38%) reported vomiting. The median duration of diarrhea was 6 days (range, 3 to 10 days). Twenty-four cases (57%) were hospitalized for their illness. The median length of hospitalization was 4 days (range, 1 to 43 days). Three cases of hemolytic uremic syndrome were identified. Two patients underwent colectomy.

Meat Testing and Traceback

Meat testing and traceback was initiated to determine the source of contaminated meat. This was a cooperative effort with the Minnesota Department of Agriculture (MDA) and the United States Department of Agriculture, Food Safety Inspection Service (USDA-FSIS).

Ground beef produced by Supplier A in Green Bay, Wisconsin was identified as the most likely source of the outbreak following analysis of preliminary outbreak data from MDH, Grocery Chain A store grind records, and distribution records from the Distributor A (the parent company of Grocery Chain A) Hopkins warehouse. The Distributor A Hopkins warehouse supplies 45 Grocery Chain A stores and 178 other non-Grocery Chain A independent retailers. Ground beef was shipped from Supplier A to the warehouse as intact chubs in unopened cases. The warehouse shipped the intact chubs in unopened cases to the stores; no processing of the ground beef occurred at the warehouse. During November, 37 Grocery Chain A stores received Supplier A ground beef and 43 Grocery Chain A stores received ground beef from Supplier B. Only 21 of the 178 non-Grocery Chain A independent retailers received Supplier A ground beef from the Hopkins warehouse during November. The Grocery Chain A stores serviced by the Hopkins warehouse received greater than 20 times more pounds of Supplier A product from November 1 through December 1 than these 21 non-Grocery Chain A independent retailers. Eighty-two of the 178 independent retailers received ground beef produced by Supplier B from the Hopkins warehouse during the first two weeks of November. MDH and MDA initiated meat testing and further evaluation of store records to confirm this initial assessment.

As a result of this information, on December 1 and 2 Distributor A issued a voluntary recall of all ground beef sold at Grocery Chain A Foods and the 21 other stores serviced from the Distributor A Hopkins warehouse that received Supplier A product from November 1 to December 1. On December 4, Supplier A issued a voluntary recall of all ground beef produced in its plant (Plant A) on November 2 and 3, 2000 as well as selected products produced by Plant B on November 2 and 3, 2000.

Ground beef from several sources was collected and submitted to MDA for testing. Cases were asked if they had any remaining ground beef from the same source as the ground beef that they consumed in the week prior to onset of illness. Seven of the cases had ground beef remaining in their home that was tested by MDA. Both MDA and USDA-FSIS tested intact chubs of ground beef produced by Supplier A and Supplier B that were in the Distributor A Hopkins warehouse at the time the outbreak investigation was initiated (Supplier A production dates, 11/21 and 11/22; Supplier B production date, 11/25). MDA also tested six chubs of school lunch commodity ground beef produced between November 8 and November 16 in Plant B, which had products included in Supplier A's December 4 recall. MDA also tested intact packages of ground beef returned by customers to various metropolitan area Grocery Chain A stores following the recall by Distributor A. All returned intact packages tested were 1- to 3-pound packages labeled by percent lean meat content. The categories of lean meat content were 93%, 85%, 80%, and 75%. Packages were labeled with a time stamp when wrapped that could be linked back to the grind time on store grind records. Grocery Chain A policy allows trimmings and ground beef re-ground from the previous day to be packaged only in family packs, thus family packs were excluded from testing. One Grocery Chain A store purchased trimmings from Supplier C to grind in the store for 80% lean 1- to 3-pound packages. Samples of these intact packages were collected for testing. *E. coli* O157:H7 isolates that MDA recovered from meat were submitted to MDH for PFGE subtyping.

Interviews of Distributor A quality assurance employees, warehouse employees, and individual store meat managers were conducted by MDA and USDA-FSIS to determine standard operating procedures for the handling, grinding, and packaging of ground beef. Pertinent shipping and receiving records were obtained. Most Grocery Chain A meat departments kept a grind record in which time of grind, lean meat content, meat processor, and production date of the meat ground was recorded. Meat department grind records from stores with positive meat samples, and from stores identified by confirmed cases that could recall the date and place of ground beef purchase, were collected by MDA in order to identify the source of contamination.

Fifteen different Grocery Chain A stores throughout Minnesota and western Wisconsin, or five other independent retailers supplied by the Distributor A Hopkins warehouse, were the point of purchase for ground beef consumed and/or purchased by cases. The case with illness onset in January was traced to ground beef purchased at a Grocery Chain A store during November. The case with illness onset in February 2001 had purchased ground beef "some time previously", but could not identify an exact purchase date, from one of the 21 independent retailers who received Supplier A ground beef from the Distributor A Hopkins warehouse.

MDA recovered *E. coli* O157:H7 from 23 different meat samples during the investigation. Four distinct PFGE subtypes of *E. coli* O157:H7 were identified from the 23 positive samples; 19 samples were positive for *E. coli* O157:H7 subtype MN9. There were no cases of human illness associated with the three non-MN9 PFGE subtypes recovered during meat testing. *E. coli* O157:H7 was not isolated from any of the intact chubs from either Supplier A or Supplier B tested by MDA and USDA-FSIS.

Four of the 23 positive meat samples were from homes of three cases. All four were positive for subtype MN9; one sample was also positive for subtype MN525. These four samples included cooked meatballs and an opened package of frozen ground beef from one home, and intact packages of frozen ground beef from two other homes. These samples were comprised of ground beef purchased from two different Grocery Chain A stores (two samples from one Grocery Chain A store and two samples from a different Grocery Chain A store). Additional testing of intact retail packages of ground beef returned to Grocery Chain A following the voluntary recall detected MN9 in ground beef from a third Grocery Chain A store.

For the household from which cooked and opened products yielded MN9, the consumer recalled that they purchased lean or extra-lean ground beef at a Grocery Chain A store on November 14 or 15. Store grind records for those dates and lean meat content linked that product to Supplier A production dates of November 2 or November 3.

Twenty-one of 54 intact retail samples of ground beef tested, including the two intact packages recovered from case homes, were positive for *E. coli* O157:H7. Of the 21 positive products, store grind records could be used to identify a processor for 15 products. Ten products were from Supplier A production dates November 2, 3, and 16. Five non-Supplier A ground beef samples yielded *E. coli* O157:H7 MN9; four were produced by Grocery Chain A, and one was produced by Supplier C. In all five instances in which non-Supplier A product yielded *E. coli* O157:H7, grind records indicate that a Supplier A product was ground within the prior 35 minutes. In each of these instances, samples of the Supplier A product that was ground within the 35 minutes prior to a positive non-Supplier A product was also positive for *E. coli* O157:H7. For the six products from one store for which store grind records were not available, the store meat manager reported that only Supplier A product was ground for all non-family packs on the dates in question. Grind records for the dates immediately before and after the dates in question did indicate grinding of Supplier A product only. In addition, shipping records confirmed that only Supplier A product was shipped from the Hopkins warehouse to the store during the time period in question.

Additional cases of *E. coli* O157:H7 MN9 infections were reported during December and January in Wisconsin and Ohio. Wisconsin had at least one case that purchased ground beef from a Grocery Chain A store that was not supplied by the Hopkins, Minnesota warehouse. The three Ohio cases purchased ground beef at Grocery Chain B, which is not associated with Distributor A (i.e., Grocery Chain B is serviced by its own warehouse system). The Centers for Disease Control and Prevention consulted with multiple states and reviewed the outcome of their investigations. They concluded that cases in Minnesota, Wisconsin, and Ohio were epidemiologically linked with ground beef produced by Supplier A on November 1, 2, or 3.

Conclusions

This was a multi-state outbreak of *E. coli* O157:H7 infections caused by ground beef produced by Supplier A. In Minnesota, cases were associated with Supplier A ground beef distributed by the Distributor A Hopkins warehouse. Supplier A ground beef distributed by other warehouses and retailers was implicated in cases in Wisconsin and Ohio. In Minnesota, Supplier A was implicated through store grind records for retail ground beef from which *E. coli* O157:H7 had been isolated. In all five instances in which non-Supplier A product yielded *E. coli* O157:H7, a positive Supplier A product was ground within 35 minutes prior, suggesting cross-contamination only from Supplier A product to non-Supplier A product. The number of separate stores involved in Minnesota indicates that contamination did not originate within the individual stores. Since ground beef is shipped to individual stores in intact chubs from Distributor A's warehouse, and two separate Distributor A warehouses were involved (in Minnesota and Wisconsin) the contamination of the ground beef could not have originated within the Distributor A distribution system. Rather, the Supplier A plant was the only common point in the distribution system that could explain all of the cases associated with Distributor A. The Ohio cases who purchased ground beef from Grocery Chain B further implicated the Supplier A plant as the source of the contamination.

(40)

Calicivirus Gastroenteritis at a Senior Citizen Complex and a Wedding Reception Linked by a Common Caterer

November Morrison County

On November 13, 2000 the Minnesota Department of Health (MDH) was notified of gastrointestinal illness occurring among residents of Pine Grove Manor, a senior citizen apartment complex in Little Falls. The following day, MDH was notified of gastrointestinal illness among guests who attended a wedding reception in the same city. The wedding reception was held at a ballroom on November 11 and was catered by the facility's catering service. Approximately 350 people attended the wedding.

The senior citizen apartment complex received daily meals from a senior nutrition program based in Upsala. A sanitarian from Morrison County followed up with the program director to assess illness among staff that prepared food. The sanitarian also contacted five other facilities that received meals from the program to assess illness among staff and residents.

Complete lists of wedding guests and foods served at the wedding reception were obtained. Epidemiologists from MDH contacted guests to gather information about their illness history and foods they had eaten at the reception. A case was defined as any person who had attended the wedding and subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). Stool samples were collected from one resident of the senior citizen apartment complex, three wedding guests, and three persons affiliated with the catering service.

Seventy-four persons who attended the wedding reception were interviewed, and 30 (41%) met the case definition. Of the 30 cases, 28 (93%) reported diarrhea, 25 (83%) reported cramps, 14 (47%) reported vomiting, 14 (47%) reported fever, and one (3%) reported bloody diarrhea. Dates of illness onset were November 12 through November 17, with the majority of illness beginning November 12 and 13 (83%). Incubation periods ranged from 7 to 142 hours, with a median of 33 hours, and duration of illness ranged from 4 to 109 hours, with a median of 46 hours.

Univariate analysis showed that multiple foods served at the wedding reception were associated with illness. Two food items were marginally associated with illness, including stuffing (26/29 cases vs. 30/42 controls; odds ratio [OR], 3.5; 95% confidence interval [CI], 0.77 to 17.7; p=0.06) and gravy (28/29 vs. 35/42; OR, 5.6; 95% CI, 0.6

to 130.6; p=0.08). Green beans (22/29 vs. 22/42; OR, 2.9; 95% CI, 0.89 to 9.4; p=0.045) and beer (14/28 vs. 10/42; OR, 3.2; 95% CI, 1.0 to 10.3; p=0.02) were significantly associated with illness. By multivariate analysis, the green beans (OR, 5.1; 95% CI, 1.5 to 18.1; p=0.01) and beer (OR, 5.8; 95% CI, 1.7 to 19.6; p=0.004) remained independently associated with illness.

Four (50%) out of 8 employees from the catering service were interviewed. Employee A reported that she and her husband were ill with vomiting on November 5 and 7, respectively. This ill employee jointly shared responsibility for preparing food for the wedding reception. Employee B reported not feeling well on the day of the wedding reception. Despite illness, Employee B dished up hot and cold food items into the serving dishes. Two additional employees and a household member of Employee B (who was not present at the wedding reception) developed symptoms of vomiting and diarrhea on November 12.

Out of the 35 senior citizen apartment complex residents who received meals from the senior dining program on Tuesday, November 7, 13 (37%) reported diarrhea and vomiting. Dates of illness onset were November 8 and 9. The average duration of illness was 48 hours. There were four secondary cases with onset of illness ranging from November 10 through November 13, including two apartment managers, one custodian, and one resident.

The senior nutrition program representative reported that none of the facility's staff members were ill. After contacting the other five sites that received meals from this program, it was determined that none of the residents became ill after consuming these meals.

Due to illness among residents at the senior citizen apartment complex, the director decided to have the November 9 meal catered into the facility rather than obtaining meals from their usual source. Therefore, Employee B from the catering service delivered and served an evening meal consisting of turkey, potatoes, gravy, stuffing, green beans, cranberries, coleslaw, rolls, and pie at the senior citizen apartment complex. Staff and volunteers from the senior citizen apartment complex helped deliver the meals from the kitchen to the tables.

The stool samples were tested for *Salmonella*, *Shigella*, *E. coli* O157:H7, *Campylobacter*, and calicivirus. Five out of the seven samples collected were positive for calicivirus. Positive stool samples were identified in the senior citizen apartment complex resident, two wedding guests, and two people associated with the catering service (Employee B and Employee B's household member). Positive calicivirus specimens from the senior citizen apartment complex resident, one wedding guest, and two people affiliated with the catering facility were sequenced; the sequences of all four calicivirus specimens were identical.

An outbreak of calicivirus infections occurred among residents of a senior citizen apartment complex in Little Falls. A local caterer delivered and served a meal to the complex while the outbreak was occurring. Subsequently, the caterer became ill and catered a wedding reception 2 days after serving the meals at the apartment complex. A second outbreak of calicivirus infections occurred among guests at the wedding reception held at a ballroom. The outbreak at the wedding reception was associated with consumption of green beans and beer. Calicivirus sequencing results indicate that the caterer may have been exposed to calicivirus while serving the meal at the apartment complex and subsequently transmitted the virus to guests at the wedding reception held at the ballroom.

(41)
Calicivirus Gastroenteritis Associated with a Christmas Party Held at a Restaurant

December Hennepin County

On the morning of December 11, 2000 the Hennepin County Community Health Department (HCCHD) was notified by the Minnesota Department of Health (MDH) of a possible outbreak of gastroenteritis in persons attending a company Christmas dinner party at a restaurant in Minneapolis on the evening of December 6. One guest had sought treatment for severe gastroenteritis at a local emergency room on December 9; his physician had contacted MDH. Subsequent inquiry revealed that others who attended the party had become ill as well. The company provided HCCHD with a list of employees who attended the Christmas dinner and their work and home phone numbers. A HCCHD epidemiologist contacted the restaurant and obtained a complete menu for the Christmas dinner, and also notified the City of Minneapolis Department of Environmental Health to alert inspectors there as to the problem and requested an investigation of the kitchen and food preparation practices of the restaurant. Attendees were interviewed about food consumption and illness history by HCCHD epidemiologists. A case was defined as a person with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the party. Stool samples were collected from attendees and from restaurant workers and submitted to MDH for bacterial and viral testing.

Seventy-four (97%) of 76 dinner guests were interviewed; 26 (35%) met the case definition of vomiting or diarrhea ($\geq$ 3 loose stools in 24 hours) after eating at the Christmas dinner, or having a positive stool sample with other symptoms consistent with gastrointestinal illness. Of the cases, 11 (42%) reported vomiting; 24 (92%) diarrhea; 20 (77%) abdominal pain; 11 (42%) fever; 20 (77%) chills; (58%) muscleaches; and 18 (69%) other symptoms (e.g., headache, fatigue). The median incubation period was 42.75 hours (range 8-80.5 hours). Three people (12%) sought medical treatment for their illness. Only two persons (8%) said that their illness had completely resolved at the time of interview, making it impossible to determine the duration of illness accurately. One guest developed gastroenteritis on December 11 and another on December 12. Because their spouses had become ill earlier and because their incubation periods were unusually long, they were considered secondary cases.

Of the 18 kitchen and wait-staff who prepared or served at the Christmas dinner, four (22%) became ill subsequently, all on December 8, the date on which illness onset peaked among guests as well. The four ill staff members had consumed some of the foods served to guests. No staff members reported gastrointestinal illness on or before the day of the Christmas party; one reported active respiratory illness. No food was available for sampling after the dinner. The environmental health inspector observed no kitchen violations or lapses in food preparation methods.

Four food items were significantly ($p<0.05$) associated with illness by univariate analysis, bread, butter, having a dessert (any kind), and obtaining a drink (any kind) from the bar. By multivariate analysis, however, none of the items was significantly related to illness, although having a dessert approached statistical significance (OR=3.6, 95% CI 0.8-15.5, p=0.009).

Stool samples from seven (88%) of eight guests and four (80%) of five foodhandlers were positive for calicivirus. The fifth foodhandler had complained only of respiratory symptoms and denied having gastroenteritis.

This was an outbreak of calicivirus associated with a Christmas party held at a restaurant. While no single menu item was associated with illness, it's conceivable that essentially any item may have been contaminated with the virus. The source of contamination remains unknown, however, since no food preparers claimed to have been ill on or immediately before the December 6 party.

(42)
Calicivirus Gastroenteritis Associated with a Union Christmas Party

December Ramsey County

On Monday, December 11, 2000 the Minnesota Department of Health (MDH) received a foodborne illness complaint from a family of three. The family had attended a union Christmas party on the afternoon of Saturday, December 9. The party was attended by approximately 30 people. Food items served at the party were prepared in a private home. An investigation was initiated with the assistance of a St. Paul-Ramsey County Department of Public Health epidemiologist. A list of attendees and food items served at the party were obtained from the union. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the party. Stool samples from two cases were collected and submitted to MDH for bacterial and viral testing.

Twenty-six persons were interviewed; 15 (58%) met the case definition, nine (35%) reported no symptoms, and two (7%) had symptoms that did not meet the case definition and were excluded from further analysis. Twelve cases (80%) had diarrhea and cramps, nine (60%) had vomiting, nine (60%) reported fever, and no one reported bloody stools. No one was hospitalized. The median incubation was 30 hours (range, 6 to 105 hours), and the median duration of illness was 35 hours (range, 30 to 87 hours). The only food item significantly associated with illness was bread rolls (13 of 15 cases vs. 4 of 9 controls; odds ratio, 8.1; 95% confidence interval, 1.0 - 72.9; $p = 0.04$). A history of recent gastrointestinal illness was reported for five members of the household involved in food preparation for the party. In addition, two guests reported recent gastrointestinal illness. Both of the stool samples obtained tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. One of the two stool samples was positive for calicivirus.

This was an outbreak of calicivirus infection associated with a party. Bread rolls were associated with illness. The source of contamination may have been recently ill persons involved in food preparation for the event and/or recently ill persons who handled food items at the party.

(43)
Viral Gastroenteritis Associated with Submarine Sandwiches

December Scott County

On Thursday, December 28, 2000 the Minnesota Department of Health (MDH) received a foodborne illness complaint from a group of nine employees at a business in Savage. The group reported gastrointestinal illness after eating a common lunch of submarine sandwiches from a restaurant in Savage on Friday, December 22. A list of names and phone numbers of the lunch attendees were obtained. Epidemiologists from MDH interviewed the lunch attendees by phone about food consumption and illness history. A case was defined as any person who developed vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after eating lunch on December 22. An MDH sanitarian visited the restaurant on December 29 to determine if there were any ill food workers. A stool specimen was collected from one of the lunch attendees and submitted to MDH for bacterial and viral testing.

Seven of the nine lunch attendees were interviewed, and all seven (100%) met the case definition. Six cases (86%) had vomiting, five (71%) had diarrhea, four (57%) had cramps, two (29%) reported fever, and no one reported bloody stools. No one was hospitalized. The median incubation period was 29.5 hours (range, 21 to 33.5 hours). The median duration of illness was 41 hours (range, 34.5 to 48 hours). Because all those interviewed were ill, statistical analysis was not conducted; however, all of the ill persons ate submarine

sandwiches. The stool specimen submitted to MDH by a lunch attendee was negative for *Campylobacter, E. coli* O157:H7, *Salmonella, Shigella,* and calicivirus. The sample was collected 5 days after recovery.

The MDH sanitarian interviewed 11 restaurant workers. Two reported recent illness; one had diarrhea, cramps, and fever with onset on December 20. This worker made sandwiches on December 19 but did not report working on December 20, December 21, or December 22. The other worker had onset of vomiting and diarrhea on the evening of December 18 and reported recovering on the afternoon of December 19. The first day this employee reportedly returned to work was December 22.

The clinical and epidemiologic characteristics of these illnesses were consistent with viral gastroenteritis. The vehicle was submarine sandwiches from a restaurant. Ill foodhandlers were identified at the restaurant.

(44)
Calicivirus Gastroenteritis Associated with a Christmas Party in a Private Home

December Washington County

On December 26, 2000, the Minnesota Department of Health (MDH) received a complaint regarding a group of individuals who developed gastrointestinal illness after attending a private holiday party on the evening of December 23. Most items served at the party were prepared in private homes, including beef stroganoff, bread, salad, and pie. A cake served at the party was obtained from a local grocery store. The Washington County Department of Public Health and Environment (WCPHE) was subsequently notified by MDH, and the illnesses were investigated by WCPHE in cooperation with MDH and the Minnesota Department of Agriculture (MDA). Items served at the party included beef stroganoff, bread, salad, crackers, cake, and pie. Names and telephone numbers of party guests, menu items and where they were purchased were obtained. The party's host and hostess, along with party guests, were interviewed by WCPHE investigators about their food consumption at the party and their illness history prior to and following the party. For the purposes of this investigation, a case was defined as any person who attended the party and who subsequently became ill with diarrhea ($\geq$3 loose stools in a 24-hour period) and/or vomiting with an incubation period of 12 hours or greater. One stool specimen was submitted to MDH for bacterial and viral testing.

Twelve individuals, including both children and adults, attended the holiday party. Eight (67%) were interviewed, and five (63%) met the case definition. All cases reported diarrhea, vomiting and abdominal pains. None of the cases reported bloody stools. One case sought medical care for dehydration. Incubation periods ranged from 29 to 35 hours, with a median of 31 hours. The median duration of illness was 42 hours. The stool specimen submitted by a case was negative for *Campylobacter, E. coli* O157:H7, *Salmonella,* and *Shigella*. The specimen tested positive for calicivirus.

Given the small number of guests attending the private holiday party and the even smaller number of individuals that were interviewed, standard univariate analysis of data from the investigation was inconclusive. No food items were statistically associated with illness.

During the week of December 26, Minnesota Department of Agriculture personnel interviewed the bakery manager and bakery employees of the grocery store where a cake served at the party was purchased. No food workers reported illness during the 7 days before or after December 23. No sanitation deficiencies at the establishment were noted during the inspection.

This was an outbreak of calicivirus gastroenteritis associated with a holiday party at a private home. The vehicle and source of contamination were not identified.

(45)
Viral Gastroenteritis Associated with a Luncheon

December Crow Wing County

On January 3, 2001 the Crow Wing County Health Department (CWCHD) received a complaint of illness in persons who attended a service club luncheon on December 26, 2000, in Brainerd. A list of attendees and menu of foods served were obtained, and an investigation was begun by Minnesota Department of Health sanitarian ans epidemiologists. Starting January 5, persons were interviewed by telephone to obtain illness and food histories. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period)after attending the luncheon.

Forty-five persons were interviewed. Three persons were excluded from the analysis because they had mild gastrointestinal illness that did not meet the case definition. Of the 42 persons included in the analysis, 35 (83%) met the case definition. Twenty-nine (83%) had diarrhea, 33 (94%) had vomiting, 11 (31%) had fever, and one person reported bloody diarrhea. Incubation periods ranged from 7 to 74 hours, with a median of 33 hours. Duration of illness ranged from less than 1 to 163 hours, with a median of 50 hours. Hamburgers (33/35 cases vs. 3/7 controls; odds ratio [OR], 22; 95% confidence interval [CI], 2.0 to 329; p=0.004), and coleslaw (31/35 vs. 2/7; OR, 19; 95% CI, 2.1 to 232; p=0.003) were statistically associated with illness. Ice (29/33 vs. 3/6; OR, 7.3 ; 95% CI, 0.67 to 71; p=0.06), water (20/32 vs. 1/5; OR, 8.3 ; 95% CI, 0.75 to 413; p=0.07), and chips (34/35 vs. 5/7; OR, 14 ; 95% CI, 0.55 to 825; p=0.07) approached statistical significance.

Environmental inspection and interview of the three kitchen workers and manager revealed that one worker had been ill with gastrointestinal symptoms on Christmas Day and returned to work the next day to assist in preparation and serving of the luncheon group. The worker's duties included several tasks: laying out buns for hamburgers, placing pickles on buns, portioning cole slaw into cups, placing items on individual plates and helping serve patrons. The manager and a household member also reported gastrointestinal symptoms between Christmas Day and New Years Day.

The clinical characteristics of this outbreak are consistent with viral gastroenteritis. This outbreak is readily explained by transmission from a recently ill food worker who was involved in the handling, construction and serving of multiple food items implicated in the outbreak.

PROBABLE FOODBORNE OUTBREAKS

(1)
Gastroenteritis Associated with Sweet Rolls Served at a Meeting

January Nicollet County

On Wednesday, January 12, 2000 Brown-Nicollet Environmental Health Service forwarded a foodborne illness complaint to the Minnesota Department of Health (MDH) South Central District epidemiologist. The complaint involved four men who had attended a meeting held at a hotel in North Mankato on Friday, January 7. The men denied any other common food exposures. Items served at the day-long meeting included coffee, juice, milk, sweet rolls and muffins, a pork tenderloin lunch, cookies, brownies, and soda. Lists of attendees, phone numbers, and foods and beverages served were obtained from event organizers. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the event. A sanitarian from Brown-Nicollet Environmental Health Service inspected the facility on January 13. No stool samples were collected.

Twenty-five attendees were interviewed. Three attendees (12%) met the case definition, 21 (84%) reported no symptoms, and one (4%) reported mild gastrointestinal symptoms that did not meet the case definition and was excluded from further analysis. All three cases (100%) had diarrhea and cramps with onset on January 7 and January 8; none reported vomiting or fever. The median duration of illness was 11.5 hours (range, 7 to 18 hours). The only food item statistically associated with illness was sweet rolls (3 of 3 cases [100%] cases vs. 6 of 21 [29%] controls; odds ratio, undefined; 95% confidence interval lower bound, 1.1; $p = 0.04$). The median incubation period from the time the sweet rolls were served was 9 hours (range, 8.5 to 22 hours). No information was available on the preparation of the implicated item. The sanitarian identified some critical foodhandling violations, including lack of an ill employee policy and lack of monitoring and recording procedures for time/temperature processes.

Although the symptoms and incubation periods reported by the three ill persons were consistent with illness caused by a bacterial intoxication, an etiology could not be determined with the number of cases. Although sweet rolls were epidemiologically implicated as the vehicle, a source of contamination was not determined.

(2)
Calicivirus Gastroenteritis Associated with a Restaurant

January Hennepin County

On January 18, 2000 the Hennepin County Community Health Department (HCCHD) received a foodborne illness complaint about a restaurant in Maple Grove. The caller stated that a group of that nine of 22 family members had become ill with gastrointestinal symptoms after eating at the restaurant on January 15. The family members had gathered earlier in the afternoon for a baptism, went to the restaurant for a meal, and then went to a family home for pie purchased at a local pie shop. Three families came from out of state and were together for the first time at the baptism and meal at the restaurant. The caller reported that the illnesses began early the morning of January 17.

The caller provided HCCHD with a list of family members, and individuals were interviewed by HCCHD epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after dining at the restaurant. A HCCHD sanitarian contacted the manager of the restaurant to determine products served, illness history of employees, and if other

complaints were received. Two stool specimens from cases were submitted to the Minnesota Department of Health (MDH) for bacterial and viral testing.

Twenty of the 22 family members (91%) were interviewed. Six (30%) met the case definition, for an attack rate of 27%. Symptoms reported were diarrhea (100%), abdominal pain (50%), nausea (50%), chills (50%), muscle aches (33%), vomiting (17%), and fever (17%). Incubation periods ranged from 22 to 34 hours and duration of illness ranged from 1 to 2 days. Both stool samples tested at MDH were negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. One of the two samples was positive for calicivirus. Two of family members worked in daycare settings and denied any recent gastrointestinal illnesses in their workplaces. Another family member worked at a nursery school where children had recently been absent for unknown reasons. Statistical analysis of foods consumed was inconclusive.

This was a probable foodborne outbreak of calicivirus. Because the group had other meals in common in the same time period, the source of the illnesses was not conclusively determined.

(3)
Calicivirus Gastroenteritis Associated with a Gathering in a Private Home

January Ramsey County

On January 18, 2000, the Minnesota Department of Health (MDH) was notified through the foodborne illness hotline of an outbreak of gastrointestinal illness among eight persons who attended a family gathering in Roseville on January 16. The eight attendees were from three different households. A list of attendees and food items served were obtained from the host. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea after attending the gathering. Diarrhea was defined as three or more loose stools in a 24-hour period. Stool samples from two cases were collected within four days of illness onset and submitted to MDH for bacterial and viral testing.

A sanitarian from the Minnesota Department of Agriculture (MDA) took leftover cheesecake served at the party and samples of the an unopened cheesecake sampler of the same brand served at the party from a grocery store in Roseville. MDA tested the cheesecake for coliforms, *E. coli* O157:H7, and *Salmonella*. Samples were also sent to MDH for viral testing.

Eight (100%) of eight attendees were interviewed and eight (100%) met the case definition. Seven cases (88%) reported vomiting, five cases (63%) reported diarrhea, and three cases (38%) reported fever. Dates of illness onset were January 17 and 18. The incubation period ranged from 17 to 37 hours, with a median of 26 hours. Duration of illness was 3 to 36 hours, with a median of 11 hours. A two-year old child at the gathering had diarrhea with onset the morning of the gathering and recovery later that day. This child reportedly developed vomiting and diarrhea 36 hours after the gathering.

Cases consumed a variety of foods at the family gathering: bratwurst, chicken wings, smokies, hamburgers, chips, sour cream dip, and cheesecake. There were no non-ill attendees; therefore, no food items could be statistically associated with illness. Cheesecake was the only food item consumed by all of the attendees. The group denied having any meals in common prior to the gathering. Both of the two stool samples tested were negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. The stool sample from the two-year old child was negative for calicivirus, and the stool sample from the eight-month old sibling of the two-year old child tested positive for calicivirus.

The cheesecake samples tested at MDA were negative for coliforms, *E. coli* O157:H7, and *Salmonella*. The samples were negative for calicivirus when tested by MDH; however, procedures for testing food for the presence of calicivirus are still being developed.

This was a probable foodborne outbreak of gastroenteritis caused by calicivirus. No vehicle was confirmed for this outbreak; because it was reported that an ill child was at the gathering person-to-person transmission cannot be ruled out.

(4)
Viral Gastroenteritis Associated with a Church Potluck

January Ramsey County

On February 2, 2000 the Minnesota Department of Health (MDH) received a complaint through the foodborne illness hotline from a person who had eaten at a potluck held at a church in St. Paul at 5:00 p.m. on January 25. The event was attended by approximately 20 people. Items served included soup, stir fry, steak, lasagna, crackers, and dip. The complainant reported that she and at least three others had become ill with gastrointestinal symptoms subsequent to attending the potluck.

Epidemiologists from MDH interviewed attendees by phone about food consumption and illness history. A case was defined as any person who ate at the church and subsequently developed vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). The minister at the church where the event was held was contacted in an attempt to obtain a complete list of attendees. No stool samples were collected.

The original complainant reported vomiting and diarrhea with an incubation period of 24 hours and a 62-hour duration of illness. Another attendee reported vomiting and diarrhea with an incubation period of 21 hours and had a 9-hour duration of illness. The minister refused to cooperate with the investigation, so no other attendees could be contacted.

This was a probable foodborne outbreak associated with a church potluck. The clinical characteristics of the reported illnesses were consistent with viral gastroenteritis. Lack of cooperation from the minister of the church precluded an adequate investigation of the event.

(5)
Viral Gastroenteritis Associated with a Convenience Store

February Pipestone County

On February 8, 2000 the Minnesota Department of Health (MDH) was notified by a sanitarian from the MDH Marshall District Office of a foodborne illness complaint about a fast food establishment located in a convenience store in Pipestone. On February 11, MDH received a separate complaint concerning the same establishment, and an investigation was initiated.

Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after eating at the restaurant. No stool samples were collected. On February 14, a sanitarian from the Minnesota Department of Agriculture (MDA) inspected the establishment.

The first complaint involved two persons who ate at the establishment on the evening of February 5. They denied any other common meals. As reported by one member of the party, both had onset of illness on February 6 with a 28-hour incubation period. Both reported vomiting, cramps, chills, and fever with a 6.5-hour duration of illness.

The second complaint involved four persons who also ate at the establishment on the evening of February 5. Three (75%) met the case definition; the fourth person had milder gastrointestinal symptoms. Two cases (67%) had vomiting and two (67%) had diarrhea. No information was collected about fever. Incubation periods were 32, 37, and 46 hours. Illness durations were 9, 17, and 24 hours. These four persons had also shared other food items prior to eating at the establishment.

The MDA sanitarian interviewed food workers and did not identify any recently ill employees. The restaurant management denied any additional complaints. The sanitarian observed extensive bare-hand contact with ready-to-eat food items and recommended that this practice be discontinued.

This was a probable foodborne outbreak of viral gastroenteritis. Due to the lack of systematically collected information on symptoms and food consumption, the association between the restaurant and the illnesses could not be confirmed.

(6)
Hepatitis A Virus Infections Associated with a Party

February Washington County

On March 17, 2000, the Minnesota Department of Health (MDH) was notified of one confirmed and one suspected case of hepatitis A virus in residents of Washington County. Approximately one month prior to the onset of symptoms, both cases had attended a party at a prior home where foods were prepared and then served by a sales representative demonstrating the use of cooking products.

A suspected case of hepatitis A was defined as an individual reporting any of the following symptoms after attending the party: fever, headache, malaise, fatigue, anorexia, nausea, vomiting, abdominal pain, tea-colored urine or jaundice. A confirmed case of hepatitis A was defined as an individual with positive hepatitis A-specific IgM antibody test or an individual with discrete onset of symptoms and jaundice or elevated hepatic aminotransferase levels who was epidemiologically-linked to a laboratory-confirmed case.

Party attendees were contacted by the host and informed of a possible exposure to hepatitis A virus. Because more than 14 days had passed since the party, immune globulin (IG) was not recommended to attendees. IG was recommended for household contacts of cases and children attending a childcare program where two cases were employed.

Four confirmed cases of hepatitis A were identified among party attendees. No secondary cases were identified. All cases had symptom onset 3 to 5 weeks after the party, and the party was the only common activity identified among all four cases. However, one case also had traveled to the Caribbean during her incubation period, which may have been the source of her exposure to hepatitis A virus. This case had the earliest onset (approximately 3 weeks after the party). All of the cases had eaten all food items prepared at the party, and none of the attendees reported illness within their households prior to the party. Therefore, neither a suspect food item nor a definite index case of hepatitis A could be identified, and person-to-person transmission or other exposures could not be ruled out.

(7)
Gastroenteritis Associated with a Restaurant

February Rock County

On February 28, 2000 the Minnesota Department of Health (MDH) was notified though the foodborne illness hotline of an outbreak of gastrointestinal illness among persons who attended a family gathering on February 25-February 26. The 16 attendees were from six different households. All 16 attendees ate at a restaurant in Luverne on the evening of Saturday, February 26. In addition, 12 attendees ate at a barbecue at a private home in Edgerton on the afternoon of February 26, eight attendees ate a breakfast that included bakery rolls from a local grocery store and orange juice at the home on February 26, and eight attendees ate a dinner of ham, baked potatoes, and canned corn at the home on Friday, February 25. A list of attendees and food items served at the private home were obtained from the host. A menu was obtained from the restaurant by a sanitarian from Nobles-Rock Public Health Service. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea after attending the gathering. Diarrhea was defined as three or more loose stools in a 24-hour period. Stool samples from two cases were collected and submitted to MDH for bacterial and viral testing; both cases had recovered by the time of specimen collection.

Sixteen (100%) of 16 attendees were interviewed and six (38%) met the case definition. All six cases (100%) reported diarrhea, two (33%) reported vomiting, and two (33%) reported fever. No cases reported bloody diarrhea. Dates of illness onset were February 27 (n = 4) and February 28 (n = 2). The median duration of illness was 24 hours (range, 5 to 70 hours). Eating dinner at the private home on Friday approached statistical significance (5 of 8 exposed ill vs. 1 of 8 non-exposed ill, risk ratio, 5.0; 95% CI, 0.7 - 33.8; p = 0.06) as did eating breakfast at the private home on Saturday (5 of 8 exposed ill vs. 1 of 8 non-exposed ill, risk ratio, 5.0; 95% CI, 0.7 - 33.8; p = 0.06). Friday dinner and Saturday breakfast both had an attack rate of 63% (5 of 8 exposed became ill). The Saturday barbecue had an attack rate of 50% (6 of 12 exposed became ill); eating olives at this meal approached statistical significance (3 of 4 exposed ill vs. 2 of 11 non-exposed ill, risk ratio, 4.1; 95% CI, 1.0 - 16.3; p = 0.08). The Saturday dinner at the restaurant had an attack rate of 38% (6 of 16 exposed became ill); illness was associated with T-bone steak (3 of 3 exposed ill vs. 3 of 13 non-exposed ill, risk ratio, 4.3; 95% CI, 1.6 - 11.7, p < 0.04) and french onion soup (3 of 3 exposed ill vs. 3 of 13 non-exposed ill, risk ratio, 4.3; 95% CI, 1.6 - 11.7, p < 0.04).

The data was reanalyzed excluding the two cases with onset on February 28 that could have been secondary cases. Friday dinner and Saturday breakfast both had an attack rate of 50% (3 of 6 exposed became ill). The Saturday barbecue had an attack rate of 40% (4 of 10 exposed became ill). Eating olives at this meal was associated with illness (3 of 4 exposed ill vs. 0 of 9 non-exposed ill, risk ratio, undefined; p = 0.01). The Saturday dinner at the restaurant had an attack rate of 25% (4 of 16 exposed became ill); illness was associated with T-bone steak (3 of 3 exposed ill vs. 1 of 11 non-exposed ill, risk ratio = 11.0; 95% CI, 1.7, 71.3; p = 0.01). Eating french onion soup (2 of 2 exposed ill vs. 2 of 12 non-exposed ill, risk ratio = 6.0; 95% CI = 1.7, 21.3; p = 0.07) and hashbrowns (2 of 2 exposed ill vs. 2 of 12 non-exposed ill, risk ratio = 6.0; 95% CI = 1.7, 21.3; p= 0.07) approached statistical significance.

The sanitarian from Nobles-Rock Public Health Service did not identify any ill food workers at the restaurant.

The two stool samples obtained tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus.

Due to the small number of cases, the lack of laboratory identification of an agent, and the fact that the ill persons shared multiple meals over the course of the weekend, the vehicle of transmission and source of contamination could not be conclusively identified. Person to person transmission could not be ruled out.

(8)
Calicivirus Gastroenteritis Associated with a Restaurant

March Ramsey County

On March 15, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among seven persons, representing four households, from an extended family who attended a meal together at a restaurant in Roseville. Main entrees were ordered off the menu; however, the family shared an appetizer sampler of deep-fried vegetables, chicken wings, potato skins with sour cream, shrimp in sauce, and dips. The meal was served at approximately 8:30 p.m. There were no other recent common meals or exposures among the group.

Lists of foods consumed during the meal were obtained. Persons were interviewed about food consumption at the restaurant and illness history by MDH epidemiologists. A case was defined as any person who had attended the event and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period). Two stool samples were collected and submitted to MDH for bacterial and viral pathogen testing.

All of the 7 attendees were interviewed, and they all met the case definition. All cases had diarrhea, six (86%) had vomiting, four (57%) had fever, and one (14%) had bloody stools. Dates of illness onset were March 11 and March 12. Incubation periods ranged from 7.5 - 31.5 hours, with a median of 27.5 hours. Duration of illness ranged from 33 - 39 hours, with a median of 35.5 hours (however, three patients had ongoing symptoms at the time of the interview). The head chef at the restaurant was interviewed by a sanitarian from Ramsey County, and none of the food workers had reported illness within 7 days of the event. One of two (50%) stool samples tested positive for calicivirus. Both stool samples were negative for *Campylobacter,* E. *coli* O157, *Salmonella* and *Shigella*; one stool sample was positive for calicivirus.

There were no other complaints of illness from patrons of the restaurant regarding the day of the outbreak or during the week preceding and the week following the outbreak. Since all of the members of this party became ill, it was not possible to associate specific food item(s) with the illness.

The clinical features of this outbreak are characteristic of viral gastroenteritis. The most plausible explanation for the outbreak is that the family member(s) with the short incubation period(s) was/were previously infected and shedding virus at the time of the meal, thus serving as the source of infection for other family members through contamination of shared food items (i.e., the appetizer sampler). However, person-to-person transmission could not be ruled out.

(9)
Gastroenteritis Associated with a Restaurant

March Hennepin County

On March 20, 2000 Minneapolis Division of Environmental Health received a complaint from a group of co-workers who became ill with gastrointestinal symptoms after having lunch together at a restaurant in Minneapolis on March 16. The Minnesota Department of Health (MDH) was notified of the complaint on March 21.

A list of persons in the group who ate lunch together was obtained. Persons were interviewed about food consumption and illness history by a Minneapolis Division of Environmental Health sanitarian and epidemiologists from MDH. A case was defined as any person who had lunch at the restaurant and who subsequently became ill with vomiting or diarrhea (≥3 loose stools in a 24-hour period). No stool samples were collected for pathogen testing. The establishment was inspected on March 20 by a Minneapolis Division of Environmental Health sanitarian.

Five of five (100%) persons were interviewed. Four persons (80%) met the case definition. Three (75%) cases reported diarrhea and two (50%) reported vomiting. None of the cases reported fever. Dates of illness onsets were March 16 and March 17. Incubation periods ranged from 0.5 to 14.5 hours, with a median of 9.5 hours. Illness duration ranged from 16 to 49 hours, with a median of 24 hours.

Persons in the group denied having other meals in common. Due to the small number of cases, and not having information on people who ate there but were not ill, statistical analysis was not possible. Cases ate a variety of foods: chicken chimichangas, beef enchiladas, pork, chiles rellenos, chiles con queso, and/or burritos. All persons in the group had chips, salsa and refried beans. Four persons had rice.

The inspection of the establishment found improper cooling of the beans and salsa.

This was an probable outbreak of gastroenteritis associated with eating at a restaurant. The etiology of this outbreak was not determined, but the clinical characteristics are compatible with a toxin-mediated bacterial gastroenteritis consistent with inadequate cooling of foods. A specific food vehicle was not identified.

(10)
Viral Gastroenteritis Associated with a Birthday Party

April Washington County

On Wednesday, April 5, 2000 the Minnesota Department of Health (MDH) received a foodborne illness complaint through the foodborne illness hotline. The complaint was forwarded onto Washington County Department of Public Health and Environment (WCDPHE) the same day. The complaint concerned an outbreak of gastrointestinal illness among persons who attended a birthday party held on Saturday, April 1. A total of 18 individuals attended the midday birthday party at a restaurant and movie theater in Woodbury. Lists of food items served during the birthday party, attendees, and food handlers were obtained. WCDPHE investigators interviewed persons attending the birthday party about their food consumption at the party and their illness history. The food service establishment (a local restaurant and movie theater where birthday parties are commonly held) was also interviewed regarding health history of employees, other patron and complaints, and food handling and preparation practices. A case was defined as any person who attended the event and who subsequently became ill with vomiting or diarrhea (≥3 loose stools in a 24-hour period). Two stool specimens was collected and submitted to MDH for bacterial and viral testing.

Eighteen (100%) guests were interviewed, and 12 (75%) met the case definition. Three individuals were excluded from further analysis: a symptomatic individual not meeting the case definition and two non-symptomatic individuals with gastroenteritis prior to the event. Eleven cases (92%) had cramps, 9 had diarrhea, 9 (75%) had vomiting, and 3 (25%) had fever. None of the cases reported bloody stools. Dates of illness onset for case-patients attending the party ranged from April 2 to April 4. The two additional cases of gastrointestinal illness preceded the event by approximately 48 hours. Incubation periods for all cases ranged from 11 - 59 hours, with a median of 35 hours, and the duration of illness ranged from 10-66 hours, with a median of 22 hours.

All food items served at the birthday party were commercially prepared and served to the party's tables in the movie theater. No food workers at the restaurant reported illness within 7 days of the event. However, the hostess of the party reported that her two children (ages 5 and 8 years old) were ill with vomiting and diarrhea less than 2 days prior to the birthday party. Both children and their parents attended the party. Their parents assisted in the service of foods and beverages to the children. The pizza was served family style, with children often helping themselves. Cheese pizza (odds ratio, 9.0; 95% confidence interval, 0.5 to 359.4; p=0.08) approached a statistically significant association with illness.

Stool specimens from two cases tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, and calicivirus.

The clinical and epidemiologic characteristics of these illnesses were consistent with viral gastroenteritis. The probable vehicle was pizza served at a birthday party attended by recently ill children. However, person-to-person transmission cannot be ruled out.

(11)
Gastroenteritis Associated with a Private Party

May Anoka County

On May 4, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among persons who shared a common meal on May 1 at a private home. Seven people in three families shared the meal of four submarine sandwiches purchased from a restaurant in Fridley, potato chips, soda pop, and a cake purchased from a bakery. Lists of foods served during the meal and attendees were obtained from the person who hosted the party. Two of the three families were from out of state, and their food consumption and illness history were provided to MDH epidemiologists by the hostess of the meal. A case was defined as any person who had attended the event and who subsequently became ill with vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period).

A sanitarian from Anoka County Community Health and Environmental Services (ACCHES) visited the restaurant and interviewed the manager and the food workers that worked on May 1. ACCHES also contacted the bakery where the cake was purchased by telephone.

Four (57%) of seven attendees met the case definition. Diarrhea was reported for four (100%) cases, vomiting was reported for three cases (75%), fever was reported for two cases (50%), and abdominal cramps were reported for two cases (50%). Dates of illness onset were May 3 and May 4. Reported incubation periods ranged from 32 to 46 hours, with a median of 35 hours, and duration ranged from 7 to 34 hours, with a median of 13 hours.

The restaurant manager reported that there were no ill food workers in the 7 days prior to May 1. The food workers that worked on May 1 denied any illness within 7 days of the event. The bakery manager reported not having a record of any ill bakery workers in the 7 days prior to the event.

The hostess of the party reported that she divided four sandwiches among the seven adults that attended the party. All adults ate a sandwich, chips, and the cake. Additionally, a baby that did not become ill consumed some frosting from the cake.

This was a probable foodborne outbreak of viral gastroenteritis. Due to the small number of cases and lack of firsthand information from attendees, the vehicle and source of contamination could not be determined.

(12)
Gastroenteritis Associated with a Restaurant

May Dakota County

On May 17, 2000 an individual called the Minnesota Department of Health (MDH) foodborne illness hotline and reported that she and a co-worker both developed gastrointestinal symptoms after eating at a restaurant in Eagan at approximately noon on May 16. The complainant reported that another co-worker who ate at the restaurant shortly after they did also became ill. The complainant denied any other common meals with either of the other two co-workers.

Epidemiologists from MDH interviewed the original complainant and the co-worker she ate with about food consumption and illness history. A case was defined as a person with onset of diarrhea ($\geq$3 loose stools in a 24-hour period) or vomiting after eating at the restaurant. The third co-worker declined to be interviewed. On May 17, May 18, and May 22, the consulting sanitarian from the Metro District Office of MDH Environmental Health Services inspected the restaurant. A stool sample was collected from the original complainant and submitted to MDH for bacterial, bacterial toxin, and viral testing.

Of the two patrons interviewed, one had onset of diarrhea and cramps 8 hours after the meal, and the duration of illness was 14 hours. The other patron had onset of diarrhea and cramps 12 hours after the meal, and had not recovered at the time of the interview on May 17. Both ate chicken burritos. No case-control study could be conducted because there was no way to identify other patrons.

A routine inspection of the restaurant had been conducted by an MDH sanitarian on May 17, before the complaint was received. At that time, problems with improper cooling of chicken were found. Cooked chicken was left on the stove prior to cooling in a walk-in cooler. The temperature of this chicken was unsafe (109-110 degrees F). This violation was reported to restaurant management on May 17, but this practice was observed again during the inspection of May 18, after the complaint was received. Cold foods such as cheese, sour cream, and guacamole were also found to be held at unsafe temperatures at the food prep table. The sanitarian again made recommendations about safe foodhandling practices and the temperature violations were corrected by the time of the May 22 inspection. No employees reported recent gastrointestinal illness when interviewed by the sanitarian.

The stool sample tested by the MDH Public Health Laboratory was negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, *Shigella*, *Bacillus cereus*, and *Staphylococcus aureus*. The stool tested positive for *Clostridium perfringens* enterotoxin A and calicivirus. The calicivirus PCR product was confirmed by sequencing.

This was an probable outbreak of gastroenteritis associated with a restaurant. Due to the small number of cases, no specific food vehicle could be confirmed. Cooked chicken that was subject to temperature abuse prior to serving was a plausible vehicle. The incubation period, clinical symptoms, and the possible vehicle (mishandled chicken) are consistent with *Clostridium perfringens* intoxication. An explanation for the concurrent detection of calicivirus in the stool sample was not forthcoming. Other common exposures among the co-workers cannot be ruled out as the source of the illnesses.

(13)
Calicivirus Gastroenteritis Associated with a Bridal Shower

July McLeod County

On July 13, 2000 the Minnesota Department of Health (MDH) was contacted by the manager of a grocery store in Hutchinson. The store had received a complaint from the host of a bridal shower stating that at least 11 people who had attended the shower were ill with gastrointestinal symptoms. The shower was held on the afternoon of July 9 at an auditorium in Silver Lake and was attended by approximately 60 people. Food items served at the shower were bought from the grocery store or prepared in private homes by the host and two other people.

A list of attendees and food items served at the shower were obtained from the host. Individuals were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the shower. Stool samples from five cases were collected and submitted to MDH for bacterial and viral testing.

On July 18, a sanitarian from the Minnesota Department of Agriculture (MDA) inspected the grocery store and interviewed food workers about illness history.

Forty-six attendees were interviewed, and 17 (37%) met the case definition. Fifteen cases (88%) had diarrhea, 11 (65%) had vomiting, and seven (50%) reported fever. The median incubation period was 38 hours (range, 6.5 hours to 61 hours), and the median duration of illness was 49 hours (range, 27 hours to 70.5 hours). The only food item that approached a statistically significant association with illness was ham (13 of 16 cases vs. 15 of 28 controls; odds ratio, 3.8; 95% confidence interval, 0.9 - 19.1; $p = 0.07$). The baked and sliced ham had been bought from the grocery store on July 8, refrigerated, and kept warm in a crock pot at the shower.

The sanitarian from MDA did not identify any critical foodhandling violations at the grocery store on July 18. The employee at the grocery store's meat department who sliced the ham and other meat department employees denied any recent illness or any ill family members. None of the people who prepared food in their homes for the shower reported any illness in themselves or in their household prior to the shower.

All five stool samples obtained tested negative for *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. Four of the five stool samples were positive for calicivirus.

This was an outbreak of calicivirus infection associated with a bridal shower. Although consumption of ham was associated with an elevated risk of illness, the vehicle of the outbreak was not conclusively identified, and the source of contamination is unknown. Person-to-person transmission or other exposures cannot be ruled out as the cause of the outbreak.

(14)
Gastroenteritis Associated with Restaurant Meals

July Stearns County

On July 14, 2000, the St. Cloud City Health Department (SCCHD) was notified by a country club food service manager that three of twelve persons had become ill after eating at the establishment the previous day. An investigation was conducted by SCCHD to determine the source of illness. SCCHD contacted the business whose twelve employees had eaten at the restaurant and an environmental inspection of the facility was conducted. Illness in employees and other patrons was assessed. A case was defined a person with vomiting or

diarrhea (≥3 loose stools in a 24-hour period) after eating at the country club. A sample of pepper sauce, eaten by those who were ill, was sent to the Minnesota Department of Health for testing.

Three (25%) of 12 persons experienced gastrointestinal illness. Two of the three met the case definition, with an identical incubation period of 1.5 hours until onset of symptoms. All three had eaten an identical entrée: salmon steak with pepper sauce and cheese ravioli, with differing salads, soup, beverages and dessert. No one else in the group had eaten salmon steak or cheese ravioli. No others in the group were ill.

A sample of pepper sauce served on the salmon steaks did not grow out *Staphylococcus* or *Clostridium* species. *Staphylococcus aureus* enterotoxins A, B, C and D were not found. A total plate count of 1500 organisms per gram sample was cultured, consisting of *Enterobacter* and *Pseudomonas* species as well as *Streptococcus viridans.* No stool samples were obtained.

An environmental inspection of the establishment found adequate food holding and storage temperatures. Recommendations were made for dating, holding and remaking of sauces used in the restaurant. No food service workers or other patrons of the restaurant were found to have been ill.

A 72-hour food history of the ill patrons discovered that all three had also eaten at the same St. Cloud sub shop for lunch on July 12. If this was their source of illness, their incubation was in the range of 29.5 to 35.5 hours. Followup with the sub shop found no reports of ill patrons or food service workers.

The clinical and epidemiologic characteristics of this outbreak are consistent with foodborne gastroenteritis of an unknown etiology. A thorough food history of those ill detected a second potential source of common exposure.

Looking only at the country club exposure, *Staphylococcus aureus* enterotoxin, with a rapid onset of symptoms, might be suggested as the vehicle. However, exposure from food at the sub shop, with illness onset 29 to 36 hours later, might suggest that calicivirus was the vehicle.

This small outbreak, with its limitations for statistical analysis, demonstrates the importance of conducting in depth interviews as well as the potential importance of stool sample results. Additional information gathered by interview detected not only another potential source of illness, but also the possibility of a completely different etiologic agent.

(15)
Calicivirus Gastroenteritis Associated with a Company Picnic

September Dakota County

On September 18, 2000 the Minnesota Department of Health (MDH) received a complaint from a person who developed gastrointestinal illness after attending a company picnic held on September 14. MDH contacted the company, who confirmed that an outbreak of gastrointestinal illness among picnic attendees had occurred. Company staff had conducted their own epidemiological investigation, but were unable to determine the cause of the outbreak. All the food was prepared by attendees of the picnic. Lists of foods served during the picnic were obtained. Copies of all the internal investigation questionnaires filled out by picnic attendees were obtained by MDH. Additional questions regarding illness history and food exposures were sent to picnic attendees. A case was defined as any person who had attended the event and who subsequently became ill with vomiting or diarrhea. Diarrhea was defined as three or more loose stools in a 24-hour period. Five stool samples were collected for bacterial and viral pathogen testing.

Fifty-five (59%) of 94 picnic attendees completed questionnaires. Twelve persons were excluded from the analysis because they experienced mild gastrointestinal illness that did not meet the case definition. Of the 43 persons included in the analysis, 24 (56%) met the case definition. Twenty-two (92%) cases reported diarrhea, 13 (54%) reported vomiting, and two (8%) reported fever. Incubation periods ranged from approximately 14 to 48 hours, with a median of 24 hours. Illness duration ranged from 14 to 38 hours, with a median of 22 hours. All five stool samples tested negative for *E. coli* O157:H7, *Shigella*, *Salmonella,* and *Campylobacter*. Four of the five stool samples tested positive for calicivirus.

Foods served included chicken, hamburgers, beans, macaroni salad, lettuce, tomatoes, carrot sticks, pretzels, potato "sticks", cake, snow cones and canned beverages. No food items were associated with illness in the statistical analysis.

This was an outbreak of calicivirus gastroenteritis among persons who attended a picnic. This was a point-source outbreak; however, it was unclear if food was a vehicle.

(16)
Viral Gastroenteritis Associated with a Hotel Luncheon

September Hennepin County

On Monday, October 2, 2000 the City of Bloomington Environmental Health (CBEH) was notified by the Minnesota Department of Health of a complaint of gastroenteritis illness among persons who attended a conference luncheon at the Radisson South Hotel on Friday, September 29. Approximately 160 persons attended the conference. Banquet staff served a meal consisting of salad, ravioli primavera, bread sticks, cake, and refreshments at approximately 12:00 p.m. Attendees sat at tables in groups of six in the conference room, which was set up by banquet staff just prior to the conference.

A complete list of food items served during the banquet was obtained. CBEH staff interviewed attendees selected randomly from the registration list about illness history and food items consumed during the luncheon. A case was defined as a person who ate at the luncheon and subsequently became ill with vomiting and/or diarrhea, plus one other symptom. Diarrhea was defined as three or more loose stools in a 24-hour period. CBEH staff interviewed kitchen and banquet employees involved with the luncheon about illness history. A routine environmental health inspection was conducted with emphasis on banquet kitchen operations, banquet staff operations, and areas of the main kitchen associated with the luncheon (i.e., dishwashing area, saucier line). Thirteen stool specimen kits were delivered to banquet and kitchen employees, including five banquet staff, two cooks, one saucier, and five persons who wash dishes and/or assist in portioning plates prior to events. A stool specimen kit was also delivered to one patron.

Sixty-two of approximately 160 attendees (39%) were interviewed. Five of the 62 (8%) persons interviewed met the case definition. One case was excluded from analyses due to an incubation and duration which were inconsistent with the other cases. All four remaining cases reported diarrhea and cramps, one (25%) reported vomiting, two (50%) reported chills, and one (25%) reported fever. Illness onset ranged from 4.5 to 6.5 hours, with a median of 5.8 hours. Illness duration ranged from 1.5 to 4.0 hours, with a median of 2.5 hours. Two of the four persons meeting the case definition of illness were co-workers; three of the four sat at the same table during the conference. A vomitus specimen collected from an ill patron tested negative for bacterial pathogens, calicivirus, and bacterial toxins; however, the specimen had been kept at ambient temperature for several days before submission to the laboratory.

One banquet employee became ill with vomiting and diarrhea approximately 13 hours after the luncheon, with duration of illness of 13 hours. This banquet employee tested positive for *Clostridium perfringens* enterotoxin A;

however, the specimen was collected at least 6 days after illness recovery. Another employee who did report any gastrointestinal illness also tested positive for *Clostridium perfringens* enterotoxin A. A kitchen employee who assisted in portioning plates tested positive for *Bacillus cereus* toxin despite not reporting any gastrointestinal illness. All employees tested negative for *Salmonella, Shigella, Campylobacter, E. coli* O157:H7 and calicivirus. Results of the routine environmental health inspection revealed the following two issues needing correction: 1) banquet staff were observed handling tableware utensils with bare hands while setting tables and touching surfaces that come in contact with mouths and food; and 2) dishwashing employees were observed handling soiled dishes, then clean dishes without washing hands. No food items were associated with illness in the statistical analysis.

The clinical characteristics of this outbreak are compatible with a toxin-mediated bacterial gastroenteritis associated with eating at a luncheon at a hotel. It is unclear if the symptoms experienced by the ill food worker were caused by *Clostridium perfringens*, since the specimen was collected several days after illness recovery and vomiting due to *C. perfringens* is unusual. The positive laboratory results from the asymptomatic food workers most likely represent part of their normal intestinal flora or false positive tests. The specific food vehicle was not identified.

(17)
Gastroenteritis Associated with a Restaurant

October Anoka County

On Monday, October 16, 2000 a sanitarian with Anoka County Community Health and Environmental Services (ACCHES) contacted the Minnesota Department of Health (MDH) regarding a report of gastrointestinal illness among a group of parents and children, representing five different households, who had eaten together at a restaurant in Coon Rapids on the evening of Saturday, October 14. Foods served at the dinner included pizza, french fries, chicken fingers, and pasta. Initial investigation by ACCHES indicated that approximately five of the 14 attendees subsequently became ill.

A list of names and phone numbers of the attendees was obtained from ACCHES. Epidemiologists from MDH interviewed attendees by phone about food consumption and illness history. A case was defined as any person who developed vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after eating at the restaurant on October 14. An ACCHES sanitarian visited the restaurant on October 18 to determine if there were any ill food workers. No stool specimens were collected.

All 14 attendees were interviewed. Four (29%) met the case definition, seven (50%) reported no symptoms, and three (21%) reported gastrointestinal symptoms that did not meet the case definition and were excluded from further analysis. All four cases (100%) had vomiting and cramps, three (75%) had diarrhea, and two (50%) reported a low-grade fever. The median incubation period was 13 hours (range, 12.5 to 14.5 hours). The median duration of illness was 38 hours (range, 15 to 96.5 hours). Two of the cases were from different households and two were from the same household. The ages of the cases were 3, 7, 8, and 35 years old. Two were male and two were female. All four visited a hospital emergency room and two reported that they were hospitalized overnight. Of note, two of the four cases attended the same elementary school; the third case had an older sibling that attended the school, and the fourth case was the parent of children who attended the elementary school.

French fries (4/4 cases vs. 1/7 controls; odds ratio, undefined; p=0.02) and chicken fingers (3/4 cases vs. 0/7 controls; odds ratio, undefined; p=0.02) were significantly associated with illness. Environmental health assessment of the restaurant found no ill or recently ill foodhandlers, and no foodhandlers reported any recent gastrointestinal illness in their families. A review of the preparation of french fries and chicken fingers at the restaurant did not identify any problems, and minimal opportunity for bare-hand contact with these food items

prior to serving was noted. The clinical characteristics of these illnesses were consistent with viral gastroenteritis. However, the incubation periods from the time of the restaurant meal were shorter than the typical incubation period for viral gastroenteritis. No stool samples were available to determine etiology. Consumption of french fries and chicken fingers at the restaurant were statistically associated with illness. However, three of the cases were children linked to the same elementary school and the fourth case was a parent of one of the children. Therefore, person-to-person transmission or other exposures cannot be ruled out as the source of the illnesses.

(18)
Viral Gastroenteritis Associated with a Birthday Party

October Olmsted County

On Tuesday, October 17, 2000 a sanitarian at Olmsted County Public Health Services (OCPHS) received a complaint from a person who reported that several people became ill with diarrhea and vomiting following a birthday party in her home on Sunday, October 15. The complainant reported that the ill people had no other common exposure to the rest of the group except for the birthday party, and suspected the hot dogs caused the illness. Based on the initial information, an investigation was initiated.

A complete menu of the foods served at the party was obtained from the complainant, including the source of the foods, who prepared the foods, and a summary of how they were prepared and served. A list of party attendees and their phone numbers was provided to OCPHS. Attendees were interviewed by OCPHS investigators about their food consumption at the party and their illness history prior to and following the party. For the purposes of this investigation, a case was defined as any person who attended the party and who subsequently became ill with diarrhea ($\geq$3 loose stools in a 24-hour period) or vomiting. Although stool samples were requested from those reporting illness, no stool samples were submitted for testing.

Twenty-three persons attended the party; 18 were interviewed. Nine (50%) met the case definition. Nine cases (100%) had cramps, seven (78%) had diarrhea, three (33%) had vomiting, three (33%) had fever, and one (11%) had bloody stools. Incubation periods ranged from 2 to 41 hours, with a median of 34 hours. The duration of illness ranged from 5 to 54 hours with a median of 14 hours. Food and beverage items served at the birthday party included two different kinds of hot dogs, buns, potato chips, ketchup, mustard, a cake purchased from a local bakery, ice cream, pop, juice, and ice. No foods were statistically associated with illness. The Minnesota Department of Agriculture (MDA) was informed of the investigation because of their jurisdiction over the bakery where the cake was purchased. No other complaints about the bakery were received by MDA.

The person with the 2-hour incubation period was one of two people who served the hot dogs. It was also reported that the wife of this person was not at the party because of a similar gastrointestinal illness. In addition, a 6-year old child who was at the party had onset of symptoms 4 hours before the meal.

Based on the symptoms and distribution of incubation periods, this likely was an outbreak of viral gastroenteritis. Transmission of illness could have occurred through the foodhandler with the 2-hour incubation, but person-to-person transmission could not be ruled out due to the presence of a symptomatic child at the party.

(19)
Gastroenteritis Associated with a Hotel Banquet

November Hennepin County

On November 20, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among persons who attended a banquet at a hotel in Bloomington on November 18. Over 200 people attended the event. The City of Bloomington was notified, and an investigation was initiated.

A list of foods served during the banquet was obtained. A partial list of attendees was also obtained. Despite multiple attempts by the City of Bloomington and MDH, a complete list of attendees with phone numbers could not be obtained. Persons were interviewed about food consumption at the banquet and illness history by Environmental Health Specialists from the City of Bloomington and Epidemiologists from MDH. A case was defined as any person who had attended the event and who subsequently became ill with vomiting or diarrhea. One stool sample from a food service employee was collected for bacterial and viral pathogen testing. The hotel kitchen was inspected and food service employee illness assessed by an Environmental Health Specialist from the City of Bloomington. Thirty-six attendees were interviewed, and five (14%) met the case definition. Four (11%) cases were excluded from the analysis because they had mild gastrointestinal symptoms that did not meet the case definition or were ill prior to the event. Four (80%) cases reported diarrhea, two (40%) reported vomiting, two of four (50%) reported fever, and one of four (25%) reported bloody stools. Dates of illness onset were November 18 and November 19. Incubation periods ranged from 4 to 20 hours, with a median of 7 hours, and duration ranged from less than 1 hour to 13 hours, with a median of 6 hours. One food worker reported becoming ill with vomiting 1 hour after plating foods and tasting a sauce that was served at the banquet, with duration of illness of less than 12 hours. The stool sample from the food worker tested negative for *E. coli* O157:H7, *Shigella, Salmonella, Campylobacter*, calicivirus, but was positive for *Staphylococcus aureus*. No food items were associated with illness in the statistical analysis. The inspection of the establishment revealed that turkeys had been thawed on a cart at room temperature, and that the salad worker was not wearing gloves. No other problems were identified.

The clinical characteristics of this outbreak are compatible with a mild toxin-mediated bacterial gastroenteritis. It is unclear whether the illness among attendees was caused by *Staphylococcus aureus*. The specific food vehicle was not identified.

(20)
Gastroenteritis Associated with a Hotel Banquet

December Hennepin County

On December 14, 2000 the Minnesota Department of Health (MDH) was notified through the foodborne illness hotline of gastrointestinal illness among 11 co-workers who ate together at a restaurant in Raymond on December 7. A list of co-workers was obtained from the complainant, and those individuals were interviewed by MDH epidemiologists about food consumption and illness history. MDH was unable to obtain a list of other patrons who ate at Cheers on December 7. In addition, MDH contacted the care center where all 11 patrons are employed. The director of nursing at the care center reported that were no additional illnesses among employees or residents of the care center. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after eating dinner at the restaurant. No stool samples were collected from ill patrons. Eleven (100%) of 11 patrons were interviewed, and 10 (91%) met the case definition. Nine (90%) cases reported diarrhea, six (60%) reported vomiting, and five (50%) reported fever. Dates of illness onset were December 8 and 9. The median incubation period was 12 hours (range, 7 to 34 hours). The median duration of illness was 43 hours (range, 16 to 76 hours).

One employee was interviewed and reported having diarrhea throughout his shift on December 7. In addition, the employee reported that a family member had been ill with vomiting and diarrhea two days prior to his onset. The restaurant manager reported that the restaurant received no other complaints from ill patrons.

The co-workers all consumed the restaurant special of the day: fried chicken, lettuce salad, baked potato, and bread. In addition, several people reported sharing appetizers such as mozzarella sticks, fried vegetables, cheese balls, and onion rings. The co-workers denied any other common meals. Because their was only one non-ill person in the group, it was not possible to conduct meaningful statistical analyses to determine if there were any association between food items and illness.

The source of these illnesses was undetermined. The combination of the median incubation period plus signs and symptoms was not consistent with known foodborne pathogens if the restaurant was the source. The signs and symptoms were characteristic of viral gastroenteritis, but the median incubation period was too short to be consistent with the restaurant as the source of foodborne viruses. It is possible that the illnesses were due to person-to-person transmission or to an undetermined common exposure prior to the dinner at the restaurant.

(21)
Calicivirus Gastroenteritis Associated with a Christmas Party in a Private Home

December Ramsey County

On December 27, 2000 the Minnesota Department of Health (MDH) was notified of an outbreak of gastrointestinal illness among 11 persons who attended a Christmas dinner at a private home in Shoreview on December 24. Guests at the dinner were interviewed by MDH epidemiologists about food consumption and illness history. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) after attending the dinner. A stool sample was collected from one ill guest and submitted to MDH for bacterial and viral testing.

Eight (73%) of 11 attendees were interviewed, and seven (88%) met the case definition. Six (86%) cases reported vomiting, four (57%) reported diarrhea, and four (67%) reported fever. Dates of illness onset were December 25 and 26, 2000. The incubation period ranged from 6 to 42 hours, with a median of 32 hours. Duration of illness ranged from 5 to 55 hours, with a median of 33 hours.

The stool sample tested negative for *Shigella*, *E. coli* O157:H7, *Salmonella*, and *Campylobacter*. However, calicivirus was identified in the stool.

The majority of the cases reported eating prime rib, mashed potatoes, jello, green bean casserole, broccoli salad, bread and a variety of snacks, such as crackers, cheese spread, veggies and dip, nuts and cookies. No food items served at the dinner were significantly associated with illness. However, because only one non-ill person in the group was interviewed, it was not possible to conduct meaningful statistical analyses to implicate specific food items.

These gastrointestinal illnesses were caused by calicivirus and may have been caused by contamination of one or more food items served at the private dinner. However, no particular food items were associated with illness and person-to-person transmission could not be ruled out. The source of calicivirus was not determined.

(22)
Calicivirus Gastroenteritis Associated with a High School Basketball Team

December Olmsted County

During the weekend of December 30, 2000 the Minnesota Department of Health (MDH) on-call epidemiologist was notified of an outbreak of gastrointestinal illness among eight members of a high school basketball team who played in a varsity basketball tournament in Rochester on December 28 and 29. The high school also had a sophomore basketball team that competed in a separate tournament in Rochester on the same dates. A list of sophomore and varsity basketball players, coaches, cheerleaders, and student managers was obtained from the varsity basketball coach. Players, staff, and other members who attended the sophomore and varsity basketball tournaments were interviewed by MDH epidemiologists about illness history and food consumption during the tournament. A case was defined as a person with onset of vomiting or diarrhea ($\geq$3 loose stools in a 24-hour period) during or after the tournament. Three stool specimens were collected from players and submitted to MDH for bacterial and viral testing.

Persons interviewed reported eating meals at many restaurants throughout the duration of the tournament. Based on the cases' onset of symptoms and initial epidemiological analysis, only one of the restaurants appeared to be a potential source of exposure. Therefore, an Olmsted County sanitarian interviewed all staff at Restaurant A that prepared or served food for the varsity team members.

Thirty-nine (80%) of 49 varsity and sophomore players, coaches, managers, and cheerleaders were interviewed, and 15 (38%) met the case definition. Twelve (80%) cases reported vomiting, 12 (80%) reported diarrhea, and four (47%) reported fever. Dates of illness onset were December 29, 2000 through January 2, 2001.

The attack rates varied among the different groups associated with the event. Eleven (69%) of 16 varsity team players became ill. However, only four (19%) of 21 members of the other groups became ill. These included two (17%) of 12 sophomore team players, one (20%) of five cheerleaders, and one (50%) of two managers became ill. None of the coaches experienced any illness.

The meal date and time used to calculate provisional incubation periods was based on the first meal the majority of cases shared at Restaurant A on December 28 at 2:00 pm. Using this exposure, incubation periods ranged from 13 to 114 hours, with a median of 42 hours. Duration of illness ranged from 3 to 85 hours, with a median of 38 hours.

Three stool specimens were collected from players. The stool samples tested negative for *Shigella*, *E. coli* O157:H7, *Salmonella*, and *Campylobacter*. However, calicivirus was identified in all three stools.

None of Restaurant A's staff members reported any signs of illness.

Throughout the tournament, the sophomore basketball team ate separately from the varsity team. Most of the varsity players and members affiliated with the varsity team ate meals together at numerous restaurants and shared food items from coolers, such as doughnuts, oranges, apples, bananas, grapes, and bottled beverages.

The first analysis included only the varsity players, coaches, student managers, and cheerleaders. Being a player on the varsity team was significantly associated with illness (11/13 [85%] cases vs. 5/13 [38%] controls; odds ratio [OR], 8.8; 95% confidence interval [CI], 1.0 to 94.9; p=0.02). Consuming fruit, doughnuts, or beverages from the cooler was significantly associated with illness (12/13 [92%] vs. 7/13 [54%]; OR, 10.3; 95% CI, 0.8 to 284.8; p=0.04).

After excluding cases whose onset occurred before eating meals at Restaurant B and Restaurant C, meals at the two restaurants remained significantly associated with illness: Restaurant B (9/11 [82%] vs. 4/13 [31%]; OR, 10.1; 95% CI, 1.1 to 121.1; p=0.01) and Restaurant C (9/10 [90%] vs. 6/13 [46%]; OR, 10.5; 95% CI, 0.81 to 299.4; p=0.04).

The second analysis examined only the varsity basketball players. None of meals or food items were significantly associated with illness.

This was an outbreak of calicivirus infections among basketball players and affiliated team members. This outbreak may have been caused by contamination of food or beverages in the coolers and/or person-to-person transmission throughout the tournament.

The sophomore basketball team was not included in the food consumption analysis because they had very different exposures than the varsity basketball players and associated team members. The varsity players, coaches, managers, and cheerleaders rode the bus together, consumed food and beverages from coolers, ate many meals together, played basketball together, and roomed together at the hotel. For these reasons, analyses that included the varsity group and varsity team only were considered.

Within the varsity group (including coaches, cheerleaders, and managers), being a player remained significantly associated with illness. People affiliated with the varsity team ate together at many restaurants and came into contact with each other frequently throughout the tournament. The environmental health investigation and lack of epidemiological significance indicate that the meal at Restaurant A was not associated with illness. Although meals from Restaurant B and Restaurant C were significantly associated with illness in the analysis, they do not appear to be a source for the outbreak since several cases' onset of symptoms was before those meals occurred. Consuming food or beverages from the coolers was significantly associated with illness. Contamination of food items in the cooler may have been a source of exposure. One individual reported being ill with vomiting sometime during the week before the tournament. Therefore, person-to-person transmission throughout the tournament is also a likely source of illness given the frequency of contact among the players, coaches, managers, and cheerleaders of the varsity team.

CONFIRMED WATERBORNE OUTBREAKS (DRINKING WATER)

(1)
Giardiasis Associated with Drinking Water at a National Wildlife Refuge

June Aitkin County

On July 3, 2000 personnel from a U.S. Fish and Wildlife Service area in Aitkin County requested that the Minnesota Department of Health (MDH) Environmental Health Services test well water at a national wildlife refuge in Aitkin County. There were reports of gastrointestinal illness among staff at the refuge. Staff and their families had began using a maintenance complex as living quarters in mid-May. Water from the well serving this complex was positive for coliform bacteria, and MDH recommended that the staff stop drinking the water. Further inspection by MDH found that a drain line from the well pit was connected to the sewer line, allowing fresh sewage to enter the well pit. On July 13, orders were given to immediately stop using the water supply serving the maintenance complex for any purpose.

On July 18, a list of staff and relatives of staff that had used the maintenance complex was obtained from the wildlife refuge site manager. Persons were interviewed by MDH epidemiologists about exposures and illness history. A case was defined as any person with onset of diarrhea ($\geq$3 loose stools in a 24-hour period) subsequent to working at or visiting the maintenance complex at the refuge. Stool kits were distributed at the refuge and six people mailed kits to MDH for parasitic and bacterial testing.

All 13 people on the list provided by the site manager were interviewed. Twelve of 13 (92%) fit the case definition; one person had milder symptoms that did not meet the case definition and was excluded from further analysis. All 12 cases (100%) had diarrhea, 10 (83%) had cramps, four (33%) had vomiting, one (8%) had bloody stools, and no one had fever. Onset dates of illness ranged from June 10 to July 3. The median duration of illness was 17 days (range, 7 to 24 days). Two cases reported recovery and then relapsing for 3 days each. Both these patients were treated with metronidazole after the relapse and recovered. Nine (75%) visited a physician for their illness; none were hospitalized. Ten cases (83%) reported that they were treated with antimicrobials for their illness; of the eight that could recall the name of the antimicrobial agent, three reported treatment with metronidazole (Flagyl), three with ciprofloxacin, and two with cephalexin. All 12 of the cases reported drinking water from the maintenance complex prior to illness onset.

Three of the six persons who submitted stool samples to MDH were positive for *Giardia*. One person who was positive for *Giardia* also was positive for *Dientamoeba fragilis*, another protozoan flagellate. The stools were negative for *Cryptosporidium*, *Campylobacter*, *E. coli* O157:H7, *Salmonella*, and *Shigella*. Additionally, there were five persons positive for *Giardia* who submitted stool samples to their private physicians.

This was a waterborne outbreak of giardiasis among workers at a national wildlife refuge in Aitkin County. There were eight laboratory-confirmed and four probable cases of *Giardia*. The cause of the outbreak was cross-contamination between well water and sewage systems serving a maintenance complex. MDH Environmental Health Services supervised the drilling of replacement wells and replacement of distribution system components and devised a plan for continuous system chlorination with concurrent water testing.

CONFIRMED WATERBORNE OUTBREAKS (RECREATIONAL WATER)

(1)
Cryptosporidiosis and Shigellosis Associated with a Swimming Beach

July Hennepin County

During the last week of July, 2000 the Minnesota Department of Health (MDH) received reports of a case of *Cryptosporidium* and two cases of *Shigella sonnei* that reported swimming in a pond at a county park reserve. The county parks water quality supervisor regarding the potential outbreak. Records of their water testing results were obtained for a 5 week period. Interviews were conducted of all confirmed cryptosporidiosis and shigellosis cases reported to MDH to ascertain swimming exposures.

Two cases of cryptosporidiosis and 13 cases of shigellosis reported swimming at the pond. One of the cryptosporidiosis cases also was positive for *Shigella sonnei*. A third case of cryptosporidiosis was identified in a family member of one of the reported cases; however, illness onset date and lack of swimming exposure indicated that this was likely a secondary case. Illness onsets for the two cryptosporidiosis cases were July 27 and August 1. Illness onset for the shigellosis cases ranged from July 11 to July 23. Reported swimming dates were from July 10 to July 16.

Two (100%) of the cryptosporidiosis cases reported having diarrhea, two (100%) abdominal cramps, one (50%) bloody diarrhea, and one (50%) vomiting. The median duration of illness of the two cases of cryptosporidiosis was 19 days (range, 16 to 21 days). Neither case was hospitalized.

Thirteen (100%) of the shigellosis cases reported having diarrhea, 12 (92%) abdominal cramps, nine (69%) fever, eight (62%) nausea, six (46%) bloody stools, and six (46%) vomiting. Median duration of illness was 6 days (range, 3 to 14 days). Three cases were hospitalized.

The county park's water quality personnel routinely tested water at the beach for fecal coliforms; no elevated levels of coliforms were observed during the month of July.

This was an outbreak of cryptosporidiosis and shigellosis at a public swimming beach with transmission over at least a 7 day period. A source of contamination was not identified.

(2)
Cryptosporidiosis Associated with a Swimming Pool at a Children's Camp

July Washington County

On July 25, 2000 the Minnesota Department of Health (MDH) received a call from a parent whose child had been diagnosed with cryptosporidiosis. The child attended a summer day camp in Washington County. The camp hosted a total of 200 campers (full- and part-time) and 20 counselors and staff. Daily camp activities included canoeing, tennis, arts and crafts, horseback riding, swimming lessons, hiking/bike riding, and various group activities. The camp did not provide room or board, only day camp services. All campers were required to take swimming lessons. The index case was purported to have been experiencing diarrhea while attending camp in late July. The index case’s last day at camp was July 20, which was also the case’s illness onset date.

On July 26, the Washington County Department of Public Health and Environment (WCDPHE) contacted the children's camp to inform them of the potential *Cryptosporidium* exposure for other campers and camp staff. A WCDPHE investigator evaluated the camp swimming pool, water supply, recreational pond, and various other camp activities to determine the level of risk of transmission. Water samples were collected from the swimming pool, well, and recreational pond. As part of the investigation, in late July the investigator requested the swimming pool and lavatories facilities be evaluated by WCDPHE environmental health personnel.

On July 28 and 31, campers and their parents were informed by the camp director of the potential for exposure to *Cryptosporidium* by the camp director. Stool kits were provided to the camp management for sample collection by symptomatic staff and their family members that may have participated in camp activities. Three samples were submitted to MDH from the camp.

No ill individuals other than the index case were identified during the visit to the camp by WCDPHE on July 26. On August 8, WCDPHE was notified by the camp nurse of two suspect cases of cryptosporidiosis in campers. Neither of these cases could be confirmed by MDH through follow up contact with the cases and/or their physicians. One additional case of cryptosporidiosis in a camper was identified through routine surveillance at MDH, although this case was reported to MDH after the camp was closed for the summer. Two of three samples submitted by the camp management were positive; again, these samples were collected after the camp was closed. All water samples tested were negative for *Cryptosporidium parvum*.

The environmental health assessment found several operational and structural deficiencies with the swimming pool. Chemical analysis of the pool water indicated the chlorine residuals (total, free or combined) were not at proper concentrations. The pool filtration and circulation system was inadequate and under sized for the pool and bather load. Lavatory facilities at the camp were marginal and showers were not available for swimmers prior to entering the pool. The swimming pool was order closed on August 10, the day of the assessment. The pool was not reopened the remainder of the camp's season.

Four confirmed cases, and three suspect cases of cryptosporidiosis were associated with the camp. The epidemiologic and environmental health findings support *Cryptosporidium* transmission at the camp through repeated exposure to improperly filtered and treated pool water.

(3)
Cryptosporidiosis Associated with a Swimming Beach

July St. Louis County

On August 10, 2000 the Minnesota Department of Health (MDH) received a call from the St. Louis County Department of Public Health and Long Term Medical Health about a possible outbreak of cryptosporidiosis associated with a swimming beach on a lake. The county had received a report on August 8 from a day care provider that had taken children to the beach on July 31, and all the children had subsequently become ill with gastrointestinal symptoms. On August 10, stool samples from at least one of those children yielded *Cryptosporidium parvum.* The county issued a press release asking sick people who had used the swimming beach to call St. Louis County. St. Louis County closed the swimming beach for public use on August 10.

People calling in to report illness were interviewed by either St. Louis County or epidemiologists from MDH. People who used the swimming beach without clinical illness were also interviewed as controls. The interview included questions regarding swimming exposures and food consumed at the swimming beach. A case was defined as anyone who had gone swimming at the lake and subsequently developed vomiting or diarrhea of 3 or more days duration. Diarrhea was defined as 3 or more loose stools in a 24-hour period. Homeowners around the lake were called by St. Louis County and questioned about any gastrointestinal illness and swimming history.

Several hundred people swam at the beach on August 6 as part of a triathalon. A list of participants was obtained from the event organizer. Twenty randomly selected participants were contacted and asked about illness history.

St. Louis County inspected the plumbing in the club house at the swimming beach to determine if there were any plumbing deficiencies that could allow human sewage to contaminate the swimming area. The club house consisted of shower rooms, restroom facilities, concession stand, and a golf pro shop. City sewer lines were being extended to the lakeshore residents, and septic tanks in areas around the lake were being abandoned. Inquiries were made to the contractors installing the city sewer lines to determine if there was any possibility that a sewage spill could have occurred during this construction. Air surveillance was conducted of areas upstream from the lake to determine if there was a chance for animal effluent entering the swimming area.

Cryptosporidium parvum isolates received at the MDH Laboratory were analyzed by PCR to determine if they were Type 1 (human-associated) or Type 2 (animal-associated) genotypes.

Three hundred twenty-six people were interviewed as part of the call-in survey. Eighteen cases of *Cryptosporidium parvum* infection were confirmed; one of these cases also had *Giardia*. Another case of *Giardia* infection was also confirmed. Both *Giardia* cases were members of one family. Another member of that family was diagnosed with only a *Cryptosporidium* infection. An additional 202 people met the outbreak case definition. Dates of exposure at the beach ranged from July 20 through August 7. Onset of illness ranged from July 24 through August 18. One of twenty triatheletes interviewed met the case definition; this case was not laboratory confirmed. The only time that person swam at the beach was during the triathalon on August 6. Onset of illness for this case was August 7. Two people among 33 households of lakeshore homeowners that were interviewed met the case definition. One of these people had swum at the beach as well as in front of their home.

Risk factors associated with clinical illness on univariate analysis included; getting the head wet while swimming (odds ratio [OR] = 17.9; 95% confidence interval [CI], 7.4, 41.5; $p<0.0001$) and eating food brought from home (OR = 3.2; 95% CI, 1.1, 11.2; $p = 0.025$). Upon multivariate analysis the only risk factor independently associated with illness was getting the head wet while swimming (OR = 21.4; 95% CI, 8.1, 56.7; $p<0.001$).

Of eight *Cryptosporidium parvum* isolates analyzed by PCR, seven were genotype 1 (human-associated).

No plumbing irregularities were identified at the swimming beach facilities. No animal reservoirs were identified upstream from the beach. Contractors working on the sewer line project denied any incidents that would cause a sewage spill into the lake. There were numerous reports of people changing babies' diapers on the beach, and even washing off babies in the lake while changing diapers.

Interventions were suggested to the operators of the beach including adding diaper changing stations in the restrooms, restricting diaper changes on the beach, and requiring diaper-aged children to wear special swimming diapers. The beach was allowed to reopen on August 19.

This is an outbreak of cryptosporidiosis and associated with a swimming beach. The magnitude of the role of *Giardia* in this outbreak was not clearly established. No definitive source of contamination was identified, but contamination from diaper-aged children was the most plausible source.

(4)
Cryptosporidiosis Associated with a Hotel Swimming Pool

July Hennepin County

On August 3, 2000 the St. Paul Ramsey County Department of Health was notified of an outbreak of gastrointestinal illness among members of a youth baseball team from Woodbury who attended a baseball tournament in Minnetonka. Several members of the team stayed at a hotel in Eden Prairie during the tournament. The team shared several meals during the weekend. The team members that stayed at the hotel also swam together in the hotel swimming pool. Because the hotel was in Hennepin County, the investigation of the outbreak was conducted by the Hennepin County Department of Health (Hennepin County) and the Minnesota Department of Health (MDH).

A roster of players that attended the tournament was obtained from the coach. Lists of meals shared during the tournament were obtained. Team members were interviewed about food consumption at the tournament, swimming exposures, and illness history by an epidemiologist from the MDH. A case was defined as any person who had attended the tournament or stayed at the hotel and who subsequently became ill with vomiting or diarrhea lasting three or more days. Diarrhea was defined as three or more loose stools in a 24-hour period.

An environmentalist from Hennepin County visited the hotel and inspected the pool, whirlpool, and sauna. Water samples were collected from the pool and whirlpool for parasitic pathogen testing at the MDH laboratory. A list of other guests at the hotel on July 22 was obtained, and an epidemiologist from Hennepin County interviewed them regarding pool exposure and illness history. Two stool samples were collected by physicians for bacterial and parasitic pathogen testing.

All 12 team members were interviewed, and five (42%) met the case definition. One (11%) of nine other hotel patrons interviewed met the case definition. Six (100%) cases reported diarrhea, six (100%) reported vomiting, six (100%) reported abdominal cramps, and two (33%) reported fever. Dates of illness onset were July 26 through July 28. Incubation periods ranged from 4 to 6 days, with a median of 5 days, and duration of illness ranged from 4 to10 days, with a median of 5.5 days. Both stool samples tested were positive for *Cryptosporidium parvum* antigen. No abnormalities were noted during the inspection of the pool, and water samples were negative for *Cryptosporidium*.

Using the hotel swimming pool and whirlpool was associated with illness (6 of 6 cases versus 3 of 15 controls; odds ratio undefined; p=0.001). The only hotel patron not associated with the baseball team that met the case definition was also the only patron interviewed that swam. Among persons who used the pool, swallowing water from the pool also was significantly associated with illness (5 of 6 cases versus 0 of 3 controls; odds ratio undefined; p=0.008).

This outbreak of cryptosporidiosis associated with swimming in a hotel swimming pool. Swallowing water from the pool was a risk factor for illness.

(5)
Shigellosis Associated with a Swimming Beach

August Hennepin County

On August 14, 2000 an epidemiologist from the Hennepin County Community Health Department (HCCHD) received a call from a person reporting that children had become ill after swimming at a public swimming beach on Lake Minnetonka. The caller reported swimming with three other families on Friday, August 11, in the

afternoon and that many of the children in these families became ill with diarrhea and high fever on Sunday, August 13. On August 15 and 16, staff from Minnetonka Environmental Health reported that two other groups of families had notified them of illness following swimming at the beach on August 11.

The epidemiologist from HCCHD interviewed the initial reporting caller and obtained the names and numbers of the families in the other groups that contained individuals who reportedly became ill after swimming. HCCHD interviewed families from each of the three groups regarding exposure and illness history, and requested stool samples from several individuals with current illness. A person was considered a case if they had at least three loose stools in a 24-hour period. Stool samples were tested at the Minnesota Department of Health (MDH) for the presence of bacterial and viral pathogens. Minnetonka Environmental Health conducted an inspection of the beach, took water samples, and interviewed workers at the concession stand regarding history of gastrointestinal illness.

There were three groups of families, 13 families total, that swam at the beach August 11 from 12-4:00 pm and reported subsequent illness. Thirty-one people in 11 families were interviewed. Seventeen (55%) cases were identified. The median age of cases was 4 years. The mean incubation period was 54 hours (range, 34 to 77 hours). There was one case of secondary transmission to a parent reported, with the onset 2 days after the child was ill. Symptoms of cases included diarrhea (100%), fever (88%), abdominal pain (59%), nausea (35%), chills (29%), and vomiting (25%).

Stool cultures were obtained from nine people in six families. Seven (78%) were positive for *Shigella sonnei*, two were negative. Of the 11 families, five families had at least one person positive for *Shigella sonnei*, one family had negative cultures, and five families were not tested. An additional eight people with *Shigella sonnei*, identified through routine surveillance, also reported swimming at the beach on August 11.

All of the family groups interviewed by HCCHD swam on the side of the beach closest to the food stand. Those in the first two groups had ice cream treats from the concession stand. The adult who became ill spent much of her time in the deeper water but did go into the shallow end to visit with other mothers.

One person was also positive for *Giardia* on a specimen tested by the health care provider. This person also swam regularly in other lakes in northern Minnesota. MDH was notified, and ova and parasite tests were run on three of the specimens sent to the MDH laboratory. All three were negative for *Giardia*.

The inspection by Minnetonka Environmental Health revealed no abnormalities; water samples were within normal limits for coliforms. All concession stand workers denied any gastrointestinal illness.

This was an outbreak of shigellosis at a public swimming beach. Because all of the illnesses occurred among people swimming at a particular area of the lake at a specific date and time, it is likely that the water was contaminated by a person who was shedding *Shigella sonnei* either in a diaper or a fecal accident in the lake. No other cases were identified in swimmers on other days, it suggesting a point source exposure rather than ongoing contamination at the swimming beach.

(6)
Cryptosporidiosis Associated with a Community Swimming Pool

August Goodhue County

Retrospective analysis of data gathered while interviewing cases of cryptosporidiosis reported to the Minnesota Department of Health (MDH) revealed that four people reported swimming in the same community swimming pool in Red Wing during the 2 weeks prior to onset of their illness.

All confirmed cases of cryptosporidiosis reported to MDH were interviewed by epidemiologists about illness history, water exposures, animal exposures, daycare exposures, and food consumption using a standardized questionnaire.

Four cases with confirmed cryptosporidiosis reported having swimming the Red Wing community swimming pool during the 2 weeks prior to onset of their illness. No other common exposures among these four cases were identified. Dates of illness onset ranged from August 15 to August 28. Four (100%) cases reported diarrhea, two (50%) reported weight loss, one (25%) reported vomiting, and one (25%) reported fever. Median duration of illness was 6 days (range, 4 to 8 days). No cases were hospitalized as a result of their illness.
No cases were hospitalized as a result of their illness.

These cases represented an outbreak of cryptosporidiosis associated with swimming in a municipal swimming pool. The outbreak was detected after the pool had closed for the summer.

PROBABLE WATERBORNE OUTBREAKS (RECREATIONAL WATER)

(1)
Cryptosporidiosis Associated with a Community Swimming Pool

July Winona County

Retrospective analysis of data gathered while interviewing cases of cryptosporidiosis reported to the Minnesota Department of Health (MDH) revealed that four children reported swimming in the same community swimming pool in St. Charles during the 2 weeks prior to onset of their illness.

All confirmed cases of cryptosporidiosis reported to the MDH were interviewed by an epidemiologist about illness history, water exposures, animal exposures, daycare exposures, and food consumption using a standardized questionnaire.

Four case-patients with confirmed cryptosporidiosis reported swimming at a community pool in St. Charles during the 2 weeks prior to onset of their illness. No other common exposures among these four cases were identified. Dates of illness onset ranged from July 10 to September 8. Four (100%) cases reported diarrhea, two (50%) reported vomiting, two (50%) reported weight loss, and one (25%) reported fever. One case was hospitalized. Median duration of illness was 7 days (range, 2 to 7 days). One case was hospitalized.

These cases may have represented an outbreak of cryptosporidiosis associated with swimming in a municipal swimming pool. However, because of the wide range in illness onset dates, sporadic transmission from different sources could not be ruled out. The possible link to the St. Charles pool was identified after the pool had closed for the summer.

NON-FOODBORNE, NON-WATERBORNE OUTBREAKS: OUTBREAKS DUE TO ANIMAL CONTACT

(1)
Salmonellosis Associated with Chicks Purchased from a Farm Store

May — Multi-County (Chippewa, Swift, and Sibley)

During a three week period beginning May 16, 2000 the Minnesota Department of Health (MDH) Public Health Laboratory received four isolates through routine surveillance of *Salmonella enterica* serotype Montevideo with an indistinguishable pulsed-field gel electrophoresis (PFGE) subtype, designated SMON5. Three of the isolates were from stool, while the fourth isolate was from blood.

All four cases were interviewed about food consumption, animal contact, and illness history by an epidemiologist from MDH. A case was defined as any person who had a confirmed isolation of *Salmonella* Montevideo subtype SMON5. An epidemiologist from MDH visited the homes of the two cases that reported buying chicks at a common source to collect environmental and fecal samples from the birds. Additional chicks were purchased at the store and sacrificed for collection of fecal and intestinal samples. Environmental swabbing of surfaces near the chickens were also obtained. Store management was interviewed regarding the source of their chickens. Records were obtained from the store of other persons that had purchased birds from the store in the same time frame, and those customers were called to inquire about gastrointestinal illness.

Two (50%) of four cases reported purchasing chickens from the same farm store in Montevideo from May 4 through May 7. Samples from the environment of case homes where the chickens were kept and fecal samples from the chickens at the case homes yielded *Salmonella* Montevideo of subtype SMON5. Samples from the chickens and environment at the store yielded *Salmonella* Montevideo of a different PFGE subtype (SMON19).

The store reported receiving chicks twice a week from the same hatchery in Iowa. However, the supplier had several flocks, and chicks did not necessarily come from the same flock each time. The store employee responsible for care of the chicks reported having suffered from gastrointestinal illness that her physician attributed to salmonellosis, but no stool culture was obtained.

Two cases reported not purchasing chicks from the same store. Of these, one reported consuming chicken that was raised by his neighbor and slaughtered on the farm. Two (25%) of eight families interviewed that purchased chicks from the same store as the conformed cases reported gastrointestinal illness among three children in their families compatible with salmonellosis.

This was an outbreak of salmonellosis associated with chicks purchased at a farm store.

(2)
Multiple Enteric Pathogen Infections Associated with Exposure to Calves at a Day Camp

June — Ramsey County

On July 10, 2000 the Minnesota Department of Health (MDH) received a call from a mother who was aware of sick children that had attended a day camp that her child was scheduled to attend. That same day, a *Cryptosporidium parvum* case identified through routine surveillance reported attending the same day camp.

During the camp the children were responsible for feeding and caring for a variety of farm animals. There were three levels of camp: Novice Farm Hand for grades K to 4, Expert Farm Hand for grades K to 4, and Ag Adventures for grades 5 to 8. There were eight sessions held throughout the summer. Each session lasted 1 week, and approximately 50 children attended each session.

Lists of children who attended the camp were obtained. Children were interviewed about animal contact, handwashing habits, food consumption at the camp, and illness history by MDH epidemiologists. A case was defined as any person who attended the event and who subsequently developed gastrointestinal illness (diarrhea or vomiting) that lasted 3 or more days. Diarrhea was defined as three or more loose stools in a 24-hour period. Stool samples were collected for bacterial and parasitic pathogen testing. Epidemiologists from MDH and the University of Minnesota College of Veterinary Medicine visited the camp on July 11. They conducted an evaluation of the facility and collected fecal samples from calves. Two subsequent visits to evaluate interventions and collect additional fecal samples were made on July 24 and August 10.

The initial visit of the facility revealed that children had the opportunity for contact with numerous species of farm animals, including calves, pigs, sheep, horses, and chickens. Most animal contact was with calves, as the children were directly responsible for the care of a calf, including feeding and cleaning of pens. Calves that were ill were housed in the same facility as those that the children cared for.

One hundred ninety attendees were interviewed, and 53 (28%) met the case definition. Ten (5%) additional children reported illness that did not meet the case definition. Fifty (94%) cases reported diarrhea, 44 (83%) reported abdominal cramps, 27 (51%) reported vomiting, 14 (26%) reported fever, and two (4%) reported bloody stools. Dates of illness onset ranged from June 15 through July 31. Stool samples were positive for *Cryptosporidium parvum* (11 children), non-O157 enterohemmorhagic *E. coli* (2), *Salmonella enterica* serotype Typhimurium (1), and *Campylobacter jejuni* (1). No children had more than one pathogen identified in their stool sample.

Twenty-five fecal samples from 23 different calves yielded *Giardia* (12 calves), *Cryptosporidium parvum* (6), *Campylobacter jejuni* (3), *Campylobacter coli* (3), *Campylobacter lari* (1), *Salmonella enterica* serotype Typhimurium (2) and Shiga toxin of *E. coli* (2). Ten calves had more than one pathogen identified from their fecal sample including *Campylobacter jejuni* and *Giardia* (2 calves), *Campylobacter coli* and *Giardia* (2), *Cryptosporidium parvum* and *Giardia* (1), *Cryptosporidium parvum* and *Campylobacter jejuni* (1), *Campylobacter coli* and *Salmonella* Typhimurium (1), *Campylobacter lari* and *Giardia* (1), *Giardia* and *E. coli* Shiga toxin (1), and *Cryptosporidium parvum*, *Campylobacter coli*, *Salmonella* Typhimurium, and *Giardia* (1). Two calves sampled 30 days apart shed *Campylobacter coli* on both occasions. A pooled culture of three chicken fecal samples did not yield any pathogenic bacteria.

Pulsed-field gel electrophoresis (PFGE) was conducted on the *Salmonella* Typhimurium isolated from both children and calves. The *Salmonella* Typhimurium isolated from the child (PFGE subtype TM153) did not match the isolate from the calves (PFGE subtype TM54).

Serotyping of the non-O157 enterohemmorhagic *E. coli* isolates from human cases was performed. One was serotype O111:H8, and the other was O111:nonmotile.

The only activity significantly associated with illness was contact with a calf that was sick (20 of 46 [43%] cases vs. 21 of 106 [20%] controls; odds ratio, 3.1; 95% confidence interval, 1.5 - 6.6; p = 0.005).

Interventions at the camp included removal of sick calves from the barn used for the day camp, addition of handwashing stations in the calf barn, and counselor emphasis and supervision of the children's handwashing. Attack rates peaked during the second session (June 19-23) when 21 of 32 campers (66%) interviewed had

clinical illness compatible with the case definition. Attack rates declined to 3% during the fifth session (July 17-21) following implementation of the interventions.

This was an outbreak of enteric infections among children due to multiple etiologies acquired by contact with farm animals, primarily calves, at a day camp. Etiologies included *Cryptosporidium parvum*, non-O157 enterohemmorhagic *E. coli*, *Campylobacter jejuni*, and *Salmonella* Typhimurium. Multiple pathogens were also isolated from calves at the day camp, including *Giardia, Cryptosporidium parvum*, three species of *Campylobacter*, and *Salmonella* Typhimurium. Interventions included installation of portable handwashing stations, increased emphasis on handwashing, and the removal of sick calves from the facility.

(3)
E. coli O157:H7 Infections and Hemolytic Uremic Syndrome Associated with Contact with Calves at a Family Reunion

August Carlton County

On August 11, 2000 the Minnesota Department of Health (MDH) was notified of two children, 3 and 11 years of age, that were admitted to Minneapolis Children's Hospital with Hemolytic Uremic Syndrome (HUS). The children were cousins and had recently attended a family reunion held August 5 and 6 at the farm of an aunt in rural Carlton County. Parents of the children were interviewed using a standard enteric illness questionnaire. Stool samples were collected from the children, and *E. coli* O157:H7 isolated from the stools was subtyped at MDH using pulsed-field gel electrophoresis (PFGE). The aunt who hosted the family reunion was interviewed about attendees, food served, and other possible exposures. A list of people who attended the event was obtained, and they were contacted regarding illness history. Stool samples were collected from calves at the farm and submitted to MDH for bacterial culture. *E. coli* O157:H7 isolates from the calves were subtyped by PFGE.

Of eight families that attended the reunion, three had one member with illness compatible with an *E. coli* O157:H7 infection (diarrhea of $\geq$ 3 stools in 24 hours for 2 or more days). These three cases included the two children who subsequently developed HUS. The two children that developed HUS were hospitalized for 15 and 23 days, respectively. There were no deaths associated with this outbreak.

E. coli O157:H7 with an identical PFGE subtype (designated MN31) was isolated from both children that developed HUS. The third person who developed gastrointestinal illness did not submit a stool sample for culture. *E. coli* O157:H7 MN31 was isolated from four of six calves sampled. Additionally, six of six calves were positive for *Campylobacter jejuni*. The three cases all reported having contact with the calves on the farm. There were no common meals served at the family reunion. Each family brought their own food to the family reunion and was responsible for providing meals for their family.

This outbreak of *E. coli* O157:H7 subtype MN31 infections was caused by contact with calves carrying the same subtype of *E. coli* O157:H7. Increased attention to handwashing after contact with calves may have prevented this outbreak.

Confirmed Foodborne Outbreaks
Minnesota, 2000

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
Jan	Restaurant, table service	24	1	Meat, cheese, and vegetable platters	Calicivirus	Ill food workers	Dakota
Jan	Catered wedding reception	44	4	Fruit and vegetable tray	Calicivirus	Ill food worker	Anoka
Jan	Nursing home	71	2	Unknown	Calicivirus	Ill food worker	Hennepin
Jan	Birthday party, private home	11	0	Cucumber sandwiches	Viral gastroenteritis*	Recent illness in home where food prepared	Washington
Feb	High school cafeteria	21	1	Multiple lunch items	Calicivirus	Unknown	Ramsey
Feb	Workplace cafeteria	10	2	Leftover fried rice	*Bacillus cereus* emetic toxin	Improper cooling and reheating	Hennepin
Feb	Baby shower, private home	17	0	Strawberry shortcake and brownies	Viral gastroenteritis*	Recent illness in food preparer	Hennepin
Feb	Nursing home	26	1	Unknown	Calicivirus	Ill food worker	Wabasha
Mar	Restaurant, table service	38	38	Unknown	Hepatitis A virus	Infected food worker	Ramsey
Mar	Elementary school cafeteria	18	6	Ground beef hotdish	*E. coli* O157:H7	Contaminated ground beef; inadequately prepared hotdish	Hennepin
Apr	Restaurant, table service	8	8	Unknown	Hepatitis A virus	Infected food worker(s)	Mower
Apr	Restaurant, table service	2	0	Chopped salad	Unknown	Unknown	Hennepin

* Epidemiologically defined agent

Confirmed Foodborne Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
Apr	College cafeteria	37	0	Salad bar items	Viral gastroenteritis*	Ill food worker	Nicollet
Apr	Restaurant, table service	5	5	Multiple items	*Salmonella* Heidelberg	Cross-contamination, time-temperature violations, infected asymptomatic food workers	Olmsted
Apr	Restaurant, table service	6	0	Unknown	Calicivirus	Unknown	Hennepin
Apr	Resort	11	0	Ham	Viral gastroenteritis*	Unknown	Becker
May	Restaurant, table service	6	6	Unknown	*Salmonella* Typhimurium	Unknown	Hennepin
May	Restaurant, buffet	3	3	Chinese food buffet	*Shigella sonnei*	Unknown	Ramsey
May	Restaurant, table service	6	0	Unknown	Unknown	Unknown	Hennepin
Jun	Restaurant, table service	5	0	Unknown	Unknown	Unknown	Hennepin
Jun	Graduation party, private home	5	5	Smoked turkey	*Salmonella* Typhimurium	Unknown	Hennepin
Jun	Catered events	33	5	Focaccia sandwiches, cantaloupe	Calicivirus	Unknown	Benton
Jun	Restaurant, buffet	2	0	Unknown	Unknown	Unknown	Ramsey
Jun	Restaurant, table service	3	0	House salad	Viral gastroenteritis*	Unknown	St. Louis
Jun	Restaurant, takeout	3	0	Eggrolls	Unknown	Improper cooling	Mower

* Epidemiologically defined agent

Confirmed Foodborne Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
Jun	Dairy farm event	8	1	Malts made with unpasteurized milk	*Campylobacter* spp.	Raw product	Kittson
Jun	Restaurant, table service	2	0	Tuna steaks	Scombrotoxin	Unknown	Hennepin
Jul	Catered conference	21	0	Rice	Unknown	Unknown	Ramsey
Jul	Wedding reception, private home	14	2	Smoked turkey	*Salmonella* Heidelberg	Unknown	Mille Lacs
Aug	Company picnic	24	2	Fresh fruit, onion dip	*Shigella sonnei*	Ill attendee	Ramsey
Aug	Commercially distributed frozen product	3	3	Hamburger patties	*E. coli* O157:H7	Contaminated product	Multi-County
Sep	Restaurant, table service	14	10	Multiple items	*Salmonella* Enteritidis	Cross-contamination; time-temperature violations; infected asymptomatic food workers	Dakota
Oct	Restaurant, fast food	14	2	Submarine sandwiches	Calicivirus	Unknown	Hennepin
Oct	Restaurant, table service	2	0	Tuna burgers	Scombrotoxin	Unknown	Hennepin
Oct	Restaurant, table service	12	4	Unknown	Calicivirus	Unknown	Hennepin
Oct	Catered wedding reception	34	3	Cherry tomatoes, dip	Calicivirus	Recently ill guests at event	Ramsey
Nov	Picnic	14	3	Unknown	Calicivirus	Unknown	Hennepin
Nov	Catered lunch	46	7	Unknown	Calicivirus	Unknown	Hennepin

Confirmed Foodborne Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
Nov	Commercially distributed ground beef	42	40	Ground beef	*E. coli* O157:H7	Contaminated product	Multi-County, Multi-State
Nov	Catered wedding reception	30	2	Green beans, beer	Calicivirus	Ill food workers	Morrison
Dec	Company holiday party, table service restaurant	30	11	Unknown	Calicivirus	Unknown	Hennepin
Dec	Union holiday party, banquet hall	15	1	Bread rolls	Calicivirus	Recent illness in household where food prepared	Ramsey
Dec	Restaurant, fast food	7	0	Submarine sandwiches	Viral gastroenteritis*	Ill food workers	Scott
Dec	Holiday party, private home	8	1	Unknown	Calicivirus	Unknown	Washington
Dec	Luncheon, service club	35	0	Hamburgers, coleslaw	Viral gastroenteritis*	Ill food worker	Crow Wing

TOTAL: 45

* Epidemiologically defined agent

Confirmed Waterborne Outbreaks (Drinking Water or Recreational Water)
Minnesota, 2000

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	Contributing Factor	County
Jun	Wildlife refuge	10	8	Drinking water	*Giardia lamblia*	Cross-contamination between sewage and drinking water systems	Aitkin
Jul	Swimming beach	15	15	Recreational water	*Cryptosporidium parvum; Shigella sonnei*	Unknown	Hennepin
Jul	Camp swimming pool	7	4	Recreational water	*Cryptosporidium parvum*	Inadequate chlorination and filtration of pool	Washington
Jul	Swimming beach	220	18	Recreational water	*Cryptosporidium parvum*	Contamination from diaper-aged children	St. Louis
Jul	Hotel swimming pool	5	2	Recreational water	*Cryptosporidium parvum*	Unknown	Hennepin
Aug	Swimming beach	17	7	Recreational water	*Shigella sonnei*	Unknown	Hennepin
Aug	Community swimming pool	4	4	Recreational water	*Cryptosporidium parvum*	Unknown	Goodhue

TOTAL: 7

Non-Foodborne, Non-Waterborne Gastroenteritis Outbreaks
Minnesota, 2000

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
Jan	Daycare	52	21	Person-to-person	*Shigella sonnei*	Hennepin
Feb	Assisted living facility	38	0	Person-to-person	Viral gastroenteritis*	Hennepin
Mar	Nursing home	52	2	Person-to-person	Calicivirus	Aitkin
Mar	Elementary school	11	11	Person-to-person	*Shigella sonnei*	Ramsey
Mar	Daycare	4	4	Unknown	*Salmonella* Saintpaul	Hennepin
Mar	Elementary school	27	13	Person-to-person	*Shigella sonnei*	Scott
Mar	Elementary school	30	11	Person-to-person	*Shigella sonnei*	Anoka
Apr	Daycare	7	2	Person-to-person	*Shigella sonnei*	Anoka
Apr	Elementary school	43	32	Person-to-person	*Shigella sonnei*	Anoka
Apr	Elementary school	13	11	Person-to-person	*Shigella sonnei*	Ramsey
Apr	Daycare	16	7	Person-to-person	*Shigella sonnei*	Ramsey
May	Private homes	4	4	Contact with chicks purchased at a store	*Salmonella* Montevideo	Multi-county (Chippewa, Sibley, Swift)
May	Daycare	3	3	Person-to-person	*Shigella sonnei*	Anoka
May	Daycare	27	9	Person-to-person	*Shigella sonnei*	Hennepin
May	Daycare	18	13	Person-to-person	*Shigella sonnei*	Dakota

* Epidemiologically defined agent

Non-Foodborne, Non-Waterborne Gastroenteritis Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
Jun	Daycare	4	4	Person-to-person	*Shigella sonnei*	Ramsey
Jun	Day camp	53	15	Contact with calves	Multiple enteric pathogens	Ramsey
Jun	Daycare	4	4	Person-to-person	*Shigella sonnei*	Anoka
Jun	Daycare	6	5	Person-to-person	*E. coli* O157:H7	Rice
Jun	Daycare	16	10	Person-to-person	*Shigella sonnei*	Anoka
Jun	Daycare	14	13	Person-to-person	*Shigella sonnei*	Anoka
Jun	Shelter	6	5	Person-to-person	*Shigella sonnei*	Ramsey
Jul	Daycare	7	7	Person-to-person	*Shigella sonnei*	Washington
Jul	Assisted living facility	7	3	Person-to-person	*Salmonella* Muenchen	Martin
Jul	Daycare	22	17	Person-to-person	*Shigella sonnei*	Anoka
Jul	Daycare	16	8	Person-to-person	*Shigella sonnei*	Hennepin
Jul	Daycare	27	12	Person-to-person	*Shigella sonnei*	Hennepin
Jul	Daycare	14	2	Unknown	*E. coli* O157:H7	Dakota
Jul	Daycare	9	7	Person-to-person	*Shigella sonnei*	Scott
Jul	Daycare	5	4	Person-to-person	*Shigella sonnei*	Ramsey
Aug	Family reunion	3	2	Contact with calves	*E. coli* O157:H7	Carlton
Aug	Daycare	50	13	Person-to-person	*Shigella sonnei*	Hennepin

Non-Foodborne, Non-Waterborne Gastroenteritis Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
Aug	Daycare	5	3	Unknown	*Salmonella* Java	Hennepin
Sep	Elementary school	8	5	Person-to-person	*Shigella sonnei*	Brown
Sep	Daycare	28	8	Person-to-person	*Shigella sonnei*	Hennepin
Sep	Daycare	10	0	Person-to-person	Unknown	Hennepin
Sep	Daycare	22	11	Person-to-person	*Shigella sonnei*	Hennepin
Sep	Daycare	17	5	Person-to-person	*Shigella sonnei*	Hennepin
Sep	Elementary school	6	4	Person-to-person	*Shigella sonnei*	Hennepin
Oct	Elementary school	10	9	Person-to-person	*Shigella sonnei*	Anoka
Nov	Daycare	2	2	Unknown	*Giardia lamblia*	Dakota
Nov	Daycare	30	12	Person-to-person	*Shigella sonnei*	Hennepin
Nov	Elementary school	9	7	Person-to-person	*Shigella sonnei*	Anoka
Nov	Elementary school	8	6	Person-to-person	*Shigella sonnei*	St. Louis
Nov	Nursing home	17	1	Person-to-person	Calicivirus	Morrison
Nov	Elementary school	7	7	Person-to-person	*Shigella sonnei*	Renville
Nov	Elementary school	24	0	Person-to-person	Viral gastroenteritis*	Pipestone
Dec	Nursing home	97	2	Person-to-person	Calicivirus	Dakota
Dec	Holiday party, private home	9	0	Person-to-person	Viral gastroenteritis*	Hennepin

* Epidemiologically defined agent

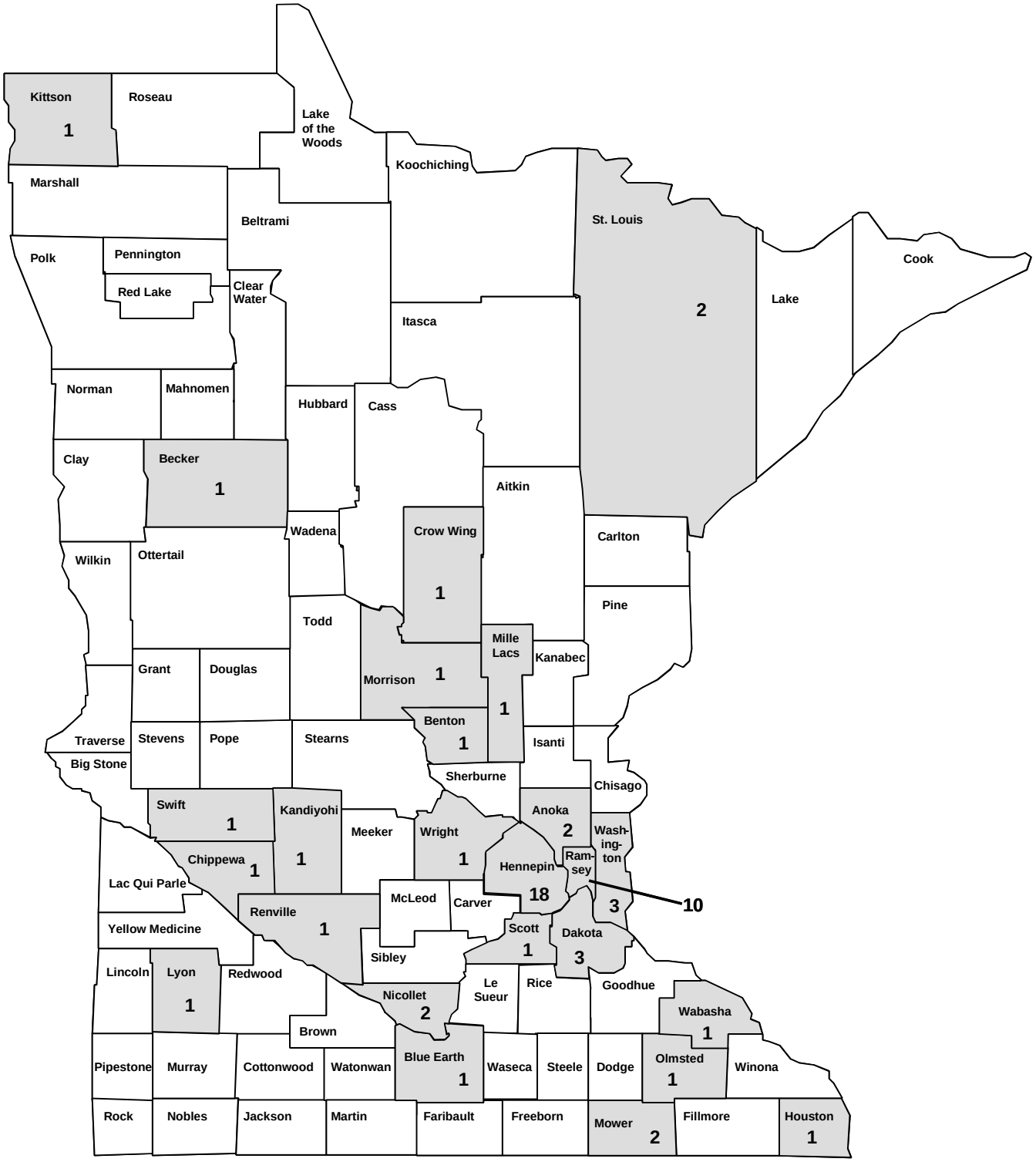
Non-Foodborne, Non-Waterborne Gastroenteritis Outbreaks
Minnesota, 2000 (continued)

Month	Setting	No. Cases	No. Laboratory-Confirmed	Vehicle	Agent	County
Dec	County jail	13	0	Unknown	Viral gastroenteritis*	Todd
Dec	Nursing home	26	0	Person-to person	Viral gastroenteritis*	Ramsey
Dec	Daycare	12	4	Person-to-person	*Shigella sonnei*	St. Louis
Dec	Daycare	6	4	Person-to-person	*Shigella sonnei*	Hennepin
Dec	Elementary school	2	2	Person-to-person	*Shigella sonnei*	Clay
Dec	Nursing home	61	0	Person-to-person	Viral gastroenteritis*	Wright
Dec	School	2	2	Person-to-person	*Shigella sonnei*	Scott

TOTAL: 56

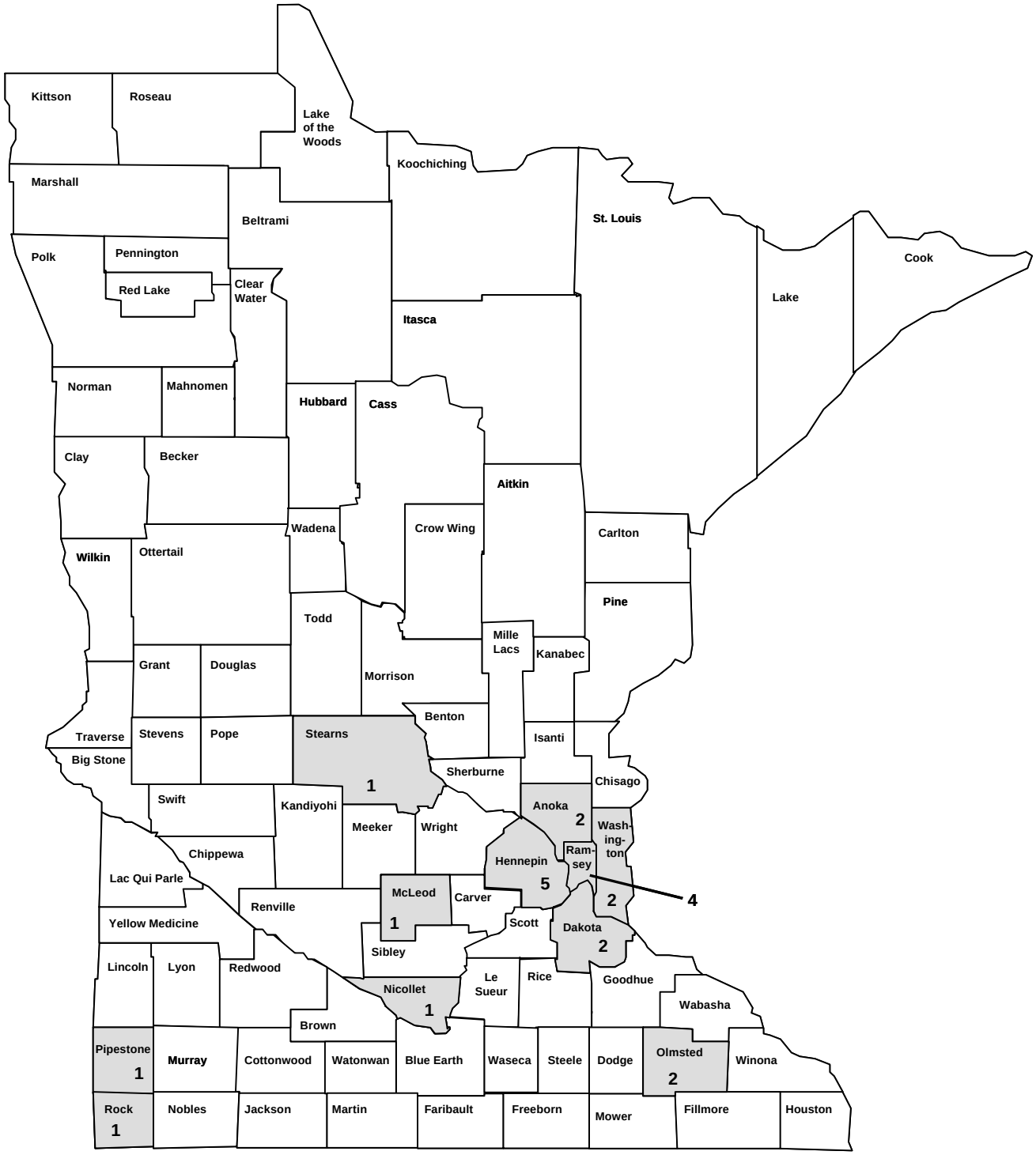
* Epidemiologically defined agent

Confirmed Foodborne Outbreaks by County, Minnesota, 2000 (n=45*)

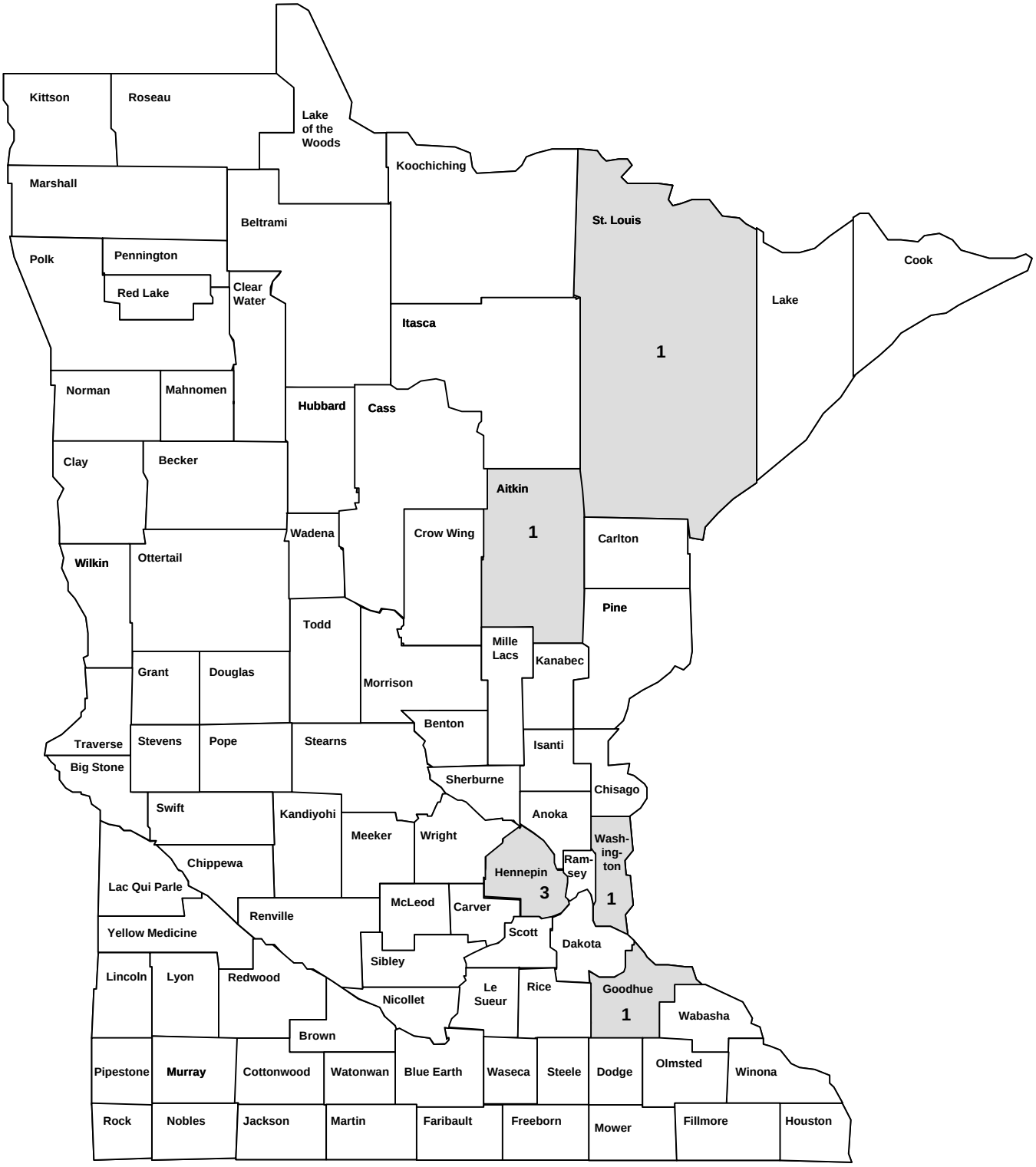


* Numbers on map add up to 59 because 43 of the 45 outbreaks involved single counties but two involved multiple counties. One outbreak involved Ramsey and Washington Counties and another outbreak involved Hennepin, Ramsey, Dakota, Anoka, Kandiyohi, Blue Earth, Wright, Renville, Chippewa, Swift, Houston, Nicollet, Lyon, and St. Louis Counties.

Probable Foodborne Outbreaks by County, Minnesota, 2000 (n=22)

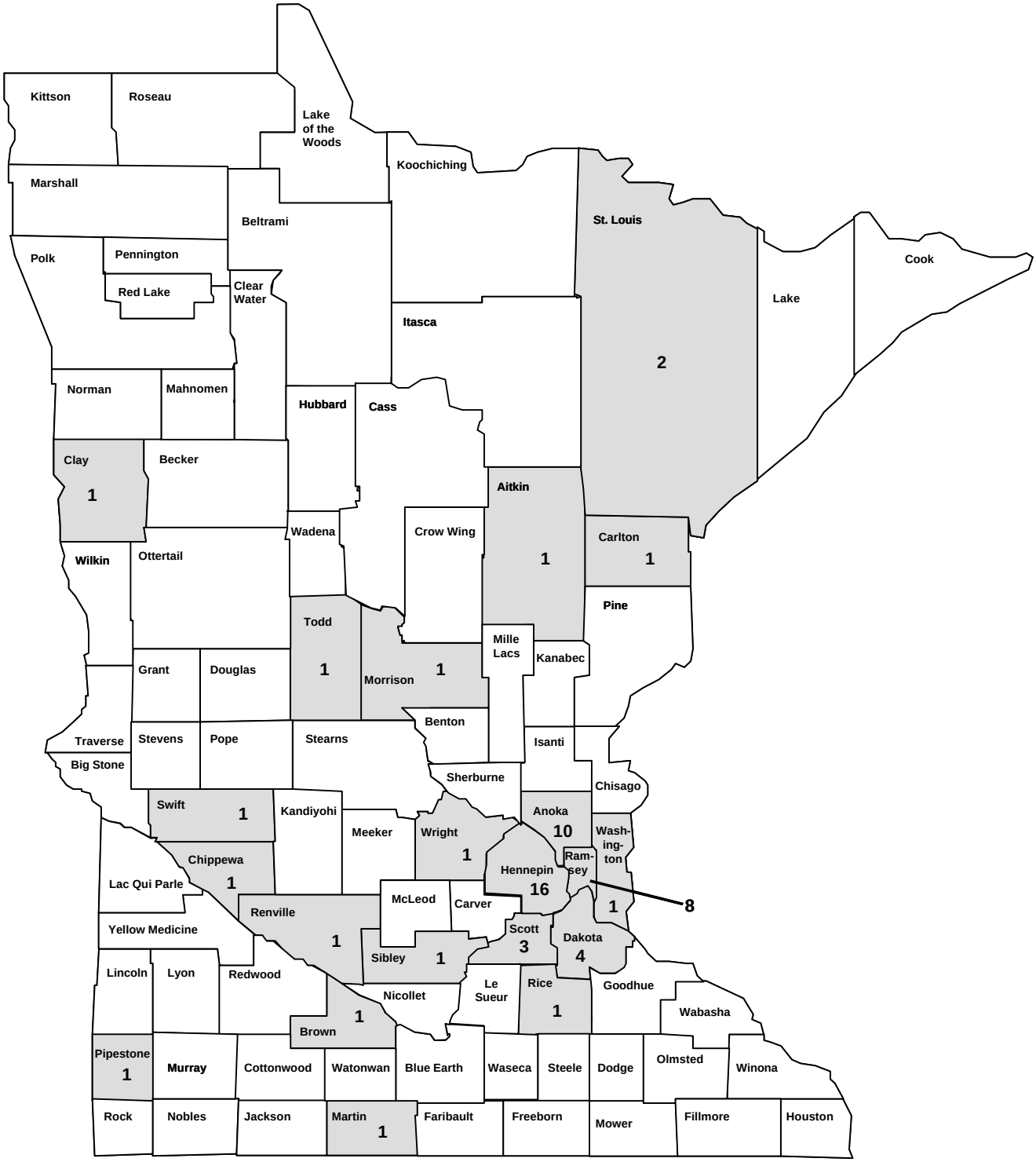


Confirmed Waterborne Outbreaks by County, Minnesota, 2000 (n=7)



Probable Waterborne Outbreaks by County, Minnesota, 2000 (n=1)

Non-Foodborne, Non-Waterborne Gastroenteritis Outbreaks by County, Minnesota, 2000 (n=56*)



* Numbers on map add up to 58 because 55 of the 56 outbreaks involved single counties but one involved three counties (Chippewa, Sibley, and Swift).

Foodborne Illness Complaints
Minnesota, 2000

City or County	Foodborne Illness Complaints Faxed From MDH To City or County	Foodborne Illness Complaints Received By MDH From City or County	Total
Aitkin County	0	0	0
Albert Lea, City of	1	0	1
Anoka County	17	1	18
* Becker County	4	0	4
* Beltrami County	2	0	2
* Benton County	1	0	1
Big Stone County	0	0	0
Bloomington, City of	32	35	67
* Blue Earth County	11	0	11
Brooklyn Park, City of	8	0	8
Brown County	1	0	1
* Carlton County	0	0	0
+ Carver County	6	0	6
Cass County	2	0	2
Chippewa County	0	0	0
+ Chisago County	6	0	6
Clay County	3	0	3
* Clearwater County	0	0	0
Cook County	0	0	0
Cottonwood County	0	0	0
* Crow Wing County	3	0	3
Crystal, City of	2	1	3
+ Dakota County	69	0	69
* Dodge County	0	0	0
Douglas County	2	0	2

Foodborne Illness Complaints
Minnesota, 2000

City or County	Foodborne Illness Complaints Faxed From MDH To City or County	Foodborne Illness Complaints Received By MDH From City or County	Total
Duluth, City of	0	0	0
Edina, City of	9	0	9
Faribault County	0	0	0
* Fillmore County	0	0	0
* Freeborn County	1	0	1
Golden Valley, City of	6	0	6
Goodhue County	2	0	2
* Grant County	0	0	0
Hennepin County	39	31	70
Hopkins, City of	6	0	6
* Houston County	3	0	3
* Hubbard County	2	0	2
+ Isanti County	1	0	1
* Itasca County	0	0	0
* Jackson County	0	0	0
* Kanabec County	1	0	1
Kandiyohi County	6	0	6
* Kittson County	0	0	0
* Koochiching County	0	0	0
Lac Qui Parle County	0	0	0
Lake County	2	0	2
* Lake of the Woods County	1	0	1
Le Sueur County	1	1	2

Foodborne Illness Complaints
Minnesota, 2000

City or County	Foodborne Illness Complaints Faxed From MDH To City or County	Foodborne Illness Complaints Received By MDH From City or County	Total
Lincoln County	0	0	0
* Lyon County	0	0	0
* Mahnomen County	0	0	0
Maplewood, City of	11	0	11
* Marshall County	1	0	1
Martin County	0	0	0
* McLeod County	3	0	3
* Meeker County	0	0	0
* Mille Lacs County	3	0	3
Minneapolis, City of	67	52	119
Minnetonka, City of	15	0	15
Moorhead, City of	0	0	0
Morrison County	2	0	2
* Mower County	5	0	5
Murray County	1	0	1
New Brighton, City of	3	0	3
Nicollet County	4	0	4
Nobles County	0	0	0
* Norman County	1	0	1
Olmsted County	4	44	48
* Otter Tail County	4	0	4
* Pennington County	0	0	0

Foodborne Illness Complaints
Minnesota, 2000

City or County	Foodborne Illness Complaints Faxed From MDH To City or County	Foodborne Illness Complaints Received By MDH From City or County	Total
+ Pine County	2	0	2
Pipestone County	2	0	2
* Polk County	0	0	0
Pope County	0	0	0
Ramsey County	42	7	49
* Red Lake County	0	0	0
Redwood County	0	0	0
* Renville County	0	0	0
* Rice County	0	0	0
Richfield, City of	11	0	11
Rock County	1	0	1
* Roseau County	0	0	0
St. Cloud, City of	6	3	9
St. Louis County	4	18	22
St. Louis Park, City of	6	2	8
St. Paul, City of	79	0	79
+ Scott County	7	0	7
* Sherburne County	1	0	1
* Sibley County	0	0	0
Stearns County	1	2	3
* Steele County	2	0	2
Swift County	0	0	0
* Stevens County	0	0	0

Foodborne Illness Complaints
Minnesota, 2000

City or County	Foodborne Illness Complaints Faxed From MDH To City or County	Foodborne Illness Complaints Received By MDH From City or County	Total
Swift County	0	0	0
Todd County	1	0	1
* Traverse County	0	0	0
Wabasha County	1	0	1
Wadena County	1	0	1
Waseca County	0	0	0
Washington County	17	9	26
Watonwan County	0	0	0
Wayzata, City of	1	0	1
Wilkin County	0	0	0
Winona County	0	0	0
+ Wright County	1	0	1
Yellow Medicine County	0	0	0
Bureau of Indian Affairs	4	0	4
Food and Drug Administration	7	0	7
Minnesota Department of Agriculture	63	0	63
University of Minnesota	3	0	3
United States Department of Agriculture	12	0	12
TOTAL	**649**	**206**	**855**

* complaint faxed to an MDH District Office (n=49)
\+ complaint faxed to MDH Environmental Health Services (n=92)

In 2000, the MDH Acute Disease Epidemiology Section (ADES) received 495 foodborne illness complaints from the public. Detailed information on symptoms and a 4-day food history was obtained from each caller (see form on next page), and the complaint was faxed to the appropriate jurisdiction for each restaurant, deli, grocery store, or other establishment named in the complaint. The 495 complaints received by ADES resulted in 649 faxes sent to environmental health staff or local agencies. In addition, ADES received 206 foodborne illness complaints forwarded from other public health agencies.

FOODBORNE ILLNESS COMPLAINT FORM

Stool kit delivered **G**
Daily **G**

Foodborne Illness Report
Minnesota Department of Health
Phone: (612) 676-5414 Fax: (612) 676-5730

Complaint date: ___/___/___ Tennessen: **Q** Reporter: _____

Agency: _____ Phone:_____ Fax: _____

First Name:_____ Last Name: _____ Age: _____ **Q** Female **Q** Male

Address _____ Zip: _____

Day phone: (_____)_____ Evening phone: (_____)_____

Occupation: _____ Daycare exposure: Yes No

Illness History: Illness onset: ___/___/___ Time: _____ Illness Recovery Date: ___/___/___ Time: _____

Vomiting Y N Onset date: ___/___/___ Time: _____ Vomiting recovery date: ___/___/___ Time: _____

Diarrhea Y N Onset date: ___/___/___ Time: _____ Diarrhea recovery date: ___/___/___ Time: _____

Number of stools per 24 hour period: _____ Cramps Y N Fever Y N temp:_____ Bloody stools Y N

Other symptoms: _____

Called healthcare provider: Y N Visited provider: Y N Please circle Office / ER Date of visit: ___/___/___

Provider requested stool sample: Y N Date stool submitted: ___/___/___ Result: _____ Hospitalized: Y N

Food History:
If only one person is ill; complete entire four day food history.
If ill persons live in the same household complete entire four day food history.
If more than one person is ill and they live in different households, then record only the common meals.

Date of Illness Onset: ___/___/___

Meal Time Foods and Drinks Consumed and Location (including home)

Brk: _____

Lun: _____

Sup: _____

Oth: _____

Day Prior to Illness Onset: ___/___/___

Meal Time Foods and Drinks Consumed and Location (including home)

Brk: _____

Lun: _____

Sup: _____

Oth: _____

Two Days Prior to Illness Onset: ___/___/___ Caller's name:_____

Meal Time Foods and Drinks Consumed and Location (including home)

Brk: _____

Lun: _____

Sup: _____

Oth: _____

Three Days Prior to Illness Onset of Illness: ___/___/___

Meal Time Foods and Drinks Consumed and Location (including home)

Brk: _____

Lun: _____

Sup: _____

Oth: _____

Establishment or Product Complainant Suspects (for products, include brand, size, flavor, UPC, purchase date & location)

_____

Number of persons exposed: _____ Number ill: _____ Did complainant call the establishment: Yes No

History of others Ill:

First name:_____ **Last name:**_____ **Age:**____

Address: _____ **Phone:** _____

Illness onset date: ___/___/___ Onset time: _____ Recovery date: ___/___/___ Recovery time: _____

Vomiting Y N Onset date: ___/___/___ Time: _____ Vomiting recovery date: ___/___/___ Time: _____

Diarrhea Y N Onset date: ___/___/___ Time: _____ Diarrhea recovery date: ___/___/___ Time: _____

Number of stools per 24 hour period: _____ Cramps Y N Fever Y N temp:_____ Bloody stools Y N

Other symptoms:_____

Foods eaten at common event:

_____

_____

_____

Agencies Notified **Q** MDH-EHS **Q** MDH-District Office **Q** MN Dept of Ag **Q** FDA **Q** USDA

Q Local Agencies: _____

Comments _____

_____

Complainant Expectations: **Q** Follow-up restaurants/establishments requested **Or** **9** MDA Follow-up requested

9 Complaint to be logged in database only

MDH Use Only: Stool collected: ___/___/___ Received at MDH: ME I M

Results: Calicivirus O157 *Shig* *Salm* *Campy* *Yersinia* Other_____ Negative

Notified case: ___/___/___ Notified local agency: ___/___/__

Original Caller: _____

History of others Ill:

First name:_____ **Last name:**_____ **Age:_____**

Address: _____ **Phone:** _____

Illness onset date: ___/___/___ Onset time: _____ Recovery date: ___/___/___ Recovery time: _____

Vomiting Y N Onset date: ___/___/___ Time: _____ Vomiting recovery date: ___/___/___ Time: _____

Diarrhea Y N Onset date: ___/___/___ Time: _____ Diarrhea recovery date: ___/___/___ Time: _____

Number of stools per 24 hour period: _____ Cramps Y N Fever Y N temp:_____ Bloody stools Y N

Other symptoms:_____

Foods eaten at common event: _____

_____

History of others Ill:

First name:_____ **Last name:**_____ **Age:_____**

Address: _____ **Phone:** _____

Illness onset date: ___/___/___ Onset time: _____ Recovery date: ___/___/___ Recovery time: _____

Vomiting Y N Onset date: ___/___/___ Time: _____ Vomiting recovery date: ___/___/___ Time: _____

Diarrhea Y N Onset date: ___/___/___ Time: _____ Diarrhea recovery date: ___/___/___ Time: _____

Number of stools per 24 hour period: _____ Cramps Y N Fever Y N temp:_____ Bloody stools Y N

Other symptoms:_____

Foods eaten at common event: _____

_____

Foodborne Disease Outbreak Investigation Guidelines
Minnesota Department of Health
Phone: (612) 676-5414 Fax: (612) 676-5743

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 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 **$3 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 <u>specific</u> 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 <u>specific</u> 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) <u>Exposure History</u>

- # 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., calicivirus) 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 $\leq$ 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

1) When interviewing food workers, Tennessen statements should be written to reflect the needs of the investigation to share illness history information with the establishment management.

2) Obtain illness histories directly from **ALL** food workers and catering staff. Ask employees about illness within 10 days of the event (in some situations, such as an outbreak involving ongoing Salmonella transmission in a restaurant, determine if there was any employee illness in the relevant time period). Please do not rely on

management assessment of illness in employees, but **interview all employees directly**. Ask about gastrointestinal illness in the families of food workers, and obtain detailed information about the foods each food worker assisted in preparing for the event and any foods they may have consumed. Obtain stool samples from all employees who were ill prior to or following the event.

3) Ask management and kitchen staff about food preparation and storage practices, including:

- # food worker tasks (do workers have multiple tasks, do servers prepare any food, etc.)
- # food preparation (who, when, how, shared cutting surfaces, shared utensils, etc.)
- # bare-handed or glove-handed contact by food workers
- # pre-cooking of any dishes
- # food storage
- # cooking methods
- # cooling methods
- # reheating methods
- # warming trays used
- # serving/delivery (self serve salads, hot/cold buffet table, Sterno heaters, ice beds, etc.)
- # cleaning surfaces, dishes (who, when, how)

4) Food samples are rarely tested, even when epidemiologically implicated. Occasionally, the Minnesota Department of Agriculture tests food, but MDH relies almost exclusively on stool samples from cases.

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 Section:

- # Date the investigating agency was notified of outbreak
- # Description of the initial report made to the investigating agency
- # Date of the event

Methods Section:

- # Who provided information about attendees, including names and phone numbers
- # Other agencies notified of the outbreak and investigation

- Number of people who attended the event
- Case definition (The standard definition: vomiting or diarrhea after attending the event)
- Number of people interviewed
- Number who met the case definition among those interviewed
- Number of stools collected for testing
- Pathogens tested for in stools

(Note: When possible, all persons interviewed should be selected **randomly** from guest lists, not by word of mouth from cases. Cases are likely to mention other ill persons which may bias the results. At least one control should be interviewed per case, and preferably two or more controls per case.)

Results Section:

- Percentage of interviewed cases with Fever
- Percentage of interviewed cases with Diarrhea ($\geq$3 loose stools in a 24-hour period)
- Percentage of interviewed cases with Vomiting
- Percentage of interviewed cases with Bloody stools
- Percentage of interviewed cases with Abdominal cramps
- Incubation range
- Median incubation
- Duration range
- Median duration
- Results of stool testing
- Food items or events associated with illness.
- Odds ratio of implicated item(s)
- Confidence intervals for implicated item(s)
- p values for all implicated item(s)
- All relevant information found in the establishment investigation
- Results of food worker interviews
- Results of food worker stool cultures

Conclusion Section:

- Etiologic agent
- Discussion of route of transmission (contaminated food)
- Contributing factors (cold food items contaminated by infected food worker; person to person transmission; undercooked food; improperly stored food, etc.)
- Defense of conclusion, if needed (for example, how do the symptoms, median incubation period and median duration suggest a causal agent). Discuss all plausible sources of contamination when necessary.

SAMPLE FOODBORNE OUTBREAK INVESTIGATION QUESTIONNAIRE
Name of Outbreak
City, Minnesota
Day, Month, Year

Tennessen: Y N
Date:_____
Interviewer: _____

Name (Last, First):_____ Date of birth ____/____/____ Sex: M F

Street:_____ City:_____ County: _____

State: _____ Zip code: _____ Phone (H)_____ (W)_____

Case Illness History: Illness onset: Date: ____/____/____ Time: _____ Recovery: Date: ____/____/____ Time: _____

Vomiting Y N Onset: Date: ____/____/____ Time: _____ Cramps Y N Fever Y N temp:_____ Bloody stools Y N

Diarrhea Y N Onset: Date: ____/____/____ Time: _____ Maximum number of stools per 24 hour period: _____

Diarrhea Recovery Date: ____/____/____ Time: _____ (Diarrhea duration: _____days / hours)

First symptom: _____

Other symptoms: Y N specify: _____ Onset of other symptoms: Date: ____/____/____ Time: _____

Called provider: Y N Visited provider: Y N Please circle: Clinic / ER Date of visit ____/____/____

Provider requested stool sample Y N Stool sample submitted: Y N ____/____/____ Hospitalized over night: Y N

Food History (for cases and controls): Date of meal: ____/____/____ Time of meal (military):_____

[*sample menu*]

Fried chicken	Y N	Soda	Y N Type(s): _____
Ham	Y N	Fruit punch	Y N
Au gratin potatoes	Y N	Coffee	Y N
Baked beans	Y N	Water	Y N
Potato salad	Y N	Ice	Y N
Tossed salad	Y N	Other food or drink:	Y N _____
dressing:_____	Y N		
Angel food cake	Y N		

Did any one in your household experience vomiting or diarrheal illness in the week prior to this dinner (party, wedding...): Y N

Name (last, first)	Age	Onset date
_____	____	____/____/____
_____	____	____/____/____
_____	____	____/____/____