

Name _____

Class _____

Date _____

Spice Lab - CIBT

(80 mins)

An investigation of the antibiotic properties of spices.

Question to Consider: Which spices have effective antibiotic properties?

When you have a bacterial infection, such as strep throat, your doctor gives you antibiotics to kill the infection. In 1928, Alexander Fleming discovered that molds make chemicals that stop bacteria from growing. These chemicals became our first antibiotics. (He won a Nobel Prize for this discovery!)

Think about early human beings. They could not drive to the pharmacy for medicine. They used what they had- in many cases, plants. Spices are parts of plants and some evolutionary biologists think that we eat spices because they protect us from infections. In this lab you are going to investigate whether common spices are capable of killing bacteria.

How to Set up Your Experiment:

1. Decide what spice or spices you are going to test. Think about what controls you will need.
2. Answer the questions on the next page then fill in the table on the last page to help you design a well controlled experiment investigating the antibiotic effectiveness of various spices. Have your experimental design approved by your teacher before going on to the next steps.
3. Pick up materials - Petri dishes, spices, spoons and a marker. Label your plate with the name of your group and your spice.
4. Place a small amount of spice in the center of Petri dish. If you are using a whole spice, like clove or cinnamon (not ground) or allspice, put 1 or 2 in the middle of the Petri dish. If you are using a ground spice, put about 1/2 tsp in the bottom of the plate. Get a bottle of melted agar and pour enough into the dish to just cover the spice - taking care to disturb the spice as little as possible. If the whole spice moves around, use the spoon to center it in the plate. Allow the agar in your dishes to cool. Once the agar is solid, pour another thin layer of agar over the spices to completely cover them. Let this layer of agar cool.
5. Once the agar is solid, it is time to add bacteria to your plate. If you are using your fingers, dip your finger into water and rub it across a surface such as your cell phone, the water fountain, a door knob, the inside of your cheek, etc then gently rub it along the surface of the agar in the Petri dish. If you are using a liquid culture of bacteria, use a cotton-tipped swab to completely cover the area. Let the dishes sit for a few minutes, then turn them upside down and give them to your teacher. The plates will be incubated at 37°C to allow the bacteria to grow.

How will you treat your experimental group different than your control group?

What is your independent, aka manipulated, variable? _____

What is your dependent, aka responding, variable? _____

List 3 other variables that you should keep constant between the control and experimental groups.

1. _____
2. _____
3. _____

Answer these questions **AFTER** you view your results

What results did you get? _____

Were you surprised by your results? Why or why not? _____

Identify two (2) ways the experiment could be improved

1. _____
2. _____

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Group Members _____

An investigation of the antibiotic properties of spices

Problem	Which spices have effective antibiotic properties?	
Hypothesis (If → then) DO NOT WRITE A QUESTION!!		
Experiment (What materials will you use then list exactly what you will do. Step 1, Step 2, etc)	<u>Materials</u>	<u>Procedure</u>
Observations		
Conclusion (Be sure to reference your original hypothesis)		