

Electronic Foodborne Outbreak Reporting System	Investigation of a Foodborne Outbreak This form is used to report foodborne disease outbreak investigations to CDC. It is also used to report Salmonella Enteritidis and E. coli O157:H7 outbreak investigations involving any mode of transmission. A foodborne outbreak is defined as the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food in the United States. This form has 7 parts. Part 1 asks for the minimum or basic information needed and must be completed for the investigation to be counted in the CDC annual summary. Part 2 asks for additional information for any foodborne outbreak, while Parts 3 - 6 ask for information concerning specific vehicles or etiologies. Please complete as much of all parts as possible.	CDC Use Only 15049
		State Use Only 2008-28

Part 1: Basic Information

1. Report Type A. <input checked="" type="checkbox"/> Please check if this a final report B. <input type="checkbox"/> Please check if data does not support a FOODBORNE outbreak	3. Dates Please enter as many dates as possible Date first case became ill <input type="text" value="10/07/2008"/> <small>Month / Day / Year</small> Date last case became ill <input type="text" value="10/19/2008"/> <small>Month / Day / Year</small> Date first known exposure <input type="text" value="10/02/2008"/> <small>Month / Day / Year</small> Date last known exposure <input type="text" value="10/11/2008"/> <small>Month / Day / Year</small>	4. Location of Exposure Reporting State <input type="text" value="Washington"/> <input type="checkbox"/> Multi-State Exposure outbreak <input type="checkbox"/> Multi-State Residents outbreak Other States <input type="text"/> Reporting County <input type="text" value="Snohomish"/> <input type="checkbox"/> Multi-County Exposure outbreak <input checked="" type="checkbox"/> Multi-County Residence outbreak Other Counties <input type="text" value="King"/>
2. Number of Cases Lab-confirmed cases <input type="text" value="19"/> (A) Including <input type="text" value="2"/> Secondary Probable cases <input type="text" value="5"/> (B) Including <input type="text" value="1"/> Secondary Estimated total ill <input type="text" value="68"/> <i>(If greater than sum A + B)</i>		

5. Approximate Percentage of Cases in Each Age Group <table style="width: 100%;"> <tr> <td>1 year <input type="text" value="3"/> %</td> <td>20-49yrs <input type="text" value="51"/> %</td> </tr> <tr> <td>1-4 yrs <input type="text" value="3"/> %</td> <td>50yrs <input type="text" value="18"/> %</td> </tr> <tr> <td>5-19 yrs <input type="text" value="22"/> %</td> <td>Unknown <input type="text"/> %</td> </tr> </table>	1 year <input type="text" value="3"/> %	20-49yrs <input type="text" value="51"/> %	1-4 yrs <input type="text" value="3"/> %	50yrs <input type="text" value="18"/> %	5-19 yrs <input type="text" value="22"/> %	Unknown <input type="text"/> %	6. Sex (Estimated percent of the total cases) Male <input type="text" value="33"/> % Female <input type="text" value="66"/> %	7. Investigation Methods (Check all that apply) <input type="checkbox"/> Interviews of only cases <input checked="" type="checkbox"/> Case control study <input checked="" type="checkbox"/> Food preparation review <input type="checkbox"/> Cohort study <input type="checkbox"/> Investigation at factory or production plant <input type="checkbox"/> Investigation at original source (farm, marine estuary, etc.) <input type="checkbox"/> Food product traceback <input checked="" type="checkbox"/> Environment/food sample cultures
1 year <input type="text" value="3"/> %	20-49yrs <input type="text" value="51"/> %							
1-4 yrs <input type="text" value="3"/> %	50yrs <input type="text" value="18"/> %							
5-19 yrs <input type="text" value="22"/> %	Unknown <input type="text"/> %							

8. Implicated Food(s) (Please provide known information)				
Name of Food	Main Ingredient(s)	Contaminated Ingredient(s)	Reason(s) Suspected	Method of Preparation <small>(See codes and explanations below)</small>
<small>e.g., Lasagna</small>	<small>e.g., Pasta, sauce, eggs, beef</small>	<small>e.g., Eggs</small>	<small>e.g., 4</small>	<small>e.g., MI</small>
1) <input type="text" value="guacamole, unspecified"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="MI"/>
2) <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3) <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Food vehicle undetermined Reason Suspected (Choose all that apply) 1-Statistical evidence from epidemiological investigation 4- Other data (e.g., same phage type found on farm that supplied eggs) 2-Laboratory evidence (e.g., identification of agent in food) 5- Specific evidence lacking but prior experience makes it likely source 3-Compelling supportive information				

CDC 52.13 REV 4/2004

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9. Etiology (Name the bacteria, virus, parasite, or toxin. If available, include the serotype and other characteristics such as phage type, virulence factors, metabolic profile. Confirmation criteria available at [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm2000a04.htm](#) or MMWR2000/Vol 49/SS-1 Appendix B)

	Etiology	Confirmed	Serotype (if available)	Other Characteristics	Detected In (see below)
1.)	Escherichia coli, Enterohemorrhagic	<input checked="" type="checkbox"/> Confirmed	O157:H7		Patient Specimen(s)
2.)		<input type="checkbox"/> Confirmed			
3.)		<input type="checkbox"/> Confirmed			

Etiology undetermined

Detected In (Choose all that apply)
 1-Patient Specimen(s) 3-Environment specimen(s)
 2-Food Specimen(s) 4- Food Worker specimen(s)

10. Isolate Subtype

	State Lab ID	PFGE (PulseNet designation)	PFGE (PulseNet designation)
1.)	WA_12892	EXHX01.2134	EXHA26.0888
2.)			
3.)			

11. Contributing Factors (Check all that apply)(See codes and explanations below)

- Contributing factors unknown
- Contamination Factor**
 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 (describe in Comments) N/A
- Proliferation/Amplification Factor (bacterial outbreaks only)**
 P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 (describe in Comments) N/A
- Survival Factor (microbial outbreaks only)**
 S1 S2 S3 S4 S5 (describe in Comments) N/A
- Was food-worker implicated as the source of contamination?** Yes No
- If yes, please check **only one** of following
 - laboratory and epidemiologic evidence
 - epidemiologic evidence (w/o lab confirmation)
 - lab evidence (w/o epidemiologic evidence)
 - prior experience makes this the likely source (please explain in Comments)

Part 2: Additional Information

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12 Symptoms, Signs and Outcomes		
Feature	Cases with outcome/feature	Total cases for whom you have information available
Healthcare Provider Visit	23	23
Hospitalization	4	26
Death	0	27
Vomiting	7	22
Diarrhea	27	27
Bloody Stools	20	23
Fever	8	23
Abdominal Cramps	22	22
ILUS	1	27
Asymp		
*		
*		
*		

13. Incubation Period
(circle appropriate units)

Shortest Days
 Longest Days
 Median Days

Unknown

14. Duration of Illness (Among those who recovered)
(circle appropriate units)

Shortest
 Longest
 Median

Unknown

- Use the following terms, if appropriate, to describe other common characteristics of cases
- | | | |
|----------------------|-------------|----------------------|
| anaphylaxis | diplopia | myalgia |
| arthralgia | flushing | paresthesia |
| bradycardia | headache | septicemia |
| bullous skn lesions | sore throat | thrombocytopenia |
| cough | tachycardia | temperature reversal |
| coma | hypotension | urticaria |
| descending paralysis | itching | wheezing |
| | jaundice | |
| | lethargy | |

15. If Cohort Investigation Conducted:

Event specific attack rate = / * 100 = %

ill exposed Total # of persons in cohort for whom you have illness info

- 16. Location Where Food Was Prepared**
(Check all that apply)
- | | |
|---|---|
| <input checked="" type="checkbox"/> Restaurant or deli | <input type="checkbox"/> Nursing home |
| <input type="checkbox"/> Day care center | <input type="checkbox"/> Prison, jail |
| <input type="checkbox"/> School | <input type="checkbox"/> Private home |
| <input type="checkbox"/> Office setting | <input type="checkbox"/> Workplace, not cafeteria |
| <input type="checkbox"/> Workplace cafeteria | <input type="checkbox"/> Wedding reception |
| <input type="checkbox"/> Banquet Facility | <input type="checkbox"/> Church, temple, etc |
| <input type="checkbox"/> Picnic | <input type="checkbox"/> Camp |
| <input type="checkbox"/> Fair, festival, other temporary/ mobile services | |
| <input type="checkbox"/> Caterer | |
| <input type="checkbox"/> Contaminated food imported into U.S. | |
| <input type="checkbox"/> Grocery Store | |
| <input type="checkbox"/> Commercial product, served without further preparation | |
| <input type="checkbox"/> Hospital | <input type="checkbox"/> Other (please describe) |
| <input type="checkbox"/> Unknown or undetermined | |

- 17. Location of Exposure or Where Food Was Eaten** (Check all that apply)
- | | |
|--|---|
| <input checked="" type="checkbox"/> Restaurant or deli | <input type="checkbox"/> Nursing Home |
| <input type="checkbox"/> Day care center | <input type="checkbox"/> Prison, jail |
| <input type="checkbox"/> School | <input type="checkbox"/> Private home |
| <input type="checkbox"/> Office Setting | <input type="checkbox"/> Workplace, not cafeteria |
| <input type="checkbox"/> Workplace cafeteria | <input type="checkbox"/> Wedding Reception |
| <input type="checkbox"/> Banquet Facility | <input type="checkbox"/> Church, temple, etc |
| <input type="checkbox"/> Picnic | <input type="checkbox"/> Camp |
| <input type="checkbox"/> Fair, festival, temporary/ mobile service | |
| <input type="checkbox"/> Grocery Store | <input type="checkbox"/> Hospital |
| <input type="checkbox"/> Other (please describe) | <input type="checkbox"/> Unknown or undetermined |

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18. Trace back			
<input type="checkbox"/> Please check if trace back conducted			
Source to which trace back led			
Source (e.g., Chicken farm, Tomato processing plant)	Location of Source	Country	Comments
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. Recall		20. Available Reports	
<input type="checkbox"/> Please check if any food product recalled		<input type="checkbox"/> Unpublished agency report (please attach)	
Recall Comments		<input type="checkbox"/> Epi-Aid	
<input type="text"/>		<input type="checkbox"/> Publication (please reference)	
<input type="text"/>		<input type="text"/>	
21. Agency reporting this outbreak		22. Remarks Briefly describe important aspects of the outbreak not covered above (e.g., restaurant closure, immunoglobulin administration, economic impact, etc)	
<input type="text" value="WA DOH"/>			
Contact Person			
Name	<input type="text" value="Kathryn MacDonald"/>		
Title	<input type="text" value="eFORS admin"/>		
Phone No	<input type="text" value="206-418-5432"/>		
Fax No.	<input type="text" value="206-418-5515"/>		
E-Mail	<input type="text" value="kathryn.macdonald@doh.wa.gov"/>		
		<input type="text" value="Restaurant closed for cleaning, restocking. No cases after re-opening."/>	

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Enterohemorrhagic E. coli (O157:H7) Outbreak Ixtapa, Lake Stevens, WA October 2008

Notification of Illness

On Tuesday, October 14th, 2008 the Snohomish Health District (SHD) Communicable Disease (CD) Program received an E. coli 0157 lab report. Upon initial interview, the case did not reveal having eaten at Ixtapa (This case ate at Ixtapa on 10/10/08, but was not identified as a patron until another discussion with the case transpired. By this time the outbreak was well established). On Wednesday, October 15th, 2008 a 2nd E. coli lab report was received. Upon interviewing (on 10/16/08), this was the 1st case to be identified as having eaten at Ixtapa (at Lake Stevens) on October 9th, 2008. The 3rd and 4th E. coli 0157 cases were reported via labs to the SHD CD Program on Thursday, October 16th. Upon follow up, these cases also indicated eating at Ixtapa. The 3rd and 4th reported cases ate at Ixtapa on October 2nd and 9th. At this point (on 10/16/08), the Environmental Health Food and Living (FLE) Program was notified. The Childcare Health Program was also notified on 10/16/08 and proceeded to follow up with 2 of the cases that were identified as working at a childcare facility. On Friday, October 17th, 2008 the SHD CD Program received 5 more E. coli case reports. All of these cases reported eating at Ixtapa between 10/09/08 – 10/11/08. FLE staff completed an onsite inspection of the restaurant on Friday, October 17th.

Case Investigation of the Outbreak

Beginning on October 16th, the CD Program interviewed the 1st reported E. coli 0157 case known to have eaten at Ixtapa (on 10/9/08) and initiated the use of the "Supplemental E. coli 0157 case questionnaire" (standard for all E. coli 0157 case interviews). Once Ixtapa was identified as a highly probable source of the outbreak (Friday, October 17th) and the Ixtapa menu was obtained (by FLE), a food questionnaire specific to the food items available at Ixtapa was created by CD Program staff. The Ixtapa food questionnaire was completed Monday (10/20/08) morning. E. coli 0157 cases reporting a history of eating at Ixtapa were then interviewed using the Ixtapa food questionnaire instead of the standard "Supplemental E. coli 0157 case questionnaire". Additionally, CD investigators interviewed patrons of Ixtapa that were not ill (controls). Controls were obtained by asking interviewed cases if they knew of others that ate during the same time frame that were not ill. After careful consideration of possible causes of the E. coli 0157 outbreak, Snohomish Health District put out a media release on 10/21/08 indicating that the Ixtapa restaurant was the likely source of 13 E. coli 0157 illnesses reported within Snohomish County. After this media release, many Snohomish County residents called the SHD CD Program reporting that they had eaten at Ixtapa and had clinical symptoms compatible with E. coli 0157, but had no lab testing conducted and no contact with a lab confirmed case. As a result, these individuals were denoted as "suspect" cases and tracked in a line list.

Confirmed and probable cases were entered into PHIMS (Public Health Issues Management System) and a line list created within an E. coli Access database. Additionally, the suspect cases were entered into a separate line list within the Access database. The Ixtapa food questionnaire information was entered into a line list within the Access database. Statistical analysis of the Ixtapa food questionnaire data was conducted using SPSS 13.0.

Epidemiological Analysis

During the span of the outbreak (reported cases from 10/14 – 10/31), 23 confirmed & probable cases (that were identified as Snohomish County residents), and 41 suspect cases were reported as having eaten at Ixtapa during their exposure periods. One resident from King County (not included in the Snohomish County case count) ate at Ixtapa during the identified exposure period and identified as a confirmed case.

These cases became ill from 10/7 – 10/18 (Refer to Graph #1). Additionally, 3 secondary cases (2 confirmed, 1 probable) were reported. Cases were classified as secondary if they had contact with confirmed cases, but did not eat at Ixtapa during their exposure period

Criteria for Diagnosis:

Clinical Criteria for Diagnosis

Enterohemorrhagic *E. coli* causes an infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Illness may be complicated by HUS (hemolytic uremic syndrome) or TTP (thrombotic thrombocytopenic purpura); asymptomatic infections occur and the organism may cause extraintestinal complications.

Laboratory Criteria for Diagnosis

1. Isolation of *Escherichia coli* O157:H7 from a clinical specimen, or
2. Isolation of a Shiga toxin-producing *E. coli* from a clinical specimen

Case definitions (used during course of outbreak):

Confirmed - Isolation of *Escherichia coli* O157:H7 or Shiga toxin producing *E. coli* (by the DOH Public Health Lab) from a clinical specimen.

Presumptive – A case with isolation of *E. coli* O157 or Shiga toxin from a private lab. The specimen was sent on to the WA DOH Public Health Lab for additional/confirmatory testing.

Probable - A case with isolation of *E. coli* O157 from a clinical specimen, pending confirmation of H7 antigen or Shiga toxin production, or a clinically compatible case that is epidemiologically linked to a confirmed or probable case, or identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case.

Suspect – Clinically compatible case (without lab confirmation) that reported eating at Ixtapa during the same time period in which confirmed and probable cases ate at Ixtapa.

Demographics:

Ages of the patrons ranged from 7 years old to 75 years old, with a mean age of 34.4 years (median = 28 yrs. The age of the non-ill controls was not recorded upon interview, and thus unavailable for comparison. Among the cases 69.6% (16/23) were female and 30.4% (7/23) were male.

Symptoms:

The average incubation period (time eaten at Ixtapa to time symptoms occurred) for the 23 cases was 4.3 days (with a range of 1-8 days).

Symptoms reported during interviews with cases include (Refer to Graph #2): diarrhea (100%, 23/23), cramps (95.7%, 22/23), bloody diarrhea (87.0%, 20/23), nausea (69.6%, 16/23), fever (34.8%, 8/23), vomiting (30.4%, 7/23). Other clinical findings of note include 4 hospitalized cases (17.4%), 2 cases with underlying illnesses, and 1 case developing HUS (hemolytic uremic syndrome). Additionally, 5 cases (21.7%) were prescribed and initiated antibiotic treatment after diagnosis, which is contraindicated for enterohemorrhagic *E. coli* O157 infections.

Laboratory testing:

Of the 23 confirmed & probable cases, 18 had *E. coli* O157 cultured at the WA State Department of Health (WA DOH) Public Health Lab (PHL) in Shoreline and 3 have been identified via private labs and are awaiting confirmation at the DOH lab. Of the 18 cultures, 15 had exact PFGE (pulsed field gel

electrophoresis) matches and 2 are yet to be determined. The remaining PFGE result was only slightly different and was indicated to be linked to the other matching 15 PFGEs.

Foods associated with illness:

As mentioned earlier, an Ixtapa food questionnaire was developed to assist the CD Program in identifying possible sources of infection. Once the cases and controls were interviewed with Ixtapa food questionnaires, the data were entered into an electronic spreadsheet for analysis. The data were then analyzed using SPSS 13.0. The analysis consisted of 2 steps: 1) in which a chi-square analysis was conducted (including the calculation of the odds ratio estimate) on each individual food exposure identified and 2) then a logistic regression was run with the food variables of interest identified by the chi-square analysis.

Based upon the chi-square analysis (which identified whether there was a statistically significant difference between the cases and the controls reported consumption of a food item), 6 food variables were included in the logistic regression model. Of all the food variables analyzed initially, guacamole had the strongest association with the reported cases (21 of 25 cases ate the guacamole, where as only 13 of 40 controls ate the guacamole) having 10.9 times greater odds of eating guacamole compared to the controls (odds ratio (OR) estimate = 10.9, $p < .001$, 95% C.I. = 3.1 – 38.3). The other variables identified to be included in the logistic regression analysis were sour cream, pico de gallo, ground beef, enchiladas, cheese (age was not included on the Ixtapa food questionnaires, so it was not available for controls and consequently unavailable for analysis).

The logistic regression model was used to identify an association between cases and foods eaten compared to controls while accounting for confounding effects (foods that may be masking the true association between the food exposure and the outcome of an individual as a case or control). After analyzing the selected food exposures using the logistic regression model, guacamole remained the only significant food exposure identified with an OR estimate = 26.5 ($p=.001$, 95% C.I. = 3.5 - 77.7)

Environmental Health Investigation

On Thursday, October 16, 2008, the Food Program was notified by the Communicable Disease (CD) Program of two cases of E. coli. The cases had eaten at Neapolis Pizza & Pasta & at Ixtapa at Lake Stevens in the days preceding the onset of their symptoms. Plans were made to inspect both restaurants on Friday. A second report of E. coli came in to the food program via the CD Program and the cases identified Ixtapa as one of several restaurants where they had eaten. The Food Program decided to investigate Ixtapa in Lake Stevens ahead of other restaurants as it had been mentioned by at least two separate parties.

On Friday, October 17, 2008, Chris Stringer went to Ixtapa in Lake Stevens to evaluate food handling and get information on foods used in the restaurant. Ixtapa management was not aware of any customer complaints. Vendors of produce & meat were identified by Chris & there was no report of ill employees. Chris did find approximately 2 pounds of unidentified white cheese in walk-in cooler. Recent concerns over possibly illegal queso fresco in the Puget Sound area was considered (and later ruled out). EH checked with other Ixtapa restaurants to determine if the vendors were the same as those used by the Lake Stevens store. They were. More reports of E. coli illness came in to the CD Program and most had a history of eating at Ixtapa in Lake Stevens during their exposure period. Rick Zahalka called Janet Anderberg, Department of Health, to advise her of the developing foodborne outbreak. She volunteered to assist in interviewing employees with a goal of determining if any employees had been or were still ill. A call to the manager resulted in his cooperation to have all employees present that evening. Janet Anderberg, John Sipkens & Evan Brestar went to the restaurant at 5 p.m. and interviewed all employees. No one reported being ill, having ill family members or knowing of a fellow employee being ill. A few instances of food service employees using bare-hand contact with ready to eat foods were noted during the evening.

On Monday, October 20, 2008, John Sipkens went to the restaurant and collected the white cheese and delivered it to the state lab for analysis (it later came back negative for E. coli).

On Tuesday, October 21, 2008, SHD determined there was sufficient evidence to make a public statement to the effect that there was a strong positive correlation between the people ill with E. coli and people that ate at Ixtapa in Lake Stevens. Rick Zahalka called the restaurant to advise the owner of our findings before SHD went to the media with the story. The owner decided to close the restaurant and cooperate fully with SHD. Randy Durant & Rick Zahalka went to the restaurant to meet with the owner and direct open food disposal and sanitization of the facility.

On Wednesday, October 22, 2008, Chris Stringer and Randy Durant inspected the facility and found the restaurant in compliance with sanitizing recommendations. The owners received approval to have fresh food brought into the restaurant and began preparation in advance of reopening. Teresita Corona, Health Education Delivery Specialist with SHD, delivered a food safety retraining session to the employees in the Spanish language. The restaurant was permitted to reopen.

On October 23, 2008, Chris Stringer visited the restaurant to get detailed information on the preparation of pico de gallo, guacamole and salsa. The pico de gallo, guacamole and salsa are prepared by the same employee every day and in succession. Only enough onions, tomatoes and cilantro are prepared for a single product being made. That is, large amounts of onion are not prepared in advance for use as an ingredient in all three dishes. Rather the amount of onion, tomato and cilantro needed to make pico de gallo is prepared, the pico de gallo made and stored in the walk in cooler before the employee prepares ingredients for the guacamole or salsa. The station used for the preparation of these three products is in continuous use as is the slicing and dicing equipment until all products are made. Chris also contacted the produce distributor to attempt to determine source of onions, cilantro, tomatoes and avocados. The trace back was not productive. Chris left 3 stool sample kits for the three employees involved in vegetable preparation.

On October 24, 2008, the stool samples were collected and returned to SHD for shipment to the lab. One sample was incorrectly collected and could not be sent. A fresh kit was delivered to the restaurant for a replacement stool sample.

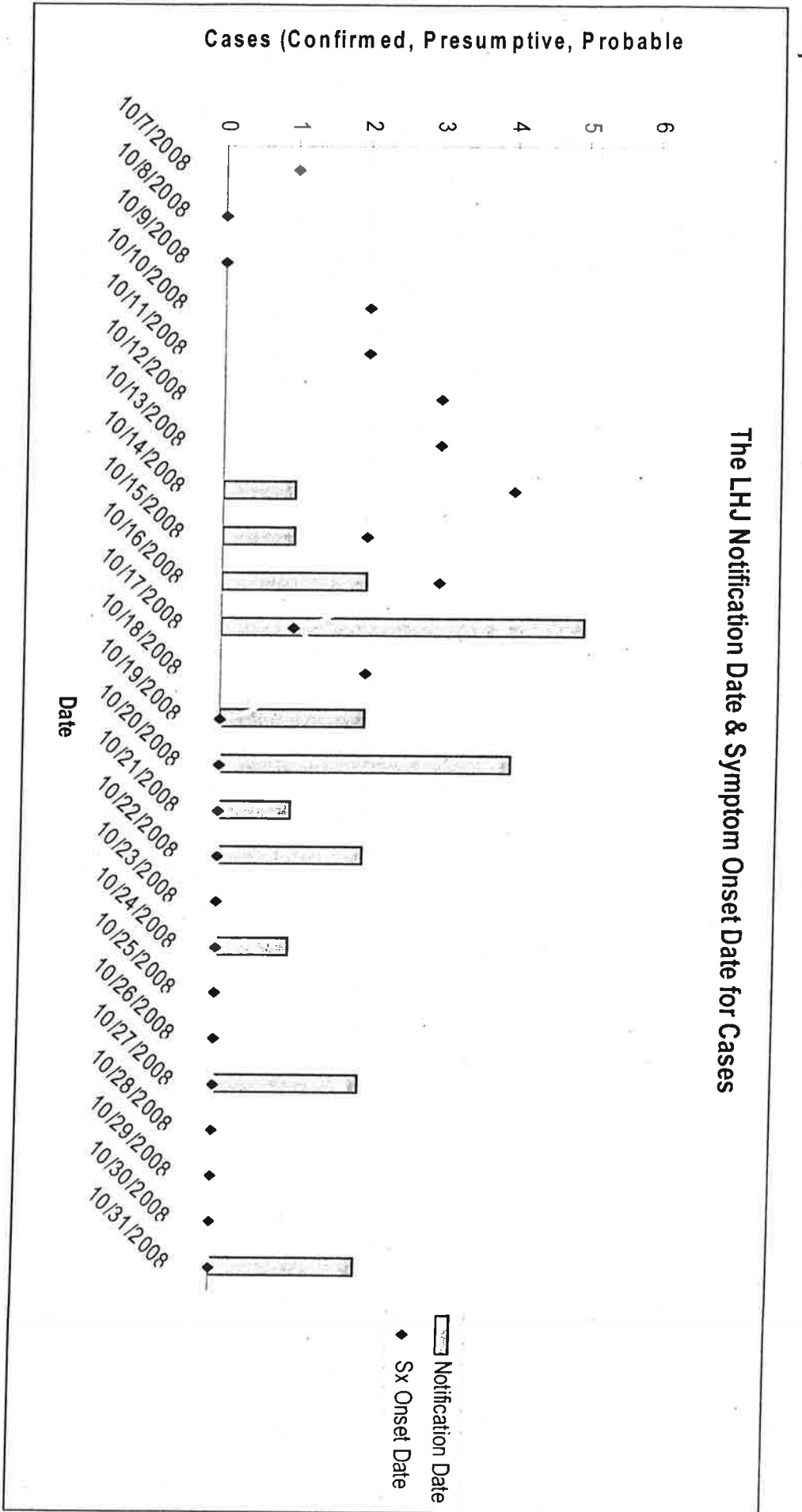
On October 27, 2008, the stool sample was collected from the restaurant and delivered to the lab. All stool samples tested at DOH PHL were negative for E. coli 0157.

Conclusions

Though the analysis of the Ixtapa food exposures identified indicate that a strong association between becoming ill and having eaten guacamole existed, the exact source of transmission remains un-identified. If the guacamole was indeed the sole source of infection, it is unknown how the guacamole became contaminated. Possible contamination routes include a contaminated product used to make the guacamole (the ingredients used during the exposure period were not available for testing at the time of the initial restaurant inspection), cross-contamination with another contaminated food product during and/or after preparation, or an ill-food worker (of which none were identified, but cannot be conclusively ruled out) contaminating the guacamole. Also, the guacamole cannot be identified as the sole causative agent of infection based upon the information available. For instance, the salsa was eaten by most patrons interviewed (54/65, 83.1%), so it was not possible to identify a reliable odds estimate since so few patrons did not eat it.

Since the restaurant voluntarily closed (10/21/08), disposed of all food items, sanitized, and then reopened, there was no evidence of ongoing transmission beyond the originally identified meal dates (10/2, 10/9-10/11).

The LHJ Notification Date & Symptom Onset Date for Cases



Symptom Frequency Among the 23 Cases that Ate Ixtapa

