

Investigating Your Health: Amazing Antioxidants

Name: _____

Objective: Investigate fruits by comparing the nutrients of frozen, dried, and canned fruit. Develop or research recipes to learn about ways you can add more fruit to your diet.

Antioxidants are vitamins and other nutrients that protect your body from harmful molecules that are found in the environment or created by the body. These substances can contribute to cancer and heart disease. Your body can protect itself against these molecules to an extent; however, it isn't completely effective in destroying them. Therefore, eating fruits high in antioxidants will help your body destroy these harmful substances. Vitamins A, C, E, and the mineral zinc are common antioxidants in our diet. Vitamin C is the most common antioxidant, and is needed to heal cuts and protect bones and teeth. Citrus fruits including grapefruit, lemon, lime, orange, and tangerine are the highest in Vitamin C. Vitamin A is found in colorful fruits,

like apricots and cantaloupe. Vitamin A helps your eyes. Vitamin E and zinc help your immune system and can be found in many different foods. The mineral selenium and the phytochemicals lycopene, lutein, and beta-carotene are also antioxidants.

As with vegetables, you should eat 1 ½ cups of fruit every day. For example, you can drink ½-cup of orange with breakfast and eat 1 banana for a snack in the afternoon to meet this recommendation. Most of us do not eat enough fruits. It's easy to add fruits to your diet. Instead of eating potato chips as a snack, eat a piece of fruit like an apple, orange, or banana. You can keep it in your backpack and eat it when you are hungry. You could also have a fruit salad for dessert or add fruit to your cereal in the morning. Try to eat dried fruit instead of candy. They're just as sweet and good for you too! Use the *Try This at Home* recipe to make a fruit snack!



PART A: Antioxidants in Fruit

- Go to the grocery store and look at the Nutrition Facts label on one frozen, one dried, and one canned fruit. Try to find the same fruit for each kind. If you are unable to go to the grocery store, use the handout provided by your teacher or access the nutrient database on USDA’s website. Complete the Nutrition Facts Labels below.

USDA Nutrient Database: <http://ndb.nal.usda.gov/ndb/search/list>

Frozen Fruit:

Dried Fruit:

Canned Fruit:

Frozen Fruit:		Dried Fruit:		Canned Fruit:	
Nutrition Facts		Nutrition Facts		Nutrition Facts	
Serving Size _____		Serving Size _____		Serving Size _____	
Calories _____		Calories _____		Calories _____	
Total Fat _____		Total Fat _____		Total Fat _____	
Sodium _____		Sodium _____		Sodium _____	
Total Carbohydrates _____		Total Carbohydrates _____		Total Carbohydrates _____	
Dietary Fiber _____		Dietary Fiber _____		Dietary Fiber _____	
Sugars _____		Sugars _____		Sugars _____	
Protein _____		Protein _____		Protein _____	
Vitamin A ____% Vitamin C ____%		Vitamin A ____% Vitamin C ____%		Vitamin A ____% Vitamin C ____%	
Vitamin E ____% Calcium ____%		Vitamin E ____% Calcium ____%		Vitamin E ____% Calcium ____%	
Iron ____% Thiamin ____%		Iron ____% Thiamin ____%		Iron ____% Thiamin ____%	
Niacin ____% Folate ____%		Niacin ____% Folate ____%		Niacin ____% Folate ____%	
Vitamin B ₁₂ ____% Zinc ____%		Vitamin B ₁₂ ____% Zinc ____%		Vitamin B ₁₂ ____% Zinc ____%	
Magnesium ____%		Magnesium ____%		Magnesium ____%	

2. Before you begin, compare the serving size for each label. If the serving sizes are different use the space below the labels to standardize each label so that you can compare their nutritional content. Ask your teacher for help if you have to standardize your labels.

Frozen Fruit:

Dried Fruit:

Canned Fruit:

Frozen Fruit:	Dried Fruit:	Canned Fruit:
_____	_____	_____
Nutrition Facts	Nutrition Facts	Nutrition Facts
Serving Size _____	Serving Size _____	Serving Size _____
Calories _____	Calories _____	Calories _____
Total Fat _____	Total Fat _____	Total Fat _____
Sodium _____	Sodium _____	Sodium _____
Total Carbohydrates _____	Total Carbohydrates _____	Total Carbohydrates _____
Dietary Fiber _____	Dietary Fiber _____	Dietary Fiber _____
Sugars _____	Sugars _____	Sugars _____
Protein _____	Protein _____	Protein _____
Vitamin A ____% Vitamin C ____%	Vitamin A ____% Vitamin C ____%	Vitamin A ____% Vitamin C ____%
Vitamin E ____% Calcium ____%	Vitamin E ____% Calcium ____%	Vitamin E ____% Calcium ____%
Iron ____% Thiamin ____%	Iron ____% Thiamin ____%	Iron ____% Thiamin ____%
Niacin ____% Folate ____%	Niacin ____% Folate ____%	Niacin ____% Folate ____%
Vitamin B ₁₂ ____% Zinc ____%	Vitamin B ₁₂ ____% Zinc ____%	Vitamin B ₁₂ ____% Zinc ____%
Magnesium ____%	Magnesium ____%	Magnesium ____%

TEACHER'S NOTE: Regardless of the source used to obtain the food labels, students should seek labels that use identical serving sizes. If students choose a fruit with different serving sizes listed on the label, they will need to mathematically standardize each serving size before comparing them. Dried fruit will have the smallest serving size, while frozen fruit will have the largest. This is because the calories and nutrients are condensed in dried fruit.

To standardize serving sizes across nutrition labels, students will need to convert each serving size into the same value (cup, tablespoon, etc.). Students will then need to convert all fractions to a decimal. Finding the largest decimal, the students will then divide it by one of the others. Multiply each number in the nutrition facts label using this answer. For example: $\frac{3}{4} = 0.75$, $0.75 \div 0.5 = 1.5$. Repeat these steps with the other labels. Please reference the Sample Nutrition Facts Standardization Worksheet found at www.foodmaster.org.

Students should find that dried and canned fruit have more sugar for the same mass or volume than frozen fruit. The vitamin content will also vary. Frozen fruit normally contains higher amounts of Vitamin C.

3. Identify which of the listed vitamins and minerals are antioxidants. Circle each in the standardized labels.

Vitamin C, Vitamin E, Zinc, & Iron

4. Which fruit has the highest % Daily Value for each antioxidant? List the fruit, the antioxidant, and the amount below.

Frozen pineapple - (Vitamin C: 13%; Iron: 2%)

Dried pineapple - (Iron: 2%)

Canned pineapple - (Vitamin C: 20%)

5. Describe other differences between the fruit types.

Dried pineapple has the most calories, sugar, and sodium. Canned pineapple is the second highest in sugar and calories.

6. Infer why these differences occur.

Dried pineapple has added sugar that is acting as a preservative. The fruit is also condensed, making it more nutritionally dense per serving. Dried pineapple has more sodium to help preserve it. Half a cup of dried fruit is equivalent to 1 cup of fruit. Canned pineapple may also have added sugar in liquid it's canned in.

PART B: Everyday Fruits

Create three recipes, one for each meal – breakfast, lunch & dinner, using fruit as a main ingredient.

RECIPE #1: BREAKFAST

Student answers will vary.

RECIPE #2: LUNCH

Student answers will vary.

RECIPE #2: DINNER

Student answers will vary.