

Logbook

Title:

- Gas in Drinks

Statement of the Problem:

- The purpose of this experiment was to determine the amount of gas in beverages. I became interested in this experiment because my grandmother had a gastric bypass and when you get a gastric bypass you shouldn't drink beverages that have gas because it can make the stomach burst. This information can help people because some people can't have gas beverages and it affects their stomach.

Objective:

- In this experiment I will be measuring how much gas is in beverages and the most gas releases into the balloon.

Hypothesis:

- I hypothesized in this experiment that Coca-Cola will release the most gas. Research states that Coca-Cola has carbonation that makes the gas bubbles release in the balloon. "The coke blew up the balloon, because it has carbonation in it which is carbon dioxide, and the gas bubbles are being released outside the coke into the balloon."
- (<https://csef.usc.edu/History/2014/Projects/J0615.pdf>)

[Gas: Which Beverages Release the Most Gas and How Does It Affect the Stomach?](#)

<https://prezi.com>

<https://ericsscienceproject.weebly.com>

Materials:

- Science Fair Log Book
- 1 tablespoon Vinegar
- 5 water bottles (16.9 oz)
- 1 Heating pad brand unknown (12x24)
- 75 Balloons
- 60in Cloth tape measure
- 12in Ruler
- White Printer Paper and Pens/Pencils for documenting
- 1 Cup Measuring cup
- Iphone 13 Plus timer

5 Drinks

- 1 Cup Dr.Pepper
- 1 Cup Coca-Cola
- 1 Cup Red Bull
- 1 Cup 2% Milk
- 1 Cup Orange Juice

Dependent and Independent Variable:

- Independent- Beverages (Dr.Pepper,Coca-Cola, Red Bull, 2% Milk, Orange Juice)
- Dependent- the amount of gas
- Control- no control

Procedure: Number your steps.

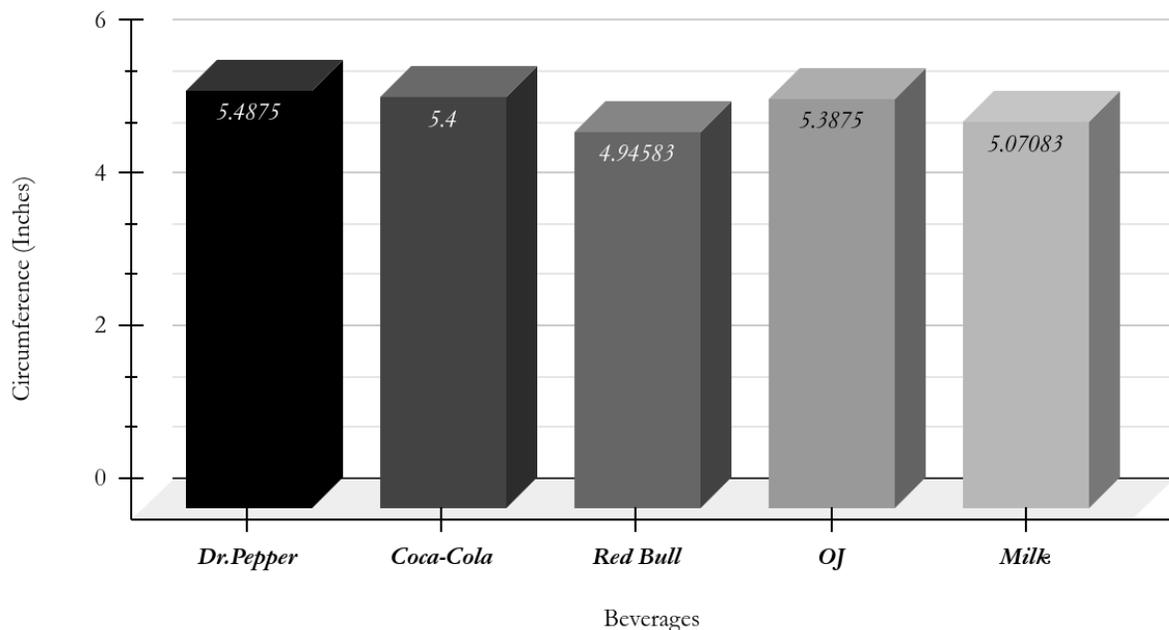
1. Put one cup of each of the five drinks into a separate water bottle.
2. Put 2 tsp.of vinegar into each water bottle.
3. Plug in the heating pad to heat it up.
4. Blow up any type of party balloon with breath to stretch it out and then deflate it.
5. Put the balloon on the water bottle with the beverages in it.
6. Put the water bottle with the balloon covering the top on the heating pad for 30 minutes and see how big the balloon gets.
7. Measure the balloon's circumference by inches.
8. Convert measurement from fractions to decimals
9. Write down the measurement on a piece of paper
10. Repeat for all 5 water bottles with the liquids and vinegar with a balloon on it for 15 times each.

Results:

- The results for this experiment showed that after averaging my 15 trials, Dr.Pepper released enough gas to make the balloon's circumference increase to 5.4875 inches. Coca-Cola released enough gas to make the balloon's circumference increase to 5.4 inches. Red Bull released enough gas to make the balloon's circumference increase to 4.94583 inches. Orange Juice released enough gas to make the balloon's circumference increase to 5.3875 inches. 2% Milk released enough gas to make the balloon's circumference increase to 5.07083 inches. This information indicates that Dr.Pepper has the most gas and Red Bull has the least amount of gas.

Drinks	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	AVG
Dr.Pepper	5.375	5.0	5.25	5.6875	5.6875	5.5	5.5	5.6875	5.75	6.25	5.5625	5.8125	5.625	4.5625	5.0625	5.4875
Coca-Cola	5.375	5.5	5.25	5.25	5.125	5.75	5.0625	5.25	6.5	5.8125	5.75	5.0	5.6875	4.875	4.8125	5.4
Red Bull	5.375	1.875	2.5	5.0	5.1875	6.125	5.125	5.0	6.6875	5.5625	5.5625	4.9375	5.875	4.6875	4.6875	4.94583
OJ	5.5	6.0	5.75	5.75	5.375	5.625	4.6875	5.75	5.625	5.3125	4.875	5.9375	4.8125	4.75	5.0625	5.3875
2% Milk	3.875	4.5	5.125	5.125	5.1875	5.6875	5.8125	5.625	5.75	5.75	4.8125	5.0	4.625	4.375	4.8125	5.07083

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	AVG
Dr. Pepper	0.175	0.375	0.175	1	1.0625	1	0.175	0.75	1	1.125	1.15625	1	0.96875	0.9375	0.875	0.785
Coca-Cola	0.175	0.175	0.175	0.75	0.75	1.09375	0.75	0.75	0.9375	1	1.0625	0.78125	0.9375	0.8125	0.5625	0.71467
Red Bull	0.175	2.5	0.3125	0.71875	0.8125	1.125	0.175	0.6875	1	0.9575	0.875	0.8125	0.6875	0.625	0.71875	0.812167
OJ	0.90625	1	0.46875	0.375	0.75	1.0625	1.9375	0.75	0.9375	0.8125	0.78125	1	0.78125	0.625	0.75	0.8625
Milk	0.25	0.625	0.90625	0.8125	0.8125	1	1	1.0625	0.8125	2.0625	0.875	0.90625	0.65625	0.5625	0.625	0.864583

How Much Gas is in Beverages?**Conclusion:**

1. In this experiment my objective was measuring how much gas is in beverages and the most gas releases into the balloon. I would put the 5 beverages with a balloon on top of it with vinegar and put them on the heating pad for 15 times.
2. In this experiment I hypothesized that Coca-Cola will release the most gas. Research states that Coca-Cola has carbonic acid that makes the gas bubbles release in the balloon. My hypothesis was incorrect because Dr. Pepper released the most gas.
3. The results for this experiment showed that after averaging my 15 trials, Dr. Pepper released 5.4875 inches of gas. Coca-Cola released 5.4 inches of gas. Red Bull released 4.94583 inches of gas. Orange Juice released 5.3875 inches of gas. Milk released 5.07083 inches of gas. This information indicates that Dr. Pepper has the most gas and Red Bull has the least amount of gas.
4. As someone who has a genetic stomach problem I wanted to know how the different types of drinks affect the stomach. I learned that most drinks can affect the stomach.
5. If I would do this experiment again I would make it more precise by using the volume formula instead of doing the circumference and radius.



Figure 1: 2% Milk, Orange Juice, Red Bull, Coca-Cola, and Dr. Pepper



Figure 2: 2% Milk, Orange Juice, Red Bull, Coca-Cola, Dr.Pepper with 2 tablespoons of vinegar on a 12x24 heating pad

Gas in Drinks

McKenzie L. Avelar-Pilkington

Saint Francis of Assisi Catholic School

English

Mrs. Casanova

February 9, 2022

Gas In Drinks

This project explains how much gas is in beverages. The problem that was investigated was the amount of gas in beverages. I hypothesized that Coca-Cola would have the most gas. This experiment is important because some people can't consume a lot of gas and if they do their stomach can combust. This can be a benefit for some people because it can help them understand how much gas is in their favorite beverages. This can be of an importance for some people because they might not want to drink gas drinks.

Method

The scientific method was used to conduct this experiment. The question that was studied during the experiment was how much gas is in different beverages. I hypothesized that Coca-Cola would have the most gas because Coca-Cola is one of the drinks that have a lot of gas. (<https://prezi.com>)

Materials

There were several materials needed for this experiment. I used a heating pad to substitute the heat of the stomach. I used balloons to hold the gas from the beverage. I used five different plastic water bottles to put the beverage in it. I used vinegar to represent the stomach acid. I used five different beverages, Coca-Cola, Dr.Pepper, Red Bull, Orange Juice, and 2%Milk to see the different types of gas in a wide range of beverages. I used measuring cups to measure the amount of liquid I was going to use. I used a cloth measuring tape and ruler to measure the circumference and radius of the balloon. I used an Iphone 13 plus timer because each drink had to be on the heating pad for 30 minutes. The last thing I used was a paper and pen/pencil to collect my data. These are all the materials I used.

Procedures

There were many procedures performed to do this experiment. The first thing I did was get five plastic water bottles and put a cup of Coca-Cola, Dr.Pepper, Red Bull, Orange Juice, and 2% Milk in the separate bottles. The second thing I did was put a tablespoon of vinegar in each bottle. The third thing I did was I blew in the balloon to stretch it out then put it on the open part of the water bottle. Next, I put all five bottles on a heating pad for thirty minutes. When the thirty minutes was up I took the bottles off the heating pad and took the balloon off and tied the bottom of the balloon. Then I measured the circumference and radius and wrote down the measurements. I did this 15 times for 15 different trials. These were all the procedures I did to perform my experiment.

The results of this science experiment showed that Dr.Pepper has the most gas.

Results

The experiment produced results. They are as follows. After fifteen trials Dr.Pepper averaged enough gas to make the balloon's circumference increase to 5.4875 inches, Coca-Cola averaged released enough gas to make the balloon's circumference increase to 5.4 inches, Red Bull averaged released enough gas to make the balloon's circumference increase to 4.94583 inches, Orange Juice averaged released enough gas to make the balloon's circumference increase to 5.3875 inches, and 2% Milk averaged released enough gas to make the balloon's circumference increase to 5.07083 inches.

Discussion

Much information can be found on the topic of the gas in drinks and how it affects the stomach. Kaylee J. Hopkins conducted an experiment testing which beverages release the most gas and how it affects the stomach. She put different types of beverages in plastic bottles and mixed vinegar in each one to represent stomach acid, then they blow up balloons so it would be easier to expand then put the open end of the balloons over the opening of each bottle, she placed each bottle on a heating pad and watched the balloons as the heat and document which one expanded the most. Her results were that the coke made the balloon expand the most, the orange juice expanded slightly and the water and milk didn't expand at all.

(<https://csef.usc.edu/History/2014/Projects/J0615.pdf>)

Gabby Perez conducted an experiment testing which beverages release the most gas and how it affects the stomach. She poured an equal amount of each beverage into separate plastic bottles, she mixed a couple teaspoons of vinegar into each beverage, the vinegar will represent the stomach's acid, she blew-up and released the air in a balloon for each bottle, this would stretch the balloons so they are more easily inflated, stretch the open end of a balloon over the opening of each bottle, she placed the bottles on a warm heating pad, she observed the balloons at different intervals as the liquids begin to heat. The results showed that any type of soda would react the fastest and the milk the slowest, the soda had the most fizz so it reacted quicker than any other beverages, the milk had the slowest result in producing acidity to your body.

(<https://prezi.com/>)

As stated on Carbonics website, "Upon being opened, the carbon dioxide gas reacts with water to form carbonic acid, giving the drink a bit of acidity. When carbonation bubbles waft into

the nose of the person drinking the beverage, it also strengthens the drink's tastes, while bubbles in the mouth produce a pleasing feeling on the tongue."(<https://www.vscarbonics.com>)

As stated on Phan-tastic Smiles website, "Consuming carbonated soft drinks may cause repeated belching as your stomach stretches from the accumulation of carbon dioxide gas."(<https://www.phantasticsmile.com>)

Conclusions and Future Study

The results of this experiment showed my hypothesis was contradicted. My experiment worked because I was very cautious about my measurements for the drinks, the vinegar and measuring the circumference of the balloon. I also took my time and did not rush the experiment. The results told me that Dr.Pepper has the most gas out of Coca-Cola, Red Bull, Orange Juice, and %2 Milk. What I want to do in the future is make my experiment more precise. What I would like to change in my experiment if I were to do it again is measure the balloon by using the volume formula and test more beverages.

References

Flowers, E. (May 8, 2013) *How Much Gas Does Your Favorite Beverage Produce?*

ericsscienceproject.

<https://ericsscienceproject.weebly.com/introduction-how-much-gas-does-your-favorite-beverage-produce.html>

Perez, G. (March 18, 2016) *How much gas does your favorite beverage produce?* Prezi.

<https://prezi.com/extmfgxdmyuq/how-much-gas-does-your-favorite-beverage-produce/>

Hopkins, K. (2014) *Gas: Which Beverages Release the Most Gas and How Does It Affect the Stomach?* CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT

SUMMARY. <https://csef.usc.edu/History/2014/Projects/J0615.pdf>

Appendix

Table A1

Drinks	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	AVG
Dr.Pepper	5.375	5.0	5.25	5.6875	5.6875	5.5	5.5	5.6875	5.75	6.25	5.5625	5.8125	5.625	4.5625	5.0625	5.4875
Coca-Cola	5.375	5.5	5.25	5.25	5.125	5.75	5.0625	5.25	6.5	5.8125	5.75	5.0	5.6875	4.875	4.8125	5.4
Red Bull	5.375	1.875	2.5	5.0	5.1875	6.125	5.125	5.0	6.6875	5.5625	5.5625	4.9375	5.875	4.6875	4.6875	4.94583
OJ	5.5	6.0	5.75	5.75	5.375	5.625	4.6875	5.75	5.625	5.3125	4.875	5.9375	4.8125	4.75	5.0625	5.3875
2% Milk	3.875	4.5	5.125	5.125	5.1875	5.6875	5.8125	5.625	5.75	5.75	4.8125	5.0	4.625	4.375	4.8125	5.07083

Figure A1

How Much Gas is in Beverages?

