Gastrointestinal Illness Outbreak Associated with a Theme Park Safari Excursion

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Presentation Outline

- Introduction
- Methodology
- Results
- Conclusions
Introduction: Foodborne Complaint System

Complaint Filing Methods
- Fax
- Mail
- Phone
- Online

CHD Conducts Interview

Environmental Health

Epidemiology

DOH Regional Food & Waterborne Epidemiologist

Standard Inspection
- Only Regulatory Agency

Joint Inspection
- Regulatory Agency & Environmental Health
- Epi if warranted

Regulatory Agency
- Department of Business and Professional Regulation
- Department of Agriculture and Consumer Services
- Agency for Health Care Administration
Introduction:
Safari Excursion

• Nature walk
• Ropes course
• Safari truck ride
• Themed meal
• Additional cost
• ~12 person group
• Excursion: ~3 hours

Bevil, D., Orlando Sentinel, January 14, 2011, orlandosentinal.com
Methodology: Techniques

- Multiple joint assessments
- By reservation only!
- Retrospective cohort study
  - Source / ongoing?
- Scaled response
- Remote strike team
Methodology:
Case Definition

- A staff member or guest who experienced diarrhea or vomiting within 6 days of attending the Safari Excursion during June 4 – 11 or July 1-11, 2012
## Results: Epidemiology

<table>
<thead>
<tr>
<th>Cohort Results</th>
<th>June</th>
<th>July</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Population</td>
<td>617</td>
<td>248</td>
</tr>
<tr>
<td>Response Rate (%)</td>
<td>59</td>
<td>58</td>
</tr>
<tr>
<td>Study Population</td>
<td>351</td>
<td>132</td>
</tr>
<tr>
<td>Attack Rate (%)</td>
<td>33</td>
<td>14</td>
</tr>
<tr>
<td>Female (%)</td>
<td>58</td>
<td>52</td>
</tr>
<tr>
<td>Age (years) - Median</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>- Range</td>
<td>7-71</td>
<td>8-86</td>
</tr>
</tbody>
</table>
## Results: Epidemiology

<table>
<thead>
<tr>
<th>Symptomology</th>
<th>June (%)</th>
<th>July (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea – Watery</td>
<td>78</td>
<td>58</td>
</tr>
<tr>
<td>- Mucous</td>
<td>80</td>
<td>42</td>
</tr>
<tr>
<td>- Bloody</td>
<td>3</td>
<td>58</td>
</tr>
<tr>
<td>Body Aches</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>Fatigue</td>
<td>37</td>
<td>68</td>
</tr>
<tr>
<td>Headache</td>
<td>23</td>
<td>47</td>
</tr>
</tbody>
</table>

**Incubation** (Hours) (Avg±SD)  
50 ± 28  
39 ± 26

**Duration** (Days) (Avg±SD)  
5.1 ± 3.3  
3.4 ± 5.0
Results:

Epidemic Curve

Case Frequency

June 2012

Illness Onset Date

Division of Disease Control and Health Protection
Results:
Response/Attack Rate

June 2012
Date Attended Trek

- Total
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Response Rate
Attack Rate
Results:

Exposure Analysis

- No statistically significant non-food exposures

<table>
<thead>
<tr>
<th>Food Items</th>
<th>Relative Risk (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bivariate Analysis</strong></td>
<td></td>
</tr>
<tr>
<td>* Melon Balls</td>
<td>3.1 (1.2-7.8)</td>
</tr>
<tr>
<td>* Jicama</td>
<td>1.9 (1.3-2.8)</td>
</tr>
<tr>
<td>Smoked Salmon</td>
<td>1.8 (1.2-2.7)</td>
</tr>
<tr>
<td>Shrimp</td>
<td>2.3 (1.2-4.5)</td>
</tr>
</tbody>
</table>

* Statistically significant in multivariable logistic regression analysis

Lannom, C., October 21, 2012, flickr.com

Division of Disease Control and Health Protection
Results:
Environmental Health
First Joint Assessment - June 22

Information gathering at food preparation facility

- No ill food workers or safari guides
  - Absentee records

- Menu or food sources had not changed

- No safari specific food items

- No food samples available
  - Bulk Food: 3 days maximum
Results:
Environmental Health

Second Joint Assessment - July 13
Risk assessment throughout safari excursion

- No direct animal contact
- Food transported in cooler - ~30 minutes
- Hand washing station available
- Re-interviewed food workers
- Changed food preparation practices
  - Previously: In-house hand scooping melon balls
  - Currently: Order pre-cut

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Results:
Environmental Health

Third Joint Assessment – August 15
Full hazard analysis and critical control points (HACCP) assessment to identify deficiencies

• Violations
  – Improper use of thermometer
  – Improper hand washing
  – Black mold build-up in preparation sink
  – No hot water at hand washing sink
  – Improper use of hand washing sink
Results:
Laboratory Analysis

Bureau of Public Health Laboratories

• Seven stool samples
  Common enteric pathogens (i.e., viral, bacterial, protozoan)

Centers for Disease Control and Prevention - Calicinet Laboratory

• Three stool samples
  
  Norovirus      ETEC      Parechovirus
  Sapovirus      EPEC      Bocavirus
  Astrovirus      Shiga toxin      Rotavirus
  Adenovirus      Aichi virus
Study Limitations

• No food from outbreak time period

• No records on dates used bulk food

• Few quality clinical samples
Conclusions

• Illness associated with safari excursion
  – Epidemiology and environmental evidence

• Outbreak limited in duration
  – June 4-10, 2012

• Foodborne outbreak
  – Jicama or melon balls
Implications

Facility

• Improved food preparation process
• Improved facility cleaning process

Public Health

• Improved data collection capability
Acknowledgments

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Centers for Disease Control and Prevention
To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

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