

ZIP-LOCK PICKLES

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Introduction

Pickling is a method of preserving foods by either the addition of acid, usually in the form of vinegar, or by brining in a salt-water solution. This experiment allows one to make individual pickles in a Zip-Lock bag.

Materials Needed

Chemicals Needed:

pickling cucumbers (Kirby cucumbers or equivalent)
sodium chloride, NaCl. Pickling or canning salt preferred as it is pure sodium chloride without any anticaking agents. If neither is available, use Kosher salt.
water, H₂O. Tap water is adequate for this procedure.
vinegar, 5% acetic acid solution
mixed pickling spice
dill, fresh (preferred) or dried
optional: garlic
aluminum foil or food-grade paper such as butcher paper. (See safety information)

Materials Needed:

Zip-Lock freezer bag, quart size
measuring spoons
measuring cup

Safety

Safety glasses or goggles must be worn in the laboratory at all times.

If this experiment is performed in a chemistry laboratory, all work surfaces must be cleaned and free from laboratory chemicals. It is advised to cover all work areas with aluminum foil or a food-grade paper covering.

There are no safety hazards associated with the materials used in this experiment.

Disposal

Generally, all waste materials in this experiment can be disposed in the trash or poured down the drain with running water.

Procedure

Wash the work surface with soapy water and dry it before starting this experiment.

Cover the work area with aluminum foil or clean food-grade paper.

Measure 250 mL (1 cup) water, 15 mL (1 Tbs.) vinegar, and 7.5 mL (1 1/2 tsp. or 1/2 Tbs.) sodium chloride into a quart size Zip-Lock freezer bag. Mix well to dissolve the salt.

Add 5 mL (1 tsp.) mixed pickling spice, one sprig of fresh dill or a pinch of dried dill, and, if desired, 1 clove of garlic, crushed, to the bag.

Obtain one medium size cucumber or two small cucumbers and place in the brine in the quart size Zip-Lock freezer bag. Squeeze out as much air as possible and seal the bag. Allow the bag and its contents to sit upright, so that the cucumber is completely immersed in liquid. If the cucumber is exposed to air, even inside the bag, it will spoil.

The cucumber should be kept at room temperature for one day before tasting. The pickling process will continue as long as the bag and contents remain at room temperature. To halt the pickling process, place the bag and contents in a refrigerator.

Explanation

Pickling is a method of preserving vegetables by impregnating them with acid which discourages the growth of many microorganisms. Generally, both methods use a brine to remove moisture from the vegetables by osmosis before treating with either vinegar or “fermenting”.

Cooked pickles are either cooked or are placed in a brine to draw out moisture, then they are placed in vinegar along with spices for flavoring. This method is used for sweet and sour pickles, onions, cauliflower, peppers, and others along with mixtures such as relishes and ketchup.

Fermented pickles are placed in a brine that is strong enough to prevent the growth of undesirable bacteria, but weak enough to allow the growth of microbes that produce lactic acid. Sauerkraut and dill pickles (the type prepared in this experiment) are the most common fermented products. This process can take up to three weeks. In this experiment, vinegar is added to prevent the growth of unwanted bacterial and to increase the acidity of the brine speeding up the pickling process.

Want to make a larger batch of pickles? Here’s my recipe:

- 2 - 3 pounds of pickling cucumbers
- 6 - 8 branches of fresh dill
- 1 - 2 gallons of water
- 1 cup vinegar per gallon of water
- 1/2 cup salt per gallon of water (avoid an excess of salt)
- 1/4 cup mixed pickling spice per gallon of water
- 5 garlic cloves, crushed (add more or less garlic to suit individual taste)

Wash the cucumbers carefully and place in a stone or ceramic crock layering them with the branches of dill. (A heavy plastic container will work. Avoid metal containers as the metal will react with the brine.)

Make a brine from the water, salt, vinegar, pickling spice, and garlic. Pour the brine over the cucumbers, covering them completely. Weigh down the cucumbers by covering with an inverted dish and placing a heavy stone or a brick

on top. (Wash the stone or brick well, then cover with plastic wrap.) Store at room temperature until desired degree of doneness. When the pickles are ready, place in jars, add sufficient brine to cover, and store in the refrigerator.

Mixed pickling spice varies depending on the dealer from whom it is purchased as each has his own formula. When you find a mixture you like, look on the label for a list of ingredients or ask the dealer for a list. It will take some experimenting to prepare your own mixture. The most common ingredients, in order by decreasing amount are:

Allspice	Bay leaves
Mustard seed	Red pepper (dried)
Ginger	Chilies
Coriander seed	Dill seed
Black (or white) pepper (whole)	Mace
Cinnamon stick	Cardamom
Cloves	

References

Levinson, Leonard Louis, *The Complete Book of Pickles and Relishes*, Hawthorn Books, New York, 1965.

McGee, Harold, *On Food and Cooking*, Charles Scribner's Sons, New York, 1984.