



## Canning and Freezing Questions and Answers

The following are some commonly asked food preservation questions (with their answers)

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### IN THIS ARTICLE

- Question: I have some old canning recipes that my grandmother gave me. Are they still safe to use?
- Question: What can I process in half-gallon canning jars?
- Question: Jar leakage during processing, but sealed. Is this safe to consume?
- Question: Can I can applesauce without processing in a waterbath?
- Question: What is the problem with canners that do not have flat bottoms?
- Question: Are microwave pressure cookers safe to use for canning foods?
- Question: Can adding red wine vinegar in place of water in the canned meat jars give a more tender result. Is this safe?
- Question: homemade vinegar? It is safe to use as an ingredient in home canning recipes?
- Question: Sometimes when I preserve foods with garlic, the cloves turn a blue color. Is it still safe?
- Question: Black seeds in home canned tomatoes, is there any danger in using these tomatoes?
- Question: Are yellow tomatoes, pink, orange or red tomatoes canned the same way?
- Question: Why do we add lemon juice or citric acid when canning tomatoes?

- Question: Is there anything you can do to prevent the darkening of home canned corn?
- Question: There is a white substance surrounding pieces of canned squash. Is this safe to eat?
- Question: Processed red beets turned out very pale in color and not a deep red. Why?
- Question: I would like to transfer honey into 3 oz. jars for short term storage. Proper canning steps?
- Question: Is canning chocolate sauce safe?
- Question: What are the directions for canning walnuts?
- Questions and Answers: Pickling
  - Question: I have an old recipe that calls for adding a grape leaf to each jar of pickles. Why is this done?
  - Question: Why is table salt not recommended for canning and pickling?
  - Question: Is there a safe process for canning pickled radishes?
- Questions and Answers: Freezing
  - Question: What is the correct method for freezing celery?
  - Question: What is the best way to preserve Walnuts?
- Questions and Answers: Sauerkraut
  - Question: Sauerkraut was made more salty than desired. What can I do?
  - Question: The brine level has fallen below the top of the cabbage in my sauerkraut. What should I do?
  - Question: My Sauerkraut is not fermenting properly, what's wrong?
- Questions and Answers: Breads and Cakes
  - Question: I have a recipe that recommends baking pumpkin bread in a glass canning jar. Is this safe?
  - Question: Is it safe to bake and store cakes and breads at home using canning jars?
    - References and additional information

- Questions and Answers: Artificial Sweeteners
  - Question: Can artificial sweeteners be used when canning fruits?
  - Question: Can Splenda (sucralose) be used in preserving food?
- Questions and Answers: Jams and Jellies
  - Question: Wild Black Cherry Jam, safe to consume?
  - Question: Where can I purchase ClearJel for thickening canned fruits and jams?
  - Question: How do I get consistent results for jams and jellies?
  - Question: Can I use Agave Syrup to make jams and jellies?
- Vegetables and Herbs Stored in Oil
  - Question: Are there any safe methods for preparation, processing, and storage of vegetables and herbs in oil?
  - Question: Is there a safe method for preserving hot peppers in oil?



**Question: I have some old canning recipes that my grandmother gave me. Are they still safe to use?**

**Answer - Many older recipes for canning do not have the proper safeguards to assure a safe product. Always use**

**the latest instructions and recipes that have been scientifically tested for safety. Current canning information is available from the USDA Complete Guide to Home Canning and Penn State Extension.**

**Question: What can I process in half-gallon canning jars?**

Answer: At least one canning jar manufacturer is selling half-gallon canning jars. That manufacturer has a printed note on the top that says half-gallon jars are only used for some highly acidic foods in a boiling water canner, with instructions to call a toll-free number for the instructions. When we last called, the only choices are grape juice and apple juice, as we also recommend.

The only processes that USDA, the National Center for Home Food Preservation and the University of Georgia have to recommend for half-gallon jars are for very acidic fruit juices (and juice only):

- [Apple Juice](#)
- [Grape Juice](#)

This process time is not to be used for tomato juice, for example.

There are no other research-tested processes for half-gallon jars. Boiling water processes for other foods for jars larger than those published with recipes (usually pints and/or quarts) cannot be extended by any formula to a larger jar.

We are aware that there are historical recommendations for canning foods in half-gallon jars. However, these are not currently accepted or endorsed by the USDA, Extension System or U.S. manufacturers of home canning jars.

## **Question: Jar leakage during processing, but sealed. Is this safe to consume?**

Answer: Yes, this should be safe. There can be an issue of thermophilic spoilage when the product is held at an elevated temperature too long, but my guess is probably not. Watch for dome drying of the product from sitting out of moisture too long. Make sure the cans have sealed and remain sealed during storage. Consume these sooner than other batches. If you see any sign of spoilage or gas formation, discard the product. MB, LL

Example: A home canner pressured canned her green beans at 10:30 PM last night, and forgot to remove the lid and take them out of the canner. Today at 7:30 AM, she took them out. All sealed fine, but one only has about half jar of liquid left.

## **Question: Can I can applesauce without processing in a waterbath?**

Answer: The method, called Hot-Fill-Hold (take the very hot applesauce and put it in hot jars, sealed it with hot lids and turned them up-side down.), or open kettle canning, is not recommended for home canners. Its possible that not all the filled jars reached the proper temperature and under-processing occurred. For consistent results, we recommend the water bath canning method described in [Apples](#) . Keep an eye on these jars for signs of spoilage. Better yet, refrigerate them and eat the sauce within a few weeks.

## **Question: What is the problem with canners that do not have flat bottoms?**

Answer: If the canner bottom is not flat, there will not be complete contact with a flat heating element. Therefore, it will take longer for the water to heat to the proper temperature. However, since process times start when boiling or the critical pressure occurs, the process will still be safe. It will just take a longer time to get to the point where the clock starts. The product will be somewhat overcooked but it will be safe.

## **Question: Are microwave pressure cookers safe to use for canning foods?**

Answer: They are safe to use for simple cooking of foods. However, they should not be used for canning low acid foods because the actual pressure inside the cooker cannot be monitored. Because of the the danger from underprocessing, microwave canning is not recommended!

## **Question: Can adding red wine vinegar in place of water in the canned meat jars give a more tender result. Is this safe?**

Answer: Adding vinegar might make the meat more tender although the extremely long heating times should make a tender product without added acid. Adding vinegar will not make this product unsafe, but we do not recommend that consumers modify the recipes in the USDA Complete Guide to Home Canning.

See this link for information, read [Meat and Poultry](#)

## Question: homemade vinegar? It is safe to use as an ingredient in home canning recipes?

**Answer** - Store-bought vinegar is standardized to at least 5% acetic acid or about pH 3 (read the label).

The acidity of homemade vinegar is variable because of variation in characteristics of the starting material. It could contain more or less acid.

To assure a safe product when pickling or canning with vinegar, the USDA Complete Guide to Home Canning recommends using vinegar of at least 5% acidity.

Homemade vinegars should not be used in canning recipes.

## Question: Sometimes when I preserve foods with garlic, the cloves turn a blue color. Is it still safe?

**Answer** - Yes, the blue or green color is caused by an enzymatic reaction and is perfectly harmless. Visit [What's Cooking America](#) for tips on how to prevent this from happening.

## Question: Black seeds in home canned tomatoes, is there any danger in using these tomatoes?

**Answer:** If the seeds began to discolor during storage, it is probably not a sign of spoilage as long as the product was processed correctly and a vacuum, indicating a tight seal, has been maintained. It may be a reaction of harmless polyphenol compounds in the seeds with iron or other minerals in the water.

## Question: Are yellow tomatoes, pink, orange or red tomatoes canned the same way?

**Answer:** All tomatoes, no matter what the color, are canned by the same method as red tomatoes. Be sure to read up on [home preservation of tomatoes](#) in the series of fact sheets

## Question: Why do we add lemon juice or citric acid when canning tomatoes?

Answer: Tomatoes were once considered an acid food that could be safely canned in a boiling-water canner. However, because of the potential for botulism when some newer, less acidic tomato varieties are canned, certain precautions must now be taken.

Add 1 tablespoon bottled lemon juice to pints and 2 tablespoons bottled lemon juice to quarts of tomatoes. Or add one-fourth teaspoon crystalline citric acid to pints and one-half teaspoon crystalline citric acid to quarts of tomatoes. Acid can be added directly to jars before filling. Four tablespoons of 5 percent acidity vinegar per quart may be used instead of lemon juice or citric acid, however, it may cause undesirable flavor changes. Add sugar to offset acid taste if desired. Note: Don't use fresh lemon juice as its acidity varies. Tomato canning tablets should not be used as they are ineffective.

Be sure to read up on [home preservation of tomatoes](#)

## Question: Is there anything you can do to prevent the darkening of home canned corn?

Answer: There are two ways for corn to darken; 1) by the enzyme polyphenoloxidase which acts before the corn is blanched and processed, or 2) by non-enzymatic oxidation reactions involving phenolic compounds in the corn with air to form dark pigments after processing (and often especially after the lid is removed). The non-enzyme reaction is catalyzed by the presence of harmless metal ions (like iron) that are normally present in corn tissue or in blanching or fill water.

Blanching the corn in boiling water according to directions in "[Sweet Corn](#)" should prevent the enzyme reaction so if those directions are followed, then the non-enzyme post-processing reaction is probably the culprit.

Sweet and white corn varieties tend to darken after canning more so than other varieties but switching varieties is not usually an option. The non-enzyme reaction can be inhibited by adding substances that are anti-oxidants (such as vitamin C) which binds metals so they cannot participate in the reaction (such as citric acid). There are commercial anti-browning solutions on the market. Follow the directions on the label for preparing an anti-browning solution and soak or blanch the corn in that. Some experimentation might be needed to determine the best way to add it. Because Fruit Fresh is composed of acids, it is safe to use since if it affects the pH at all, it will be to drop it and thus not result in an under processing situation. But

use only the minimal amount needed to prevent discoloration since it might affect the taste of the final product.

## **Question: There is a white substance surrounding pieces of canned squash. Is this safe to eat?**

**Answer:** A cloudy brine or white or gray flecks could be result of excess starch from over-mature vegetable or precipitated calcium salts from excessively hard water. If regular table salt was used instead of canning salt, anti-caking materials in the salt can precipitate. Neither of these situations is harmful and the product should be safe to eat if properly processed.

## **Question: Processed red beets turned out very pale in color and not a deep red. Why?**

**Answer:** The red pigments in beets (betalaines) are sensitive to high temperatures and can transform into a colorless compound during canning. Some varieties are more sensitive than others. The reaction is reversible and often the color of the canned product will return to a darker red after a few days of storage at room temperature.

Some people recommend that you leave two inches of stem and tap root attached to the beets before boiling to remove the skins. Then trim the stem and root and slice, dice or leave whole for canning. Use only tested recipes from Extension for canning beets.

## **Question: I would like to transfer honey into 3 oz. jars for short term storage. Proper canning steps?**

**Answer -** Clean the jars with hot soapy water, rinse thoroughly, and allow them to completely air dry. You do not have to boil them or use a chemical disinfectant. Pure honey keeps best in air-tight containers in a dry place at room temperature (70°F to 80°F). An air-tight cover is necessary because honey loses aroma and flavor and absorbs moisture and odors when exposed to air. Normally honey is low enough in water that no microorganisms can grow. But if moisture gets into it, it can dilute it and set up the right conditions for the growth of yeasts and molds. Honey that foams and smells like alcohol is spoiled and should be discarded.

Honey may crystallize or granulate as it gets older, or if it is refrigerated or frozen. This is a natural process and does not harm the honey in any way. To return crystallized honey to liquid form, place the open container of honey in a pan of hot (not boiling) water until crystals disappear. You can also do this to make filling into jars easier. Be careful not to overheat because too much heat causes honey to change color and flavor.

## Question: Is canning chocolate sauce safe?

Chocolate sauces are low acid recipes and are a risk for botulism food poisoning. Therefore any recipes that use the boiling water canning process are especially at risk.

The National Center for Home Food Preservation does not recommend canning fudge sauces.

Instead, try freezing fudge sauces. For recipes, see [Canning Chocolate Sauces Unsafe](#).

## Question: What are the directions for canning walnuts?

**Answer** - The best way to store nuts is to freeze them with minimal exposure to light and oxygen. After the kernels have been removed, place them in a plastic bag and store in the freezer. The nut meats will keep almost indefinitely when stored in the freezer. Kernels can be stored for short periods in the refrigerator.

- [Harvesting, Cracking, and Storing Black Walnuts](#)

## Questions and Answers: Pickling

**Question:** I have an old recipe that calls for adding a grape leaf to each jar of pickles. Why is this done?

**Answer:** Grape leaves contain tannins that supposedly inhibit the enzymes that make pickles soft. However, according to the National Center for Home Preservation, removing the blossom ends (the source of undesirable enzymes) will make the addition of grape leaves unnecessary.

**Question: Why is table salt not recommended for canning and pickling?**

**Answer: The salt we buy at the grocery store is usually not pure sodium chloride. Instead it is a mixture of sodium chloride, potassium iodide, dextrose, and an anti-caking agent. In the U.S., salt producers add potassium iodide at a level of 0.006% to 0.01% as a public health measure to reduce the incidence of goiter cause by iodine deficiency. Dextrose, also called glucose, is a simple sugar that stabilizes the iodide. The amount added is less than 0.04% and thus is not a significant source of calories. Calcium silicate is a white, odorless, tasteless, anti-caking compound that has no nutritional characteristics. It is usually added at levels less than 0.5%. It absorbs moisture inside the package that would otherwise cause the salt to stick together and not flow freely in the salt shaker.**

**Table salt is used for baking, cooking and normal table use. However, it is not recommended for canning recipes because the calcium silicate may cause clouding or settle to the bottom of jar. Furthermore, the iodide may discolor some foods. Neither of these effects make the food harmful to eat. However, the visual quality of the product is adversely affected.**

**Canning and pickling salts do not contain potassium iodide, dextrose or calcium silicate and thus can be used for cooking, baking, canning, pickling as well as for the table. Because anti-caking agents are not added, it may form lumps in humid weather or if exposed to moisture and should be stored in an air-tight container or re-sealable plastic bag. Kosher salt is usually pure salt and thus is also appropriate for pickling and canning. However, check the label to make sure it does not contain additives.**

**Question: Is there a safe process for canning pickled radishes?**

**Answer: At present there is no approved process for safe canning of pickled radishes. In order to be safe for consumption, a canned product must have an approved process (time and temperature) to assure shelf life at room temperature. We currently rely on the USDA Canning Guide for safe processes.**

**However, there are many recipes for preparing pickled radishes that are safe if you store them in the refrigerator.**

## **Questions and Answers: Freezing**

**Question: What is the correct method for freezing celery?**

**Answer: Select crisp and tender stalks of celery that are free from coarse strings. Wash thoroughly and cut into desired lengths for soups, or other cooked dishes in which you will use celery. Blanch in boiling water for 3 minutes, then chill quickly in ice-cold water. You can individually quick-freeze on a cookie sheet and package the pieces in small lots or after draining put them in a freezing bag and freeze in bulk. Read the "[Freezing](#)" article for more information.**

**Question: What is the correct way to freeze corn? Does it always have to be blanched?**

**Answer: Frozen corn on the cob is prepared by blanching small ears (1 1/4 inches or less in diameter) for 7 minutes in boiling water; medium size ears (1 1/4 to 1 1/2 inches in diameter) for 9 minutes, and large ears (over 1 1/2 inches in diameter) for 11 minutes. Cool in several changes of cold water and drain. To package, fill into quart or half-gallon freezer bags. Squeeze out air, seal, label, and freeze.**

**For frozen cut corn, blanch for 4 minutes, cool, and cut kernels from the cob at about three-fourths of their depth. Fill pint- or quart-size freezer bags to a level of 3 to 4 inches from their tops. Squeeze out air, leaving a 1-inch headspace, label, and freeze.**

**Corn kernels can also be individually frozen before packaging so that small portions can be removed from the freezer bags. Spread corn kernels on a cookie sheet or shallow pan and place in the freezer for a few hours until they are firm. Remove from the freezer and scrape the kernels into a freezer bag. Squeeze out air, seal, label, and return the frozen corn to the freezer.**

**Research has shown that unblanched super sweet corn can be held in frozen storage for up to 8 months without significant loss of flavor quality. Beyond 8 months of frozen storage, however, the blanched corn was preferred by a taste panel. The storage life of frozen corn is likely to vary depending on the variety used and growing conditions for a particular year.**

**So a good rule of thumb is that if the corn is to be eaten within the same year it is grown, it may not require blanching. However, for longer term frozen storage, blanching will result in a higher quality product. For more information read the article about [Sweet Corn](#) .**

**Question: What is the best way to preserve Walnuts?**

**Answer: The best way to store nuts is to freeze them with minimal exposure to light and oxygen. After the kernels have been removed, place them in a plastic bag and store in the freezer. The nut meats will keep almost indefinitely when stored in the freezer. Kernels can be stored for short periods in the refrigerator. [Harvesting, Cracking, and Storing Black Walnuts](#) factsheet**

## **Questions and Answers: Sauerkraut**

**Question: Sauerkraut was made more salty than desired. What can I do?**

**Can it be rinsed and then packed into jars and then add clear water before processing in a boiling water bath?**

**Answer: Can it be rinsed and then packed into jars and then add clear water before processing in a boiling water bath? No. Sauerkraut should not be rinsed before processing since that would also rinse away natural acids in the brine. Heat destruction of harmful microbes is slower under less acid conditions so she would be creating a food safety risk.**

**Process the salty kraut as it is now. To reduce saltiness, rinse only **after** the jars are processed and opened.**

**Question: The brine level has fallen below the top of the cabbage in my sauerkraut. What should I do?**

**Answer: There is often not enough liquid to cover the cabbage properly.**

**Remove any dried, discolored leaves or any showing signs of mold growth. Then add enough boiled and cooled brine made from 1 1/2 Tablespoons of salt per quart of water to cover. For more information, read the article about [Sauerkraut](#) .**

**Question: My Sauerkraut is not fermenting properly, what's wrong?**

**Answer: I packed 100# of shredded cabbage in a blue, plastic 30 gal. (approx) barrel and made sure the salt water (1/2 c. per 10#) covered the cabbage. I placed the barrel in my basement in a room approx. 70 degrees. I put a clear plastic bag of**

salt water (1/4 c. salt per gallon of water) on the cabbage. During fermentation, I saw no bubbles and smelled only a little gas. When I took the plastic bag off today, there was a layer of mold. I took that off. The liquid, which didn't reach to the top of the cabbage, was "ropey", stringy, gelatinous. The kraut was mostly white instead of the translucent color I expected. Can you suggest what was wrong with the batch from the information I gave?

Looks like the fermentation process that forms acid did not get started allowing conditions for mold growth. Could also be some contamination occurred from spoilage microorganisms. White stuff could be yeasts. Throw this batch out since we really don't know exactly what is going on and eating molds and mold by-products can be dangerous. Next time thoroughly clean the container with mild unscented dish detergent, rinse completely, and sanitize with a chlorine sanitizer. Mix 1 teaspoon of common household bleach with 1 gallon of water. Add 2 teaspoons of white vinegar. Allow the sanitized container to air dry before using. For more information read this [sauerkraut factsheet](#)

## Questions and Answers: Breads and Cakes

**Question:** I have a recipe that recommends baking pumpkin bread in a glass canning jar. Is this safe?

**Answer:** During holidays, many recipes circulate that recommend baking breads and cakes in canning jars. Consumers like to do this because the jar makes an attractive package for their favorite recipe. However, many do not think about the safety of this practice. These products are not shelf-stable and so cannot be stored at room temperature. If they are stored at room temperature, harmful bacteria could grow in them and make the product unsafe to eat.

Typical instructions to bake bread or cake in a canning jar are as follows: batter is poured in the jar and then baked in an oven. As soon as it is done, it is taken out of the oven while the steam is still exhausting. The jar is immediately sealed to create a vacuum seal. The jars are then stored without refrigeration, for sometimes over one year.

Some cakes or breads prepared in this manner have shown a water activity of 0.93 and a pH of 7.2. Harmful bacteria can grow under these conditions. Furthermore, the oxygen-free environment due to the vacuum seal is ideal for the growth of

*Clostridium botulinum*, the bacteria that causes botulism. Therefore, baking bread or cake in a canning jar and storing it at room temperature is not a safe practice.

If breads or cakes are baked in canning jars, seal them after they are completely cooled so that a vacuum seal is not created. This will prevent the growth of *Clostridium botulinum*. Also, immediately refrigerate. Refrigeration temperatures will prevent the growth of other harmful bacteria that can grow at the water activity and pH typically found in these types of products. The shelf-life in the refrigerator is several weeks.

Additionally, there is always the risk of having the jar break in the oven or upon removal from the oven. Also, the jars can be very hot so use oven mitts to prevent burns.

From: Dr. Angie Fraser, Food Safety Specialist, North Carolina State University.

**Question: Is it safe to bake and store cakes and breads at home using canning jars?**

**Answer:** Recipes for canned breads and cakes as gift items seem to appear each year around Christmas time. These products are typically made by pouring batter into glass canning jars and baking them in the oven. Once the cake or bread is done, the steaming jars are taken out of the oven and then sealed and cooled to create a vacuum. Most recipes claim that they can be stored without refrigeration for about a year. Some say they will keep indefinitely.

The microorganism we are concerned about in these products is *Clostridium botulinum*. If spores of this type of bacteria are allowed to germinate and grow, deadly botulism toxin is produced. Very small amounts of the toxin can cause an often fatal disease called botulism. *Clostridium botulinum* spores are abundant in nature but fortunately will only grow and produce toxin in unrefrigerated high moisture foods that are low in acid and exposed to little or no oxygen. These conditions occur in canned foods such as asparagus, green beans, beets, and corn. Thus low-acid canned foods must be processed in pressurized retorts at temperatures of 240 degrees F or higher to make sure that the heat resistant spores are killed.

Outbreaks of botulism from more unusual sources have been reported such as garlic in oil mixtures, improperly handled baked potatoes wrapped in aluminum foil, and home-canned or fermented fish. Some research studies have shown that low acid

canned bread or cake products may have characteristics that are favorable for growth of *Clostridium* spores.

Several years ago, a professor of Food Science at Penn State developed a recipe for canned bread. It was carefully formulated so that acid and moisture levels would prevent the growth of *Clostridium botulinum* spores during room temperature storage. The product can be safely made as long as the original Penn State recipe is followed exactly as written. However, there is a significant risk that the creative cook may make ingredient substitutions or omissions that could significantly change the pH of the product such that conditions might be more favorable for growth of *Clostridium* spores.

In addition to the risk of botulism, there is also a significant risk for consumers to become injured from broken glass when baking cakes and breads in glass canning jars. Canning jars are intended for use in hot water baths or pressure canners. They are not designed to withstand the thermal stresses that occur with dry oven heat.

Therefore, Penn State strongly discourages consumers from canning cakes and breads in jars. Botulism is a serious and often fatal disease and no consumer should take unnecessary risks with this microorganism. If someone gives you a home canned cake or bread product, assume that it is unsafe to eat and discard the contents.

## REFERENCES AND ADDITIONAL INFORMATION

- [Botulism](#), Centers for Disease Control and Prevention
- Growth of *Clostridium sporogenes* PA 3679 in home-style canned quick breads. Aramouni, F. M., K. K. Kone, J.A. Craig and D.Y. C. Fung. 1994. J. Food Protection 57: 882-886.

The safety of a home-style canned quick bread was investigated using spores of *Clostridium sporogenes* putrefactive anaerobe (PA) 3679. Baking was done at 177 degrees C for 30, 40 and 50 min, at 191 degrees C for 45, 50 and 55 min, and at 204 degrees C for 40, 45 and 50 min. Products were analyzed for pH, water activity (aw) and vacuum level. The microbial quality of the products was determined before and after baking. Of the products baked at 177 degrees C, some were stored for 90 days at room temperature (23 to 25 degrees C) or in an incubator at 35 degrees C to study their shelf-life. Inoculated and endogenous vegetative cells and their spores were counted before and after baking and after storage using Fung's Double

Tube method. Results showed germination of endogenous spores in uninoculated products after baking at 177 degrees C for 30 min and storage at 35 degrees C for 90 days. Survival of inoculated *C. sporogenes* PA 3679 was detected for all baking and storage treatments. Further work is recommended to determine safe processing procedures for this type of product.

## Questions and Answers: Artificial Sweeteners

**Question:** Can artificial sweeteners be used when canning fruits?

**Answer:** In general, non-nutritive (artificial) sweeteners are not recommended for canning. Aspartame containing sweeteners such as Equal or NutraSweet degrade with heat and lose their sweetening power. Saccharine-based sweeteners such as Sweet'N Low, Sugar Twin, or Sweet 10 become bitter when exposed to canning temperatures and should be added after the canned fruit is opened.

Sucralose or Splenda is a new artificial sweetener derived from sugar molecules and will not produce an aftertaste when heated.

**Question:** Can Splenda (sucralose) be used in preserving food?

**Answer:** The following answer is taken from [The National Center for Home Food Preservation](#) website.

Granular Splenda<sup>®</sup> does not provide preservative properties like sugar. There has not been any published research work with using sucralose in the canning of fruits at home. If one uses Splenda<sup>®</sup> instead of sugar, our best assumption at this time is that the texture and color preserving aspects of sugar syrup won't be there. The expectation is that the result would be like canning in water except for the additional sweetness contributed by the Splenda<sup>®</sup>. The USDA fruit canning directions do allow for water canning, as there is adequate preservation for safety from the heat and not sugar. There should be no reason why Splenda<sup>®</sup> cannot be used in these heat-processed products, as it is heat stable, but some people do notice an aftertaste in other products, so it's possible it might change in flavor a little over storage time.

In other cases, where sugar is important, like some preserves or pickled fruits, it is not recommended that substitution of Splenda<sup>®</sup> be used for sugar if the product is

to be canned for shelf stability. Splenda® cannot be used in traditional Southern preserves, like fig, peach or pear preserves, which are whole or uniform pieces of fruit in a very thick sugar syrup. (These preserves are not jam or pectin gel products.) Sugar is required for the preservation of these products as published, with very short boiling water canner processes. Without that sugar, they also become like fruit canned in water and the longer fruit canning process times would be needed.

You could use Splenda® as the optional sweetener in a jam or jelly made with a no-sugar needed pectin, such as Mrs. Wages™ Lite Home Jell® Fruit Pectin or Ball® No-Sugar Needed Pectin. With these low-methoxyl pectins, no sugar is required at all. Sugar substitutes can be added as desired simply for flavor. The package inserts with these pectins give instructions on when to add the sugar substitutes (usually after all the cooking, right before filling the jars). We have not yet tried Splenda® with these pectins with an extensive variety of fruits, however.

## Questions and Answers: Jams and Jellies

**Question:** Wild Black Cherry Jam, safe to consume?

A client would like to make jam from wild black cherries and wants to know if it is safe to do so. We do know the leaves of this cherry plant are toxic. We have been unable to find any information about the fruit. Can you help?

**Answer -** The fruit is safe to consume. The leaves are toxic.

**Question:** Where can I purchase ClearJel for thickening canned fruits and jams?

**Answer -** ClearJel is a heat stable starch that is sometimes available in candy making or baking supply stores or in stores with a good home canning department. You can easily find it for sale online.

**Question:** How do I get consistent results for jams and jellies?

**Answer:** Problems with jams and jellies are usually the result of not using good quality materials or not following directions adequately. Use only sound, good flavored fruit at the maturity level specified in the recipe. Follow the directions for

the exact ratio of fruit to sugar and acid since this is often crucial for obtaining good gel formation. Do not over or under-cook and make sure you process the filled and sealed jars in a boiling water bath. The directions on the back of commercially available pectin mixes are often the best advice for obtaining consistently good results.

Additional information on making jams and jellies can be found in the [Jelly, Jam, Spreads](#) article.

**Question: Can I use Agave Syrup to make jams and jellies?**

**Answer:** Since Agave is similar to honey (in that the main sugar type is fructose) one could start by using guidelines for replacing cane sugar with other sweeteners including honey when making jams and jellies.

Sugar helps in gel formation, contributes flavor to the jelly, and at the concentration of 55 percent by weight, serves as a preservative. Cane sugar or beet sugar (both sucrose) is the usual source of sugar in jelly or jam. Corn syrup or honey can replace part of the sugar in jelly recipes. The flavor of the fruit may be overcome if too much honey or corn syrup is substituted. To substitute honey or corn syrup for sugar use these amounts.

- For no-pectin-added jelly—Corn syrup may replace  $\frac{1}{4}$  of the sugar. Honey may replace  $\frac{1}{2}$  the sugar
- For pectin-added jelly—Powdered pectin—Corn syrup may replace up to  $\frac{1}{2}$  the sugar. Honey may replace up to 2 cups of sugar.
- Liquid pectin—Corn syrup or honey can replace up to 2 cups sugar.

**Do not attempt to reduce the amount of sugar called for in traditional recipes. Reduction in the amount of sugar will interfere with gel formation and result in a product in which yeasts and molds can grow.**

**In short, try starting with  $\frac{1}{2}$  sugar and  $\frac{1}{2}$  agave syrup.**

**For more information, read [What is Agave Syrup?](#)**

## **Vegetables and Herbs Stored in Oil**

**Question: Are there any safe methods for preparation, processing, and storage of vegetables and herbs in oil?**

Authors of a June 2011 article in the Journal of Food Protection Trends reviewed extension publications for processing and storing vegetables and herbs and oil. The following recommendations have been issued based on the risk *Clostridium botulinum* growth and formation of deadly botulism toxin:

For canning vegetables marinated in oil, use only the three recipes in Section 6 of the [USDA Complete Guide to Home Canning](#). These are for 1) marinated whole mushrooms (6-18), 2) marinated peppers (60-20), and 3) pickled three-bean salad (6-14). There are recipes for canned garlic, tomatoes, or other vegetables or herbs that have been tested for safety.

Garlic, vegetable or herb in oil mixtures may support the growth of *C. botulinum* bacteria. For safety reasons, they should be made fresh. Leftovers should be refrigerated for use within three days, frozen, or discarded.

**Question:** Is there a safe method for preserving hot peppers in oil?

An individual has asked about the safety of preserving little red thin hot peppers (dried ) made in Italy browned in olive oil kept in a jar at about 75 degrees F. The family has been making this for hundreds of years. Is this something that should be refrigerated? (Does it have the same recommendations as garlic and oil?)

**Answer -** The peppers may be dry enough after cooking to be safely preserved in oil. But we just can't be sure that the moisture content, which is critical to prevent botulism, is low enough. Recommendations are always conservative in these cases so treat as garlic in oil. Better yet, preserve these items in vinegar or lemon juice. See the link below for more on this topic.

See an update to this answer in "Prepared vegetables and herbs stored in oil".