

Fall Tomatoes - why pH matters

Let's pretend we are in your high school science class and we are discussing pH- the measurement of acidity and alkalinity. We might think of pH in a solution, but pH also exists in food and the soil.

The pH of food will dictate the appropriate process for canning food. Acid foods such as fruits and pickles with a pH of 4.6 or lower may be canned in a water bath canner. Low-acid foods such as vegetables and meats with a pH above 4.6 must be processed in a pressure canner.

Clostridium botulinum bacteria are the main reason why low-acid foods must be pressure canned to be safe. *Clostridium botulinum* spores can survive boiling water (212 °F) and grow in a sealed jar of low-acid food. The spores can change into the vegetative cells that produce the deadly botulinum toxin. You must use a pressure canner to raise the temperature to the desired 240–250 °F to destroy the spores during the canning of low-acid foods. Some foods, such as figs and tomatoes, may be processed as acid foods, but because they may have pH values slightly above 4.6, lemon juice or citric acid must be added before canning.

As fall approaches, those end of season unripe tomatoes are still usable. Be sure to pick them before a frost or freeze if canning them. Unripe, or green, tomatoes can be preserved just like ripe tomatoes. Tomatoes for many years were considered high acid. However, new varieties, over-mature fruits, and tomatoes from dead or frost-killed vines may have a pH greater than 4.6.

The USDA and University-based researchers have determined that to ensure a safe acid level for boiling water canning of whole, crushed, or juiced tomatoes, add 2 tablespoons of bottled lemon juice or ½ teaspoon of citric acid per quart of tomatoes. For pints, use 1 tablespoon of bottled lemon juice or ¼ teaspoon of citric acid. Acid can be added directly to the jars before filling the jars with product. Add sugar to offset acid taste, if desired. Four tablespoons of 5-percent-acidity vinegar per quart may be used instead of lemon juice or citric acid. However, vinegar may cause undesirable flavor changes.

If you don't want to can your green tomatoes or it is after a frost or freeze, it is simple to freeze tomatoes for later use. Start by selecting firm, sound green tomatoes. Wash, core, and slice 1/4-inch thick. For Frying – Pack the slices into containers with freezer wrap between the slices. Leave 1/2-inch headspace. Seal and freeze. Remember, frozen tomatoes are best for cooking or seasoning, as tomatoes will not be solid when thawed.

Think creatively when planning to preserve tomatoes, but also think "safety". There are many tested procedures and recipes available to preserve your tomatoes. Creating your own procedures and recipes could result in a hazardous product, since the pH range of tomatoes is on the borderline between acid and low-acid foods.

Source: You Asked It, October 2020, Karen Blakeslee, Kansas State University Rapid Response Center

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