Agricultural Extension Service ● University of Minnesota

FACT SHEET

FOOD SCIENCE AND NUTRITION NO. 33 1976

EDMUND A. ZOTTOLA and ISABEL D. WOLF

Home Canning Tomatoes

Tomatoes are the most common home grown vegetable crop. Home gardeners frequently find themselves with an abundance of ripe tomatoes and want to preserve them for future use.

While tomatoes may be canned, frozen, or dried, canning gives a product that is more acceptable to consumers.

Acidity of Foods

The acidity of substances generally is expressed in terms of pH. The pH scale ranges from 1 to 14 with 1 the most acid, 14 the most alkaline, and 7 neutral like distilled water. Most foods have a pH of below 7.

In home canning, foods with a pH of over 4.6 must be processed in a pressure canner at temperatures over 212° F. This is necessary because sealed, canned foods with a pH of greater than 4.6 that have not been properly processed will permit spores of Clostridium botulinum to germinate and grow, producing a deadly poison. Heating to temperatures over 212° F. will destroy these spores and prevent toxin production.

Foods with a pH below 4.6 contain sufficient acid to prevent the spores of C. botulinum from growing and producing poison. Therefore, to prevent spoilage, acid foods need only be heated to temperatures which destroy yeasts, molds, and bacteria. This heat treatment can be achieved either in the water bath canner or by a brief process in a pressure canner. Products processed in a water bath canner, no matter how long they are processed, will never reach temperatures higher than 212° F.

Tomato Acidity

Much misinformation has been printed in the popular press about so-called "low acid" tomatoes. Tomatoes contain enough naturally-occurring acids to permit canning in a water bath canner at 212° F. Acidity determinations on 65 varieties of tomatoes by the USDA Research Laboratory, Philadelphia, Pennsylvania, and the University of Minnesota Department of Food Science and Nutrition during the summer of 1975 found no varieties with a pH greater than 4.6. The tomatoes were tested for pH when firm and colored; overripe tomatoes tend to have higher pH values.

As tomatoes ripen from green to slightly underripe to firm ripe to overripe, the amount of acid decreases. Therefore, to be sure the tomato contains sufficient acid to prevent any risk of botulism food poisoning, use slightly underripe to firm ripe tomatoes. Soft, overripe and decayed tomatoes should not be used for any home canned tomato product. The use of soft and overripe tomatoes for home canned tomato juice can result in a serious risk of botulism food poisoning.

The term "low acid" tomatoes has been used in seed catalogs to describe varieties of tomatoes with a sweet, non-tart taste. These tomatoes are often white, yellow, or pink. Despite their non-tart taste, these tomatoes are not low in acid content. The higher sugar content masks the acid flavor. Reports in horticultural journals repeatedly show these tomatoes to be higher in acid content than most red varieties.

Canning Tomatoes

Methods

Tomatoes may be canned in a boiling water bath canner or by processing in a pressure canner. Both methods result in reaching approximately the same internal temperature in the product. Using a pressure canner takes less time, uses less energy, and limits the amount of steam in the kitchen.

Get all your equipment ready before preparing the tomatoes. Wash and rinse the canning jars. Check the rims to be sure they are free from nicks. It is not necessary to sterilize canning jars. They will be sterilized during the heat processing.

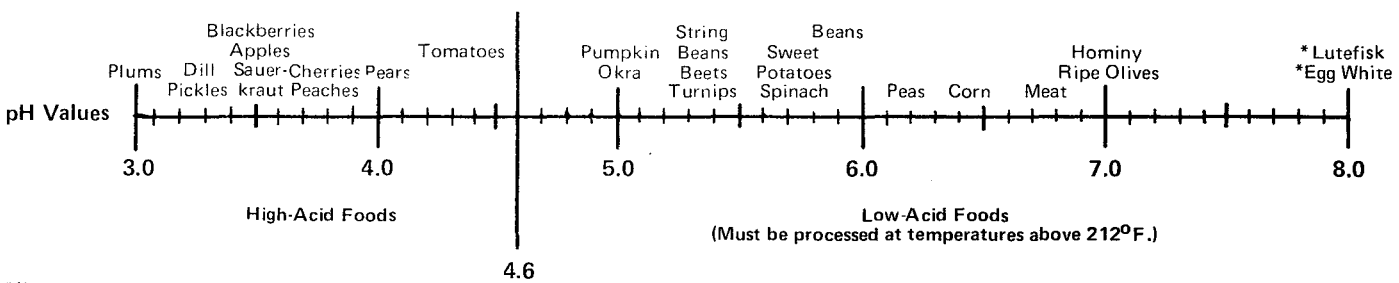
Wash tomatoes, dip into boiling water for ½ minute. Plunge into cold water. Cut out the core and loosen the skin.

Put whole tomatoes or cut quarters into clean jars. Press down with a spoon to pack. The juice will fill the jar. Do not add any water. Remove air pockets by sliding a rubber or plastic spatula down the side of the jar. Leave ½ inch headspace at the top.

You may add: 1 tsp. salt to each quart
½ tsp. salt to each pint.

Wipe rim of jar with clean cloth.

Apply canning lid to top of jar. Follow the instructions which accompany the type of lid, one piece or two piece, that you are using.



*(Not to be canned, but indicates high pH foods.)

pH OF SOME COMMONLY HOME-CANNED FOODS

To Water Bath Process

Have hot water in canner. Put the filled jars in the canner so that the level of the water is 1 inch over the top of the jars.

Allow 2 inches of water at top of canner for boiling. If the water boils away, add more boiling water.

Begin timing when the water boils.

Process: 50 minutes for quarts
40 minutes for pints.

Remove hot jars from canner with lifter. Cool jars upright on clean, dry cloth or wooden boards.

Check for seal the next day and store sealed jars in a cool dry place at about 70° F.

To Pressure Process Tomatoes

This method for processing tomatoes in a pressure canner was developed in a research project on home canning of foods in the Department of Food Science and Nutrition at the University of Minnesota.

Pack the tomatoes as described above.

Place the jars of tomatoes in a pressure canner which contains 2 to 3 inches of boiling water.

Lock the lid into closed position. Put the burner on high. When a steady column of steam is escaping from the vent, put on the pressure regulator or weighted gauge. When the dial gauge or weighted gauge indicates the pressure has reached 15 pounds, turn off the heat and allow the pressure to return to 0 pounds. If you have an electric range, remove the canner from the burner.

Remove pressure regulator or weighted gauge. After 10 minutes, unlock the lid and remove cover of canner.

Remove hot jars from canner with lifter. Cool jars upright on clean, dry cloth or wooden boards.

Check for seal the next day and store sealed jars in a cool dry place at about 70° F.

Tomato Mixture

Home canners frequently request recipes for canned mixtures of tomatoes, celery, peppers, and onions. In preparing such mixtures, it is important that the amount of ingredients with pH greater than 4.6 (peppers, onions, and celery) not reduce the overall acidity of the mixture.

The following recipe for canned tomato mixture was developed in the Department of Food Science and Nutrition at the University of Minnesota. If the ingredient proportions are followed carefully, the tomato mixture may be safely canned using the process methods and times given above for tomatoes. Do not add any more pepper, onion, or celery than called for in the recipe.

Minnesota Tomato Mixture

For 7 pints

12 cups tomatoes, peeled and quartered
1 cup chopped celery
½ cup chopped onion
½ cup chopped pepper
3 tsp. salt

Simmer the vegetables for 10 minutes. Pack into clean hot canning jars and process.

For 7 quarts, double the recipe and process.

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55108. We offer our programs and facilities to all persons without regard to race, creed, color, sex, age, or national origin.