

Volunteer Leader Training Guide

Berry Health: The Health Benefits of Berries

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Introduction

Berries are one of the nation's most well-liked fruits. They signify the "summer," which is peak harvest time and one of Americans' favorite times of the year. Berries originated in both Europe and the U.S., depending on the berry. Native Americans were the first to incorporate berries into their diets and lifestyle in the U.S. Traditionally, berries include the strawberry, raspberry, blackberry and blueberry.

Target Audience

- EHC leaders
- Adult audiences

Objectives

Participants will learn:

- The health benefits and food sources of phytochemicals.
- Recommendations for including fruits/berries in their diet.
- How to buy, prepare and store berries for maximum quality.
- The folklore and culture associated with berries.

Main Teaching Points

- History and folklore relevant to strawberries, blueberries, blackberries and raspberries.
- Definition of phytochemicals.
- Three main categories of phytochemicals.
- Fruits, berries and plant foods that are good sources of phytochemicals.
- Phytochemicals' role in the reduction of chronic diseases.
- How to refrigerate and freeze berries.
- How to use berries in recipes to achieve good quality products.

Handouts

- Handout 1: Phytochemicals/Selection, Preparation and Storage of Berries
- Handout 2: Freezer Jams/Berry Recipes
- Pre/Post-Survey

- Activity (optional): Taste Test – Prepare one of the berry recipes for participants to sample either before, during or at the end of the lesson. Use the activity to review major points on the selection, preparation and storage of berries indicated in **Handout 1**.

Suggestions for Teaching

- Review the lesson guide to become familiar with the lesson content.
- Obtain and make copies of Handout 1, Handout 2 and the Pre/Post-Survey form.
- Obtain ingredients and supplies for the taste testing activity, if included in the lesson.
- Have participants complete the survey form at the end of the lesson.

Icebreaker

Ask the participants to answer the three questions below, which are at the beginning of the PowerPoint presentation. These questions are designed to get the participants actively involved in the discussion and introduce the main topics of the lesson.

- 1) Native Americans were the first to incorporate berries into their diet.
 - a) True
 - b) False

The answer is “true.” One of the things we will discuss today is the rich and interesting history berries have both in this country and around the world.

- 2) Phytochemicals are substances found naturally in plant foods that help protect against disease.
 - a) True
 - b) False

Phytochemicals are substances found naturally in plant foods, including fruits, vegetables, grains, legumes, nuts and teas. Phytochemicals work with vitamins, minerals and dietary fiber in plant foods to prevent disease and promote health. Another thing we will discuss today is the health benefits associated with berries and the phytochemicals they contain.

- 3) Berries are highly perishable fruits that should be eaten within a week after purchase.
 - a) True
 - b) False

Berries are highly perishable, and they should be eaten within a week after purchase. If you are not able to use them within a week, you will need to freeze them. So, the last thing we will talk about today is the selection and preparation of berries.

History and Folklore of Berries

Strawberries

The history of strawberries goes back to the ancient Romans and Greeks. Some historians believe that the strawberry was cultivated in Greek and Latin gardens. In the 12th century, strawberries were thought to be unfit to eat because they grew close to the ground where they would likely be contaminated by snakes and toads. In the 1300s, the strawberry was cultivated in Europe, and the plant was considered to be more ornamental and used for its flower.

Strawberries are indigenous to both the northern and southern hemispheres. Native North American varieties are considered to be superior in size, flavor and beauty to all varieties found in Europe. Strawberries were first sold in the marketplace in London around 1830. In 1843 growers in Cincinnati, Ohio, were the first to ship strawberries using refrigeration, which was in the form of ice packed on top of boxes of strawberries. Refrigeration led to an increase in marketing and an increase in popularity of the strawberry.

Blueberries

The blueberry is one of the few fruits native to North America. North America is the world's leading producer of blueberries, accounting for almost 90 percent of the world production. The blueberry canning industry began in the northeastern U.S. in the late 1800s. July, which is peak harvest time, is National Blueberry Month.

The Pilgrims at Plymouth, Massachusetts, learned to gather and sun-dry blueberries from Native Americans. Native American tribes from the northeast revered blueberries, and much folklore developed around them. Tribes believed that the berry was sent by the "Great Spirit" to relieve children's hunger during famines. Some tribes made tea from the leaves because it was believed to be "good for the blood." Others made juice from the berry and used it to treat coughs as well as to make dyes for coloring baskets and cloth.

The blueberry industry is segmented into two markets: fresh and processed. About 50 percent of all blueberries are dedicated to the fresh market. Blueberries are processed in various ways so they can be used year-round by consumers and the food industry. For example, canned blueberries are used as pie fillings and dried blueberries are used in snack foods (like trail mixes and granolas).

Blackberries

During the Civil War, blackberries were used to make a tea that was thought to be a cure for dysentery. During outbreaks of dysentery, temporary truces were declared to allow soldiers to "go blackberrying" to forage for blackberries to ward off the disease. Blackberries were enjoyed by the ancient Greeks, who believed them to be a cure for diseases of the mouth and throat, as well as a preventative against many ailments, including gout. The blackberry leaf was also used as an early hair dye. English herbalists recommended it to "maketh the hair black."

Blackberries are a native crop to many areas of the United States, but the University of Arkansas has received much attention for developing cultivars of erect blackberries, particularly a thornless variety.

Raspberries

Raspberries are native to Europe and Asia. They are not believed to be popular in ancient times, and they were not popular in Europe until the late 1500s. Some historians believe this might be due to the general nature of the plant, which is a bramble. Raspberries were not popular in the U.S. until the late 1700s.

Raspberries are available in red (most common), black, purple and yellow varieties. Technically, they are not a "berry"; they are an aggregate fruit, composed of small, round globes that make up the berry. The plant itself is hardy, but the berry is one of the most delicate fruits. It is highly perishable. Raspberries are commonly eaten "as is" or used to make jams, jellies, wine, vinegar and sweets. Xylitol, an artificial sweetener, is extracted from the raspberry and used to sweeten foods, such as sugar-free candies.

Berry Nutrition

Vitamins and Minerals

Berries are plant foods that are basically fat free if eaten “as is.” If we make pies, cakes, tarts, etc., with them, we are adding fat and calories. Therefore, it is best to look for recipes that are low in fat and calories. Berries are colorful fruits that contain many vitamins, minerals, fiber and phytochemicals. As a fruit, berries are a source of fiber and vitamin C in particular.

Dietary fiber is a complex carbohydrate that cannot be digested by human enzymes in the small intestine. A diet high in fiber promotes bowel health by preventing constipation and diverticular disease (diverticulitis, diverticulosis). Numerous controlled clinical trials have found that increasing intake of dietary fibers, particularly from legumes (dry beans, peas, and lentils) and oat products, decreases total cholesterol and LDL cholesterol. Fiber-rich diets are associated with significant decreases in coronary heart disease risk and lower incidences of colorectal cancer.

Vitamin C is a water-soluble antioxidant vitamin. Our bodies need vitamin C to form collagen, a protein that gives structure to bones, cartilage, muscle and blood vessels. Vitamin C helps our bodies absorb and utilize iron, which is needed to prevent anemia. Vitamin C is destroyed by exposure to light, heat, air or pro-oxidant minerals such as iron or copper. To maximize vitamin C content of dietary sources, these foods should be stored in sealed containers under refrigeration and prepared by methods requiring low temperatures and minimal cooking time.

Vitamin A is a generic term for a large number of related compounds, such as beta-carotene and other carotenoids. These compounds are synthesized by plants. Carotenoids are yellow-orange pigments found only in foods of plant origin where they are closely associated with chlorophyll.

Phytochemicals

Phytochemicals are substances found naturally in plant foods, including fruits, vegetables, grains, legumes, nuts and teas. Phytochemicals work with the vitamins, minerals and dietary fiber in plant foods to prevent disease and promote health. Researchers have discovered more than 900 different phytochemicals so far. Because they occur in association with the pigments in plants, bright-colored fruits and vegetables contain the most phytochemicals and nutrients.

Review **Handout 1**, the general categories of phytochemicals, the health benefits associated with each and good food sources of each. Focus on berries that contain ellagic acid and anthocyanins.

Dietary Recommendations

The Dietary Guidelines for Americans recommends that we eat fruit every day. The number of servings we need depends on our age and gender. Women above the age of 30 need to eat 1½ cups of fruit each day. Men need 2 cups. To get the full benefits of all the nutrients and phytochemicals in fruits and berries, we need to eat a variety. The best way to do that is to eat different colored fruits (and vegetables) every day.

Selection, Preparation, and Storage of Berries

Berries are best when bought “in season.” Unless you grow your own, picking your own on a farm may be the least expensive way to buy berries. Strawberries are in season from April to June. Blueberries and blackberries are in season from June to July, and raspberry season starts in July.

Review selection, preparation and storage information in **Handout 1**. Focus on the following points:

- Buy berries that are dry, firm and well-shaped.
- Do not wash berries before storing them in the refrigerator.
- Freeze berries to keep them for 10 to 12 months.
- Do not thaw commercially frozen berries before adding them to baked goods.
- Make berries the last ingredient you add to batters.

Review recipes in **Handout 2**. Discuss results of taste test if used as an activity in the lesson.

Conclusion

As a review, ask participants what they learned with the following questions.

- 1) Research suggests that phytochemicals may do which of the following?
 - A. Decrease risk of some cancers
 - B. Lower blood cholesterol
 - C. Lower blood pressure
 - D. All of the above**
- 2) Berries contain ellagic acid, a compound that may reduce the risk of some types of cancer.
 - A. True**
 - B. False
- 3) To maintain the quality of berries, you should wash them before storing them in the refrigerator.
 - A. True
 - B. False**

Pre- and Post-Survey

Distribute the survey form and instruct participants to complete and return it.

References

- 1) International Food Information Council. (March 2006). Functional Foods Fact Sheet: Antioxidants. Retrieved March 2009 from <http://www.ific.org>.
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- 4) U.S. Highbush Blueberry Council. (2002). The Highbush Blueberry. Retrieved March 2009 from <http://blueberry.org>.
- 5) American Cancer Society. (June 2007). Phytochemicals. Retrieved March 2009 from <http://www.cancer.org>.