**Sweetness Lab**

What is “sweetness?” How do you define it? A fruit’s sweetness varies not only with its age (ripe vs. unripe), but also with its type, or cultivar. A cultivar is a type of plant with desired characteristics that growers have created by breeding and then maintained by cultivation. So, cultivars of the same plant have different characteristics; using apples as an example, Red Delicious are sweeter than Granny Smiths or Lady Apples.

This lesson has students create a scale that will allow them to measure and compare the sweetness of several types of apples, a non-sweet plant (potato) and a popular sugar-sweetened soft drink.

**Objectives**

Students will:

 • Invent an “Apple Sweetness Scale” by tasting and rating ascending concentrations of sucrose (table sugar).

• Taste and rate at least four different varieties of apples, as well as a potato and a sugar-sweetened soft drink.

• Discuss:

\* why sugar tastes sweet.

\* the role that sweetness has played in the proliferation of the apple and its popularity.

\* the pros and cons of Michael Pollan’s hypothesis that the evolutionary success of the apple is a result of its ability to satisfy the human desire for sweetness.

**Materials**

• Four to ten different types of apples

• Potatoes

• One 8-oz bottle of sugar-sweetened soda such as Coke or Pepsi

• Five concentrations of sucrose solution (1, 4, 6, 8, and 10%), made with table sugar and water. •

 Seven small (5-oz) cups per student, labeled as described below

• Data collection sheets

• Bottled water

**Sweetness Discussion Questions**.

What is the purpose of sweetness?

How has the successful dissemination of apples throughout the world been related to sweetness?

Is there such thing as too sweet? How much sweeter soda is than an apple? Have your taste preferences have changed as they have grown older, and if so, to speculate why that has occurred. If not, why not?

**PROCEDURE**

1. Before tasting begins, have your students first drink plain

water to cleanse their palates.

2. Create a baseline for sweetness by having students taste

the 10% sucrose solution and assign this level of

sweetness a score of 100 on a sweetness scale.

3. Have the students taste plain water and assign it a

score of 0 on a sweetness scale.

4. Have students taste the 1, 4, 6, 8% sucrose solutions

and using numbers from 0 to 100, rate the sweetness of

each solution. They should record their ratings on their

data collection sheet.

5. Provide students with slices or chunks from at least four different varieties of apples, and have students rate with a ranking between 0 and 100. Use your sucrose ratings to help you rate each apple, according to their sweetness.

6. Taste and rate a slice of potato.

7. Taste and rate 5 ml of a sugar-sweetened soft drink according to sweetness. Students should rate each item in relation to the sucrose solutions by assigning it a number. You may re-taste the sugar solutions to refresh their memories at any time.

**Results**

* Graph your results showing how sweetness rating V. sucrose concentration.
* Which apple did you rate as the sweetest?
* Which apple would you rate as the tastiest or most delicious?
* Other than sweetness, which other factors would you need to consider if you were asked to rate the apples based on how yummy they are?

**Conclusion**

Discuss the role that sweetness has played in the popularity and distribution of the apple across North America.

* • How is sweetness responsible for changing apple distribution from the mountains of Kazakhstan to all over North America?
* • If the apple is so widely distributed, why are there so few varieties of apples on grocery store shelves in America?
* • Has human desire for sweetness assured or endangered the survival of apples into the future?
* What other tastes ( there is at least 5) does our body register and how are we able to distinguish between them?

