

Norovirus Outbreak Associated with Commercially Prepared Fruit Salad, Wisconsin, 2015

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Background

- Outbreak occurred among guests of a May 15 wedding which was held in the bride and groom's backyard with food supplied by a caterer and a bakery.

Methods

Caterer & Bakery

- Inspection focusing on areas that are high risk for norovirus transmission
- Ordered cleaning per PHMDC's norovirus cleaning protocol
- Employees assessed for recent illness
- Contacted other large groups who had events the same weekend to see if anyone else was ill

Caterer

- Stool samples collected from all employees
 - Owner reported an employee was ill 11 days prior to wedding
 - Recent inspections showed conditions that could facilitate the spread of foodborne pathogens

Case-Control Study

- Online questionnaire used to conduct a case-control study among the 106 wedding guests.

Case Definitions

- **Confirmed**: An individual who attended the wedding or who worked at the caterer or bakery and had a stool sample collected in May 2015 that tested positive for norovirus GII.
- **Probable**: An individual who attended the wedding or who worked at the caterer or bakery and had vomiting or diarrhea and at least one of the following with onset between May 16 and 18, 2015: nausea, abdominal cramps, fever, chills, muscle aches, headache, or fatigue and did not have a stool sample that tested positive for norovirus GII.

Stool Sample Testing

- Stool samples collected from 4 wedding guests and all caterer employees
- Stool samples tested for norovirus, shiga toxin, and enteric bacterial pathogens at the Wisconsin State Laboratory of Hygiene

Fruit Salad Testing

- Two fruit salad samples available for testing
 - Fruit salad served at the wedding and frozen by the bride
 - Unopened fruit salad from same lot served at the wedding saved by the caterer
- Fruit salad was commercially prepared, arrived at the caterer ready to serve
 - A caterer employee cut a watermelon and added it to the fruit salad served at the wedding
- Both samples tested for norovirus by RT-PCR using an experimental protocol at a Food and Drug Association Center for Food Safety and Applied Nutrition (CFSAN) Division of Molecular Biology lab

Sequencing

- All positive samples related to the outbreak were sent to the Calicivirus Laboratory in the Division of Viral Diseases at the Centers for Disease Control and Prevention for amplification by hemi-nested PCR and sequencing.

Results

Bakery & Caterer

- No food code violations found
- No employees reported symptoms of gastrointestinal illness except the previously reported caterer employee
- No other groups reported illnesses

Stool Sample Testing

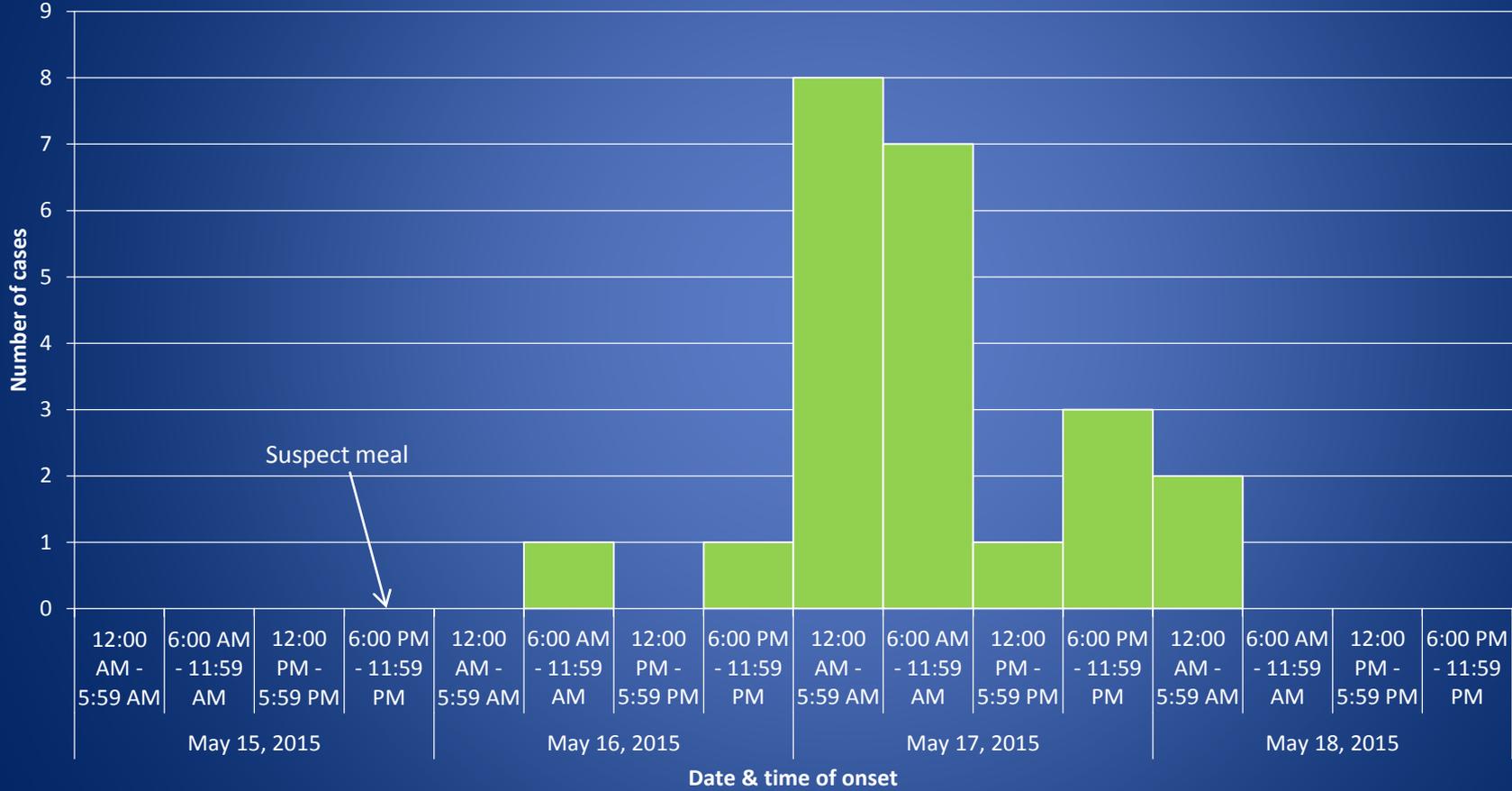
- All 4 wedding guests stool samples tested positive for norovirus GII
- One asymptomatic caterer employee tested positive for norovirus GII.

Epidemic Curve

SS Wedding Norovirus Outbreak

Belleville, WI

May 2015



Case-Control Study

- 56 (53%) guests included in data analysis
 - 23 cases and 33 controls
- Fruit salad associated with illness (odds ratio=5.6, 95% confidence interval=1.4, 22.4)
 - 20/23 (87%) wedding guests who met confirmed or probable case definition ate the fruit salad

Fruit Salad Testing

- Both fruit salad samples tested positive for norovirus



Sequencing

- All positive stool and food samples contained norovirus GII.4 Sydney
- All 5 positive stool samples had identical sequences
- Both fruit salad samples had identical sequences
- The stool sample and fruit salad sequences were similar but slightly different from each other

Conclusions

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- The fruit salad was contaminated at some point prior to arriving at the caterer
- The infected caterer employee likely became infected after eating leftover fruit salad served at the wedding
- The presence of different sequences in the stool and food samples doesn't rule out the fruit salad as the source of the outbreaks – other outbreaks have identified different strains in human and food samples

Follow-Up

- Minnesota Department of Agriculture conducted an inspection of the plant that packaged the fruit salad, no obvious sources of contamination were found and no ill employees were reported at the time of processing
- Additional next generation sequencing is ongoing to determine if the strain of norovirus identified in the human samples is also present in the fruit salad samples

Lessons Learned

- Can no longer assume that there must be a “local” infected person.
- Test food employees regardless of symptoms, if possible.
- Ask employees if they ate any food served at the event
- Find out who did what in food preparation and serving early on.
- Collect food samples early and store at health department if possible.
 - Use chain of custody forms
 - Take pictures of food samples and packaging

Acknowledgements

- Rachel Klos* & Traci DeSalvo, Wisconsin Department of Health Services
- Efstathia Papafragkou*, Michael Kulka* & Heidi DeBeck, Food and Drug Administration
- Aron Hall*, Preeti Chhabra* & Jan Vinje*, Centers for Disease Control & Prevention
- Tim Davis, Wisconsin State Laboratory of Hygiene
- Jillian Urbas, Wisconsin Department of Agriculture, Trade, and Consumer Protection
- Alida Sorenson & Carrie Rigdon, Minnesota Department of Agriculture
- James Blackmore*, Beth Cleary*, Courtney Ziemer, Stefanie Moccero, Doug Voegeli, Kate Louthier, Mary Michaud & Karri Bartlett, Public Health – Madison & Dane County

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Submitting Food for Norovirus Testing

- Methods still experimental so consult with state and/or CDC epidemiologists, who will make the request to FDA if the epi evidence and justification are strong