

SOP #2006

The Effects of Bleach on Yeast Growth

Authors: **RM**, JK, **DM**

Effective Date: January 28, 2022

Page	Description/Section
1	Title Page
2-3	Basic Information
4-5	Procedure and Checklist
6	Results

Signatures:



(JK, Senior Scientist)



(RM, Owner of OB)



(DM, Leading Author)

Purpose: The purpose of this Standard Operating Procedure is to determine how bleach affects the growth of yeast in a petri dish. We want to accomplish knowing the results of the experiment based on bleach's role in affecting yeast's growth.

SOP Format: This Standard Operating Procedure uses simple steps format, because it has a routine procedure and it is easy for the reader to follow along. It is simple and also precise for the readers.

Scope: Our new employees will not need to cooperate with other departments, because they will have all the material to complete the SOP on their own, and it will get them used to not relying on other people to do their job.

Introduction: There are many ways to grow and change the growth conditions of yeast and bacteria. In this scenario, we want to use bleach, yeast, and a petri dish to explore the effects that bleach has on yeast growth.

References:

How to use a micropipette:

[https://solutions.pipette.com/use- /](https://solutions.pipette.com/use-/)

How to use a bunsen burner:

<https://research.wayne.edu/oehs/pdf/factsheet-bunsen-burner.pdf>

<https://www.youtube.com/watch?v=VLpCIJHT9bQ&t=151s>

How to swab a petri dish:

<https://www.youtube.com/watch?v=DAm21yPGMRo>

How to label a petri dish:

<https://www.youtube.com/watch?v=aK9nDAzjyv0&t=30s> timestamp: (0:52 - end of video)

Terminology Definitions:

Petri Dish: A round, shallow dish used to grow bacteria

Inoculating loop: A tool used to pick up and transfer a small sample from a culture of microorganisms

Streaking: A technique used to isolate bacteria, a zigzag motion

Culture: To grow living organisms in a prepared mixture of nutrients (media).

Media: Substance containing nutrients needed for cell growth.

Sterile/Aseptic Technique: Laboratory procedures used in handling cultures, media and equipment that prevent contamination.

Yeast: A single celled fungus that ferments sugar to produce alcohol

Dilution: the process of reducing the concentration of a solute in solution, usually simply by mixing more solvent

Beaker: A thin glass vessel used for containing liquids

Incubator: A heated, insulated box used to grow and maintain microbiological or cell cultures

Bunsen Burner: A source of open flame that is used to sterilize

Materials and Supplies:

- Container for yeast
- Yeast broth (1 gram of baker's yeast + 50 mg of warm water)



Use beaker as the yeast broth's container

- Warm water
- Incubator
- Household bleach (10% bleach)
- PPE (safety gloves, safety goggles, etc)
- 5 petri dishes (already prepared with agar)
- Inoculating loop
- Bunsen burner (if using metal inoculator)
- Pen
- Ruler

Cautions: Keeping the skin and face safe, being careful around the bleach, staying away from the bunsen burner when not using it, making sure things are disinfected when finished. If bleach gets in your eyes, wash your eyes out immediately and have someone call 911. If bleach touches skin, immediately wash the body and have someone call 911.

Personnel Qualifications: The new employees need to be second year Biotechnology students. They need to know how to use a micropipette, how to incubate agars, how to label agars, and how to use agar stroke techniques.

Procedure:

1. Put on all PPE and collect materials.
2. With a pen, label the petri dishes. Labeling the petri dish should be around the rim on the outside of the base. It includes your initials, the date, type of agar, and type of organism, respectively.

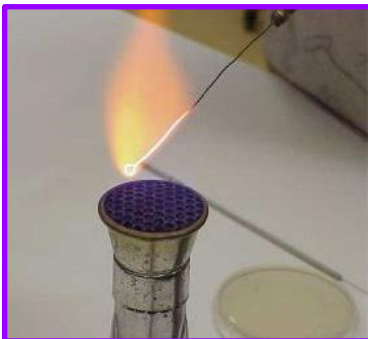


Example:

3. Draw a grid (1cm x 1cm squares) on each agar plate.



4. Prepare all of the materials and spray 4 of the petri dishes with bleach. Let the petri dishes dry. Leave one petri dish without bleach, as that is the control for this experiment.
5. Then, using the clamshell method (by lifting the lid of the petri dish slightly upwards/open), dip the inoculating loop into the yeast broth and streak one plate using the T-streak method.
6. If the inoculating loop is metal, then, between plates, use the bunsen burner and heat the loop in the middle of the flame, and allow it to cool to room temperature, to clean it. Otherwise, if the loop is plastic, use a new swab each time.



7. Repeat steps 5 and 6 for four more petri dishes.
8. Incubate the petri dishes for 24 hours at 30 °C.
9. Clean up all materials and PPE, if necessary. Then put the PPE in its respected place.
10. After the full incubation period, put on respected PPE and remove the petri dishes from the incubator.
11. To calculate the amount of growth on the petri dishes: count the number of colonies in each petri dish and divide by the number of squares on the Petri dish to get the percentage of yeast colonies in each dish. Use the equation below for each petri dish.

$$\frac{\text{\# of colonies}}{\text{total \# of squares on Petri dish}} = \% \text{ of yeast colonies in each petri dish}$$



12. To end the procedure, spray all petri dishes with 10% bleach. Throw all materials, including hand gloves, in the trash. Put the rest of the PPE back to their designated spot and clean according to instructions.

As you go...

Did you:

- Put on all PPE and gather materials?
- Label and grid the petri dishes?
- Spray 4 petri dishes with bleach and one without?
- Swab ALL petri dishes?
- Incubate?
- Calculate growth?
- Clean up?

Measuring Results: Data Table

	Control (without bleach)	Trial 1 (with bleach)	Trial 2 (with bleach)	Trial 3 (with bleach)	Trial 4 (with bleach)
Percentage (%) of yeast in petri dish					