



## In a Pickle

Canning food preserves throughout the Fall and Winter seasons to enjoy year-round. You will learn how to use an acid, white vinegar, to pickle and preserve vegetables!



### Fun Facts/Information:

- **Pickling vs. Marinating:** Pickled foods can be marinated, but not all marinated foods are pickled. Marinating means flavoring a food with acid. Pickling means preserving a food with salt or with acid. To be considered pickled, the food needs to be preserved in the brine or marinade and not just flavored by the brine or marinade (Howard, 2024).
- **Shelf Life:** Because these pickled beets are processed, they are shelf-stable and do not need to be stored in the refrigerator when sealed. Store canned pickled beets in a cool, dry place for up to 12 months. Once opened, pickled beets will last about three to four days in the refrigerator (Howard, 2024).
- **Electrolyte:** Vinegar is chemically called acetic acid and is a weak electrolyte (Howard, 2024).
- **Consumption Safety:** Vinegar is fine to use on food and when mixed with water, juice, or another liquid is safe to drink. However, with a pH between 2.4 and 3.3, vinegar is acidic enough to erode tooth enamel, inflame the esophagus and stomach, and trigger nausea and acid reflux (Howard, 2024).

### Learning Objectives:

- Students will understand that pickling vegetables is a type of food preservation.
- Students will differentiate between pickling (salt brine) and marinating (flavor).
- Students will determine that white vinegar is an acid on the pH scale and a weak electrolyte [meaning it can transfer energy].
- Students will classify the **benefits** and **challenges** of pickling (i.e. **food preservation, enhanced flavor and minerals** versus **tooth decay, acid reflux**).



### Materials:

- 5 lbs. Beets (or other vegetables like cucumber, peppers, onions, carrots, etc.)
- 2 cups white vinegar
- 1 cup sugar
- 1/8 cup cloves (or to taste)
- 10 pint-sized Mason jars
- Stainless steel colander
- Vegetable peeler or knife
- Large stockpot
- Large saucepan
- Pot holders
- Tongs

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## **Procedure:**

### ***Safety Considerations***

- Adult supervision is necessary when using the stove (or hot plates), knife, or vegetable peeler.
- Check all mason jars for cracks and rust, discarding any that are damaged.
- Use potholders when handling hot lids and jars.
- Wash hands before and after handling food.

### **1. Boil:**

- Gather ingredients. Place beets in a large stockpot with water to cover. Bring to a boil, and cook until tender, about 15 minutes.
- Meanwhile, inspect 10 pint-sized jars for cracks and rings for rust, discarding any defective ones. Immerse in simmering water until beets are ready. Wash new, unused lids and rings in warm soapy water.

### **2. Drain & Peel:**

- Drain beets, reserving 2 cups of beet water. When beets are cool enough to handle, peel and discard skins.
- Combine sugar, 2 cups beet water, vinegar, and pickling salt in a large saucepan; bring to a rapid boil.

### **3. Jar:**

- Fill each sterilized jar with beets. Evenly divide cloves among the jars.
- Pour the hot brine over the beets in the jars and seal the lids.

### **4. Process:**

- Place the stainless steel colander in the bottom of a large stockpot and fill halfway with water. Bring to a boil over high heat, then carefully lower the jars into the pot using a holder. Leave a 2-inch space between the jars.
- Pour in more boiling water, if necessary, until the water level is at least 1 inch above the tops of the jars. Bring the water to a full boil, cover the pot, and process for 10 minutes.

## **Discussion Questions:**

- Why do you think it's important to preserve food?
- Why do you think salt is used in our pickling recipe? (preserves food)
- What flavor does the vinegar add to our vegetables? (sour)
- What about the sugar? (sweetens it)
- What is the difference between pickling and marinating?
- How can we test that the white vinegar is safe for consumption? How do we know that it is acidic? Is it a strong electrolyte?
- What are the benefits to pickling vegetables? What are the challenges?

**Extensions:**

- What other vegetables would you like to try pickling?
- What will you eat your pickled beets with? (salad, feta cheese, etc.)
- Would you get the same result if we tried storing the vegetables in water?

**References:**

Howard, S. (2024, November 5). Pickled Beets. All Recipes.

<https://www.allrecipes.com/recipe/38109/pickled-beets/>

Is white vinegar a strong electrolyte? (n.d.).

<https://www.calendar-australia.com/faq/is-white-vinegar-a-strong-electrolyte>

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