Research Plan

RATIONALE:

I wanted to test the amount of sugar particles in freshly squeezed fruit juices and canned juices (without any added sugar) using a device called a refractometer (commonly called a BRIX meter). Would there be a difference in the number of sugar particles between the two types of juices?

Degrees Brix, usually shortened to "Brix", refers to a scale of measurement for soluble solids in a liquid. In the juices of fruits and vegetables, soluble solids are mostly sugars, and the Brix measurement approximates the sugar content of a sample; 20 Brix means approximately **20%** sugar. This research can help determine if drinking canned fruit juices would taste the same as fresh fruit juices, which could help people with their health choices. This could impact society, because people would try to drink more fresh fruit juices if they are sweeter, because processed fruit juices do not do the same for the human body as fresh fruit juices.

RESEARCH QUESTION(S):

Which is perceived as sweeter, fresh fruit juices or canned fruit juices? People need to know which is the better health choice.

HYPOTHESES:

Null: Canned and fresh fruit juices will have a similar Brix readings when testing for sugar particles
Alternate: Fresh fruit juices will have a higher Brix reading for sugar particles when compared to canned fruit juices.

Independent Variables:

Fresh and canned fruit juices, grapefruit, oranges, pears, pineapples, blackberries

Dependent Variable:

The level of sugar [content when using a Brix meter to measure sugar content, soluble solids are mostly sugar and the Brix measurement approximates the sugar content of a sample so 20 Brix means approximately 20 sugar (1 degree Brix = 1 g of sucrose /100 g of solution) = 1%]

EXPECTED OUTCOMES:

The fruit juices squeezed fresh into the juicer would come out as sweeter which means that they will have a higher BRIX reading. .

RESEARCH METHODOLOGY:

Materials:

BRIX refractometer , fresh: grapefruit, oranges, pears, pineapples, blackberries, can versions of all fresh fruit, googles, apron, plastic cups, plastic pipettes, thermometer.

Procedure:

Juice preparation:

- The fresh juices were squeezed into a cup using a handheld juicer. Canned fruit juices were purchased that did not contain any added sugar.

Collecting readings:

- For each juice, clean Brix refractometer with a lens cleaning tissue before applying any juice to the prism.
- All juices were at the same temperature for all readings. Juices were mixed well before using a plastic pipette to obtain a sample of the juice.
- One drop of juice was placed onto the prism; the lid was closed and the refractometer was held up to the light to view and read the Brix levels which was displayed on the side of the prism and record.
- Each juice was tested six times and then the procedure was repeated for the remaining fresh and canned fruit juices.

How will you collect/measure data?

I will collect data by using a Brix refractometer and recording the Brix levels for the six trials for each type of juice. The prism will be cleaned in between each use to avoid any false readings. All juices will be at the same temperature and mixed thoroughly before taking a sample.

RISK AND SAFETY:

Nitrile gloves will be used when handling and making the fruit juices. Care will be taken when chopping up and blending fresh fruits for the juices. Care will be taken when opening and handling the metal lids or tabs of canned fruit juices. Student researcher has no fruit allergies when working with fruit. Safety goggles will be worn to avoid juice splashing into the eyes.

DATA ANALYSIS:

Average Brix readings (6 trials for each) for all of the fresh and canned fruit juices will be calculated along with the standard deviation to determine if sugar levels differ. Results will be compared to see if it accepts or rejects the null hypothesis, “Canned and fresh fruit juices will have similar Brix readings when testing for sugar particles”. determine After all of the juices are juiced and poured out of the cans, the Brix reformeter would be placed in each of the juices. The average measurement of sugar

in each of the fruit juices will be recorded and displayed on a bar graph.

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