



Tooth Decay Egg Experiment

Grade Levels: 1-12

Tooth enamel is tough but can be eroded by sugar in your beverages and acids in your mouth.

Sugary beverages are not good for teeth as they stick to the surface and bacteria then break down the sugar to make acid, which can damage teeth. When tooth enamel is exposed to acidic beverages or acid generated by sugary beverages, it softens and loses some of its mineral content. Saliva helps neutralize the acid, restore the mouth's natural pH balance, and slowly harden the tooth enamel again. However, because the tooth's recovery process is slow, if the acid exposure happens frequently, the tooth enamel does not have the chance to repair. This can cause tooth sensitivity and lead to the need for dental treatment to protect the tooth and the dentin underneath.

Research Question: Can sugary or acidic beverages really weaken teeth?

Objective: Since egg shells are similar to tooth enamel, examine hard-boiled egg shells soaked for 2 days in various beverages to see if the acid weakens tooth enamel.



Materials

- Beverages: sugary - Soda, energy drink (e.g. Red Bull), sports drink (Gatorade), Juice; acidic - vinegar, orange juice, water (control), milk (control)
- Clear cups or glasses (one for each drink) with covers or pieces of foil or plastic wrap and rubber bands to cover
- Hard-boiled eggs
- Extra toothbrush
- Toothpaste



Procedure

1. Label each cup with the liquid and carefully add a hard-boiled egg to each cup. Optional: include cup and put some tooth paste on a small area or whole egg before soaking.
2. Pour 1 cup of each type of drink into its own cup. Make sure to include one cup with water (control). Soak for 48 hours at room temperature or refrigerator
3. Take out soaked hard-boiled eggs and make observations about its color and texture. Compare each experimental eggshell to the "control" eggshell that was just soaked in water.
4. Can you brush off the stains using tooth brush?
5. Record your observations and any conclusions you make about how the sweetness or acidity of drinks affect teeth.

Questions

1. The enamel of your tooth is similar to the egg's shell. What happened to the egg shells that were soaked in liquids that are sugary? Why?
2. What happened to the egg shells that were soaked in liquids that are acidic? Why?
3. If you used toothpaste what was the effect? Why?
4. Based on what happened to the eggshells in your experiment, which drinks do you think are BEST for your teeth? Why?

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