Exercise 1 Food Safety

In this laboratory, you will incubate microbes collected from unwashed and washed produce and from opened and unopened milk. After incubation, you will compare the number and types of microbes that develop from each food source and relate the results to practices for maintaining food safety in your home.

**Note: Two containers of milk are needed. Open one container exactly 7 days prior to beginning the experiment and allow the second to remain closed until used in the procedures. Place both containers in a refrigerator when not in use. It is best if the two containers are purchased on the same date and have the same expiration date.**

Procedure

Part 1:

1. Approximately 1 hour before you begin this exercise, pour two agar plates. Download the [**Pouring Agar Plates**](https://holdrive.s3.amazonaws.com/content/dkamansh/fcvktrzm/dtadnbvc/46-0213-00-01-SUP-Pouring-Agar-Plates.pdf?X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAJ6HAHQFQ3H2DQETA%2F20230210%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20230210T045316Z&X-Amz-SignedHeaders=host&X-Amz-Expires=1800&X-Amz-Signature=defca0f50b0dc6ebda5f52b03d59be7ff7514afce6a3836f0561bcfa02665740) supplemental document for detailed instructions or watch this video on [**Preparing Agar Plates**](https://www.youtube.com/watch?v=wCK_cms7vIo).

**Note: One TSA pour tube should be used to fill two 60 mm Petri dishes.**

1. Clear a work area and gather all materials listed for this experiment.
2. Wash your hands thoroughly with soap and warm water.
3. Put on the safety gloves, face mask, apron, and goggles.
4. Disinfect the work surface by wiping it with a 10% bleach solution.
5. Using the permanent marker, divide the bottom of each agar plate into two sections. Label the sections of one plate “Milk Fresh” and “Milk Opened.” Label sections of the other plate “Lettuce Washed” and “Lettuce Unwashed.” See Figure 4.

**Figure 4.**

Labeled agar plate.

1. Remove a sterile swab from the packet and moisten with distilled water.
2. Rub the moistened swab on the surface of the unwashed lettuce.
3. Transfer the sample to the “Lettuce Unwashed” section of the agar plate by rubbing the swab on the agar surface within the section until it is completely coated with inoculant.

**Note: Be careful to only inoculate the surface within the outlined section.**

1. Place the used swab in a container of undiluted bleach.
2. Thoroughly wash the lettuce with soap and water. Pat it dry with paper towels.
3. Repeat steps 7-10 using the washed lettuce.
4. Remove a sterile swab from the packet and saturate with the milk that has been opened for 7 days.
5. Transfer the sample to the “Milk Opened” section of the agar plate by rubbing the swab on the agar surface within the section until it is completely coated with inoculant.
6. Place the used swab in container of undiluted bleach.
7. Open the fresh container of milk and repeat steps 13-15 for this sample.
8. Place the inoculated plates bottom-side up (inverted) in your incubation location for 48 hours.
9. Dispose of the used and bleached swabs in the garbage.
10. Wipe down your work area with a 10% bleach solution.
11. Wash and return items to your kit for future use.
12. Wash your hands thoroughly.

Part 2:

1. Observe the culture plates after 48 hours for microbial growth. If no colonies are observed, incubate for an additional 24 hours.

**Note: Do not remove the lids of the plates when observing. Unknown microbe cultures should always remain covered.**

1. Wipe down your work area with a 10% bleach solution.
2. Wash your hands thoroughly with soap and warm water.
3. Put on your goggles, a new pair of gloves, face mask, and apron.
4. Gather the two incubated agar plates.
5. Observe each of the sections without removing the lid. Count the number of different colony types present in each section and record in **Data Table 1.**
6. Count the total number of colonies in each section and record in **Data Table 1.**
7. Take a photo of your developed plates. Upload the image into **Photo 1.**

Cleanup:

* Soak reusable equipment, such as test tube clamps and racks, in a 10% bleach solution for 2 hours after contact with active cultures. Reusable materials should then be rinsed with tap water and allowed to dry before returning to the lab kit.
* Soak all disposable equipment, such as pipets and inoculation loops, in a pure bleach solution for 2 hours before wrapping with paper towels, sealing in a plastic bag, and placing in the garbage. Secure all disposed items out of reach of children and pets.
* Dispose of cultures by soaking the containers and media in a pure bleach solution for 2 hours before taping closed, wrapping in paper towels, sealing in a plastic bag, and placing in the garbage. Secure all disposed cultures out of reach of children and pets.
* Wipe down your work area with a 10% bleach solution.
* Wash your hands thoroughly with soap and warm water.

**Exercise 1 - Questions**

**Question 1**

**Why is food safety important?**

Food safety can help prevent the consumption of food that has been contaminated. It can stop cross contamination from kitchen equipment or surfaces.

**Question 2**

**How does food become compromised by microbes?**

Food that is left out from refrigeration can become comprised. Food items that are not properly cleaned and washed can also become contaminated with micorbes.

**Question 3**

**How can food safety be improved in the home environment?**

Wash down countertops and interior fridge surface often with bleach solution. Store and prepare meat, poultry and eggs separately from vegetables and fruit. Cook meat to the right temperatures

**Question 4**

**Based on the results recorded in Data Table 1, which food contained the highest number and diversity of microbes?**

Milk contained the highest number of microbes

**Question 5**

**How will the results of this experiment impact your food safety practices at home?**

I will be better about cooking food to the right temperatures and storing them at the proper temperatures as well.

