# Which food is most prone to bacteria?

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# Purpose-

What is the purpose of this experiment?

- The purpose of this experiment is to test which foods are the fastest or the most prone to bacteria.
- This would also test if the five second rule was true or wether bacteria wouldn't be caught on in 5 seconds.
- Not only will people be informed if the five second rule was true but so that they know how much bacteria is on your food.
- You must be cautious and informed if you were to drop a piece of food onto the ground.





# Materials

What materials are necessary for this experiment?

- Agar Powder
- Petri Dishes
- Cold water
- 330 mL of Boiling water
  - Measuring cups
  - Measuring Spoons
    - Microwave
      - Bowl
  - Q-tip/cotton swab



### Images of Materials necessary





# Variables

What are the variables included?

The six most common variables are dependent, independent, intervening, moderator, control, and extraneous. Dependant variable is dependent on an independent variable. If the independent changes so does the dependendent. Intervening variable is also known as a mediating variable. It explains the relation between the dependent and independent variable. It is also a hypothetical variable which means you can't actually see it. A moderator is a variable that affects the strength of the relation between the independent and dependant variable. Extraneous variables are known as confounding variables. They aren't the independent variable but can change the dependants. The independent variable in my experiment, which foods are most prone to bacteria, is the food dropped. The controlled variable is the gel because the gel for each food is the same and uses the same procedure.



# Hypothesis

What do I think is going to happen?

During this experiment, I realized that there should be different types of food from different category types. To make the experiment more reliable, I tried using a dairy product, a vegetable, a fruit, and a wheat product. The carrot being the vegetable I believe that after 20 seconds on the ground the carrot will have less bacteria growth than the others. This idea is because a carrot isn't as juicy and messy as a grape or cheese and less attracted to bacteria. The same goes for the bread (the wheat product.) Overall, I think that the grape and the cheese will be the most attracted to bacteria and the bread and carrot being the least.



## Procedure

What are the steps in making the experiment ?

- 1. Get around 10 grams of agar powder and 330mL of room temperature water
- 2. Stir the solution for about a minute
- 3. Once the solution is fully mixed put it into the microwave for 4 minutes (Make sure the bowl is microwavable)
- 4. Take out the mixture once it starts boiling and let it cool for 2-3 minutes
- 5. Slowly pour the mixture into the petri dishes (fill up to the middle or less)
- 6. Let the solution solidify for about an hour
- 7. An hour later the solution will be a gel
- 8. Cut any type of food (in my case) and drop it for a certain amount of time and certain height off the ground
- 9. Take a Q-tip or cotton and rub it against the food that you dropped
- 10. Very lightly rub the Q-tip onto the gel in lines or zig zags
- 11. Close the dish ad but it in a warm and dark area
- 12. Do NOT open the petri dishes while bacteria is growing this could make you sick and ruin the growth
- 13. After a week you have the results





# Analysis

What can you analyze from this information?

The growth of bacteria is proliferation of bacteria is made into two daughter cells that are identical to the original cell. This process is also called binary fission.

Bacteria can be measured just by observing the colonies of bacteria. Another way that you could measure the colonies of bacteria very accurately is by using a microscope. The microscope will help zoom in a humans vision allowing them to see smaller objects bigger. FAT TOM is an acronym for all the conditions necessary for bacteria to grow. The six conditions are food, audacity, time, temperature, oxygen, and moisture.



# Research

What are some things that could be helpful to know?

How is bacteria formed? Bacteria is formed by reproduction of binary fission. A bacterium, which is a single cell, divides into two daughter cells.

What conditions are necessary for bacteria growth?

- Food
- Water
- Air
- Temperature

What are the most common types of bacteria (indoor)? Micrococcus, Staphylococcus, Bacillus, and Pseudomonas



How is the gel formed to grow bacteria?

Using agar by adding water and heat. This is used for a sterilized surface for the bacteria to grow on. After the mixture solidifies, it used as a medium for bacteria growth. What is in agar?

A typical agar composition is 70% agarose and 30% agaropectin. Agar is obtained by red algae.





# Results

What ended up happening at the end?









#### Carrot-

By observing the petri dish I saw that some bacteria a grown on the lid of the petri dish. In the inside of the dish had many colonies of bacteria. On the very side there is a very visible circle coming outwards. There were also some bubbles forming on the bottom.

#### Grapes-

The growth of bacteria was very visible in grapes. There is a thick zigzag line with many visible dots. The bubbles on the bottom are larger and are more above the bottom. The lid have some bacteria on the very edges.

### Bread-

Of all the food I've experimented with the bread had the least bacteria growth. There was no bacteria on the lid of the petri dish. The inside only had a couple of colonies. The bubbles are much more risen then the others. There is a circle in the centre in which I believe that was the foundation for other bacteria to be grown.

#### Cheese-

Just with a quick glance you can see lots of bacteria on the lid all around. The inside has visible lines and has smaller but more bacteria.

### Bacteria Growth From Carrot

### Petri dish





### Petri dish

### Bacteria Growth From Grape

Most bacteria was found in the centre













### First one is carrot. Second is grape. Third is bread. Last is cheese.





## Conclusion

What happened at the end?

Overall, the cheese was the most prone to bacteria and the bread was the least. My hypothesis wasn't all right but not all wrong I did say that the cheese was the most prone to bacteria.

This experiment had many hard parts to it but many pats I enjoyed. It was difficult to find the agar. It took me awhile to find the right type of gel to use and I had countless fails. There are many things I would change in my experiment now that I reflect back If I could do this experiment again I would definitely do each food 3 times so I get a more accurate result,. Although this experiment was difficult at times I enjoyed the experience. In conclusion, I enjoyed the experience and this experiment really made me more informed.

# Acknowledgements

What are some websites that helped?

https://www.stevespanglerscience.com/lab/experiments/growing-bact eria/

https://learning-center.homesciencetools.com/article/bacteria-experim ent-guide/

https://www.youtube.com/watch?v=JIZ7Ij3y4MQ&t=77s

https://slidesgo.com/





# **THANK YOU!**

Do you have any questions?

### Credits

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