

Harvest of the Month



Network for a Healthy California



Nutrition Facts

Serving Size: ½ cup chopped sweet green pepper (74g)

Calories 15 Calories from Fat 1

| | % Daily Value |
|-----------------------|---------------|
| Total Fat 0g | 0% |
| Saturated Fat 0g | 0% |
| Trans Fat 0g | |
| Cholesterol 0mg | 0% |
| Sodium 2mg | 0% |
| Total Carbohydrate 3g | 1% |
| Dietary Fiber 1g | 5% |
| Sugars 2g | |
| Protein 1g | |
| Vitamin A 5% | Calcium 1% |
| Vitamin C 99% | Iron 1% |

PEPPERS

Health and Learning Success Go Hand-In-Hand

Research has long supported a positive correlation between students' healthy eating habits and performance in the classroom. To some, eating the recommended daily amounts of fruits and vegetables can seem challenging. Remind students that all forms of fruits and vegetables count—fresh, frozen, canned, dried, and even 100% juice. Encourage students and parents to eat a nutritious breakfast and pack healthy snacks and lunches, or to enroll in the school's meal programs. *Harvest of the Month* can help empower your students to eat their recommended daily amounts—and improve learning!

Exploring California Peppers: Taste Testing

Getting Started:

- Contact school nutrition staff about getting bell peppers for taste testing. Or, harvest peppers from your school garden, a local farm, or farmers' market.*

What You Will Need (per group):

- 3 bell peppers (1 each of green, yellow/orange, red)
- Paring knives and cutting boards
- Printed botanical image and Nutrition Facts labels for peppers**

Activity:

- Make predictions if green, yellow, and red peppers will smell and taste different.
- Explore the look, feel, and smell of each bell pepper. Record observations.
- Cut open peppers. Record observations of color, smell, and texture of the interior.
- Draw cross-section diagram and compare to printed botanical image. Label parts.
- Taste each bell pepper and record observations.
- Discuss predictions and observations. Take a vote of students' favorite variety.
- Compare and contrast the nutrients using the Nutrition Facts labels. Refer to *Students Sleuths #1* on page 3 for questions.
- Complete follow-up exercise in *Adventurous Activities* (page 4).

*Visit www.localharvest.org for locations.

**Download from the Educators' Corner of www.harvestofthemonth.com.

For more ideas, reference:

School Foodservice Guide – Successful Implementation Models for Increased Fruit and Vegetable Consumption, Produce for Better Health Foundation, 2005, pp. 39-42.

Cooking in Class: Pico de Gallo

Ingredients:

Makes 36 tastes at ¼ cup each

- 3 pounds ripe tomatoes, chopped
- 4½ cups chopped onion
- 1 cup chopped fresh cilantro
- 3 small jalapeño peppers, seeds removed, chopped
- 6 tablespoons lime juice
- 6 cloves garlic, minced
- ¾ teaspoon salt
- Baked tortilla chips
- Small cups

1. Combine all ingredients (except chips) in a medium bowl.
2. Spoon into cups. Serve with chips.

Adapted from: *Healthy Latino Recipes*, Network for a Healthy California, 2008.

For more recipes, visit: www.cachampionsforchange.net.

Reasons to Eat Peppers

- A ½ cup of hot peppers (red and green) is an excellent source of vitamin C. It is also a good source of vitamin A, vitamin K, and vitamin B₆.
- A ½ cup of sweet green peppers is an excellent source of vitamin C.
- A ½ cup of sweet red peppers is an excellent source of vitamin A and vitamin C and a good source of vitamin B₆.

Champion sources of vitamin B₆.*

- Avocados ■ Bananas
- Peppers ■ Potatoes

*Provide a good or excellent source of vitamin B₆.



What is Vitamin B₆?

- Vitamin B₆ (pyridoxine) is one of eight B vitamins: thiamin (B₁), riboflavin (B₂), niacin (B₃), pantothenic acid (B₅), biotin (B₇), folate (B₉), and cobalamin (B₁₂).
- These water-soluble vitamins are essential for growth, development, and a variety of other bodily functions. They play a major role in the activity of enzymes (proteins) that regulate chemical reactions in the body, such as turning food into energy.
- Vitamin B₆ helps the body break down or metabolize protein, aids in the formation of red blood cells, and helps maintain normal brain function. It also plays a role in synthesizing antibodies in the immune system.
- A diet that includes whole grain products, fruits, and vegetables is sufficient to provide the body with the B vitamins it needs. (NOTE: Freezing causes a decline in the amount of vitamin B₆ in foods.)

For more information, visit:

<http://ods.od.nih.gov/factsheets/vitaminb6.asp>

How Much Do I Need?

A ½ cup of chopped peppers is about one small pepper. The number of cups of fruits and vegetables you need depends on your age, gender, and physical activity level. (Students need at least 60 minutes of physical activity!) All forms of fruits and vegetables count—fresh, frozen, canned, and dried! Look at the chart below to find out how much your students need.

Recommended Daily Amounts of Fruits and Vegetables*

| | Kids, Ages 5-12 | Teens and Adults, Ages 13 and up |
|---------|---------------------|-------------------------------------|
| Males | 2½ - 5 cups per day | 4½ - 6½ cups per day |
| Females | 2½ - 5 cups per day | 3½ - 5 cups per day |

*If you are active, eat the higher number of cups per day.

Visit www.choosemyplate.gov to learn more.

How Do Peppers Grow?

Peppers are warm-season crops, sensitive to freezing, and do not grow well in cold, wet soil. It is best to germinate seeds indoors in late winter and then transplant to the garden in late spring. In California, peppers are harvested from late April in the southern desert regions through November in the Central Valley region. Sweet peppers were almost always harvested when green (immature), but more recently, are harvested when red and yellow. Hot peppers are harvested at any stage, depending on variety, use, and intended flavor. Usually, redness is a sign of ripeness, not hotness.

For a chart with information about how to plant and grow peppers, refer to *Peppers Botanical Images* (in the Educators' Corner) on www.harvestofthemonth.com.

For more information, visit:

www.cfaic.org/GardenGuide/pdf/GardenGuidePart3.pdf

Botanical Facts

Pronunciation: pĕp'ər

Spanish name: pimientos/pimentones

Family: Solanaceae

Genus: *Capsicum*

Species: *Capsicum annuum*



The pepper plant is a member of the *Solanaceae* or "nightshade" family, which also includes tomatoes and potatoes.* Peppers are botanically a fruit of *Capsicum* plants. However, in the culinary world, people recognize peppers as a vegetable. Nearly 2,000 varieties of peppers are cultivated worldwide. They are commonly grouped into two categories: hot (chili) and sweet peppers.

Hot peppers are named for their fiery, hot taste. They contain *capsaicinoids*, natural substances that feel hot in the mouth. *Capsaicin*, the primary capsaicinoid, is a flavorless, odorless substance that acts on pain receptors in the mouth and throat. Hot peppers can be picked at any stage, but are hottest when fully ripe. They ripen into yellow, orange, purple, red, and even brown. Each variety differs in flavor and heat intensity depending on the number of *capsaicinoids* in the pepper.**

Sweet peppers were not widely grown until after World War II. Today, there are more than 200 varieties. When left to ripen, green peppers mature into red, yellow (or orange), and purple peppers with various levels of sweetness.

| Sweet Peppers | Hot Peppers |
|--|---|
| Bells (Red, Early, Golden, Shamrock, California Wonder, Keystone Resistant Giant, Yolo Wonder), Banana, Cubanelle, Pimento | Hungarian Wax, Cayenne, Jalapeño, Serrano, Anaheim (California Green Chile), Ancho, Cherry, Poblano, Habañero, Chile de Árbol |

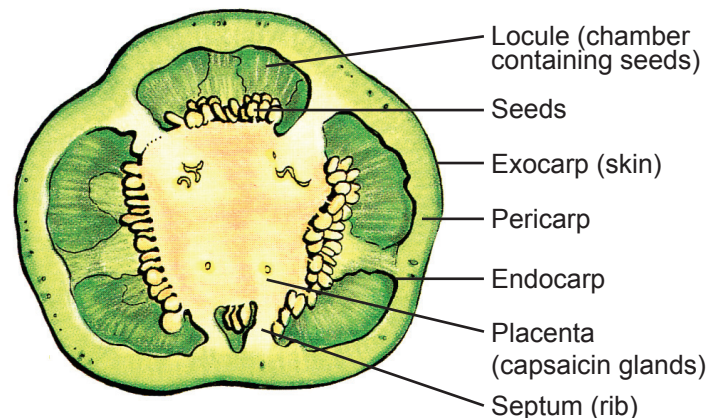
*For information about "nightshade" family, refer to *Tomatoes* newsletter. Or, refer to *Peppers Adventurous Activities* on www.harvestofthemonth.com.

**Do *Student Sleuths* #3 on page 3 to learn more about capsaicinoids.

For more information, visit:

www.urbanext.uiuc.edu/veggies/peppers1.html#8

<http://aggie-horticulture.tamu.edu/extension/easygardening/pepper/pepper.html>



Source: *Cool as a Cucumber, Hot as a Pepper*, Meredith Sayles Hughes, Lerner Books, 1999.

School Garden: Pepper Plants

If your school has a garden, here is an activity you may want to implement. Look for donations to cover the cost of seeds, tools, irrigation systems, electric pumps, and any salary incurred by garden educators or others.

As an annual plant, peppers require year-round work. Here is a monthly tasks calendar for growing peppers.

- January-March: Plant seeds indoors in container gardens; prepare rows in outdoor garden.
- April: Transplant seedlings to garden rows and fertilize; protect under covers if weather drops below 50 F.
- May: Fertilize at bloom set.
- June: Fertilize at fruit set, post stakes in garden beds.
- July-September: Harvest peppers.
- October: Replace covers over plants; continue harvest.
- November: Remove covers, add compost, till row beds.
- December: Expose to weather and add more compost.

Helpful Hints:

- Instead of growing from seed, buy plants about 4-6 inches tall and plant in late spring or early summer.
- If you plan to grow “fall” peppers, plant them 12-16 weeks before the first expected frost.

For more ideas, visit:
www.csgn.org

Student Sleuths

- 1 Compare the Nutrition Facts labels for sweet and hot peppers, both red and green varieties. What nutrients are the same for all peppers? What nutrients are different? Which variety has the most vitamin A? List the excellent sources for both sweet red and green peppers. Why does the nutrient content of a sweet pepper increase as it ripens (becomes red)?
- 2 What is vitamin B₆? What role does it play in the body's functions? What happens if you are deficient in vitamin B₆? What happens if you have too much vitamin B₆? Make a list of foods that are excellent (>20%) or good (10-19%) sources of vitamin B₆.
- 3 What are *capsaicinoids*? What part of the pepper contains capsaicin? Why are some peppers hotter than others? How is the “hotness” level measured? What unit is used to measure the amount of capsaicin or “heat” in peppers? What is the best way to get relief after eating a very hot pepper: drink water or milk? Why?

For information, visit:

Dietary Reference Intakes: The Essential Guide to Nutrient Requirements, Institute of Medicine, 2006.

www.fruitsandveggiesmatter.gov

www.nal.usda.gov/fnic/foodcomp/search/



Student Champions

Encourage students to visit a local retail store to learn more about the produce section and to share ideas for how the store can help support healthy eating in the community. Distribute copies of the *Harvest of the Month* Fact Sheet to store managers. Share copies of community newsletters for managers to distribute to customers.*

Get Connected:

- Visit local grocery stores and go to produce section.
- Make a list of all pepper varieties for sale.
- Circle sweet varieties. Underline hot varieties.
- What is the average cost for sweet peppers? For hot peppers?
- Are the peppers grown in California?
- Does the store offer brochures or recipe cards with serving ideas for peppers?
- Talk to produce manager and share your findings.
- Tell manager about your school's participation in *Harvest of the Month*. (Show Fact Sheet and community newsletters.) Share three ideas you have for how they can promote peppers during summer.

*Download from the Educators' Corner of www.harvestofthemonth.com.

Home Grown Facts

- California is the nation's leading grower of bell peppers and ranks second in production of hot peppers.
- Four main growing regions in California harvest peppers from April through November: southern desert valleys (Imperial and Riverside), the southern coast (San Diego, Orange, and Ventura), the central coast (San Luis Obispo, Monterey, San Benito, and Santa Clara), and the Central Valley (Kern, Tulare, Fresno, Merced, Stanislaus, Sacramento, and San Joaquin).
- There is five times more acreage in California for production of sweet peppers (about 28,000 acres) than for hot peppers (about 5,500 acres).

2007 Data

Activity:

Research one of the four main growing regions. Describe the geography (land, soil, climate) and why it is a good region for growing peppers. What other crops are grown in these regions?

For more information, visit:

www.cdffa.ca.gov

<http://anrcatalog.ucdavis.edu/pdf/7244.pdf>

<http://anrcatalog.ucdavis.edu/pdf/7217.pdf>

Cafeteria Connections

Work with your school nutrition staff to feature peppers.

- Dry hot peppers by stringing them on a “ristra.” Display in the cafeteria.
- Conduct a taste test of raw and cooked bell peppers. Offer samples in the lunch line or salad bar.
- Print menu slicks and feature peppers in the monthly school menu. Highlight every time it is in a school meal.

For tips on drying and roasting peppers, visit:

www.urbanext.uiuc.edu/veggies/peppers1.html#8

Physical Activity Corner

California summers are perfect for going outdoors to be active. Students need at least 60 minutes of physical activity every day. With warmer temperatures, it becomes more important for students to stay hydrated when active.

Activity:

- What does water do in the body?
- Why is water essential to our bodies?
- What is dehydration? What are the symptoms?
- How can we get enough water daily?
- Why do you need more water when active?
- Based on your weight, how many ounces of water do you need?
- When active, how many more ounces do you need?

Remind students to drink water before, during, and after physical activity.

For information, visit:

www.cdc.gov/nccdphp/dnpa/nutrition/nutrition_for_everyone/basics/water.htm

Adventurous Activities

Botanical Investigation

What You Will Need (per group):

- 1 each bell pepper, eggplant, and tomato
- Printed botanical image of peppers*
- Microscope or magnifying glass

*Download from the Educators' Corner of www.harvestofthemonth.com.

Activity:

- Cut each vegetable in half.
- Draw a cross-section diagram for each and label the parts. (Use botanical image for assistance.)
- Compare and contrast the differences.
- Use microscope to compare the flesh and seeds.
- Share findings as a class and discuss how the seeds differ from other plants that are not a part of the nightshade family (e.g., green beans and squash).

Adapted from: www.healthylaund.net

Activities & Resources Galore

Visit the Educators' Corner online for more resources:

- Cooking in Class (recipe analyses, cooking tips)
- Reasons to Eat (Nutrition Glossary)
- How Does It Grow (botanical images, growing tips)
- Student Sleuths (Answer Key)
- Adventurous Activities
- Literature Links (book lists)
- Links to California Content Standards (all grades)

All available at www.harvestofthemonth.com.

Just the Facts

- By weight, green bell peppers have twice as much vitamin C as citrus fruit. Red bell peppers have three times as much. Hot peppers contain even more—357% more vitamin C than one orange.
- As bell peppers mature (become red), their taste becomes sweeter and milder.
- The amount of heat in a hot pepper depends on the variety, soil, climate, and other conditions. Within a variety, larger peppers are usually milder because the proportion of white membrane to their size is smaller.

Activity:

Study the Nutrition Facts labels for sweet and hot peppers (red and green varieties).*

- How much higher in beta carotene are sweet red peppers over green ones? What is the difference for red and green hot peppers?

*Download from the Educators' Corner of www.harvestofthemonth.com.

For more information, visit:

www.fruitsandveggiesmatter.gov/month/

A Slice of Pepper History

- About 9,000 years ago, the wild pepper plant originated near Bolivia and Peru. It was later cultivated for its fruits by the Olmecs, Toltecs, and Aztecs.
- The seeds rapidly spread throughout Central America by wind and movement of settlers.
- Columbus discovered peppers in the West Indies and mistook them for spices. He brought them to Europe where they spread throughout Europe, Africa, and Asia.
- The Pueblo Indians of the American Southwest acquired a wild chili pepper called *chiltepin* through trade with native Mexicans.
- Juan de Oñate (founder of New Mexico) and Spanish explorers are credited with bringing peppers to the U.S. in 1583.

For more information, visit:

<http://aggie-horticulture.tamu.edu/PLANTanswers/publications/vegetabletravelers/pepper.html>
www.hort.purdue.edu/newcrop/proceedings1993/v2-132.html

Literature Links

- Invite your school librarian to help with your school garden. Ask for a list of sources for summer gardening activities.
- Ask librarian to have a reading session about peppers and other nightshade crops in the school garden.
- Help coordinate a class alliteration contest on peppers. Winners can receive special library passes or books.



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