Pathogen Tracker Game

Stage Two: Find the Contaminated Food

Level II Student Worksheet

Answer Sheet

Vocabulary: control group, infected group, matched-pairs analysis, statistical analysis
Remember, as you play this stage of the game, to add to the "Actual Steps" and "Stages" in your table on page 2 of your worksheet for Stage One.

Encourage the students to add to their tables as they work through this stage of the game.

Describe in detail the steps in a matched-pairs analysis.

Step 1: For each infected person (case), a non-infected person (control) with similar characteristics, like age, gender, race, and health status, is selected. All of the non-infected people will make up the *control group*

Step 2: Both the infected group and the control group are interviewed to find what foods they ate for a specific period of time before their illness onset. The period of time of interest is dependent on the incubation period of the pathogen; the time from exposure to illness onset.

Step 3: The two groups are compared using statistical analyses to see if there are any foods the infected group was more likely to eat than the control group.

In the Table for Matched-Pairs Analysis below, list the name of the infected person, the control person match, and the characteristics the two have in common.

Table for Matched-Pairs Analysis		
Infected Person	Control Person	Common Characteristics
Amodini Khan Age 26	Jaishree Srinivasian Age 32	Female; Indian; Pregnant
Matt Rufello Age 9	James Malrovia Age 10	Male; Caucasian; Kidney Transplant
Roger Martin Age 68	Herbert Wellsley Age 72	Male; Caucasian; Diabetic
Franklin Spoon Age 45	Reginald Jackson Age 34	Male; African American; Leukemia
Aimee Ferguson Age 20	Sarah Ryan Age 22	Female; Caucasian; HIV Infected

List the foods commonly associated with an infection from each of the following bacteria: *Escherichia coli (E. coli)* O157:H7*, Listeria monocytogenes (L. monocytogenes),* and *Salmonella.*

Escherichia coli (E. coli) O157:H7*:* beef (particularly ground beef), poultry, raw milk, apple cider, cantaloupe, vegetables

Listeria monocytogenes (L. monocytogenes): deli meats (sliced turkey, roast beef etc.), hot dogs, smoked fish, soft cheese (Camembert, Brie etc.), milk, raw milk, butter, ice cream, raw vegetables, deli salads

Salmonella: meat, poultry, shellfish, eggs, milk, chocolate, vegetables, fruits, peanuts,

In the following table, list all of the foods that could be the possible source of contamination, tell whether or not you will include that food in the simulated interview, and give the reason for your choice.

Food	Yes/No	Reason
Hamburger	No	Not listed under *Listeria*
Poultry	No	Not listed under *Listeria*
Milk	Yes	Listed under *Listeria*
Raw Potato	No	Not listed under *Listeria*
Apple Cider	No	Not listed under *Listeria*
Hot Dogs	Yes	Listed under *Listeria*
Smoked Fish	Yes	Listed under *Listeria*
Soft Cheese	Yes	Listed under *Listeria*
Raw Vegetables	Yes	Listed under *Listeria*
Nuts	No	Not listed under *Listeria*
Steak	No	Not listed under *Listeria*
Oysters	No	Not listed under *Listeria*
Ice Cream	Yes	Listed under *Listeria*
Deli Salad	Yes	Listed under *Listeria*
Coffee	No	Not listed under *Listeria*
Deli Meats	Yes	Listed under *Listeria*
Eggs	No	Not listed under *Listeria*
Butter	Yes	Listed under *Listeria*
Citrus Fruit	No	Not listed under *Listeria*
Miracle Whip	No	Not listed under *Listeria*

Describe how successful you were in choosing the correct foods.
Answers will vary depending on how successful the student was in choosing the correct foods.

In the table below, record the foods that have been eaten by the infected group and the control group.

Foods Eaten by the Infected Group and the Control Group

Food eaten	Amodin	Jaishree	Matt	James	Roger	Herbert	Franklin	Reginald	Aimee	Sarah
Milk	X	X	X	X	X	X	X			X
HD	X		X	X	X		X		X	
SF	X				X			X		
SC	X	X				X		X	X	
RV	X	X	X		X	X		X	X	X
IC	X		X	X		X	X	X	X	X
DS		X		X			X	X	X	X

DM		X	X	X	X	X	X			X
Butter		X	X	X	X		X	X	X	X

Based on the data in the above table, which food(s) do you predict is the source of the outbreak? What reasons do you have for choosing this food?

Hot dogs are the cause of the outbreak – more people in the infected group than in the control group ate hot dogs. The hot dog was the food that showed the largest difference between the two groups.

After reviewing the graph "Incidence of Food Consumption", was there a food that more people from the infected group ate than the control group ate? How does this food compare to the food you predicted could be the possible source of the outbreak?

Five infected people ate hot dogs while only one control person ate them. My prediction was correct.

Return to the table on page 2 of your worksheet for Stage One. Again, describe how well you did in predicting the steps the scientists would follow in finding the cause of the foodborne illness outbreak.

The answers to this question will vary – the students should at least compare their predicted steps with those the scientists actually followed.

Password to continue to Stage Three: HOTDOG. It is important for the students to enter the password correctly – as one word – if they enter it as HOT DOG – the password will not work.