

Can It Really Be That Sweet?

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Chapter/Unit to be used in

Sensation and Perception: Taste

Overview

Synsepalum dulcificum is the plant that produces the taste-altering berry known as the “Miracle Berry/Fruit.” The plant itself originates from West Africa, where it is widely used before meals. The active ingredient in the miracle berry/fruit is **miraculin**. Miraculin is a protein that binds to the sweet taste receptors on the tongue, causing sour and bitter foods to taste sweet. Scientists have yet to discover why miraculin appears to have this effect on certain taste receptors, but some hypothesize that miraculin briefly alters the shape of the sweet taste receptors, making them responsive to bitter and sour tastes*.

*(<http://www.wired.com/science/discoveries/news/2006/12/72251>)

Important note

As with any experiment/activity that calls for students to ingest a product, please be sure to get permission from the students parent(s)/guardian(s) prior to conducting the activity. It is also very important to get administration approval before you engage this activity.

There does not appear to be any known side effects from this tablet/berry. Since the tablet/berry does not change any chemical compound of any of the foods that are used, they will retain their high acidity. Be careful not to ingest high quantities of highly acidic foods, this can lead to oral ulcers (due to high levels of acidity).

Purpose

Increase knowledge of how taste receptors can be tricked/altered, which produces an opposite sensation.

Resources/Materials

- Miracle Frooties (*Synsepalum dulcificum*) - \$13 for 10 small tablets; \$15 for 10 extra large tablets available from theworldsbestfruit.com:
<http://theworldsbestfruit.com/pages/buynow.html>
 - o One tablet per person; the larger tablets can be split in half.
 - o Please note that this sensation may only last about a half hour.
 - o Also important, some may people may experience a greater sensation of sweetness than others.
- Food items
 - o Lemons, limes, grapefruit, kiwi, cranberries, pineapple, green grapes, green mangos, Granny Smith apples, goat cheese, rhubarb, olives, pickles, apple cider vinegar (use in very small doses), and many other “sour or bitter” foods.
 - o Cut foods into small wedges for easy consumption.

Procedure

- Have students taste some of the sour/bitter foods prior to the experiment, in case they are unsure of their taste.
- Rinse mouth out with plenty of water to clean palate.
- Students are to put one tablet on their tongue, and let the substance dissolve (this should take approximately three minutes).

- Once tablet is fully dissolved students can pick up a wedge of the sour/bitter food and proceed to put in their mouths and eat.
 - o Be careful not to eat the seeds of those fruit that contain them. This can be avoided by the teacher removing the seeds prior to the experiment.
- Students will be amazed at the taste of the previously sour/bitter foods.

Results

- Students can rate each food based on their individual sweetness taste on the board, thus creating a class average rating for each piece of food. This can be compared to trials prior to the use of the tablet.
- Students can be asked to calculate the mean, median and mode of their trials as well as other various statistical readings (range, outliers, etc...)