

# Pathogen Tracker Game



## Pathogen Tracker Game

### Stage Three: Find the Source of the Contaminated Food

#### Level II Student Worksheet

#### Answer Sheet

**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.

Interviews with Patients – list what kind of hotdogs each of the following patients ate:

- Amodini Khan – **Dog Days**
- Matt Rufello – **Rusty’s Red Hots**
- Roger Martin – **Aunt Miriam’s**
- Franklin Spoon – **Dog Days, Aunt Miriam’s, Rusty’s Red Hots**
- Aimee Ferguson – **Dog Days, Aunt Miriam’s**

**BEFORE YOU CONTINUE THE GAME**, explain whether or not you think you have enough information to determine the source of the outbreak.

**There is not enough information; the companies that make the hotdogs need to be interviewed.**

#### CONTINUE THE GAME

Interviews with vendors – tell from which manufacturer each of the restaurants bought its hotdogs.

- Aunt Miriam’s – **Frank N. Furter, Inc.**
- Dog Days – **Homerun Hots and Frank N. Furter, Inc.**
- Rusty’s Red Hots – **Frank N. Furter, Inc.**

Based on the results of your interviews with the patients and vendors, which meat company do you think is the most likely source of the contaminated hotdogs? Explain your reasons for choosing this meat company.

Frank N. Furter Inc. is the most likely company – all three of the restaurants bought hotdogs from it.

How many choices did you make before you chose the correct meat company?

Based on the data, students should have made the correct choice the first time.

Investigating the Meat Companies – Remember: Testing is very expensive! What rationale are you using to choose month(s) to test? Was your first choice the correct choice?

Students should refer to the Data Table in Stage One where they recorded the patients' names and the date on which their symptoms first appeared. Based on that data, students should choose August because four out of five patients became ill in August. One became ill in September.

In the Data Table below, record the results of your choices for the meat companies and months to be tested.

Data Table: Meat Companies Investigated				
Company	Month Tested			
	June	July	August	September
Over the Moon Meats				
Home Run Hots				
Frank N. Furter, Inc.			X	

**BEFORE YOU CONTINUE THE GAME**, after reading the encyclopedia entry about the process used to manufacture hotdogs, list the steps in that process and explain where you think contamination could take place.

1. First, meat is selected and placed into a mixer. Spices are added and the mixture is ground into a batter called an "emulsion."
2. The emulsion is then pumped into a stuffer-linker machine, where it flows into casings. The hotdogs are made into long links.
3. Next the hotdogs are sent to the smoke house to be cooked.
4. After being smoked and cooked, the hotdogs are sprayed with cold water. They are sent through a peeler where the casings are removed.
5. The hotdogs are then sent to the packaging area where they are vacuum-sealed in plastic film.

The hotdogs could have been contaminated in any one of the five steps above, especially if the machinery was contaminated.

**CONTINUE THE GAME**

Describe in detail the steps used in the plant to test for possible areas of contamination.

1. Swabs are taken from all possible points of contamination.
2. The bacteria from these swabs are grown into cultures.
3. The bacteria from the cultured colonies of the likely *Listeria* are isolated and then their DNA is extracted.
4. This DNA is riboprinted and, using Pathogen Tracker, the strain is identified.

In the Data Table below, record the test results from the Frank N. Furter, Inc. testing.

Test Results from the Plant		
Area of the Plant	Tested	Bacteria Found
Floors	X	X
Mixer	X	
Stuffer Linker	X	X
Smoke House	X	
Peeler	X	
Packaging Machine	X	X

Based on the results from the search of the Pathogen Tracker database, which area of the plant was the source of the contamination with the strain DUP 1042B?

The area of the plant where contamination was found was the packaging machine.

What are the USDA Guidelines to be followed when a source of contamination has been found?

When a source of contamination has been found, USDA recommends that the plant initiate an immediate recall of all potentially contaminated products. The plant will often be shut down for a period of time while contamination sources are tracked and plans are developed for disinfecting the plant and for preventing contamination of finished products in the future. If the company that owns the plant refuses to comply with the USDA's recommendations, the USDA may remove its approval of the company. Once a company can provide evidence that a suitable plan to prevent future contamination incidences has been put into action, that the plant has been cleaned and sanitized appropriately, and that intensive testing does not show any contamination, the plant can be re-opened. The plant will often operate under closer USDA supervision and testing for a while.

Action Plan - Four different action plans have been proposed. Which one of these plans will you choose and which will you reject? Please give your reasons for the plan you choose and those plans you reject.

Plan 1: Rejected – the USDA recommends that a recall be issued – it does not issue the recall. The company voluntarily closes the plant and cleans it until no more contamination is present.

Plan 2: Rejected – the plan says not to issue a recall but when contamination is found, USDA usually recommends that a recall be issued.

Plan 3: Selected – this plan follows the USDA guidelines.

Plan 4: Rejected – the USDA only recommends that a recall be issued and that a plant be shut down.

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.