Teeth vs. Drinks

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PURPOSE & HYPOTHESIS

What liquid harms your teeth the most?

My hypothesis is that out of the liquids that I am testing, Sprite will harm your teeth the most because it is the most fizzy.

RESEARCH

I was interested in this topic because it involves a lot of drinks that I like. My favorite drinks in this experiment are Coke, Sprite and Gatorade. My parents and my dentist say that drinks like the ones I like are bad for my teeth. This experiment tests if what they say is true.

Teeth are made of calcium phosphate. Egg shells are made of calcium carbonate. They are not exactly the same material, but they are similar. That is why I used egg shells in my experiment instead of real teeth.

I also learned about pH levels. A lower pH number means something is more acidic, and that is bad for your teeth. Drinks that are acidic have a fizzy, sour flavor. I researched the pH levels of the different drinks I tested. Then I can tell if lower pH drinks are worse for your teeth.

I did my experiment by soaking eggs in the different liquids for 2 days, and then checking what the eggs looked like and weighed.

MATERIALS

- 8 glass cups
- 8 brown eggs
- A scale
- 6 fluid ounces of each:
  - Gatorade
  - Coca Cola
  - Sprite
  - Orange juice
  - Milk
  - Sugar (to make sugar water)
  - Apple cider vinegar
  - Bottled water

EXPERIMENT

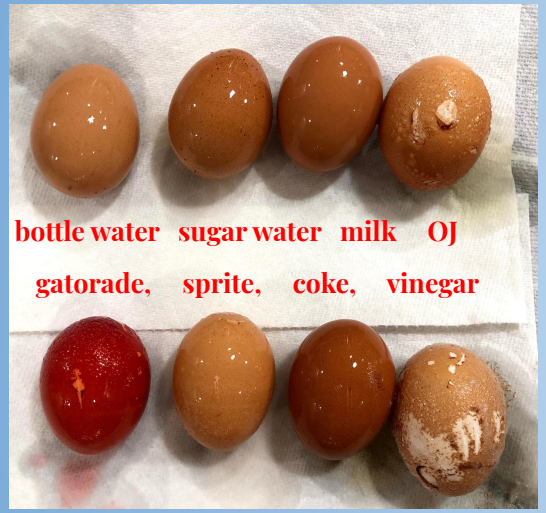
1. Get 8 brown eggs, and weigh each egg on a scale
2. Get 8 glass cups
3. Fill each glass cup with 6 fluid ounces of the different liquids
4. Put an egg into each cup
5. Put cups into the refrigerator and wait 24 hours
6. After 24 hours, take eggs out of the liquid. See how they look, and also weigh each egg on a scale again
7. Put each egg back in the glass cups, and wait another 24 hours
8. Repeat step 6
9. Clean each egg with tap water, and see how they look, and weigh it again

PHOTOS

Day 1

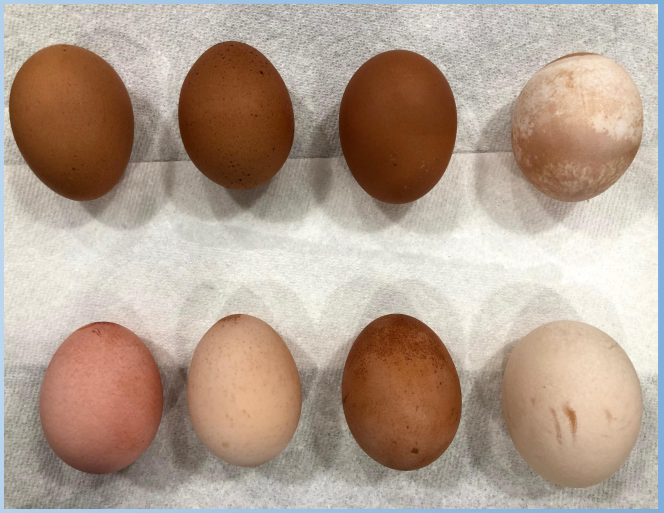
Day 2

PHOTOS



Day 1

Day 2



Day 2 (cleaned)

ANALYSIS

		Egg Weight (grams)		
Liquid	**pH Level**	**Original**	**After 2 Days**	**Egg Shell Observations (after 2 days)**
Water	7.0	58	58	No change to shell
Sugar Water	7.0	56	56	No change to shell
Milk	6.7	61	60	No change to shell
Orange Juice	3.8	60	58	Shell rubbed off a lot, big white spots
Gatorade	3.0	57	55	Shell rubbed off a lot, turned red, big white spots
Sprite	3.2	55	54	Shell rubbed off a little, some white spots
Coke	2.4	61	59	Shell rubbed off a little, some white spots
Vinegar	2.4	65	74	Shell rubbed off completely, and is soft

CONCLUSION

Of the drinks I tested, vinegar had the worst effect on the egg shell. The next worst seems to be OJ, but Gatorade, Sprite and Coke were also pretty bad.

My hypothesis, which was that Sprite would be the worst, was incorrect but not completely wrong since it still had a bad result on the egg shell.

We saw that drinks with lower pH levels, which means they are more acidic, are worse for your teeth than less acidic drinks.

REAL WORLD CONNECTION

I had a lot of fun doing this experiment and I learned a lot. I learned what pH is. I also learned that orange juice is acidic.

This experiment taught me that you should not drink too many drinks that are acidic, like sodas and orange juice. I thought that orange juice was a healthy drink, but it turns out that it is very acidic and actually not great for your teeth.

If you want healthy white teeth, you should not drink too much soda or orange juice. If you do, you should definitely brush your teeth more frequently to get rid of the acid on your teeth.

WORKS CITED

I researched these websites:

- https://sciencing.com/teeth-science-projects-6110338.html
- https://www.education.com/science-fair/article/teeth-and-soda/
- https://www.sciencefocus.com/science/soft-drinks-vs-your-teeth/
- https://www.ada.org/en/~/media/ADA/Public%20Programs/Files/JADA_The%20pH%20of%20beverages%20in%20the%20United%20States