University of Idaho Extension
Gooding County

Food Science Experiment

Topic Title: Enzymatic Browning Reaction Length of project: 1 hour

Research. What does society know. Look it up!

Some fruits and vegetables turn brown after they are peeled or cut. Additives or food treatments can be used to prevent foods from browning. Find five fruits or vegetables that brown.

Words to search: enzymatic browning reaction, prevent fruit vegetable browning edu

Situation. Try something different or document a problem that has now arrived.

Discolored foods are not very pretty to eat and can be hard to sell. How do you prevent browning from occurring?

Hypotheses. Guess what may happen.

_____ can be used to slow down or prevent enzymatic browning.

Equipment. What you need.

Gather

- 1 Red delicious apple (this variety will brown more than others) **Or** 1 Russet potato
- Cheese grater
- Paring knife
- 5 each - bowls and paper plates
- Cool water
- 2 teaspoon Sugar
- ¼ cup Lemon juice
- ½ teaspoon Ascorbic Acid (Fruit Fresh)

Methods. Set up a procedure/protocol to test your hypothesis.

- Slice the apple or potato in half. Cut the first half into 5 slices, Grate the other half into 5 piles.
- Label each plate with the treatment used.
- On each plate put 1 pile and 1 slice after applying the following treatments:
    - No Treatment- add nothing
    - Lemon Juice Treatment- dip slice and pile into ¼ cup lemon juice for 20 seconds making sure all is coated.
    - Ascorbic Acid Treatment- Sprinkle with Fruit Fresh (or use ½ teaspoon with ¼ cup water) dip slice and pile for 20 seconds making sure all is coated.

Credit: Original Written by What's on Your Plate? Exploring Food Science 4-H Curriculum
Edits by Cindy Kinder

    - Sugar Water Treatment: dip slice and pile into 2 teaspoon sugar and ½ cup water for 10 minutes making sure all is coated.
    - Cool Water Treatment: dip slice and pile into 1 cup cold water for 10 minutes.
- Wait 20 minutes then record results

Experiment. Conduct the experiment.

Conduct the experiment to test how each treatment affects the amount of browning of the food.

Change one factor and re-do the experiment

Option 1: Use apple
Option 2: Use potato
Option 3: Use another food you have that browns
Redo the experiment.

Results/Observations. What happened?

Record what happened to the fruit or vegetable you used. How brown did they get? What did each of the treatments do? Do they smell different?

Conclusion. Apply what you found out.

How could you use this knowledge?
How would you delay browning when making a banana cream pie?
What would you use for a packed lunch?