

Evelyn's Egg experiment




? My Question ?

My question was: What happens if you expose your teeth to various liquids for a week?




Background Research

I learned that eggshells have a similar chemical composition to our tooth enamel, making them react similarly with other chemicals. This can help us understand what stains teeth and how to protect them.



Background Research

Why I chose eggs? Eggshells contain mostly composite calcium carbonate, with some calcium phosphate and tooth enamel is a composite calcium phosphate. This makes the chemical composition similar between teeth and eggshells.



Hypothesis (Sugary)

The sugary liquids will start to break down the egg shell because I have heard that sugar eats away at your teeth. It would also be heavier, change color, and become weaker.



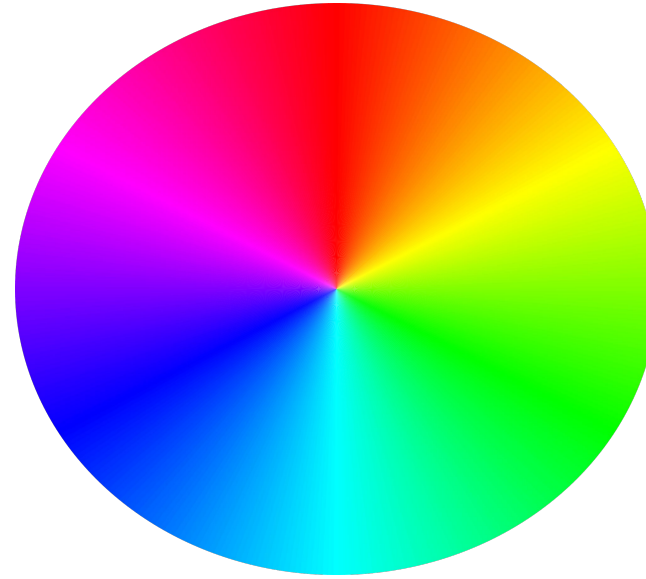
Hypothesis (Acidic)

The acidic liquids will fully disintegrate the shell because I know that acid is good at dissolving. When you dip an egg in vinegar, the shell dissolves, leaving the inner semi-permeable membrane intact. Vinegar (the acid) breaks apart the shell (the base) and the eggshell into their calcium and carbonate parts.




Hypothesis (Colorful)


The colorful liquids will stain the egg shell because the color will start to eat into the shell and stain it. I should see the coloured water pass into the egg (slowly).



My Variables

- *Dependent Variable: How decayed the eggs are after a week.*
 - *Independent Variable: The liquid I am putting the eggs in.*
 - *Control Variable: The amount of liquid, size and type of the eggs, the size of the glass/cup, and the time I'm leaving the eggs in for.*
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Procedure

1. Lay out seven glasses.
 2. Pour a cup of the different liquids into each glass. (Lemon Juice, Avocado Oil, Salt Water, Mouthwash, Vinegar, Coke, Water.)
 3. Carefully drop an egg into each cup.
 4. Observe everyday for a week.
 5. After a week, take the eggs out, then note and observe what they look and feel like.
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Lemon Juice Egg

- The egg turned slimy.
- Small bumps formed on the shell.
- The bottom half of the glass was foam.
- The egg doubled in size.
- Starting on day 3 it hovered in the middle.



Foam

Small
Bumps

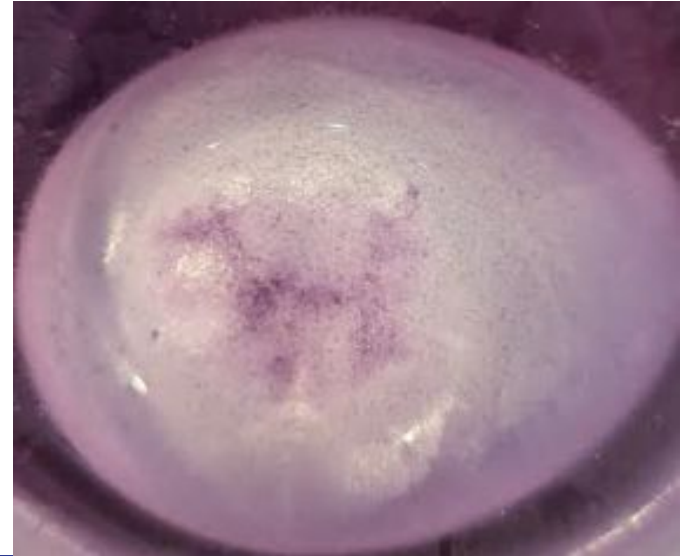


Mouthwash Egg

- There were small purple dots on the shell.
- A slimy pink film developed.



Dots



Coke Egg

Spots

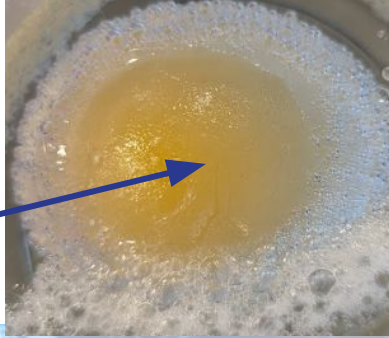


- On day 7, mold developed.
- By day 3 there were thin, paper-like spots on the shell.
- The entire egg was stained light brown with wood stains.

Mold



Vinegar Egg



Yolk

- The egg became slimy and slippery.
- As soon as I put the egg in, it was completely covered in bubbles.
- The shell dissolved entirely.
- The egg doubled in size.
- By day 2 it was floating to the top of the glass.
- On day 7 the egg was clear. (I could see the yolk).
- At the end, it was rubbery and bouncy.

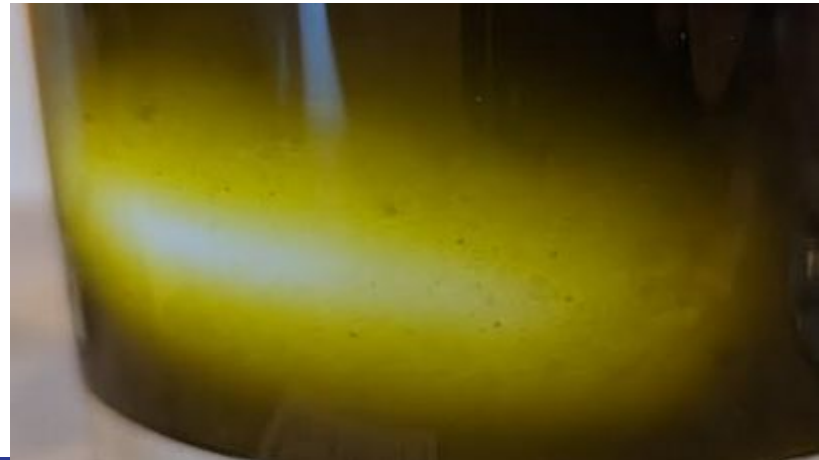
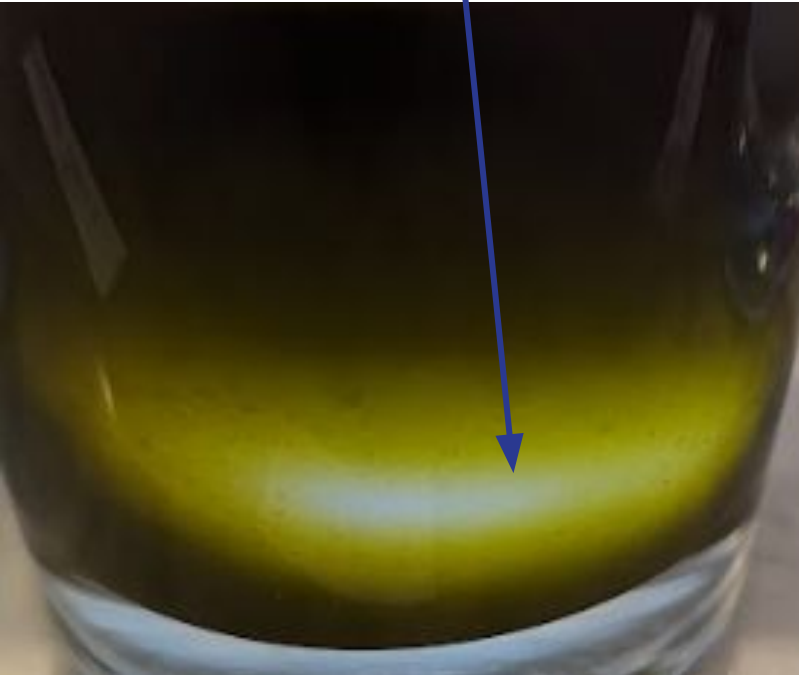


Foam

Avocado Oil Egg

Neon Stain

- After a few minutes the egg had a neon green coating that could be wiped.
- On day 3 there was a slimy green layer on the shell.



Salt Water Egg

- *There were a few bubbles on the salt water eggs shell.*
- *Nothing happened to the salt water egg.*



Water Egg



- There were a couple of bubbles on the water egg shell.
- The water egg stayed the same.



Day Seven



Conclusion

My conclusion for the acidic eggs is that they both grew a lot in size and the shell dissolved in some way. However the vinegar eggs shell completely dissolved, where the lemon egg got VERY fragile and built up layers of crust.

My conclusion for the oil egg is that it got stained a tiny bit, but you could wipe off most of it.

My conclusion for the water and salt water is that they don't decay or stain your teeth.

Conclusion

My conclusion for the sugary liquid eggs (coke and mouthwash) is that the eggs got stained because of the color. The sugar itself didn't do any damage. My hypothesis about the sugar was wrong so I did some extra research. I learned that sugar doesn't do any damage to your teeth. It just feeds the bacteria in your mouth which then produces acid that slowly decays your teeth making cavities. That's why the eggs still stayed strong.

Application/Extension

This data is important in real life because you can better understand the impacts on your teeth if you don't brush.

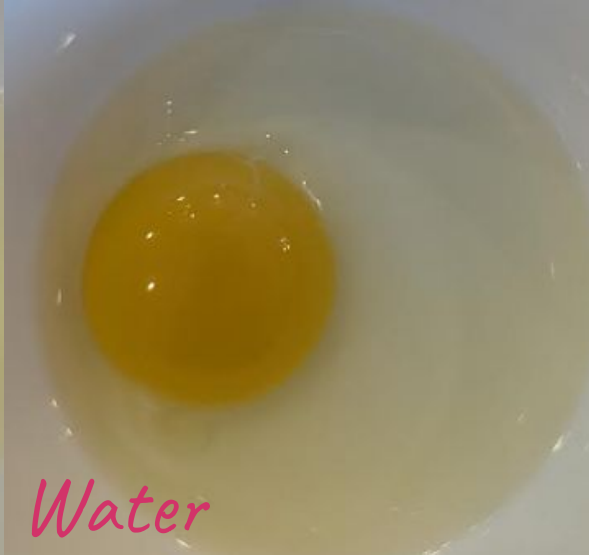
If I were to improve this experiment I would make 2 vinegar eggs, 2 coke eggs and 2 lemon juice eggs. Every day I would brush 1 of each egg for a week.

Bonus



Lemon Juice

Greenish-yellow egg whites.



Water

Normal. (Control).



Vinegar

Strong solid yolk.

Citations

Works Cited

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