

Name _____ Date _____ Period _____

Gastrointestinal Illness Strikes

Submitted by Lisa Durso
Yourtown Nebraska
Worksheet 5

After identifying hamburger as the most likely vehicle for transmission, you question the people who prepared the hamburger for the church supper. You determine that Mr. Petri, Ms. Monella, and Ms. Brown prepared the patties the afternoon of the day before the picnic. They each used hamburger from a different local grocery store, and formed it into patties using their hands. Ms. Monella added onion soup mix to the burgers she prepared. Mr. Petri froze his burgers immediately after preparation, Ms. Monella and Ms. Brown put their patties in the refrigerator.

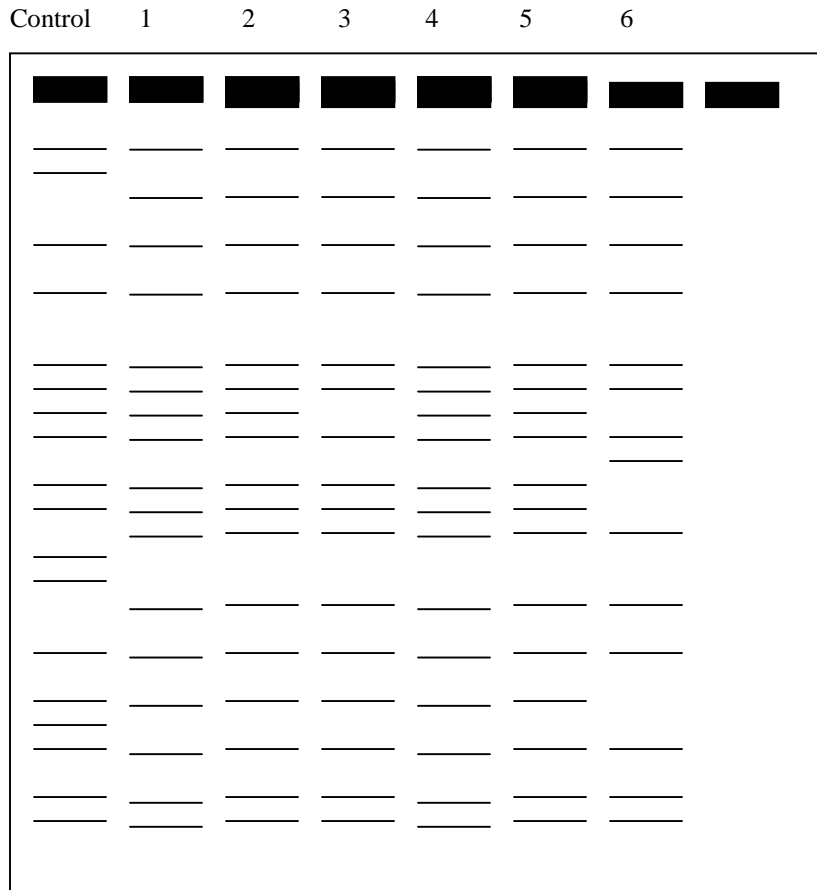
At the picnic the Mr. Coe was in charge of the grill. He was running late, and did not get set up until the students were already arriving. There was a rush for the burgers, but he was able to keep up with the demand by putting the burgers on the hot part of the grill to quickly brown the outside. The group in charge of clean up finished up the left over hamburgers for dinner.

Since the original hamburger is gone, you try to culture samples obtained at the same grocery stores where the original ground beef was purchased. The lab is able to culture *E. coli* O157:H7 from the fecal specimens, but not from any of the hamburger.

Mr. Petri's 10-year old son has been had diarrhea a few weeks before the picnic, and the son is cultured as well. He too is infected with *E. coli*. It turns out he helped to form the hamburger patties. You want to know if this is the same strain of *E. coli* as the outbreak, so you send it in for DNA fingerprinting.

14. What are the possible explanations for what happened if Mr. Petri's son has the same strain of *E. coli* as the outbreak strain? What if the strains are different?

15. The microbiology lab has just completed the DNA fingerprints. Examine the data and determine whether Mr. Petri's son was involved in the outbreak.



| Sample # | Source | PFGE Subtype | Part of outbreak? |
|----------|-----------------|--------------|-------------------|
| 1 | Patient # 2 | | |
| 2 | Patient #21 | | |
| 3 | Patient #22 | | |
| 4 | Patient #58 | | |
| 5 | Patient # 59 | | |
| 6 | Mr. Petri's Son | | |

As news of the school outbreak spread, other community members started contacting the health department to report similar illnesses. In the end 4 other people were involved in the outbreak, and you were able to collect one positive ground beef sample that had come from store A.

You entered your outbreak into a nation-wide database called PulseNet, and found that there had recently been similar outbreaks in 7 other states. By using PFGE data, you are able to determine that your local outbreak is part of a larger, multi-state outbreak. The traceback indicates that processor A was the source of the contaminated beef, but further research cannot locate the farm of origin.

As a control measure, you coordinate a recall of all affected ground beef that was shipped to Yourtown, and start a food safety education campaign.

16. Why is it necessary to show that the strain of *E. coli* O157:H7 isolated from the school picnic is identical to the ones involved in the multi-state outbreak?

Epidemiologists are mobilized under a variety of circumstances, prime ones being when a problem is acute and unexpected and when quick action is required. These criteria are also met when a commercial product presents an imminent threat to public health and safety. High levels of community concern often mandate a quick response. Involvement of the press is occasionally the driving force behind an investigation, and political pressure is also often part of the equation. Uppermost in investigators' minds is the need to institute the controls necessary to safeguard health as soon as possible, and often this step is taken before the entire investigation is complete. Limited control over the situation, little time for planning a study, and limited data sources and laboratory samples challenge investigators. However, the obligation remains to do the best science possible under the circumstances.

ASSESSMENT

Choose one of the following:

A. You are the outbreak investigator. Submit a written report of the investigation, including descriptions of who was involved, what the source of the outbreak was, how the outbreak occurred, what procedures were followed as part of the investigation, and what control measures were taken.

B. You are a reporter for the Yourtown Times. Write a feature article covering all aspects of the outbreak for the Sunday Edition.

C. You are a lawyer for Winken, Bilkin and Nod, attorneys at law. You have been hired by the families of those who were sick to represent them in a suit against the processor. Prepare a court brief describing your client's case.

NOTE: All assessment writings will be judged by the following criteria:

Uses appropriate concepts correctly

Uses appropriate vocabulary

Writing is organized and focused

Writing is thoughtful

Appropriate information is used to support concept

Language mechanics are correct, and in the proper style

References, if needed, are properly made

Writing is neat and presentable