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[Home](#) > Observing growth on a slice of bread

Observing growth on a slice of bread

Posted by Anonymous on Wed, 2020-04-08 11:23

Observing growth on a slice of bread: Is it OK for students to conduct a simple microbiological experiment at home using slices of bread which are rubbed on different surfaces and then incubated in a sandwich bag to encourage the growth of mould?

Voting:



No votes yet

Year Level:

Foundation

1

2

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Senior Secondary

Laboratory Technicians:

Laboratory Technicians

Showing 1-1 of 1 Responses

Answer by labsupport on question Observing growth on a slice of bread

Submitted by sat on 08 April 2020

Science ASSIST strongly advises against any microbiological experiments being conducted at home.

There are risks associated with growing mould on slices of bread. These risks can be well controlled when conducted in the school science laboratory but cannot be guaranteed when conducted in the home environment.

The home environment has several limitations:

- adult supervision may be limited, if at all
- there may be younger (or disabled) siblings to consider
- students sometimes do unpredictable things, even if prompted by curiosity
- students and probably their at home supervisors don't have sufficient understanding of the risks associated with microbiological procedures; and the need to conduct a biological risk assessment.

What are the hazards?

Environmental sampling

Sampling environmental surfaces and incubating on bread (or agar plates, also referred to as Petri dishes) will lead to the growth of unknown microorganisms or 'wild' bacterial and fungal cultures, some of which may be pathogenic (a microorganism which can cause disease). Sampling should not be conducted from areas that are likely to contain pathogens such as toilet areas, human body fluids or skin and surfaces where raw meats are handled.¹

With the current COVID-19 pandemic, we advise against conducting environmental sampling. Instead, we are being encouraged by the government, to routinely clean frequently touched hard surfaces with detergent/disinfectant solution/wipe.²

Growing mould on slices of bread

In a school setting this may be conducted using good quality zip lock bags.¹ However whilst the bread is placed in a sandwich bag for incubation, it is essential that bags are well sealed and **never opened**.

Release of mould spores:

- The opening of a bag or Petri dish containing any mould should not be permitted due to the release of fungal spores. These can spread like an aerosol increasing the normal load in the air which can remain in the environment for up to 4-5 weeks.
- Torn/leaking bags: This type of spill will also lead to spores being released and the need

to disinfect the contaminated surface.

- Many of the common bread moulds that are likely to grow are not considered pathogenic but are still regarded as opportunistic, meaning that given the appropriate conditions they are able to cause disease.
- The release of fungal spores is potentially hazardous for people who suffer with allergies, asthma or those who are more prone to infections. This includes people who are immunocompromised or immunosuppressed.

In a home environment: we have concerns that there is an increased likelihood that the bags may be opened releasing fungal spores and possibly aerosols of any other microorganism.

Biological risk assessment

When conducting a microbiology activity, it is important to consider what microorganisms are being used and how they are being used.

Before schools embark on working with microorganisms, they should ask the following questions and perform a site-specific biological risk assessment.

- What microorganism is being used? Is it a Risk Group 1 microorganism?
- Do the school facilities comply with the requirements of Physical Containment Level 1 laboratories?
- Does the school have the necessary equipment for sterilisation and decontamination procedures?
- Does the staff have training in microbiological skills?
- What manipulations are being performed with the microorganism? Are methods being used to eliminate or minimise exposure to potentially infectious material via aerosols, splashes, ingestion, absorption and accidental inoculation?
- Are any staff or students wishing to participate in microbiological activities immunocompromised or immunosuppressed (include those who are pregnant or may become pregnant, or are living with or caring for an immunocompromised individual)? These individuals are more prone to infections and they should consult a doctor to determine whether their participation is appropriate.¹

Science ASSIST resources:

Science ASSIST has produced “GUIDELINES for best practice for microbiology in Australian schools” see <https://assist.asta.edu.au/resource/4196/guidelines-best-practice-microb...> We recommend that your school is familiar with the content of this guide.

Note: In attachment 1, There is a SOP for ‘Growing fungi on bread’ and a SOP for environmental sampling titled ‘Microbes are everywhere’, both of which have detailed instructions and safety notes.

We have also previously answered questions on the use of bread mould. See:

- ‘Students investigating mould and bacterial growth on food items’, Science ASSIST website, <https://assist.asta.edu.au/question/2690/students-investigating-mould-an...> (11 March 2015)

- 'Mould investigations extra questions', Science ASSIST website, <https://assist.asta.edu.au/question/2782/mould-investigations-extra-ques...> (24 April 2015)
- 'Growing mould on bread', Science ASSIST website, <https://assist.asta.edu.au/question/3865/growing-mould-bread> (17 June 2016)
- 'Observing bread mould', Science ASSIST website, <https://assist.asta.edu.au/question/4474/observing-bread-mould> (5 May 2019)

References

¹ Science ASSIST. 2016. *GUIDELINES for best practice for microbiology in Australian schools*. Science ASSIST website, <https://assist.asta.edu.au/resource/4196/guidelines-best-practice-microb...>

² 'Good hygiene for coronavirus (COVID-19)', Australian Government Department of Health website, <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov...> (Accessed 8 April 2020)

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