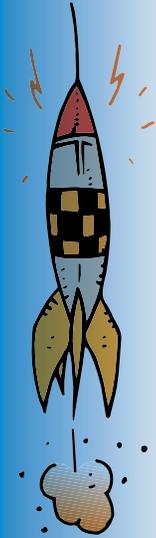


Too Much...Oxygen??



Have you ever wondered why an apple turns brown after being cut? The brown color is caused by a process called oxidation (**ox-ih-day-shun**). Oxidation happens when oxygen molecules react with other molecules (such as protein or fat), and damage their structure. Just as apples can be damaged, our bodies can also be damaged by oxidation.

Why is oxidation a bad thing? The process of oxidation produces molecules called free radicals that can damage cells in our body. A free radical acts sort of like a thief. It is a molecule that is missing an electron, and therefore steals electrons from healthy (normal) molecules. Years of exposure to free radicals may cause serious health problems, such as cancer or heart disease.

Oxidation in our bodies can be caused by environmental factors such as exposure to air pollution and cigarette smoke, and over-exposure to sunlight.

How do we stop oxidation? Antioxidants are substances that slow or stop oxidation in our bodies. If you sprinkle a cut apple with orange juice, then it will not turn brown. This is due to the fact that orange juice and all citrus fruits are a great source of antioxidants, such as vitamin C.

Natural foods with a lot of color are usually good sources of antioxidants. Here are a few that can be found in the diet:

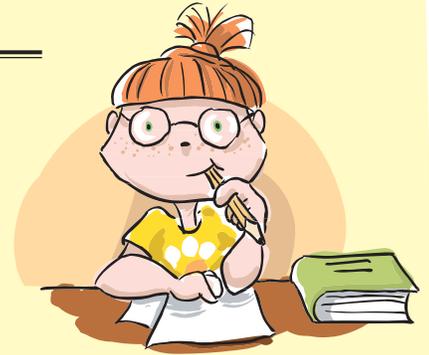
- Beta-carotene**- mangos, carrots
- Vitamin C**- oranges, strawberries
- Vitamin E**- avocados, nuts, seeds
- Selenium**- seafood, lean meats
- Zinc**- milk, nuts, shellfish
- Flavonoids**- green tea, apples, soy



Thea's Corner...

Crypto quote: Each letter stands for a different letter in the alphabet. Two of the letters are given to you to help you get started. Good luck!!! (Hint: The best way to include a variety of antioxidants each day is to eat...)

F a
B E R A W Z W U P D A Y K H K N S W U



Did you know?



- The number of food components that act as antioxidants is greater than 4000.
 - A good source of antioxidants called polyphenols is dark chocolate.
 - Space flight exposes astronauts to oxidation from the sun's radiation and high oxygen exposure.
- NASA is putting technology to work to help tsunami recovery efforts. The information provided by satellites is being used to investigate the event and document the devastation caused by the tsunami. This research will aid in the future development of models to predict tsunamis and earthquakes, and systems to warn people about them.

Try this experiment at home

How can I keep my apple from turning brown?

Materials you will need:

1 apple Measuring spoons Plastic knife
Orange juice A couple of plates

Follow these steps:

1. Cut the apple in half or have an adult do it for you.
2. Put each half of the apple on a different plate, with the cut side of the apple up.
3. Sprinkle 1 tablespoon of orange juice on one of the pieces of apple.
4. Let each half sit out for about an hour. After an hour, place them next to each other and see if there is a difference in color.
5. Draw pictures of the apples and compare them.

Questions to think about:

1. What other juices will prevent the color change?
2. Will the apple still change colors if you put it in the refrigerator or a zip lock bag?
3. What type of change is the color change: physical, chemical, or both?

Word of the Month Absorption

Can you guess what this word means? Look it up in the dictionary and see if you were right. We'll have more on this next month!

Web Challenge: Fruits and vegetables come in many different colors, such as blue/purple, green, white, yellow/orange, and red. Can you name 5 different foods for each different color group? See what you can find in the links below...

<http://www.5aday.org/>
<http://www.cdc.gov/nccdphp/dnpa/5aday/>
<http://www.nutritionexploration.org/>
<http://www.5aday.co.nz/health/colourwaybrochure.html>



Check out Thea's Bonus Page, experiments you can try, and even stuff you may have done at our website:

<http://haco.jsc.nasa.gov/biomedical/nutrition/kids.shtml>
email: Space.Nutrition.Newsletter@nasa.gov

