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Burning Issue: Using Atmospheric Steam Canners

Can acid foods be processed in steam canners?

The University of Wisconsin, under the leadership of Dr. Barbara Ingham, has conducted research on appropriate use of atmospheric steam canners for home canning in collaboration with the National Center for Home Food Preservation (NCHFP). Atmospheric steam canners are used for processing naturally acid or properly acidified foods with natural or equilibrated pH values of 4.6 or below. They are not pressurized vessels used for processing for low-acid foods.

Sufficient studies and peer review have been completed that we are now able to say that as long as certain critical controls at various steps in the canning process are achieved, USDA and NCHFP process times for canning acid or properly acidified foods (pH of 4.6 or below) at home with properly research based recipes and procedures can be used. The research looked at temperature distribution in the steam environment surrounding the jars in a dome-style steam canner, heating patterns of several different food types during processing in the canner, and the contribution of standardized cooling procedures at the end of the process time.

Some of the key controls in addition to the acidity of the food product are knowing that the canner has had the air vented out of the steam before processing begins, and that the pure steam is at the temperature of boiling water at the start and during processing. Jars must be preheated before filling with food and cooling prior to processing must be minimized. Processing times must be adjusted for altitude, and must also be 45 minutes or less, including any altitude modification. The processing time is limited by the amount of water the canner base will hold, and the canner cannot be opened to add water or for any reason at any time during the process. Finally, cooling of jars must take place in still, ambient air without any forced, more rapid cooling. The slow cooling of processed jars is important to the overall food safety of the whole canning procedure.

Dr. Ingham provides further instructions and details about carrying out canning in an atmospheric steam canner using USDA acid food processing recommendations at her webpage: <http://fyi.uwex.edu/safepreserving/2015/06/24/safe-preserving-using-an-atmospheric-steam-canner/> .

Eventually we will integrate this more complete advice into additional offerings on the National Center for Home Food Preservation website.

http://nchfp.uga.edu/publications/nchfp/factsheets/steam_canners.html

Spicy Cranberry Salsa



Spicy Cranberry Salsa

6 cups chopped red onion
4 finely chopped large Serrano peppers*
1½ cups water
1½ cups cider vinegar (5%)
1 tablespoon canning salt

1½ cups sugar
6 tablespoons clover honey
12 cups (2¾ pounds) rinsed, fresh
whole cranberries

*** Caution: Wear plastic or rubber gloves when handling and cutting hot peppers or wash hands thoroughly with soap and water before touching your face or eyes.**

Yield: About 6 pint jars

1. Wash and rinse 6 pint canning jars; keep hot until ready to use. Prepare lids according to manufacturer's directions.
2. Combine all ingredients except cranberries in a large Dutch oven. Bring to a boil over high heat; reduce heat slightly and boil gently for 5 minutes.
3. Add cranberries, reduce heat slightly and simmer mixture for 20 minutes, stirring occasionally to prevent scorching.
4. Fill the hot mixture into clean, hot pint jars, leaving ¼-inch headspace. Leave saucepot over low heat while filling jars. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a dampened clean paper towel; apply two-piece metal canning lids.
5. Process in a boiling water canner according to the recommendations in Table 1. Let cool, undisturbed, 12-24 hours and check for seals.

Table 1. Recommended process time for Spicy Cranberry Salsa in a boiling-water canner.				
		Process Time at Altitudes of		
Style of Pack	Jar Size	0 - 1,000 ft	1,001 - 6,000 ft	Above 6,000 ft
Hot	Half-pints or Pints	10 min	15 min	20 min

Developed at The University of Georgia, Athens, for the National Center for Home Food Preservation
Released by Elizabeth L. Andress, Ph.D., Department of Foods and Nutrition, College of Family and
Consumer Sciences. Revised January 2015.

This material is based upon work supported by the Cooperative State Research, Education, and
Extension Service, U.S. Department of Agriculture, under Agreement No. 00-51110-9762.

General Canning Information

For Safety's Sake

Pressure canning is the only recommended method for canning meat, poultry, seafood, and vegetables. The bacterium *Clostridium botulinum* is destroyed in low-acid foods when they are processed at the correct time and pressure in pressure canners. Using boiling water canners for these foods poses a real risk of botulism poisoning.

If *Clostridium botulinum* bacteria survive and grow inside a sealed jar of food, they can produce a poisonous toxin. Even a taste of food containing this toxin can be fatal. Boiling food 10 minutes at altitudes below 1,000 feet altitude should destroy this poison when it is present. For altitudes at and above 1,000 feet, add 1 additional minute per 1,000 feet additional elevation. Boiling means that you are able to see the liquid in the food actively forming large foamy bubbles that break all over the surface. Note that as of July 2013 the Centers for Disease Control and Prevention (CDC) recommendation is to discard any home canned food that might contain botulism toxin. (<http://www.cdc.gov/features/homecanning/>)

Caution: To prevent the risk of botulism, low-acid and tomato foods not canned according to the recommendations in the USDA *Complete Guide to Home Canning* (2015rev) or according to other USDA-endorsed recommendations should be boiled as above, in a saucepan before consuming, even if you detect no signs of spoilage.

This is not intended to serve as a recommendation for consuming foods known to be significantly underprocessed according to current standards and recommended methods. It is not a guarantee that all possible defects and hazards with other methods can be overcome by this boiling process.

The recommendation is to only can low-acid foods and tomatoes and tomato products according to the procedures in the USDA *Complete Guide to Home Canning* (2015rev) (which are the ones found in the How Do I?... menus on this website.) There are other pickles, relishes and salsas containing tomatoes that are acceptable and those we can support at the National Center are on our website.

All low-acid foods canned according to the approved recommendations may be eaten without boiling them when you are sure of all the following:

- Food was processed in a pressure canner operated according to the procedures in the USDA guidelines.
- The gauge of the pressure canner was accurate.
- Up-to-date researched process times and pressures were used for the size of jar, style of pack, and kind of food being canned.
- The process time and pressure recommended for sterilizing the food at your altitude was followed.
- The jar lid is firmly sealed and indicates a vacuum seal is present.
- Nothing has leaked from jar.
- No liquid spurts out when jar is opened.
- No unnatural or “off” odors can be detected. No mold is present.

This document was extracted from the "Complete Guide to Home Canning," Agriculture Information Bulletin No. 539, USDA (Revised 2015).

http://nchfp.uga.edu/how/general/for_safety_sake.html

Home Preserving Pumpkins

*National Center for Home Food Preservation
September 2015*

Pumpkins offer far more than a door-stop at Halloween. This season is also the prime time to find and use sugar or pie pumpkins, the best for cooking and baking. Pumpkin seeds from any pumpkin can also be dried and roasted.

Canning pumpkin butter or mashed or pureed pumpkin is NOT recommended.

Home canning *is not recommended* for pumpkin butter or any mashed or pureed pumpkin or winter squash. In 1989, the USDA's Extension Service first published the *Complete Guide to Home Canning* that remains the basis of Extension recommendations today, found in the December 2009 revision. The only directions for canning pumpkin and winter squash are for cubed flesh. In fact, the directions for preparing the product include the statement, "**Caution: Do not mash or puree.**"

Canning Cubed Pumpkin

Only pressure canning methods are recommended for canning cubed pumpkin. We have no properly researched directions to recommend for canning mashed or pureed pumpkin or winter squash, or pumpkin butter. To be safe, all low acid foods, including pumpkin, must be canned using tested pressure canning processes ([Ensuring Safe Canned Foods](#)). Older methods, such as boiling water canning for vegetables, oven canning and open-kettle canning, have been discredited and can be hazardous ([Equipment and Methods Not Recommended](#) from the USDA *Complete Guide to Canning*, 2009).

An average of 16 pounds is needed per canner load of 7 quarts; an average of 10 pounds is needed per canner load of 9 pints – an average of 2¼ pounds per quart. Pumpkins and squash should have a hard rind and stringless, mature pulp of ideal quality for cooking fresh. Small size pumpkins (sugar or pie varieties) make better products. Wash; remove seeds, cut into 1-inch-wide slices, and peel. Cut flesh into 1-inch cubes. Boil 2 minutes in water. **Caution: Do not mash or puree.** Fill jars with cubes and cover cooking liquid, leaving 1-inch headspace.

Adjust lids and process following the USDA

recommendations: http://www.homefoodpreservation.com/how/can_04/pumpkin_winter_squash.html.

Freezing Pumpkins

Freezing is the easiest way to preserve pumpkin, and it yields the best quality product. Select full-colored mature pumpkin with fine texture (not stringy or dry). Wash, cut into cooking-size sections and remove seeds. Cook until soft in boiling water, in steam, in a pressure cooker, or in an oven. Remove pulp from rind and mash. To cool, place pan containing pumpkin in cold water and stir occasionally (*So Easy to Preserve*, 2006). Pack into rigid containers leaving headspace, and freeze.

Drying Pumpkin and Pumpkin Seeds

Wash, peel, and remove fibers and seeds from pumpkin (or Hubbard squash) flesh. Cut into small, thin strips no more than one-inch wide by 1/8-inch thick. Blanch strips over steam for 3 minutes and dip briefly in cold water to stop the blanching action. There is no need to cool to room temperature prior to drying. Drain excess moisture. Dry the strips in an electric dehydrator

until brittle.

Pumpkin also makes excellent dried vegetable leather. Purée cooked pumpkin and strain. Add honey and spices, and then dry on a home food dehydrator tray.http://www.homefoodpreservation.com/how/dry/veg_leathers.html.

Drying seeds and roasting seeds are two different processes. To dry, carefully wash pumpkin seeds to remove the clinging fibrous pumpkin tissue. Pumpkin seeds can be dried in the sun, in an electric dehydrator at 115-120°F for 1 to 2 hours, or in an oven on a very low, warm temperature only, for 3 to 4 hours. Stir them frequently to avoid scorching. Dried seeds should not be stored with any moisture left in them.

For more on storing dried vegetables, see recommendations here:
http://www.uga.edu/nchfp/how/dry/pack_store.html.

To roast the seeds, take dried pumpkin seeds, toss with oil and/or salt and roast in a preheated oven at 250°F for 10 to 15 minutes.

Pickling Pumpkin

Pumpkin can be used in pickled recipes such as salsas, chutneys, and relishes; however, your recipes for these must be treated as fresh prepared foods and kept refrigerated. We do not have tested recipes and procedures to recommend for safely canning these types of products by either the boiling water or pressure canning method.

Pumpkin Preserves

Gelled preserves rely on the natural acidity present in most fruits for safe food preservation. Most fruits have natural acids so resulting jams or jellies can be safely canned in a boiling water bath process. Pumpkin, however, is a low acid vegetable and cannot be safely canned in the boiling water bath process. A jam or sweetened preserve would have to have enough sugar and/or added acid to be treated safely without concerns about botulism. A certain acidity level is also required to cause the pectin molecule to form a gel structure. The USDA and Georgia Cooperative Extension currently do not have any tested recipes to recommend for safely canning pumpkin preserves (jams, jellies, conserves, or pumpkin butter) and storing them at room temperature. These pumpkin products must be stored in the refrigerator or freezer and treated the same as fresh pumpkin.

Think Safety

Think safety when planning to preserve pumpkins. Pumpkin is a low acid vegetable and requires special attention to preparation and processing. Use excellent sanitation in handling the fresh or preserved pumpkin. Do not let cut pumpkin sit out at room temperature for more than 2 hours during preparation prior to preserving. We have no properly researched procedures to recommend for home canning of pumpkin butters or pickled pumpkin products such as salsas, chutneys and relishes; recipes you try should be served immediately or stored under refrigeration at all times.

<http://nchfp.uga.edu/tips/fall/pumpkins.html>

Resources for Home Preserving Figs

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March 2015

Select figs for preserving when they are at their peak of quality. Figs are at their peak when they are ripe, firm, and their skins un-cracked. Very soft flesh indicates that they are overripe. The color of figs does not tell you much about their quality, because color varies depending on the variety. Brown Turkey, Celeste, and Kadota are some of the varieties good for preserving. Figs are distinct from many other fruits, not just because of their unique texture and flavor, but also because figs are one of the few fruits with a borderline pH for canning. Raw figs sit right on the border between acid foods and low acid foods, which is pH 4.6, and can go over pH 5.0. What does this mean for preserving figs? In order to safely preserve figs using the boiling water canning method, the USDA process recommendation requires that you add acid to ensure a pH that will prevent the growth of botulinum toxin. (No pressure process has been developed, so acidification with boiling water canning is the only process available.)

Canning Figs

If you are new to home canning, then please read [Guide 1: Principles of Home Canning](#) in the *USDA Complete Guide to Home Canning*. This publication will give you a great starting point to begin your practice, and will likely prove to be a helpful resource as you continue canning. Also please review a brief description of [Equipment and Methods Not Recommended](#).

Preparation for [canning figs](#) is minimal; washed and dried, firm, un-cracked fruits are left whole, with short stems and peels still attached. Boiling and packing figs in light [syrup](#) (~20% sugar) will help the fruits retain their color and texture. To increase the acidity of the product, acid must be added and it can be ¼ teaspoon citric acid or 1 Tablespoon bottled lemon juice for pint size canning jars. Quart size jars require ½ teaspoon citric acid or 2 Tablespoons bottled lemon juice. Consider your altitude and [process accordingly](#), as recommended by USDA.

Freezing Figs

Peeled or un-peeled are both acceptable ways to [freeze figs](#). Either way, washed figs can be packed into freezer containers in syrup or dry. If choosing a syrup pack, then a cold, 40 percent [syrup](#) is recommended, to which ¾ teaspoon ascorbic acid or ½ cup bottled lemon juice per quart is added. For a dry pack, you may pack figs directly into containers or first freeze them on trays and then pack into containers so that they separate more easily. To preserve the color of light-colored figs, dissolve ¾ teaspoon ascorbic acid in 3 Tablespoons cold water and sprinkle over 1 quart of fruit before freezing. Remember to leave adequate [headspace](#) in freezer containers.

Drying Figs

Avoid under-ripe figs for [drying](#), because they might become sour in flavor. Clean figs can be left whole if they are small, and cut in half if they are large. Whole figs should have their skins “checked” to allow even and more rapid drying. To “check” figs, dip whole figs in boiling water for 30 seconds or more, until skins split. Immediately plunge into an ice water bath to stop further cooking. Drain well before drying. Expect figs to take between 6 to 12 hours to dry in a dehydrator, perhaps shorter for halved figs.

Figs can also be combined with other, but acid, fruits to make [fruit leather](#). Remember to also add lemon juice or ascorbic acid to prevent darkening and increase the safety margin for acidity.

Pickling Figs

Less common than dried figs, [Fig Pickles](#) are a flavorful preserved fig product. Our recipe is a good, old-fashioned southern condiment. Prepare figs for pickling by peeling them, or if leaving unpeeled, pour boiling water over them and let stand until cool, then drain. The pickling solution is a sweet and spicy vinegar solution. The figs are cooked in the solution until they are translucent, then covered and refrigerated for 12 to 24 hours. At that point in time, the spice bag is removed and the figs heated in the brine to boiling. These pickles are processed in a boiling water canner.

Fig Spreads

Although figs do not contain enough juice to make a jelly, they do make excellent quality jams and preserves. Fig Jam can be made with [liquid pectin](#) or [without added pectin](#). [Strawberry-Fig Preserves](#) is a delicious taste combination. Last but not least, we cannot forget classic southern [Fig Preserves](#), which are whole figs in a thick sugar syrup. (Sorry, but there is no reduced sugar version for this style of traditional southern fruit preserves.) For all of these fig spreads in our collection, it is important to [sterilize jars](#) before filling them since process time is only 5 minutes at sea level. Or, use clean hot jars and increase the process time to 10 minutes in boiling water canner. Remember to increase [process times](#) at altitudes over 1,000 feet.

http://nchfp.uga.edu/publications/nchfp/factsheets/preserving_figs.html

Freezing

Garlic-in-Oil

Research performed by the National Center for Home Food Preservation confirmed that mixtures of garlic in oil stored at room temperature are at risk for the development of botulism.

Garlic-in-oil should be made fresh and stored in the refrigerator at 40°F or lower for no more than 4 days. It may be frozen for long term storage for up to several months. Package in glass freezer jars or plastic freezer boxes, leaving ½-inch headspace. Label, date and freeze.

http://nchfp.uga.edu/how/freeze/garlic_oil.html

Burning Issue: Canning in Pressure Cookers

What are the process times for canning in my pressure cooker?

USDA does not have recommended processes for canning in a small pressure cooker. The recommendation for using USDA pressure processes for low-acid foods is to use a canner that holds at least four (4) quart-size jars standing upright on the rack, with the lid in place. The research for USDA pressure processes for vegetable and meat products was conducted in pressure canners that are most similar to today's 16-quart or larger pressure canners.

Pressure cookers have less metal, are smaller in diameter, and will use less water than pressure canners. The result is that the time it takes a canner to come up to processing pressure (that is, the come-up time) and the time it takes the canner to cool naturally down to 0 pounds pressure at the end of the process (known as the cool-down time) will be less than for the standard pressure canner. The come-up and cool-down times are part of the total processing heat that was used to establish USDA process times for low-acid foods. If the heat from the come-up and cool-down periods is reduced because these times are shortened, then the heat from the process time at pressure alone may not be enough to destroy targeted microorganisms for safety. That is, the food may end up underprocessed. Underprocessed low-acid canned foods are unsafe and can result in foodborne illness, including botulism poisoning, if consumed.

During earlier years of canning research, pressure saucepans were considered an alternative for home canning and it was thought that adding 10 minutes to the process times for standard canners would keep food safe. That proved not to be the case for a general, across-the-board recommendation, as there are several sizes of pressure saucepans and they were not all adequately tested. In addition, the way heat transfers (penetrates) through food during the process is affected partly by the composition of the food and not all foods and styles of preparation were tested. Later research published in journals has not resulted in an absolute recommendation either. Therefore, in the late 1980s the USDA published its recommendation to not use pressure saucepans (small cookers) for home canning.

Some manufacturers may offer process directions for smaller pressure cookers. Consumers using this equipment will need to discuss processing recommendations with those manufacturers; the USDA and National Center for Home Food Preservation recommendation is to not use them for canning with our processes.

To be considered a pressure canner for USDA processes, the canner must be able to hold at least four quart-size jars, standing upright on the canner rack, with the lid in place. It is also important to realize the canner should have a way to follow recommended venting procedures to remove air from inside the canner before it is pressurized, and to indicate that the canner remains at least at the target pressure throughout the entire process time. (Also see: [Using Pressure Canners](#))

We cannot convert processes intended for use with regular pressure canners to ensure safety when canning in other types of equipment.

September 2015

National Center for Home Food Preservation

<http://nchfp.uga.edu/publications/nchfp/factsheets/pressurecookers.html>

Burning Issue: Pre-Sterilizing Jars before Canning

Do I need to pre-sterilize my jars for canning?

New canning jars out of the box are not sterile. Being in a box or covered in plastic wrap is not the same as a sterile environment. In addition to contamination by microorganisms that cannot be seen with our bare eyes, packaged jars may accumulate dust, small bits of debris, and even chips of glass in the case of breakage (which does happen sometimes in all the steps of transport from factory to store to home).

Whether brand new or re-used many times over, you should always *clean* jars just prior to filling them when canning. Wash jars in a dishwasher or by hand, using detergent and rinsing well. Clean jars should then be kept warm prior to filling. You can leave them in the closed dishwasher after the cycle, or use your canner as it is preheating, or create a separate water bath that will keep the jars both clean and warm.

Washing is also a good time to inspect jars for any cracks or chips, discarding or re-purposing those jars for non-canning uses if any imperfections are found. If you see scales or film from hard water left on your jars, then remove this by soaking jars for several hours in a solution containing 1 cup of vinegar (5% acidity) per gallon of water.

In order to actually *sterilize* jars, they need to be submerged in (covered by) boiling water for 10 minutes. When a process time is 10 minutes or more, the jars will be sterilized DURING processing in the canner. Therefore, when process times are 10 minutes or more, *pre-sterilization* of jars is not needed. It doesn't hurt your product to do it anyway, but it does require additional time and energy and is unnecessary.

To pre-sterilize jars, place the cleaned jars right-side-up on a rack in a canner and fill the jars and canner with water to 1-inch above the tops of the jars. Bring the water to a boil and then boil for 10 minutes at altitudes less than 1,000 feet elevation. Add 1 additional minute for each additional 1,000 feet of elevation. When you are ready to fill the jars, remove the jars one at a time, emptying the water from them back into the canner. This will keep the hot water in the canner for processing filled jars.

Sometimes people choose to increase a 5-minute process time for certain jellied and pickled products to 10 minutes so that they do not have to pre-sterilize the jars. The extra process time is not harmful to most gels and spoilage should not be an issue as long as the filled jars get a full 10-minute treatment in boiling water. (And remember your altitude to increase this process time as needed.)

So, in summary: Is a 5-minute process time enough to sterilize jars? No. If you are using a process time of only 5 minutes, such as for some jellied or pickled products, then you need to pre-sterilize jars before filling them (or increase the process time to 10 minutes). If a process time is 10 minutes or more then will the jars be sterilized? Yes, but be sure to wash and rinse them well, and keep warm, before filling them with food.

Reviewed July 2015

National Center for Home Food Preservation

<http://nchfp.uga.edu/publications/nchfp/factsheets/sterilizing.html>

2016 Annual Recertification Exam Questions

- 1) Atmospheric steam canners can be used:
 - a) To process foods up to 45 minutes
 - b) To process foods with a pH of 4.6 or below
 - c) To process high acid foods
 - d) All of the above
- 2) Which canning method(s) are used to kill *Clostridium botulinum* spores?
 - a) Pressure canning
 - b) Atmospheric steam canning
 - c) Cooking in a small (<4 quart) pressure cooker
 - d) Boiling water canning
- 3) A client calls from 956 North Street, McCloud, CA 96057 and wants to make something with all their cranberries. You suggest the newly revised spicy cranberry salsa recipe. How long should they process the jars?
 - a) 0 min (jars will seal on their own from heat of contents)
 - b) 5 min
 - c) 10 min
 - d) 15 min
 - e) 20 min
- 4) Which of the following practices are not recommended for pumpkin?
 - a) Drying seeds
 - b) Canning pumpkin butter
 - c) Canning cubed pumpkin
 - d) Canning pumpkin preserves
 - e) Freezing pumpkin
- 5) What method of canning was approved in 2015?
 - a) Atmospheric steam canning
 - b) Steam oven canning
 - c) Microwave oven canning
 - d) Open kettle canning
- 6) Similar to tomatoes, what other fruit needs to be acidified before boiling water canning?
 - a) Apples
 - b) Blueberries
 - c) Loquats
 - d) Figs
 - e) Plums
- 7) True or False: Pressure canners are used interchangeably with pressure saucepans (small cookers) for home canning.
- 8) Which method is unsafe for preserving garlic?
 - a) Freezing unpeeled garlic
 - b) Freezing peeled garlic in oil
 - c) Storing garlic in oil on counter
 - d) Refrigerating garlic that is submerged in wine
- 9) If you lived between 2,000 and 3,000 feet in elevation, how long would you need to pre-sterilize canning jars for a jam recipe that requires processing for 5 minutes?
 - a) 0 minutes
 - b) 10 minutes
 - c) 12 minutes
 - d) None of the above
- 10) True or False: A commercial jam producer asks you to advise them. They want to know which of their new line of specialty jam recipes you like the best. As a UC Master Food Preserver, you are authorized to provide product feedback.