

Corn

Corn is a staple in many parts of the world, especially throughout Central and South America. Although it is now grown the world over, it first grew wild in parts of Peru. These early corn plants had ears that were the size of a person's thumb. Over the course of thousands of years, corn made its way up through the Americas. When European settlers came to the New World, they had never seen corn before and were amazed at its many uses. Native Americans used the kernels for food, the husks for preparing tamales, the silk for medicinal

teas, and the stalks for animal fodder. Today, people also use many byproducts made from corn, including cornmeal, flour, oil, syrup, and starch. There are many different corn varieties that are used for specific purposes. Sweet corn is the type of corn that we eat fresh, and its ears can range from thumb-size to arm-length, depending upon the variety. Popcorn is dried, and then eaten after being heated until the kernels pop open. Both dent and flint corn are used for animal feed.



Seasonality and Growing Conditions

Sweet corn is available from July through about September. Like many plants, corn is pollinated by the wind. When the corn plant is midway through its growing season, ears will appear on the stalks. For pollination to occur, pollen clinging to the tassels on top of the stalks must be blown onto the corn silk extending out of the ears. Once pollinated, the ears will continue to grow and develop kernels. Farmers use a simple test to determine whether corn is ripe for picking. They pull back the husk and pierce a kernel with their thumbnail. If a clear fluid appears, it is too early to harvest, while a thick, milky substance means the corn is overly mature. A thin, milky liquid means it is time to harvest the ears. Most sweet corn varieties are harvested at this milk stage, although they may vary in sweetness, color, and kernel size.

Sustainable Farming Issues

In general, if corn is grown under the right conditions—with well-drained soil and lots of sun—problems with pests or disease can be kept under control without the application of chemical pesticides. Two common pests are corn smut (a fungus indicating shady conditions or poor drainage), and worms; neither are harmful. If you find worms burrowing in the tops of the ears, simply discard or cut away the affected portion.

A new development in corn production has been the introduction of bioengineering techniques. Much of the corn produced in the United States has been bioengineered to contain Bt, a naturally occurring bacterium that acts as a pesticide. Organic farmers sometimes use Bt as a topical pesticide to

control insect because it is a natural substance that dissipates before the crop is harvested. Genetically altered Bt crops, however, do not lose the Bt, as it is part of their DNA. This fact raises concerns over the possibility of insects becoming resistant to Bt, about Bt corn destroying beneficial insects, and about Bt corn (which is not approved for human consumption) becoming mixed with other corn and getting into the food supply. There was in fact a national outcry when such mixing occurred in 2000.

Choosing, Storing, and Nutrition Information

The natural sugars in corn begin to convert to starch the moment the corn is picked, so corn ideally should be eaten immediately after purchase. When choosing ears, check the husk, silk, and kernels for freshness. The husk should still have a healthy green appearance, while the silk should be golden and sticky underneath the husk. For the kernels, check that they are small and plump, and perform the thumbnail test described above. Corn is high in niacin and potassium.

RECIPE

Corn and Avocado Salad with Cilantro

Preparation Time: 30 minutes
Cooking Time: None
Total Lesson Time: 45 minutes
Recipe Level: Easy

Background

This lesson offers a great opportunity to introduce the three kinds of sweet corn: yellow, white, and bicolor. All can vary in sweetness, intensity of color, and size of kernel. Before making the recipe, students can make detailed observations of the common characteristics of corn. Ask students to draw and label parts; as students shuck corn have them discuss the functions of the different parts.

Objectives

Students will be able to:

Identify three different types of corn.

State the parts of the corn (kernel, cob, stem, husk, and corn silk).

Understand the functions of different parts of corn.

Ingredients

For a class of 20:

- 10 ears corn
(three different types, if possible)
- 1 bunch cilantro
- 2 limes
- 1 teaspoon salt
- 1 red onion
- 2 avocados
- 1 tablespoon rice wine vinegar
- $\frac{1}{2}$ cup pure olive or canola oil

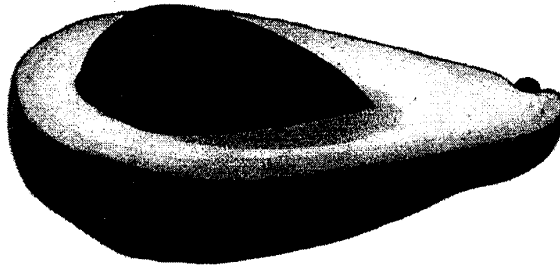
Materials

For the class:

- 1 large mixing bowl
- knife
- cutting board

For each group of 4:

- 2 cutting boards
- 2 knives
- 2 small bowls
- 4 napkins
- 4 plates
- 4 forks
- journals

**Preparation**

1. Wash the vegetables.
2. Have students wash their hands. Discuss proper methods of handling food.

Safety Precautions

Review safety precautions for using knives.

Making the Recipe

1. Provide each group of students with two ears of corn, each a different type. Give students a couple of minutes to examine and record observations about each type. Have groups switch corn with other groups so that everyone has an opportunity to examine all three types of corn.
2. Demonstrate shucking the corn and then cutting the kernels from the cob. It is best to cut each cob in half, and then place the flat edge of the cob on the cutting board to cut the kernels. (More experienced students can stand the whole cob on end and cut off the kernels that way.)
3. Demonstrate peeling and cutting the avocado, and scooping out the seed. Have each group of students shuck and cut two ears of corn. Divide up the tasks so that different groups prepare the avocado, peel and chop the onion, quarter and juice the limes, or chop the cilantro.
4. Have students place their prepared ingredients into the small bowls. Gather the bowls and mix the ingredients into a large mixing bowl. First add onion and corn, then the juice of one lime, vinegar, salt and oil. Stir well and taste for salt and acid. Mix in the avocado.
5. Have a volunteer taste and add more lime juice and salt if needed. Serve and eat.
6. While the students eat, each group can share its observations about the different types of corn. Facilitate the discussion so that the class understands the similarities and differences among the various types of corn.
7. Clean up materials and compost food scraps.

RECIPE

Corn on the Cob with Chipotle Butter

Preparation Time: 20 minutes
Cooking Time: 10 minutes
Total Lesson Time: 1 hour
Recipe Level: Easy

Background

Like the previous corn recipe, this is a great lesson for discovering the three major varieties of sweet corn: yellow, white, and bicolor. Students can try all of three types and discuss similarities and differences in their basic characteristics such as kernel color, size, pattern on the cob, size of cob, color and texture of silk and husk.

Objectives:

Students will be able to:

Identify three different types of corn.

State the parts of the corn (kernel, cob, stem, husk, and corn silk).

Understand the functions of different parts of corn.

Ingredients

For a class of 20:

- 10 ears of corn
(3 different types)
- 5 tablespoons butter
- 2 limes
- 2 chipotle chiles
- salt

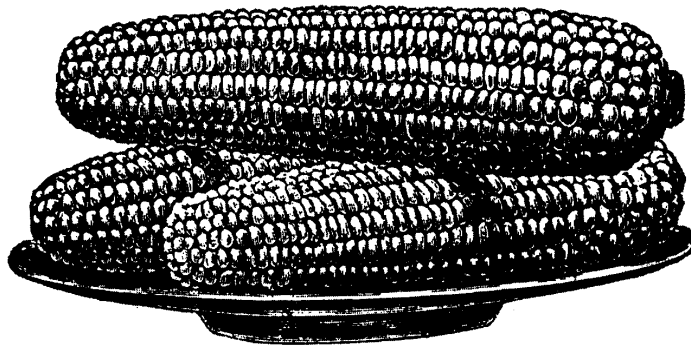
Materials

For the class:

- large pot with lid
- water
- mixing spoon
- hot plate
- 1 small mixing bowl
- tongs
- measuring spoons

For each group of 4:

- 2 cutting boards
- 2 knives
- 2 small bowls
- 4 napkins
- journals



Preparation

1. Because the chipotle can irritate eyes, prepare the chipotle butter before class. Chop finely the chipotles and mix them into the butter. Set the butter aside. Make sure you wash your hands after handling the chipotles.
2. Place a large pot of water on hot plate to boil.
3. Have students wash their hands. Discuss proper methods of handling food.

Safety Precautions

Prepare chipotle butter before class to avoid eye irritation. Be cautious when adding and removing corn from boiling water. Review safety precautions for using knives and the hot plate.

Making the Recipe

1. Provide each group of students with two ears of corn. Give students two minutes to examine and record their observations (see Background). Have groups switch corn with other groups so that everyone has an opportunity to examine all three types of corn.
 2. Demonstrate shucking corn. Have students shuck the corn and break it in half. Allow students to examine different pieces and make more observations.
 3. Ask students to put the corn in small bowls and place them on the demonstration table. When the water has boiled, add corn. Don't crowd too many ears into one batch. It will probably take two to three batches depending on the size of the corn. Each batch should cook for 3-5 minutes.
 4. While waiting for the corn to cook, have a student squeeze the lime juice and mix salt into the chipotle butter. Stir the butter mixture.
 5. Remove the corn with tongs, and give each student an ear to eat. Let the students put the butter on and eat up.
 6. While the students eat, each group can share its observations about the different types of corn. Facilitate a discussion so that the class understands the similarities and differences among the various types of corn.
 7. Clean up materials and compost food scraps.
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