PEPPERS Teaching Tips

LEARNING OBJECTIVES

Youth will be able to:

* Describe where peppers originated, and how their use spread around the world.
* Explain how peppers are classified.
* Explain how to grow and harvest peppers.
* Describe how peppers are used in cooking and in medicine.
* Prepare a recipe using peppers.

HOW TO USE THE PEPPERS SCIENCE PAGE

Ask: What do you think is the most-used spice in the world? (Answer: peppers, including both hot and sweet peppers, either fresh or dried.) Tell youth that on the Science Page, they can read about the origins of peppers, and how their use spread around the world. They can also find out about how peppers are classified, how to grow and harvest peppers, the nutritional value of peppers, and how peppers are used.

After reading the Science Page, ask youth if their families eat peppers, and if so, what dishes they make that include either fresh peppers or dried peppers as ingredients. Discuss some of the ethnic cuisines that make heavy use of peppers. For example, hot peppers are used extensively in Mexican and Southwestern dishes, such as chili and huevos rancheros. Cajun cuisine from Louisiana also includes a lot of hot pepper. Hungarians use dried sweet pepper (paprika) in many of their dishes, such as goulash. Sichuan dishes from China contain a lot of hot peppers, as do curries from India and Southeast Asia. In Ghana and Ethiopia, peppers are used in hot spicy sauces.

Emphasize the nutritional value of red pepper, especially its high vitamin C content. Youth may be interested to know that peppers played a major role in the discovery of vitamin C. Hungarian scientist Albert SzentGyorgyi, who was awarded the Nobel prize for Physiology and Medicine in 1937, isolated vitamin C from paprika peppers, which contain very large amounts of this vitamin. However, when most peppers are dried, almost all of their vitamin C is lost in the drying process.

Youth may be interested to know that chili pepper heat is measured in Scoville Units. Developed by Wilbur Scoville in 1912, Scoville Units measure chili pepper heat in multiples of 100. (As explained on the Science Page, the substance that makes a chili pepper hot, called capsaicin, is concentrated in the veins, seeds, and tips of the fruit.) Pure capsaicin measures over 16 million Scoville Units! The Scoville Unit rating of a pepper is determined by a dilution taste test. Pure ground chili peppers are blended with a sugar-water solution. A panel of testers sips the mixture in increasingly diluted concentrations until it no longer burns the mouth. The Scoville Unit number is based on how much the ground chili needs to be diluted before no heat is detected. (Nowadays, liquid chromatography, rather than Scoville's dilution taste test, is used to evaluate the heat of chili peppers.) Interested youth could try setting up a taste test to compare pepper heat in different varieties of peppers, although they should take care to avoid really hot varieties. Here are heat values of some peppers: habanero 200,000; Thai 100,000; Tabasco 50,000; cayenne 40,000; Serrano 20,000; jalapeno 5,000; poblano 1,000; sweet banana 50.

The medicinal value of peppers is another interesting topic for discussion. Through the centuries, the chili pepper has been prescribed to treat a variety of ailments. The Mayans made a hot pepper potion to treat diarrhea and cramps, and they used it on the gums to relieve toothaches. The Aztecs used mashed hot peppers to relieve muscle and skeletal aches in much the same way as people today use over-the-counter heat-producing ointments.

The active ingredient in hot peppers is capsaicin. Capsaicin is an effective expectorant. An expectorant is a medicine that can help bring up mucus from the respiratory tract. Explain to youth that when they have a cold, mucus becomes thick, sticky, and clogs the sinuses. Capsaicin can loosen mucus and get it moving again. Capsaicin triggers a sudden release of watery fluids in the mouth, throat, and lungs. This helpful action begins in the mouth, throat, and stomach, where special sensory receptors send nerve impluses to the brain, which in turn tells glands that line the airways to start producing a secretion that helps to thin down the respiratory mucus.

It was once believed that capsaicin could burn out the lining in the stomach and cause ulcers. But this has been disproved. Studies have shown that low concentrations of the chemical can prevent stomach ulcers in rats and in humans. Researchers have found that capsaicin increases secretion in the stomach but does no harm. Ironically capsaicin is now used to relieve digestive distress.

Capsaicin has a pleasurable side-effect, due to the fact that endorphins are released into the brain when hot chili peppers are eaten. Thus, eating chili peppers produces a natural high, similar to a runner's high, which is also caused by endorphins.

CROSSWORD PUZZLE

Answers

Across: 1. *capsicum*; 5. ripe; 6. Columbus; 7. America.
Down: 2. Solanaceae; 3. vitamin A; 4. paprika.

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SPOTLIGHT ON RESEARCH

The source for this information is: Billing, J. and Sherman, P.W. 1998. Antimicrobial functions of spices: why some like it hot. The Quarterly Review of Biology, 73(1), pp. 3-49.

Ask: Why do you think plants used as spices contain essential oils that keep food from spoiling? (Answer: Scientists believe that the essential oils produced by plants, which give spices their distinct flavors, evolved to protect plants from attack by bacteria, insects, and other harmful organisms.) Ask: How might spices prevent food-borne illnesses in humans? (Answer: Humans are affected by many of the same bacteria and fungi that live on dead plant and animal tissue. If spices kill bacteria or fungi, or inhibit their production of toxins, then using spices might reduce the chances of contracting food borne illnesses.)

Warn youth not to depend on eating spices to protect them from foods that contain harmful bacteria. Instead they should rely on proper food handling and cooking practices to keep them safe.

RECIPE

You can stuff any pepper you like, including habaneros, poblanos, Fresnos, and Hungarian hot wax peppers, but the one that is most often used in authentic Mexican cooking is the Anaheim. Youth may wish to try making this recipe with different types of peppers for a taste test. Explain that you must roast and peel fresh peppers, because the batter won't stick to the shiny outer skin of fresh peppers. Besides, roasting enhances the flavor of the peppers.

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