Name__Rhayn_____

CASE

Activity 5.6.2 Chill to be Safe

Purpose

Hand washing is an important part of daily hygiene, especially when working around food. The transfer of germs from contaminated work areas and dirty hands can cause illness and occasionally death. Keeping foods at an optimum temperature can also keep bacteria from growing. In the food industry, the US Department of Agriculture regulates safe food handling and packaging to ensure a safe food supply. Consider the foods you recorded in your food journal, did you give much thought to how safe the food was?

Ground meat is a commonly contaminated food. First, meat products are ideal growth environments for bacteria. Secondly, there are several steps in producing ground meat products and each step is a potential contamination point. Third, by grinding the meat, the surface area available for bacterial growth is increased exponentially over a cut, such as steak or roast. Just how safe is the food supply at the grocery store? Does refrigeration and cooking decrease or limit the bacterial growth on ground meat?

Materials

Per class:

- Refrigerated ground meat sample
- Room temperature ground meat sample
- Cooked ground meat sample
- Incubator

Per team of three students:

- 3 sterile swabs
- 3 prepared petri dishes
- Masking tape
- Marker

Per student:

- Safety glasses
- Gloves
- Pencil
- *Agriscience Notebook*

Procedure

Work in a team of three to determine the presence of bacteria on ground meat. You and your team will collect three samples from refrigerated ground meat, room temperature ground meat, and cooked ground meat.

Part One – Predictions

In your team, make a prediction of the bacterial growth for each sample listed in Table 1 on the student worksheet. Predict on a scale of 1 to 10 how much bacterial growth will occur in each sample with 1 being little to no bacterial growth and 10 being extensive bacterial growth. Explain why you made each prediction.

Part Two – Collecting Samples

1. Prior to sampling, determine which team member will collect each sample.
2. Wash your hands thoroughly with soap.
3. Put on gloves and safety glasses. Take care to avoid touching potentially contaminated surfaces.
4. With the lid of the petri dish firmly in place, carefully turn it over and use the marking pen to label the dish with your group members' initials, the date, and the name of the sample you are collecting.
5. Remove a cotton swab from the packaging.

6. Using the swab, thoroughly rub it across the meat sample assigned to you by your team. Twist the swab as you go to contact each side.
7. Raise the lid of the petri dish away from you approximately one inch to prevent contamination. Streak the agar with the swab by gently moving the swab across the dish in a zigzag pattern.
    - **Caution:** Be careful not to gouge the agar with the swab.
8. Quickly replace the lid of the petri dish.
9. Use masking tape to seal around the edges of your petri dish.
10. Put the swab back into the packaging it came from and dispose of it in the waste container as instructed by your teacher.
11. Invert the inoculated petri dish and place it in the incubator. By turning the dish upside down, you will prevent condensation and observations will be easier.

Part Three – Observations

1. Observe your team's petri dishes daily. Place the dish on black construction paper for easier viewing. **Safety precaution: Do not open your petri dish.** Colonies grown on your dish may pose health risks for you. Make all observations through the dish.
2. Record the changes you observe on the nutrient agar in Table 2 on the student worksheet.
3. Throughout your daily observations, compare your predictions to your final results. As a team, answer the first two analysis questions on the student worksheet.
12. On the final day, compare the bacterial growth on your nutrient agar to the bacteria grown on your classmates' agar. Answer the final two analysis questions on the student worksheet.
13. Place your petri dish in the disposal area provided by your teacher. Do NOT open the dish.
14. Clean up your work area and wash your hands.

Conclusion

1. Based on the results, does keeping meat refrigerated keep bacteria from growing?

No, mine had a lot of bacteria growing

15. Based on the results, does cooking meat reduce the growth of bacteria?

yes, mine did not have bacteria

16. Why is it important to practice sanitary handling of food products?

You don't want to have that bacteria in your body. It could be bad for you.

17. What can be done to keep bacteria from growing on food products?

You could cook it , and that will reduce bacteria.

Name_____

Activity 5.6.2 Student Wor

Table 1. ***Predictions***

Refrigerated ground meat	8, 1 being little to no bacterial growth and 10 being extensive bacterial growth
Room temperature ground meat	9, 1 being little to no bacterial growth and 10 being extensive bacterial growth
Cooked ground meat	7, 1 being little to no bacterial growth and 10 being extensive bacterial growth

Table 2. ***Observations***

Day 1	Day 2	Day 3	Day 4
Refrigerated Ground Meat	**Refrigerated Ground Meat**	**Refrigerated Ground Meat**	**Refrigerated Ground Meat**
Room Temperature Ground Meat	**Room Temperature Ground Meat**	**Room Temperature Ground Meat**	**Room Temperature Ground Meat**
Cooked Ground Meat	**Cooked Ground Meat**	**Cooked Ground Meat**	**Cooked Ground Meat**

Analysis Questions – During Observations

1. How do the results compare to your predictions?

I thought mine would have had bacteria all over but it was just in the two squares.

18. What potential sources of error or limitations could have influenced your results?

I could have gotten airborne bacteria, or I could have not put enough meat on the stick.

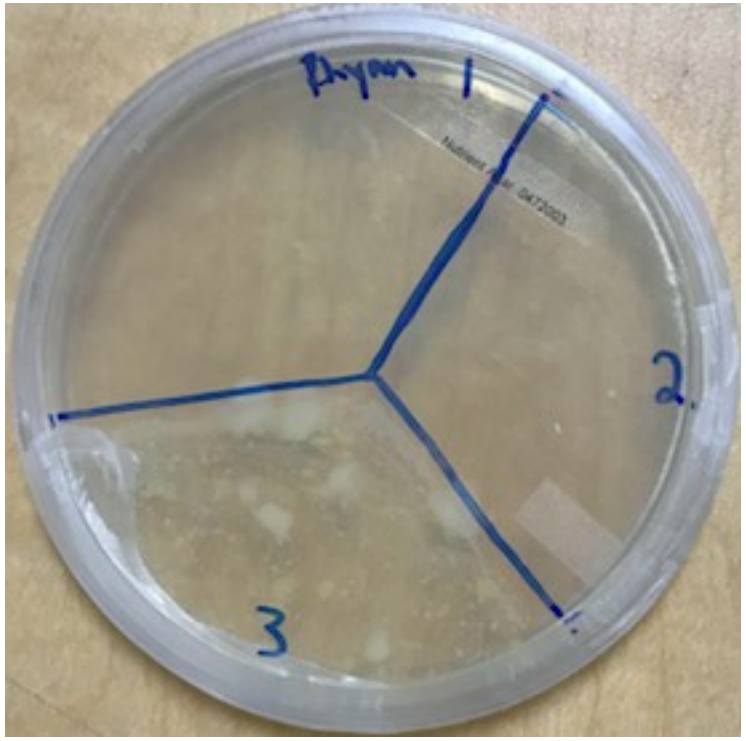
Analysis Questions – Post-Lab

19. Describe the differences in the bacterial growth from different risk factors.

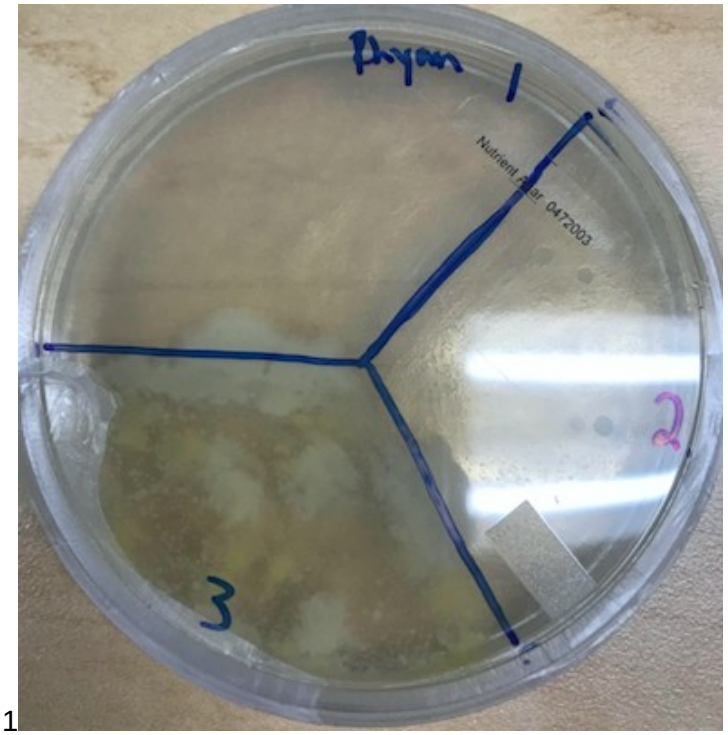
There are many contaminants in the air so if you leave your meat on the counter it is bad for the meat. Cooked meat and raw meat also have bacteria.

20. Based on your observations, does applying a preventative measure, such as cooking, reduce contamination?

No they all have some sort of contaminants.

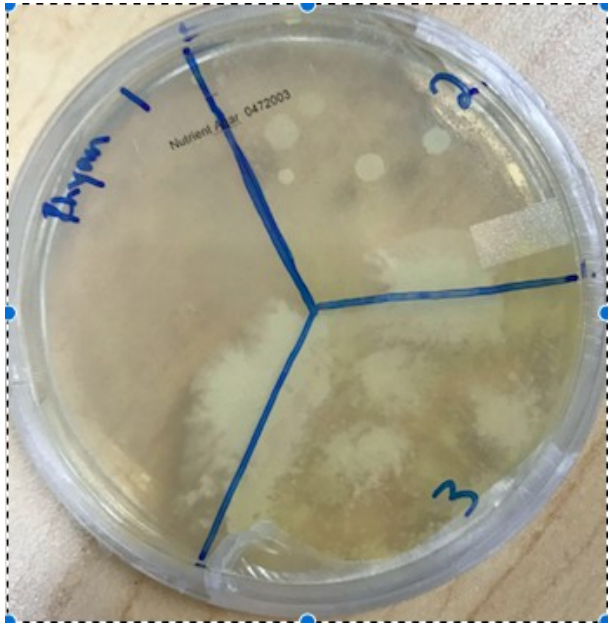


Day 1



Day 2

Day 3



Day 4