

# Modern tomato varieties: preparation no problem

UNIVERSITY PARK, Pa. - Low-acid tomatoes are not a problem in home canning, state experts at Penn State University. Spoilage of home canned tomato products is caused by too little heat processing, use of open kettle canning, or other unsafe canning practices.

Even though some new tomatoes are called low-acid, especially in seed catalogs, research has proved that the acid level, or pH, is not different from traditional varieties. Some tomatoes, especially the pear-shaped and yellow varieties, may taste less acid, but taste is deceiving.

Dr. Gerald M. Sapers of USDA's Agricultural Research Service (ARS), said in 1976 that today's tomatoes are similar in acid content to most older varieties. Several so-called low-acid tomatoes are actually not low in acid, but high in sugar which masks the tart, acid flavor of the tomato or the type of acid is chemically different.

Sapers points out that it is a misconception that yellow and white-fleshed tomatoes are lower in acid than red tomatoes - there is no scientific basis for such a

statement. Sapers evaluated about 60 tomato varieties and found four to have an acidity low enough to permit the growth of the bacteria that causes botulism when these fruits were overripe, decayed or picked from dead plants. These varieties should not be grown in home gardens or bought for home canning purposes. But of the four varieties, only Garden State and Ace are grown in the east and then only for mechanical harvesting.

Of 109 varieties of tomatoes tested at the University of Minnesota, not one was found to be low in acid when tested while firm, ripe and fully colored. Tests on soft, mushy and overripe tomatoes, however, did indicate that these tomatoes had an acidity level that was lower and could be of concern, as reported by Dr. Sapers.

Tomatoes of any variety that are overripe (very soft) should not be canned whole or used to make any other related product such as soup, juice, paste, or sauce. And, according to USDA research, adding two teaspoons of lemon juice or ¼ teaspoon powdered citric acid per pint are recommended levels of acidulents for canning tomatoes of questionable quality or varieties.

Use of vinegar as an acidulant is discouraged as it is only half as effective in acidifying the product. Also, a tomato product to which vinegar has been added was judged as less acceptable by taste panels.

The acidity of tomatoes can be changed by mold growth allowed by oxygen in headspace of cold pack and open kettle canned tomatoes

- enough that botulism can grow. Moldy canned tomatoes may not always have a rotten odor and the liquid in the jar may not always be cloudy. Don't scrape mold off home canned tomatoes and then eat the rest in the jar - discard the entire contents.

Normally, botulinum bacteria will not grow in highly acid foods such as tomatoes, but certain molds that can grow on the surface of improperly sealed canned tomatoes may eventually reduce the acidity to the point where botulinum bacteria can grow.

Heat processing times for tomatoes given in modern canning references such as Circular 561, "Canning Fruits and Vegetables," available from any Penn State Cooperative Extension Service office are adequate for all tomatoes.

Whole or quartered tomatoes in sealed pint jars must be processed in boiling water 40 minutes if filled raw; 35 minutes if filled hot. Quarts must be processed in boiling water 50 minutes if filled raw; 45 minutes if filled hot. Quarts and pints of hot filled tomato juice must be processed in boiling water 35 minutes. Raw filling of tomato juice is NOT recommended.

Processing firm, ripe, and fully colored tomatoes in a pressure canner is not necessary to insure a safe home canned product.

**TIPS ON CANNING TOMATO SAUCE OR PUREE AND JUICE SEPARATION**  
Many home canners find it very practical to can tomato sauce or puree to use quickly

in a variety of ways in family meals throughout the year. There are many different recipes for tomato sauce and tomato puree says Penn State specialists. Some have no seasoning except salt. Others are between these extremes and are seasoned for spaghetti sauce or other special use.

### Sauce or Puree

All tomato sauce or puree that has no other vegetables and no meat added should be packed by the hot pack method of packing and processed in the boiling water canner. The length of processing time will depend on the consistency or thickness of the sauce. The thinner the sauce, the longer the processing time. Thin sauce should be processed as long as tomato juice - 35 minutes for pints and quarts. If you cook down the sauce until you have about half as much volume as you had when you started to cook and fill hot into jars, processing time in the boiling water canner need be only 20 minutes. When the sauce is this thick, it will round up on a spoon, rather than just remaining level with the top edge of the spoon.

For some tomato sauces or juice, you may want to add other vegetables such as onions and green pepper even though tomatoes make up the major part of the mixture. To do this, add these other vegetables to the tomatoes and cook them all together. Then press through a sieve to remove the seeds and skins. Pack hot and process in the pressure canner at 10 psi 20 minutes for pints and 25 minutes for quarts. If such products are cooked into sauces first (reduced to about half the original volume of the pulp you began with) then pack hot in pints and process in the pressure canner at 10 psi for 40 minutes.

If you add meat to the tomato sauce, it must be processed in the pressure canner as should all meat. To do this, pack the hot sauce in the jars and process at 10 psi 60 minutes for pints and 1

hour and 15 minutes for quarts.

Catsup is normally even more concentrated than tomato sauce or tomato puree. In addition, it has a larger amount of acid, as either vinegar or lemon juice is added. Sugar and spices are also added. Therefore, a much shorter processing time is needed - 15 minutes in the boiling water is recommended.

Remember, when you can tomato sauce or tomato puree, it's important to consider the thickness of the sauce as well as what, if any, additional ingredients have been added. It's also important to follow modern directions and timetables for home canning these products. And if you have any doubt about the length of processing needed, it's better to overprocess rather than to underprocess.

**Avoid Juice Separation**  
Separation in tomato juice does not indicate spoilage but does detract from the appearance of the product. When tomatoes are cut, crushed or bruised, and exposed to air, the enzymes contained in the tomatoes are activated. These activated enzymes break down the natural pectins in the tomatoes and cause the juice to separate. Enzymes are quickly destroyed by heat, so the shorter the heating time the more you can minimize this action. It will also help to use firm, ripe tomatoes for making juice and fill the juice hot into jars.

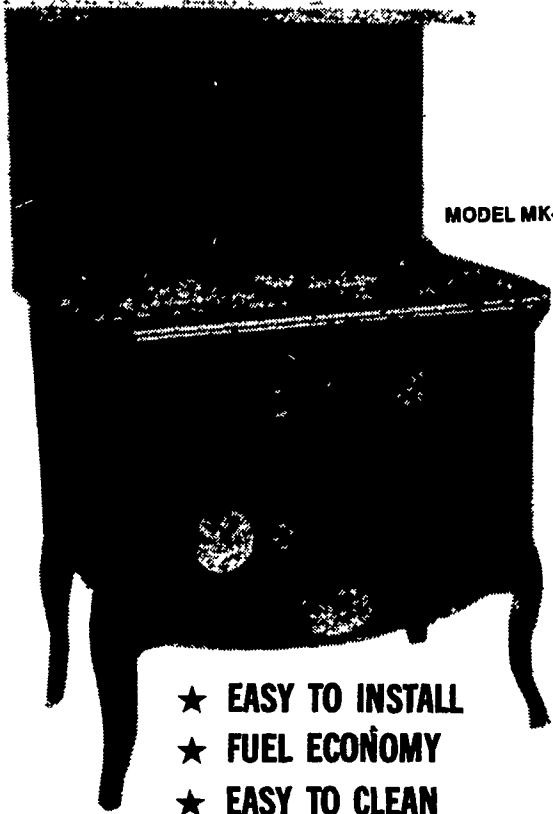
To avoid excessive separation when making tomato juice, work with the amount of tomatoes you can process at one time. Start cooking after a few tomatoes have been cut into the kettle. Add other cut tomatoes to those cooking and stir frequently until they are cooked - avoid overcooking. After putting cooked tomatoes through sieve, reheat the juice just to boiling before filling hot into jars.

Process tomato juice in boiling water 35 minutes for both pints and quarts.

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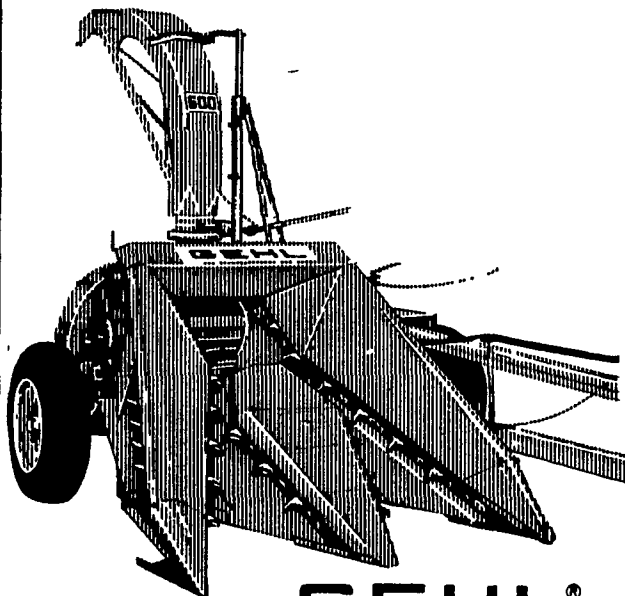
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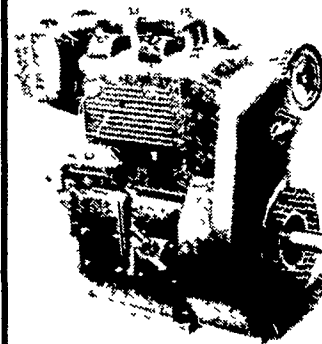


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