



## Add Acid to Tomatoes When Canning: Here's Why!

No matter whether you say tomato (toh-may-toh ) or tomato (*tuh-may-toh*), tomatoes are the most popular home-canned item. A national survey in 2005 indicated that 59% of home-canners added tomatoes to their pantry shelves that season. And not only are they a popular home-canned item, but home canning of tomatoes has been a staple of home food preservers for a long as anyone can remember.

Whether you have been home-canning for one year, or fifty, it's important to follow up-to-date, research tested recipes. One of the biggest changes in home canning occurred in 1994 with the new recommendation to **add acid to all home-canned tomato products**. And here's why.

Tomatoes can be preserved by canning, drying, freezing, or pickling. They can also be used in creating fruit spreads like jams, jellies and marmalades. When foods are placed in a sealed glass jars and processed (home canned), the safety depends primarily on the amount of acid in the product. The amount of acid in a food is recorded as the **pH value**. Foods with a pH value of 1 to 4.6 are considered 'high acid,' those with a pH value between 4.6 and 7.0 are considered 'low acid' foods. The pH of 4.6 is important in determining whether the *Clostridium botulinum* bacteria will grow in canned food and produce a deadly neurotoxin. At pH 4.6 or below (high acid foods), *Clostridium botulinum* will not grow and produce the deadly toxin, so these foods can be given a relatively mild canning treatment using a boiling water canner. At pH above 4.6, *Clostridium botulinum* is able to grow and produce toxin unless the food is heated to high temperatures in a pressure canner. Foods that are naturally high in acid like oranges, apples and most fruits can be safely canned in a boiling water canner. Foods that are low in acid like meats and vegetables; must be pressure canned.

	HIGH ACID	
Boiling Water Bath (212 °F)		Pickles, citrus juices, sauerkraut, most fruits and berries, tomatoes
pH 4.6		
Pressure Canner (240 °F)		Tomatoes, peppers, figs, most vegetables, meats, eggs, poultry, fish, olives, hominy
	LOW ACID	

Tomatoes for many years were considered high acid. However, tomatoes are fruits and, as such, the amount of acid in tomatoes varies dramatically over the growing season. The amount of acid in tomatoes is highest in unripe (green) fruit and reaching the lowest point as the fruit reaches maturity. The amount of acid, and other components like sugars, also varies in fruits based on the climate (the amount of heat/sun/rain), the soil, the variety, and other factors. Researchers now know that **tomatoes are not consistently high in acid** and **current canning recommendations require that acid be added to all canned tomato products: 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% -acidity vinegar per quart may be used instead of lemon juice or citric acid. However, vinegar may cause undesirable flavor changes. Acid is added to tomato products even if the tomatoes are pressure canned. Tested recipes have **not been** developed for canning tomatoes where the pH is above 4.6.



A recent study by the University of Illinois highlighted the variation in pH that can be seen in tomato varieties. In the study, 55 heirloom tomato cultivars were planted at the Saint Charles Horticulture Research Center. The growing season was characterized by an early warm period in May followed by cool temperatures and frequent periods of rain over the growing season. Tomato fruit was harvested and the pH level tested in all 55 varieties. The average pH of the fruit ranged from 4.18 to 4.92, with 15 of the varieties (27%) having a mature-fruit pH of 4.6 or higher. Higher-pH varieties included the popular Brandywine, Ace, Big Early Hybrid, Big Girl, Large Polish Paste, Rio Grande, and many others.

As you preserve the bounty of your garden, remember to always add acid to home-canned tomato products! And enjoy!!

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#### References:

"Complete Guide to Home Canning," Agriculture Information Bulletin No. 539, USDA, revised 2009.

National Center for Home Food Preservation. Resources for Home-Preserving Tomatoes. June 2010.

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Tomatoes Tart and Tasty. University of Wisconsin-Extension Bulletin. 2008.

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B. Ingham. May 2011.