



Preserve Today, Relish Tomorrow

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Preserving Citrus

Basic Food Safety & Sanitation

When preparing food for preservation, cleanliness is essential in preventing food-borne illness, especially when handling raw fish, meat and other foods that won't be cooked (including fruits and vegetables).

Step 1: Clean Your Work Area

Wash your sink and countertops with soap and warm water, rinse well, and dry with clean paper towels. Then apply a sanitizing solution such as bleach (1 scant teaspoon of liquid unscented bleach to 1 quart of water). Spray well and allow to air dry or let sit for 30 seconds and wipe dry with clean paper towels. If using commercial sanitizers, follow the manufacturer's instructions. Wash and sanitize both before and after preparing food.

Step 2: Wash Your Hands

Wet your hands, apply soap, lather, and then scrub for at least 20 seconds. Rinse well and dry with paper towels or a clean cloth. If using gloves, first wash your hands and then wash the gloves following these same procedures. Wash your hands again when switching tasks.



Image Source: FDA

Step 3: Avoid Cross-Contamination

Be sure to use clean cutting boards and kitchen utensils and wash them thoroughly before switching from one food type to another or use separate boards and utensils for different types of foods (e.g., use one board for raw fish or meat and another board for vegetables, herbs, etc.). Wipe up spills promptly, and re-clean your work area as often as necessary.

Basic Food Safety & Sanitation – cont.

QUICK TIPS

- use paper towels or a fresh clean dish towel to clean surfaces
- wipe up spills immediately with paper towels or a clean dish towel (and then put that towel straight into the laundry basket)
- change dish cloths and towels **every day**
- sanitize sponges between uses by using one of these 3 methods:
 - moisten the sponge and heat in a microwave for one minute
 - wash in a dishwasher with a drying cycle
 - soak in a bleach solution for one minute
- replace sponges frequently

Step 4: Prepare Your Food

Do not wash raw seafood, meat and poultry – doing so can spread pathogens and potentially cross-contaminate other foods. Wash **all** fresh produce, even if the skin or rinds won't be eaten. To wash produce, rinse under cool running water in a clean sink – do not soak.

QUICK TIPS

- clean produce right before using
- gently rub soft fruits and vegetables (such as tomatoes) with your hands under running water to remove dirt
- scrub firm fruits and vegetables (such as potatoes, carrots, and melons) with a vegetable brush (don't forget to clean the brush!)
- remove outer leaves of lettuce and cabbage before washing
- rinse herbs and sprouts, then shake to remove excess water
- use a kitchen sink sprayer to rinse berries in a colander, gently turning and shaking the colander to remove dirt and excess water

For more information on cleaning and sanitizing the kitchen using inexpensive and food-safe household products, check out this publication: <https://extension.colostate.edu/docs/pubs/foodnut/kitchen-sanitize.pdf>

When In Doubt, Throw It Out

Never taste food that looks or smells strange to see if it can still be eaten. Most bacteria that cause foodborne illness are odorless, colorless, and tasteless.



Preserving Citrus

- **Freezing**
- **Dehydrating and Candied**
- **Traditional Preserving**
- **Making salts and infused sugar cubes**
- **Using pectinase for canning citrus**

Freezing Citrus

Preparation – Select firm, tree-ripened fruit heavy for its size and free from soft spots. Wash and peel. Divide fruit into sections, removing all membranes and seeds. Slice oranges if desired. For grapefruit with many seeds, cut fruit in half and remove seeds; cut or scoop out sections.

Syrup Pack – Pack fruit into containers. Cover with cold 40 percent syrup made with excess fruit juice or water. Leave headspace. Seal and freeze.

Juice – Select fruit as directed for sections. Squeeze juice from fruit, using squeezer that does not press oil from rind.

Sweeten with 2 tablespoons sugar for each quart of juice or pack without sugar. Pour juice into containers immediately. To avoid development of off-flavors, pack juice in glass jars. Leave headspace- see chart below. Seal and freeze.

PRO TIP: Our experience shows we can freeze whole lemons and limes. Always wash and dry the whole citrus fruit before freezing. We have no experience with oranges or mandarins.

Once thawed lemons and limes hold their shape quite well and can be sliced. The texture is softer than a fresh fruit. Fruit with thicker skins may be zested. Thinner skins

Headspace to Allow Between Packed Food and Closure

Type of Pack	Container with wide top opening		Container with narrow top opening	
	Pint	Quart	Pint	Quart
Liquid Pack*	½ inch	1 inch	¾ inch	1 ½ inch
Dry Pack**	½ inch	½ inch	½ inch	½ inch
Juices	½ inch	1 inch	1½ inch	1½ inch

*Fruit packed in juice, sugar, syrup or water; crushed or pureéd fruit.

**Fruit or vegetable packed without added sugar or liquid.

Candied Citrus Peel**Yield:** about 2 cups

Refreshing, addictive, and absolutely satisfying at the end of a meal. Candied citrus peel keeps so well that it is a good idea to double the recipe.

- 2 grapefruit or 3 oranges or 6 lemons
- 2 cups sugar
- 3 tablespoons light corn syrup
- water

Peel the fruit in ~3/8" thick strips, using only the zest and white peel. If the white is very thick, trim it down a little.

Put the peel in a pan, cover with cold water and simmer for 30 minutes. Drain, cover with cold water again, and simmer until tender. Drain.

Mix one cup of the sugar with the corn syrup and ¾ cup water in a heavy saucepan; add fruit peel and stir over low heat until most of the syrup has been absorbed. Cover and let stand overnight. Reheat until syrup melts and citrus peel can be separated, then cool a little and drain. Pour remaining sugar (or more, if needed) into a baking dish and roll the peel in it, turning so that all the pieces are coated. Let them stand until they are dry; overnight or longer. Stored airtight, they will stay fresh for several months. If they become too dry put a lemon in the container for a day or two and the peel will soften.

The citrus peel may also be dried in an electric dehydrator. To dry on dehydrator trays, set temperature to 135°F, and dehydrate for 8-24 hrs. Check your candy every few hours. Rotate trays for even drying. Candy is done when dry but pliable, not brittle.

To test for dryness, condition your candy by filling a jar 2/3 full and close with a lid. If after 24 hours there is some condensation on the sides of the jar, return the candy to the dehydrator.

Source: Sunset Magazine

Dried Citrus

Prep Time: 20 Minutes **Bake Time:** 6 Hours

1. Preheat oven to 150°F.
2. Wash the citrus fruit and cut into uniform slices, about 1/8"- 1/4" thick.
3. Arrange on a baking tray over two paper towels to absorb the juices and continue layering the paper towels and fruit in a stack.
4. To bake, arrange the slices in a single layer on a baking sheet lined with parchment paper.
5. After 3 hours, place a sheet of parchment paper over the citrus slices and cover with another baking sheet. Hold both baking sheets together and flip so that the citrus slices bake evenly on both sides.
6. Return to the oven for another 3 hours or until dried; they should be bendable and no juice should come out.

Alternate technique: dry the slices in a dehydrator at 130°F for 16-18 hours, flipping several times for an even dry.

Source: Sunkist.com, 2018

Traditional Preserved Lemons**Yield:** 1 quart jar

- 10 lemons, divided
- 1/2 cup pickling or canning salt, divided
- 4 bay leaves
- 4 cinnamon sticks (each about 4 inches)
- 1 teaspoon whole black peppercorns (optional)

1. Prepare jar and lid. For this recipe, the jar needs to be sterilized prior to packing. Boil jar in water for 10 minutes and keep hot until ready to use.
2. Wash 5 of the lemons in warm water, scrubbing well to remove any dirt and wax, and dry well using paper towels. Cut a thin (1/8 inch) slice off the stem end. From stem end, cut each lemon into quarters, without cutting through the bottom end and leaving it intact. Juice the remaining 5 lemons to measure 1-1/2 cups juice.
3. Sprinkle 1 tablespoon pickling salt over the bottom of sterilized jar. Working over a bowl, pack 1 heaping tablespoon salt into each lemon before placing in the jar, stem end up.
4. When 3 lemons have been salted and packed, slip bay leaves and cinnamon sticks against sides of the jar and add peppercorns, if using. Repeat with remaining lemons and salt. Cover with the remaining salt.
5. Fill jar with lemon juice to within 1/2 inch of top of jar. Center lid on jar. Screw band down until resistance is met, then increase to fingertip-tight.
6. Place jar in a dark, cool cupboard for 2 weeks, shaking every day to distribute the salt. After 2 weeks, the lemons are ready to use. Remove pulp and membrane, using only the peel. Rinse under water to remove excess salt and dry with a paper towel.
7. Store preserved lemons in a container with an airtight lid. Cover and refrigerate for up to six months

DIY Meyer Lemon Sugar Cubes**Ingredients**

- 1/2 cup sugar: Any kind of sugar will work
- Meyer Lemons: You could use any kind of citrus fruit, mint leaves, or spices!!

Tools

- Zester or grater
- Blender or food processor
- Small molds i.e., used for candy

1. Zest the rind from one Meyer Lemon. Make sure not to get the pith (the white part).
2. Add the zest into your blender/food processor and 1/2 cup of sugar, mix until well combined.
3. Pour the contents into a bowl. Test the mixture to make sure it sticks to itself. Take a pinch and if it holds together and does not crumble then it is good to go.

You can add a half a teaspoon of water to make the sugar a little wetter, or you can omit the water if your mixture sticks together easily.

4. Scoop the sugar into the molds. Use the back of a plastic spoon to tamp it down tightly. Scrape any extra sugar off the tops to make them level. This amount of sugar should fill one mold if you have packed and scraped appropriately.
5. Let your sugar cubes sit overnight and dry completely.
6. Unmold them and ENJOY!!

Citrus Flavored Salts

Yield: 1 cup

- Zest from 1 lemon
- Zest from 1 lime
- 1 cup course sea salt

If using Fresh lemon and Lime zest:

- Use a zester to zest the lemon and lime. Save the fruit for a later use.
- Mix the lemon, lime, and salt in a mixing bowl before dehydrating.
- Spread the lemon-lime salt over a dehydrator sheet and dehydrate at 125 degrees F for about 6-8 hours, or until the zest is completely dried through.

Alternatively, spread the lemon lime salt over a baking sheet and dry in the oven at 125 degrees F about 6-8 hours, or until the zest is completely dried through. If your oven doesn't go to that low of a temperature, crack the oven a bit to let in some air flow.

- Next, grind down the larger zest into the salt with a spice grinder or mortar and pestle.

If using DRIED lemon and lime zest. simply grind down the zest into the salt with a mortar and pestle. A spice grinder works well, try not to over process.

Source: <https://www.chilipeppermadness.com/recipes/citrus-lemon-lime-salt/>

Using Pectinase For Canning Citrus

Pectinase – Pectic Enzyme

Often, when we are canning marmalade, the recipe will tell us to remove the membrane or pith of our citrus fruit. We do a process called "*Supreming*". This is a laborious process of trimming citrus fruit, removing the pith from the peel and then carefully removing the membrane so the marmalade will not be bitter.

Pectinase is a naturally occurring enzyme that breaks down pectin in the cell walls of some plants and fruits. We can use it to remove the pith and membrane from citrus. It's used in the fruit juice, beer, and wine industries to clarify the juices.

To use it, you mix 1-2 grams with 1 liter of water (1 tsp. = 4.8 grams). Soak at room temperature for a few hours or overnight in the refrigerator. Check

periodically for your best results. Gently rub the segments to remove the remaining pith or membrane and then rinse thoroughly.

Pectinase will not completely dissolve all pith, but it will be easier to remove.

Suppliers:

Modernist Pantry – Pectinex Ultra SP-L (\$14.99/2 fl. oz. bottle)

- 1 -2 grams per liter of water
 - o 1 tsp. = 4.8 grams
 - o 1 Tbps. = 14.4 grams
 - o 1 gram = 0.21 tsp.
 - o 2 grams = 0.42 tsp.
- Soak at room temperature for a few hours, or overnight in refrigerator
- Rub/rinse to remove remaining pith.

North Mountain Supply – powdered pectic enzyme (\$6.99/2 oz. jar)

- ½-1 tsp. per gallon of water (minimum/maximum per mfr.)

Canning Citrus (per NCHFP Grapefruit and Orange Sections)

Quantity: An average of 15 pounds is needed per canner load of 7 quarts; an average of 13 pounds is needed per canner load of 9 pint – an average of about 2 pounds yields 1 quart.

Quality: Select firm, mature, sweet fruit of ideal quality for eating fresh. The flavor of orange sections is best if the sections are canned with equal parts of grapefruit. Grapefruit may be canned without oranges. Sections may be packed in your choice of hot water, hot citrus juice or syrup.

https://nchfp.uga.edu/how/can_02/syrups.html

Procedure – Raw Pack: Wash and peel fruit and remove white tissue to prevent a bitter taste. If you use syrup, prepare a very light, light, or medium syrup and bring to boil. Fill jars with sections and hot water, hot juice or hot syrup.

Ladle hot liquid into hot jars one at a time, leaving ½ - inch head space. Remove air bubbles and adjust headspace, if necessary, by adding more hot liquid. Wipe jar rim with a clean, damp cloth. Attach lid. Screw down band until resistance is met, then increase to fingertip-tight. Place jar in canner. Continue to fill remaining jars one at a time.

Process jars in a boiling water bath or atmospheric steam canner for:
0-1000ft. =10 minutes, 1001-6000 ft = 15 minutes, above 6000 ft. = 20 minutes.

Removing canner lid, wait 5 minutes for boiling water. Wait 5 minutes before lifting the lid for an atmospheric steam canner. Remove jars. Cool jars for 12-24 hours, wash, label, and store in a cool dark location.

References:

<https://blog.modernistpantry.com/advice/appealingly-peeled/>
<https://www.discovermagazine.com/technology/the-science-of-perfect-citrus-supreme>

Resources for tested recipes:

UC Master Food Preservers of Central Sierra https://ucanr.edu/sites/mfp_of_cs/

UC Master Food Preserver Program <https://mfp.ucanr.edu/>

National Center for Home Food Preservation: <http://nchfp.uga.edu/>

Complete Guide to Home Canning. 2015.

http://nchfp.uga.edu/publications/publications_usda.html

Also available in paper copy from Purdue Extension (online store is located at https://mdc.itap.purdue.edu/item.asp?item_number=AIG-539)

So Easy to Preserve, Sixth Edition. 2016. Bulletin 989. Cooperative Extension/University of Georgia, Athens <https://www.fcs.uga.edu/extension/so-easy-to-preserve>

Ball Blue Book Guide to Preserving. 2020. Newell Corporation.

Ball Complete Book of Home Preserving, 2020. Bernardin, Newell Corporation.

Bernardin: <https://www.bernardin.ca/>

Ball: <https://www.ballmasonjars.com/>

Drying Fruits and Vegetables

https://nchfp.uga.edu/publications/uga/uga_dry_fruit.pdf



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