

Are you Bready for some Mold?

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Freshman Physical Science

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Abstract

This science project was done to figure out what bread would mold the fastest with liquids that were put on the bread. My hypothesis was that if I moistened the bread with sugary drinks, I think the mold will like the one with the most sugar and it will grow faster. The experimental results did not support my hypothesis because no mold was growing on any of the eighteen breads I had used. My data also shows that the days were almost completely the same while I checked throughout each day.

Question

Which bread will mold the fastest in a period with the liquids that are used?

Variables

Independent Variable- Liquids

Dependent Variable- Mold

Hypothesis

If I moisten the bread with sugary drinks, I think the mold will like the sugar and it will grow mold faster.

Background Research

Mold grows from tiny spores that float around in the air. When spores fall onto pieces of damp food, or any other materials, they will start to grow mold. The mold begins to produce chemicals that make the food breakdown and start to rot. Spores begin to take root, it starts to spread and create more spores. It develops quickly on the surface of the food.

Mold is a type of fungi which grows in multicellular structures called hyphae. The hyphae produce mold spores that can be found indoors and outdoors. Mold spores can be found everywhere, but for mold to grow it will require moisture. Therefore, mold can be general in refrigerators, shower rooms, and many other places that are moist. Although when mold grows in a home or business, it can be harmful causing property damage and health issues.

When mold first starts growing it feeds on materials it grows on, which results in irreversible damage. The mold releases tiny spores and byproducts in the air which can irritate or cause many illnesses. If the byproducts or spores are breathed in, they can lead to respiratory problems. There are many ways to tell how mold grows in a business or home. Smell and sight are simple and practical ways to identify mold growth indoors.

Different type of molds can take over food in a time of 12 to 24 hours, but other molds may take some weeks for the mold to form. However, if a food is wet the mold can grow on the damp surface within 24 to 48 hours. Some molds grow best in warm, humid condition, but can grow at refrigerator temperatures. The molds can tolerate salt and sugar and can survive on high acid foods for example like jams, pickles, fruit, tomatoes and some cured salty meats like ham, bacon, bologna, and many more. The reason sugar attracts mold faster is because the sugar is

food for the yeast cells. The additional sugar there is, the more active the yeast cells are. Yeast cells eat down on the sugar molecules, which results in the sugar breaking them apart in a chemical reaction and turn them into simpler element and compounds including carbon dioxide.

Some tips to control mold is by keeping everything clean. The mold spores from moldy food that can build up in refrigerators, dishcloth, and other cleaning utensils, If you see moldy food, do not smell or sniff it. Throw the food out by putting in a small paper bag or wrap in plastic and throw away in covered trash can away from children and animals. Clean pantry and refrigerator where food was stored and check items nearby that mold has touched.

Materials List

- Ziploc Bags
- Wheat Bread
- Caprisun 60 calories 13g sugar
- Water 0 calories 0g sugar
- Ramune (Japanese Soda) 90 calories 17g sugar
- Green Tea Bag 2 calories each mug/small amount of sugar
- Fresca 0 calories 39g sugar
- Marker

Experimental Procedure

1. Put one bread in a Ziploc bag. (You should have 18 bags and breads)
2. Label bags with Dry Bread, Bread + Water, and with other liquids that will be experimented with.
3. Put individual liquids in their labeled bags. (All over, in middle and four corners of bread)

4. Place Ziploc bags in a place where they will be untouched/undisturbed.
5. Notify parents/people about experiment so nothing will be thrown in trash.
6. Check on bread daily and make observations about bread.
7. Graph results.
8. Throw away bread after experiment is completed.

Data Analysis and Discussion

Liquid all over Bread

	Bread + Water	Bread + Caprisun	Bread + Fresca	Dry Bread/ Untouched	Bread + Tea	Bread + Ramune
Day 1	Bread is squished, and decreased in size, soft.	Bread decreased in size, liquid leaked out of bread, soft.	A hole is in bread, bread small in size.	Is regular size, soft.	Decreased in size, top folded, soft.	Bread squished, skinnier, soft.
Day 2	Water has turned yellowish brown, moist.	Bread has mixed with liquid, bread decreased in size.	Bread has mixed with liquid, moist, small in size.	Regular size, dry.	Bread folded on bottom, moist.	Bread is squished, moist.
Day 3	Damp, smaller in size.	Decreased in size, soggy, overfilled liquid leaked out of bread.	Smaller in size, moist.	Regular in size, dry.	Soggy, folded on bottom half.	Moist bread is squished sideways.

Day 4	Damp, same size as day 3.	Decreased in size, soggy, overfilled liquid leaked out of bread.	Smaller in size, moist.	Regular in size, dry.	Soggy, folded on bottom half.	Moist, bread squished sideways.
Day 5	Soggy, squished all over.	Squished all the way, soggy, small in size.	Small in size, soggy.	Regular size, dry.	Soggy, folded in size, bloated all over.	Soggy, bread squished sideways, liquid leaked out.
Day 6	Liquid leaked out, soggy, small in size.	Bloated completely deformed, liquid leaked out, holes all over bread.	Soggy, small in size.	Regular size, dry.	Bloated, folded on bottom, soggy.	Slowly getting bloated, bread squished sideways, liquid leaked out.
Day 7	Liquid leaked out, small in size, moist.	Bread deformed, bloated, liquid leaked out, bread mixed with liquid.	Small in size, soggy, liquid leaked out.	Regular in size, dry.	Bloated all over, bottom is folded, liquid leaked out.	Small in size, bread squished sideways, liquid leaked out, soggy.

Day 8	Moist, liquid leaked out, small in size.	Bread deformed, bread mixed with liquid, liquid leaked out.	Slowly getting bloated, liquid leaked out.	Regular in size, dry.	Bloated, bottom of bread folded, liquid leaked out.	Squished sideways, liquid leaked out, soggy.
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Liquids put in middle

	Bread + Water	Bread + Caprisun	Bread + Fresca	Bread + Tea	Bread + Ramune	Dry Bread/Untouched
Day 1	Moist in middle, liquid is still gathered in middle.	Moist, liquid is mostly in middle.	Moist, liquid mostly in middle.	Hole is formed by tea, moist.	Moist, liquid still placed in middle.	Regular size, dry.
Day 2	Soggy, bread went smaller in size.	Liquid has spread throughout bread, damp.	Soggy, liquid has moved to $\frac{3}{4}$ left side.	Moist in the middle and liquid is still in middle.	Wet, and liquid has gone to bottom of bread.	Regular size, dry.
Day 3	Water leaked all over bread, soggy.	Liquid went all over bread except right corner in top, moist	Fresca leaked to left of bread, moist.	Liquid leaked all over bread except right top corner, soggy, hole in bread.	Liquid all over bread except left and right corner on top, soggy.	Regular size, dry.

Day 4	Damp, liquid all over bread.	Liquid all over except right corner, damp.	Liquid all over except right corner, soggy.	Soggy, bloated on left side, hole.	Small in size, soggy liquid all over except left and right top corner.	Regular in size, dry.
Day 5	Small in size, moist.	Liquid all over except right top corner, moist.	Liquid all over except left and right top corner, moist.	Soggy, bloated, hole on left side.	Moist, small hole forming in middle, ramune all over except left and right top corner.	Regular in size, dry.
Day 6	Liquid all over, small in size, moist.	Liquid all over except right top corner, moist.	Liquid all over, moist, small in size.	Bloated all over, hole on right side, moist, small in size.	Liquid all over except left and right top corner, small hole forming in middle, moist.	Regular in size, dry.
Day 7	Small in size, soggy.	Liquid all over except right/top corner, moist.	Liquid all over bread, soggy.	Bloated, soggy, hole getting bigger, small in size.	Liquid all over except left/right top corner, moist, small hole.	Regular in size, dry.
Day 8	Slowly drying out,	Liquid all over except right/left top	Liquid all over, moist,	Soggy, hole is bigger, bloated.	Liqui all over except left/right top	Regular in size, dry.

	moist, small in size.	corner, moist, almost regular size.	slowly drying out.		corner, moist small hole forming.	
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Liquids in all four corners of bread.

	Bread + Water	Bread + Caprisun	Bread + Fresca	Bread + Tea	Bread + Ramune	Dry bread/ Untouched
Day 1	Liquid is still placed in four corners.	Liquid evenly spread throughout bread, moist.	Liquid still placed in four corners.	Bottom is squished, moist, liquid has spread throughout bread.	Four corners are moist, middle is dry.	Regular size, tiny hole in bread.
Day 2	Bread covered in liquid, moist.	Soggy, liquid moved all over bread.	Liquid has stayed in place of corners damp.	Soggy, liquid was all absorbed by bread.	Liquid is still in corners, middle is dry, wet.	Regular in size, dry.
Day 3	Liquid all over except middle, moist.	Caprisun all over bread, soggy.	Liquid all over except in middle, soggy.	Liquid leaked out of bread, soggy, bottom was folded.	Liquid all over except in middle, soggy.	Regular in size, dry.
Day 4	Liquid all over except middle, moist.	Liquid leaked out, soggy, squished.	Dry in middle, moist.	Bloated, soggy, small in size, bread soaked all liquid.	Liquid all over except middle, moist.	Regular size, dry.

Day 5	Moist, liquid all over except middle.	Liquid leaked out, soggy, squished.	Dry in middle, moist.	Bloated, shrunk in size, moist.	Dry in middle, moist.	Regular in size, dry.
Day 6	Liquid all over except middle part, drying out.	Liquid all over, liquid leaked out, soggy.	Liquid all over except middle of bottom, moist.	Bloated, small in size, soggy.	Liquid all over except middle, moist.	Regular size, dry.
Day 7	Drying out, moist in some parts of bread.	Liquid all over, soggy, liquid leaked out.	Slowly drying out, moist, liquid all over except tiny spot.	Bloated, bottom folded, all liquid soaked up, soggy.	Liquid all over except in middle, moist.	Regular in size, dry.
Day 8	Water is all over except middle, moist, drying out.	Bloated, small in size, moist.	Liquid all over bread, moist.	Bloated, small in size, bottom folded, liquid soaked up.	Liquid all over except in middle, moist.	Regular in size, dry.

Conclusions

My hypothesis was that if I moisten the bread with sugary drinks I think the mold will like the sugar and it will grow mold faster. My results do not support my hypothesis.

I think that the results didn't support my hypothesis is because my experiments that I tested none of the breads had gotten mold. They breads sat in the liquid, however one bread completely deformed.

I still don't know why the tests did not run smoothly. I put the Ziploc bags next to a humid area which it did not grow mold. Next, I tried putting it under my bed where there was no light, unfortunately it did not also work to grow the mold.

Works Cited

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