

Preserving\_2004.txt

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Newsgroups: rec.food.preserving  
Subject: Rec.food.preserving FAQ, veersion 2.3, part 1  
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Date: 1 Jan 1996 20:22:27 -0500

Part 1 of 6

Version 2.3

Introduction to the Group, Table of Contents, Canning

FREQUENTLY ASKED QUESTIONS (FAQ) in the group rec.food.preserving

LONG VERSION

This file is a compliation of shared knowledge and answers to frequently asked questions of the group rec.food.preserving. As such, this file is updated. Be a contributor--point out mistakes, write sections and reviews, provide us with new sources. All contributors will be cited in this file.

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Last Updated: 12-18-1995

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CHARTER

Rec.food.preserving is a newsgroup devoted to the discussion of recipes, equipment, and techniques of food preservation. Current food preservation techniques that rightly should be discussed in this forum include canning, freezing, dehydration, pickling, smoking, salting, distilling, and potting. Foodstuffs are defined as produce (both fruits and vegetables), meat, fish, dairy products, culinary and medicinal herbs. Discussions should be limited to home-grown or home-preserved foods.

[I have a refrigerator and live near 5 supermarkets. Why bother to preserve food?]

If you have a successful garden or orchard, have a hunting or fishing license, or know friends and neighbors that do, you will eventually be presented with an abundance of free foodstuffs. (Check out the zucchini relish recipe in pickling for one common surplus.) U-Pick sites, roadside stands, and farmers markets sell unusual varieties of produce at close to perfect ripeness, ready to be preserved. Even supermarket produce in season is abundant, cheap, and can be worth preserving.

If you have ever walked into an upscale food store, you might have noticed that dried foods, exotic jams, chutneys, marmalades, flavored vinegars and oils, pickles, cheeses, cured and smoked meats, etc,

all are expensive preserved foods. However, these items can be all be readily duplicated at home, given the ingredients, expertise, and time.

Commercially processed food can contain many ingredients that you might want to avoid, anything from MSG, BHA, BHT, to salt, sugar, or starchy thickeners. By preserving food yourself, you can control your diet.

Into recycling and reducing your garbage? If you can, you reuse your glass jars and rings, throwing away just the lids. However, most techniques require a fair amount of fresh, clean water.

Food preserving is fun. Many preserving recipes are family traditions, passed on through many generations. Often, the foods we preserve can tell us much about our past, while trading recipes tell us about each other.

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- What are the various woods used for smoking?
- :) - Rick, do you have any politically incorrect views about smoke cooking that you enjoy getting flamed about?

#### Specific Foods

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- How do I make my own bacon at home?
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#### Other Sources and References

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- Using Ascorbic Acid
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- How to reach the Jelly Stage/The Fork Test

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- Botulism. What is it?
- I'm confused about when the toxin is produced. Tell me more about the bacterium.
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V. Recipe Cavaets and Troubleshooting (part 6)

- I just got a recipe from rec.food.preserving that I'd like to try. Is it safe to make?
- Most of the recipe measurements posted here are not metric. Can you help me?
- I got some recipes from my grandparents. Are they safe? How can I make them safe?

VI. Other Sources (besides this FAQ) (part 6)

- This FAQ doesn't tell me what I need to know!
- General Reference Books
- Specific Techniques and Interests
- Books and Guides to Equipment
- Food Preserving Books of Historic Interest

Pamphlets

Magazines

Phone

Internet Sites

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----- I. The Techniques of Food Preserving -----  
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## A. CANNING

### 1. GENERAL QUESTIONS

A.1.1 [What do I *\*really\** need to know about canning?]

Basically, canning food is preserving food by: 1) placing it in an hermetically sealable container, then 2) applying a heat treatment that will destroy microorganisms and inactivate enzymes that would spoil the product or render it unsafe. (from Jean Bergeron, food chemist, <jbergero@agr.gouv.qc.ca>). A vacuum is created by a change in pressure caused by heating, then cooling said sealable cans and jars--Boyle's Law ( $PV=nRT$ ) in action. The heat is generally created by either a boiling waterbath or a pressure canner (Boyle's Law again).

What you absolutely need to know is whether your product is highly acidic (low pH) or not. High acid foods, like fruits and pickles, can be canned in a boiling waterbath; relatively low acid foods, like vegetables and meats, need to be pressure canned. You also need to know what your altitude is, because the higher you are, the lower the boiling temperature of water. Since you are creating an anerobic state, you need to be concerned about C. botulinum toxin.

A.1.2 [I made/got some home-preserved foods as a gift. How do I check them for safety?]

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EXAMINE ALL HOME-CANNED FOODS BEFORE USING THEM.

1. Inspect the can before opening:

Glass jars: metal lids should be firm and flat or curved slightly inward. There should be no sign of leakage around the rubber sealing compound. If there is mold growth around the exterior neck of the jar-- there may be mold growth inside. Check for signs of "gassiness"--floating food, bubbles rising in the food, swollen lid.

2. As the jar is opened, notice whether there is an inrush or an outrush of air. Air rushing out or liquid spurting out

indicates spoilage.

3. Smell the contents at once. The odor should be characteristic of the food. An "off" odor probably means spoilage (acid, acrid, sour, putrid, etc.).
4. Check the food carefully to see that it appears to have a characteristic texture and color. Liquids in all foods should be clear. Any change from the natural texture and/or color indicates spoilage. DO NOT TASTE ANY QUESTIONABLE FOOD.
5. Discard canned food with signs of spoilage.
  - a. High acid foods (fruit) may be discard in the garbage or disposal.
  - b. Low acid food (vegetables, meat, fish, poultry)

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must be discarded more carefully because it could contain botulinal toxin. Discard the spoiled food carefully using one of the following methods. Be careful not to contaminate your work area by spilling the food. Wear rubber gloves before handling food or containers.

1. Boil at full rolling boil for 20 minutes. Discard.
2. Burn.
3. Mix with 1-2 Tbsp household lye or 1 cup chlorine bleach in non-metal container and let stand overnight. Flush down the toilet, discard in garbage or garbage disposal.

Note: any containers or utensils that come in contact with spoiled canned should be carefully washed. Use soap and water to wash containers used for high acid foods.

Containers that come into contact with low acid foods should be sterilized with chlorine bleach or boiled for 20 minutes. Discard all lids, screw bands, wash cloths, sponges and rubber gloves used during detoxifying low acid foods.

6. As a safety precaution, boil all low acid foods (meats, fish, poultry, vegetables) BEFORE TASTING. Boiling destroys the botulinal toxin should it be present.
  - a. Boil most vegetables for 10 minutes (full rolling boil).

- b. Boil thick vegetables (spinach) for 20 minutes.
  
- c. Boil meat, fish and poultry for 15 minutes.

Prepared by Susan Brewer/Foods and Nutrition Specialist/July, 1990

EHE-682

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#### A.1.3 [Is home canning safe?]

Only two home-canning (processing) techniques are considered safe. The boiling waterbath process is used for high-acid (low pH) foods like fruit, while pressure canning is used to process low-acid foods such as vegetables. Open kettle canning, oven canning, crock pot canning, compost canning, canning with pills, microwave canning, dishwasher canning, steam canning (don't confuse with pressure

canning) are all outdated or disreputable canning techniques.

A.1.4 [What foods can be canned, and what foods shouldn't be canned?]

Foods considered high acid (pH lower than 4.6/4.7) can be boiling waterbath canned. (Taken from Putting Food By)

Foods at pH 2.0-3.0== lemons, gooseberries, underripe plums

Foods at pH 3.0-3.5== ripe plums, underripe apples, ripe oranges

and grapefruit, strawberries, rhubarb, blackberries, cherries, raspberries, blueberries, very underripe peaches and apricots

Foods at pH 3.5-4.0== ripe apples, oranges, grapefruit, overripe

blackberries, cherries, raspberries, and peaches, ripe apricots, underripe pears, pineapple, sauerkraut, (other pickles?)

Foods at pH 4.0-4.6 (BORDERLINE)==tomatoes, figs

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Above 4.6 or so, must be pressure canned.

Foods at 4.6-5.0==some tomatoes, depends on the variety. Green tomatoes are below 4.6. pimentos, pumpkin. USDA suggests that pumpkin butter cannot be canned safely.

Foods at 5.0-6.0==carrots, beets, squash, beans, spinach, cabbage, turnips, peppers, sweet potatoes, asparagus, mushrooms, white potatoes

Foods at 6.0-7.0==peas, tuna, lima beans, corn, meats, cow's milk, salmon, oysters, shrimp.

Above 7.0==hominy, black olives (each are lye cured). Leave these to the pros.

Need to also consider the size of your jars (half gallon size jars are made, but you probably shouldn't can with them), and the gooeyness of what you are canning. Pumpkin/squash purees and butters, and re-

fried beans probably shouldn't be canned--it will take a long time to get the center of the jar hot enough. However, squash and pumpkin chunks can be pressure canned, however.

#### A.1.5 [What does canning entail?]

These are two sample recipes, just to give a general idea of what is involved, one is for a waterbath treatment, the other involves pressure canning.

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#### CANNING FRUITS (PEACHES)

Fresh fruit for home canning should be at the peak of ripeness--they should have lost their greenish color and should yield slightly when squeezed. Fruit should be prepared (peeled, trimmed), treated to prevent browning, and hot-packed to exhaust air and make fruit more

pliable. Hot-packing will help prevent fruit from floating in the syrup.

Prepare syrup, hot pack fruit and water bath can. Use USDA Complete Canning Guidelines or "Canning Card" (EHE-660) for processing time.

#### Recommended Quantities:

Peaches, apples, pears:

17 1/2 lb fresh = 7 qt. 11 b = 9 qt.

1 bushel = 48 lb = 16-24 qt (2 1/2 lb per quart)

Berries: 1 1/2-3 lb (1-2 qt) fresh = 1 quart canned

Plums: 1 1/2-2 1/2 lb fresh = 1 quart canned

#### Preparing Jars

1. Wash jars by hand or in dishwasher. Rinse well.
2. Prepare lids according to manufacturer's directions.

## Preparing Peaches

1. Wash peaches under running water.
2. Skin removal (peaches, apricots):
  - a. Dip peaches in boiling water for 30-60 seconds.
  - b. Dip in cold (ice) water to stop heat treatment. Do not soak--remove immediately.
3. Cut peaches in halves, remove pits, slice if desired.
4. To prevent darkening put slices in any of these antidarkening solutions
  - a. a solution of 1 tsp or 3000 mg. of vit. C/ gallon of water.
  - b. a citric acid or lemon juice solution (1tsp citric acid USP grade or 3/4 cup lemon juice / gallon of water.
  - c. a commercial antioxidant solution.
5. Remove from antidarkening solution and drain just before heating or raw packing

6. Syrup

a. Sugar

Thin: 2 cups sugar to 4 cups water

Medium: 3 cups sugar to 4 cups water

Heavy: 4 1/2 cups sugar to 4 cups water (fruit may float)

b. Honey: 1 1/2 cups honey to 4 cups water

Thin honey: 3/4 cup honey, 3/4 cup sugar, 4 cups water.

c. Corn syrup:

Thin: 1 c corn syrup, 1 c sugar, 4 c water

Medium: 1 1/2 c corn syrup, 1 c sugar, 4 c water

Heavy: 2 c corn syrup, 2 1/2 c sugar, 4 c water

d. Fruit juice: pineapple, apple, etc.

h. Water: fruit may fall apart during processing.

7. Pack
  - a. Hot pack: heat fruit and syrup or water to boiling, then pack.
  - b. Raw pack: do not heat fruit prior to filling jars.
  - c. Pie pack: heat fruit in sugar only, no sugar, until juice drawn from fruit nearly covers fruit. Heat slowly to prevent scorching. Fill jars with hot mixture and process as for hot pack fruit.
8. Overlap fruit pieces in jars to minimize air spaces.
9. Work out air bubbles with plastic or wooden utensil.
10. Add liquid (syrup, fruit juice, water) leaving 1/2 inch of headspace.
11. Wipe off jar rims thoroughly to make sure the sealing surface is clean and free from fruit or sugar which would prevent sealing.

Processing Procedure:

1. Place filled jars on rack in canner so they don't touch sides.
2. Add hot water until the level is 1-2" over jar tops.
3. Place the lid on the canner and bring to a boil.
4. Start timing the canner when the water returns to a full boil.
5. Add more hot water as needed to keep level 1-2" over jar tops.
6. Process according to USDA Guidelines, see "Canning Card" (EHE-660)

Cooling Jars:

1. At the end of the processing time, remove the jars from the canner without disturbing lids or bands.
2. Place jars right side up on towel or rack away from drafts.

3. DO NOT tighten screw bands.
4. Lids will seal in 12-24 hours as they cool.

#### Checking Seals:

1. Jar is sealed if lid is depressed in center and does not move.
2. Remove screw bands from sealed jars, wash off any syrup which may have boiled out during processing, and store jars.
3. Unsealed jars should be reprocessed with new lids, or refrigerated and used within a few days.

#### Storing Home-Canned Fruits:

1. Remove screw bands from sealed jars.
2. Wipe jars with warm, sudsy water and dry (do not disturb lid).
3. Label and date.

4. Store in clean, cool (less than 90 F), dark, dry place.

Prepared by Susan Brewer/Foods and Nutrition Specialist/Revised, 1992

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#### Tomato-Vegetable Juice Blends

Tomatoes are a somewhat acid food. To make them safe for home canning ACID MUST BE ADDED. To each quart jar of tomatoes or tomato juice, 2 Tbsp of lemon juice, or 4 Tbsp of 5% vinegar, or 1/2 tsp of citric acid must be added. When adding vegetables, which are low in acid, the instructions must be followed exactly.

You may add less vegetable, but you must not add more vegetable than the recipe calls for. You may adjust the spices and seasonings to your taste, for example more or less pepper, add a little tabasco, or more sugar. And, you may vary the kinds of

vegetables as long as you do not add more than three cups total vegetables to 7 quarts of juice. For example, you may use 2 cups of onions and 1 cup of celery, or 1 cup each of green pepper, onion, and carrots. But no more than 3 cups total of vegetables will be safe.

An average of 22 pounds of tomatoes is needed per canner load of 7 quarts.

Preparation for Canning:

1. Wash jars by hand or in dishwasher. Rinse well.
2. Prepare lids according to manufacturer's directions.
3. Put 2 to 3 inches of water in pressure canner, or 5 to 7 inches of water in boiling water bath canner. Be sure canner has rack.
4. Start water heating. It should be hot but not boiling when

the jars go in.

Prepare juice:

1. Wash tomatoes and vegetables under running water. Trim and discard any bruised or discolored sections.
2. Chop carrots, onions, celery and green peppers, or your preferred combinations. For 7 quarts of juice you may add up to 3 cups of chopped vegetables.
3. To prevent juice from separating, quickly cut about 1 pound of fruit into quarters and put directly into saucepan. Heat immediately to boiling while crushing. Continue to slowly add and crush fresh tomato quarters into the boiling mixture. Make sure the mixture boils constantly while you add the remaining tomatoes.
4. Add the chopped vegetables to the boiling tomatoes.
5. Add sugar, salt, and spices. For 7 quarts of juice, a

mixture of 1/3 C sugar, 1/4 C salt, 1 Tbsp celery seed and

1/8 tsp cayenne pepper is a good combination.

6. Simmer mixture for 20 minutes.
7. Press hot mixture through a sieve or food mill to remove skins and seeds.
8. Reheat juice to boiling.

Fill jars:

1. Add 2 Tbsp lemon juice (or alternatives-see above) to each quart jar.
2. Fill boiling juice into jars, leaving 1/2 inch headspace.
3. Wipe top sealing edge of jar with a clean damp towel.
4. Adjust 2-piece canning lids. Tighten ring bands using thumb and two fingers until just snug, then using whole hand, tighten 1/4 turn further.

Processing:

1. Place jars on rack in canner so that they do not touch sides.
2. Add hot water to boiling water bath if necessary to bring water 1 inch over tops of jars.
3. Cover canner, or lock pressure canner lid into place.
4. Turn up heat.
5. Process:

Boiling water bath canner: when water reaches full boil, begin to count processing time. Set timer for specified time.

Pressure canner: When steady stream of steam issues from vent, set timer and allow to exhaust steam for 10 minutes.

After 10 minutes, close petcock or put weighted pressure regulator on vent. When dial gauge reads 11 psig, or when weight begins to rock or hiss at manufacturer's stated rate,

set timer for specified processing time, and gradually reduce heat to maintain proper pressure.

6. Add water to boiling water canner if necessary to maintain proper depth.

PROCESSING TIMES for canning in Illinois:

Boiling Water	Pressure Canner (10/11 psig)	
Pints	35 minutes	15 minutes
Quarts	40 minutes	15 minutes

After processing time is complete:

1. Remove canner from heat. Allow pressure to drop to zero. Wait 3 more minutes. Open canner with lid away from you to avoid steam in your face.
2. Remove jars from canner. Place upright on rack to cool away from drafts.

3. Do Not Tighten ring bands. They will tighten as they cool.
4. After 12-24 hrs check seals. Center of lid should be depressed and not give when touched. A tap with a spoon should give a clear ring.
5. Remove ring bands, wipe with warm sudsy water, rinse, label and store.
6. Unsealed jars may be reprocessed, or refrigerated.

Prepared by Mary A. Keith, Foods and Nutrition, July, 1991

Revised by M. Susan Brewer, Foods and Nutrition, June, 1992

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#### A.1.6 [Where do I get the Ball Blue Book?]

Most of the food preservation sources are in the back of this FAQ, but the Ball Blue Book (BBB) is the great canning classic of

all time (unless you have the Kerr Canning Guide). First time canners are \*well\* advised to pick up a copy. Places where you can order or find a copy are: order form on the lid box in a fresh case of Ball canning jars; sometimes the hardware store or the Walmart that you picked up the case of jars in will also have a copy for sale nearby. I got mine in a used bookstore (check the copyright date, you want one less than ten years old). New info from [hjbe@conch.aa.msen.com](mailto:hjbe@conch.aa.msen.com); can order the BBB by phone, the number is 1-800-859-2255. From the Great Pumpkin; a reliable address for ordering the BBB is: Direct Marketing, CB/ Alltrista Corporation/ P.O. Box 2005/ Muncie IN 47307-0005

A.1.7 [What if my recipe doesn't have processing instructions?]

Check out the section in this FAQ entitled Recipe Cavaets and Troubleshooting. Or follow the recipe, and simply refrigerate

the results.

A.1.8 [Specific Recipes and Tips for Unusual Canned Items.]

These are templates which can give you ideas for unusual gifts,  
or really unusual jams and jellies.

[What is the scientific formula for making jam/jellies? --Mary Going]

from our expert in low sugar jams, Sandy Fifer <sandy@halcyon.com>

I have a very general formula that works well for me. First, I check  
\_Putting\_Food\_By\_ to see what the acid content is for the particular  
fruit and use lemon juice to increase the acidity accordingly. (If  
it's not acid enough [pH 4.6] I add up to 3 Tbsp. lemon juice per  
5 cups of fruit.) Second, I use Pomona's Universal Pectin so that the  
jelling does not depend on the amount of sugar used.

So, for jam, here's my recipe: (check the Proportions list for quantities)

Prepare fruit: pit cherries, de-stone and remove cores from nectarines, pears, etc., de-skin by dipping in boiling water if necessary.

Puree fruit--shorter time if you like some lumps (fruit identity), longer if you like it smoother. Since this is jam and not jelly it will have body and not be the translucent jell commercially available.

Combine 5 cups of fruit, 1/2 to 3/4 cup sugar, 2T lemon juice, and use 1 1/2 to 2 1/2 tsp. each of pectin and calcium, prepared according to the package. This yields 4 to 5 1/2 cups jam, depending on loss during cooking: some fruits foam up (raspberries), some are thick and spit all over the kitchen while heating (nectarines and pears).

Remember, this is a very general recipe. Also, I like a minimum of sugar, just enough to bring out the taste of the fruit. With some fruits I add ginger (e.g. pears) or lemon zest (e.g. blueberries).

I cook the puree until it reaches a full boil--this can take 10 to 20 minutes depending on how high the heat is and how thick the fruit. I'm cooking to heat it thoroughly, not to reduce it or develop pectin. You bring the jam to a full boil. This means that you stir the puree around and as soon as you remove the spoon all the puree immediately starts to boil again. At this point there's no need to cook it further--you can proceed to the pectin step.

When it reaches the full boil, add the pectin, sugar and calcium according to the directions. You have to experiment to determine how much sugar you want, and how thick you want the resulting jam. Then I water-bath can the jam for six minutes. Having brought the

jam to a full boil allows you to process it for such a short time.

I believe that if you follow this recipe you will end up with, at the minimum, a really good batch of jam, even taking into account the variation in tastes. You might want to tinker with it some to suit your own particular taste. I've never had an inedible failure. In the beginning I had some jams that were too thick or thin, but they tasted fine, and I kept notes and corrected the recipe the following year.

I buy high quality fruit and use it when it's just ripe. I don't care about the cost of the fruit because it's more important to me to have a delicious end-product. Using fruit that's moldy or past its prime is a bad idea. Some mold can survive the canning process.

Once opened, low-sugar jams have a shorter shelf-life than high-sugar commercial jams, even when refrigerated. My raspberry jam lasts about three weeks (not sure why) and the other fruits last about four to six

weeks.

Basically my jam tastes like pureed fruit (in fact to make fruit sauce for toppings I use the same recipe and just leave out the pectin and calcium) and is as close as I can come to preserving summer.

---Proportions, from Sandy Fifer <sandy@halcyon.com> ---

I decided to type in my recipes for all the jams I've made. Remember, these depend on using Pomona's Universal Pectin, which doesn't require sugar to set the jam. And one box of Pomona's will last for 3 to 5 batches of jam (where one batch equals 5 cups of fruit).

Pureed fruit	Sugar	Lemon juice	# tsp. *each* of	Optional
			pectin & calcium	
Strawberries: 5 c.	7/8 c.	2 Tbsp.	2 tsp.	

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Raspberries:	5 1/2 c.	2/3 c.	2 Tbsp.	2 tsp.	
Cherries:	5 c.	1/2 c.	2 Tbsp.	1 3/4 tsp.	
Marionberries:	6 c.	3/4 c.	2 Tbsp.	1 3/4 tsp.	
Blueberries:	5 c.	1/2 c.	2 Tbsp.	1 1/2 tsp.	lemon zest
Peaches:	5 c.	1/2 c.	2 Tbsp.	2 tsp.	
Plums:	5 c.	3/4 c.	2 Tbsp.	2 tsp.	
Apricots:	5 c.	1/2 c.	2 1/2 Tbsp.	2 1/4 tsp.	
Pears:	6 c.	1/2 c.	2 1/2 Tbsp.	2 1/2 tsp.	1 tsp. fresh ginger, grated

Yield: 4 to 6 cups of jam, depending on conditions.

[Fruit butters in general, and apple butter in particular..]

From: Barb Schaller <Schaller\_Barb@htc.honeywell.com>

Re cooking and doneness of fruit butters, this from Farm Journal Freezing and Canning Cookbook, Doubleday, 1964: "1). Measure the pulp and sugar into a large kettle; add the salt. Boil rapidly, stirring constantly to prevent scorching. As the butter becomes thick, lower heat to reduce spattering. 2). Add spices and lemon juice, if used. 3) \*\*Continue cooking until butter is thick enough almost to flake off the spoon, or as Grandmother used to say: "Until it is thick enough to spread." Another test for consistency is to pour a tablespoon of the hot butter onto a chilled plate -- if no rim of liquid forms around the edge of the butter, it is ready for canning.\*\*\* 4) Pour into hot jars and seal. Process pints and quarts in hot-water bath 10 minutes.

That said, let me say this about that: This is not a fast project. Time and patience are everything. I do not bring my pulp to boil over high heat; medium high at best, watching and stirring diligently to it won't stick and scorch. Then reduce the heat! A mesh spatter

shield is invaluable to me when I do this because the pulp thickens as the liquid evaporates; as the pulp thickens the spattering increases; covering the pan to protect from spattering hinders evaporation. The closer you think you are to "done," the more attention you'll want to give it. Too-fast cooking at too high a heat will caramelize the sugar in the recipe and leave you with something akin to jam. Trust me on this; I've ruined more than one batch of apricot butter in my time. Additionally, I'd process them longer than the 10 minutes, especially if the butter is less than boiling when it's put into the jars -- I had a couple of jars not seal. The butter is dense and takes longer to heat through to ensure the seal.

The butter can also be baked (a fine alternative, especially if you're in a cool climate and welcome the warmth of the oven). Pour the seasoned and sweetened pulp into a shallow (9x13 inch pan minimum) pan -- or a shallow roasting pan. Bake at about 325 degrees F until thick, stirring every 20-30 minutes so an evaporation-induced crust doesn't form on the top.

Not as complicated as it might look. Wonderful treat. Worth the effort.

### Apple Butter Recipe

It's what I did. And I actually \*measured\* things. :-)

12 cups apple pulp (I used locally grown Haralsons)

3 to 4 cups sugar (begin with 3, I added the 4th to my taste)

3 tsp. ground cinnamon

1/4 tsp. ground nutmeg

1/8 tsp. freshly ground allspice

1/2 tsp. ground ginger

1/4 tsp. ground cloves (do not overdo cloves; taste can be overwhelming)

1/4 cup white vinegar

Make pulp: Core but do not peel apples. Cook slowly with about an inch or two of water added, stirring to prevent sticking. Put through a food

mill to make pulp. If you use more water and boil the heck out of them, do drain in a colander to eliminate the extra liquid.

Measure pulp into at least a 6-quart dutch oven, stir in remaining ingredients and cook slowly, uncovered, for several hours to desired thickness. Feel free to correct the spices to your taste; adding in cautious amounts. Can in hot, sterilized jars, process in boiling water bath maybe 20 minutes.

If my schedule requires it, I make it a two-day project. It sits fine overnight, covered.

Use imaginatively: I use as a condiment as often as a bread spread; we like it with roast pork or chops. I swirl it into my cream cheese coffee cake filling. If it's thick enough, fill a cookie with it.

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[Anyone out there have a recipe, or any tips [for marmalade]??]

from Patricia Hill <phill@rt66.com>

My recipe for blood oranges or for any of the citrus fruit marmalades is easy.

Citrus marmalade

Use lemon, limes, grapefruit, kumquat, oranges, tangerines, ugly fruit, tangelos

Mix the fruit if you please or keep separate.

Cut the fruit in halves or quarters and add water to barely cover.

Simmer for 1 1/2 hours, adding water as needed. Remove the fruit from the water. Cut into thin shreds, chop or however you like it. I like thin shreds and find it is easier for me to do it AFTER cooking. My sister-in-law likes to cut it BEFORE cooking.

Add the fruit shreds back into the water. Measure the fruit and water mixture. For every cup you have add

3/4 cup sugar

Cook over a hot flame until it reaches the jelly stage. Put in clean jars and seal.

After it has jelled, you can add a little flavor. Lime marmalade with a little Club Raki (a licorice flavored liquor) is great. Lemons with a bit of scotch is good. Orange with a little Kirsch. This makes a firm marmalade so you can actually dilute it a little. If you want more flavorings, add them to the pot before it jells.

Once we went to the store and bought some of every different type of citrus fruit they had. We cooked each fruit in a separate pot. After

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cutting we mixed the shreds in all sorts of combinations. We made some chunky and some thin shred. We put all sorts of flavorings in.

They were all good.

[Tea jelly.]

from Michael Teifel <dh97@pop.th-darmstadt.de>

I made a half litre Earl Grey tea 4 times stronger than normal. And I simply added 500 grams of a commercially available sugar/pectin mixture and followed the instructions for making jelly out of juices.

It tastes real good, nearly the same taste of the jelly from the mail order tea shop I tasted before. The next time I will reduce the amount of sugar so that the tea flavour will be stronger.

for a second batch:

I made 250 ml of green gunpowder tea with mint flavour (4 times stronger, it means 4 times more tea, not 4 times longer brewing). Then I added 150 grams of a 1:2 mixture of the sugar/pectin box (1:2 means, that you have more pectin and less sugar in the mixture, so the jelly results in more fruity flavour) and added a few pine nuts. (This tea is my favourite, in Tunisia it is very common drink: chinese green tea with mint and pine nuts.) Then I followed the instructions, and it gave a very good tea jelly with a fresh flavour of mint!

[N.B. You might want to add a bit of lemon juice/apple juice for safety.--LEB]

[Flower jellies and jams]

from Bess Halle <bhaile@leo.vsla.edu>

Basic flower jelly:

Make an infusion from edible flowers. 1 pint of flowers to 1 pint of boiling water. Most flowers have a bitter bit where the petal joins the flower so you must cut that part off. I use scissors and just trim the petals of flowers, leaving the points attached. (though once I actually snipped the points off 2 quarts of rose petals....tedious beyond belief!)

2 C flower infusion

1/4 C lemon juice

4 C sugar

6 oz liquid pectin

\*optional few drops food coloring

Mix infusion, lemon juice and sugar in stainless steel or enamelware pan. Bring to hard boil you can't stir down. Add liquid pectin and return to hard boil. Boil at this temp. 2 minutes. Pour immediately into hot sterilized jars and seal. Turn jars upside down for 5 minutes and revert. Makes 4-4.5 cups of jelly.

I've found liquid pectin works better with flowers (and herbs) than the powdered kind. You CAN make jellies with flowers and juice and I often make an apple mint jelly with apple juice and apple mint. My favorite herb combination, though, is lemon mint, made with 1 cup lemon verbena infusion and 1 cup spearmint. I never use the food coloring because I like the pale yellow and gold and pink and ruby colors. You can also pour the jellies into pretty wine glasses or other pretty glasses and seal with parafin. [Check the Tips 'N Tricks section for handling paraffin.--LEB]

P.S. The word from the wine making group (where I first got the idea to make honeysuckle jelly) is to wash the blossoms first. This is probably a good idea because I made a batch of honeysuckle jelly over the weekend and there was an awful lot of pollen in the flowers. The jelly tasted like honey, btw, and quite good...not at all lemony, but not enough of the actual honeysuckle flavor I was aiming for. I'll probably increase the proportions next time.

Here's another rose petal jelly recipe which makes more jelly.

2 quarts rose petals \*\*see note below

2 quarts water

1/4 cup lemon juice

7 cups sugar

6 oz liquid pectin

Boil petals in 2 quarts of water with the lid on, till 1/2 liquid is gone. Measure out 3 cups liquid. (save the remaining cup!!) mix with lemon juice and sugar. Bring to rolling boil. Add liquid pectin (this will be 2 packages of the liquid certo brand) and bring back to hard boil. Boil 2 minutes and pour into hot sterilized jars. Seal in preferred manner.

I use the little 4 oz jelly jars so that I can give away a lot. This makes about 15 little jars.

The remaining cup can be mixed with a 1 cup infusion of a favorite herb like mint or lemon balm and used in the previous recipe. I also boiled a cinnamon stick in with the jelly-making part (not the first boiling of petals) I think because I

heard of a restaurant called Cinnamon Rose and the name stuck.

Anyway, at first the cinnamon seemed a little strong. A friend said the jelly tasted like the apple pie from heaven. BUT after opening a sealed jar a few days later I DID detect both the rose and the cinnamon flavor. Be sure to discard the cinnamon stick before bottling.

\*\*I've used less and I've used more, so the exact proportions probably don't matter. In fact, even when I pick them at night when I get home from work, and they have little scent, cooking them brings it out a lot. Just remember, for a good red color you will need some red roses and also remember....the rose brew will stain your hands, your sink, your clothes!!!

[Canning Cake]

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BTW, several sources from the group note that you'll be disqualified from a county fair competition with a canned-cake recipe. I haven't heard anything from the USDA about the relative safety of canned cake; the batter does get hotter than 240 F. Make sure you sterilize the jars, lids, and rings.

From: linda.magee@burbank.com

Subject: CAKES IN JARS-NEW

Well, I decided to try another one. The recipe came from Heather Kelly in Canada. The bread is delicious. If you don't want to mess with the jars, I've given her directions for baking them in loaves at the bottom of the recipe.

ALMOND-CHERRY BREAD BAKED IN JARS

-----

9            12 oz            \* BALL (tm) QUILTED CRYSTAL JELLY JARS

(#14400-81400)

9 NEW LIDS (do not use old ones)

9 RINGS (OK to use old ones)

VEGETABLE SHORTENING (to grease jars)

-OR-

2 9-inch LOAF PANS, greased

2 cups CAKE FLOUR (I used Swan's Down brand)

1-1/2 tsp BAKING POWDER

2 cups MARASCHINO CHERRIES, drained, dried and  
cut in half

1/2 cup ALMONDS, blanched, finely ground

1/4 cup CAKE FLOUR

1-1/2 cups GRANULATED SUGAR

8 ozs CREAM CHEESE, softened (DO NOT use  
Light cream cheese)

1 cup BUTTER, softened (2 sticks)

1           tsp           ALMOND EXTRACT  
4           large          EGG, room temperature

-----  
Sterilize the jars, lids and rings by boiling them for  
15 minutes. Keep the lids and rings in the water until  
you're ready to use them. Make sure there are no nicks or  
cracks in the lips of the jars.

\* If you can't find the jars I've listed above, they also  
make plain jars (no diamond pattern), look for them  
instead. I don't know the number offhand, sorry. If you  
have a Smart & Final store near you they carry the plain  
jars [I've seen the diamond pattern jars in many grocery  
stores--LEB]. Another place to look would be old hardware  
stores they usually carry canning supplies. As canning  
season is a bit behind us, those are about the only two  
places I can think of that might carry the jars.

Remove the jars from the water and place them on a clean dish towel to air-dry (up, not upside down). While the jars are cooling, prepare the cake batter.

Once the jars are cool, using a pastry brush, grease the inside of each jar with shortening (DO NOT use AM, Baker's Secret, butter or margarine). Don't get any on the lip of the jar or they won't seal properly.

Preheat oven to 325-degrees. Place a cookie sheet onto the middle rack of the oven, remove the top rack.

Mix the flour and baking powder together; set aside.

Mix together the cherries, ground almonds and 1/4 cup of cake flour; set aside.

Cream together the sugar, cream cheese, butter and almond extract until light and fluffy. Slowly add the flour/baking powder mixture, mixing well. Fold in the cherry/almond/flour mixture until well incorporated.

Divide the batter among the 9 jars, filling them about 1/2 full. I found it easiest to use my small spatula to spoon the batter into the jars, it's skinny. It helped to keep the batter from getting onto the top insides of the jar--it'll burn if you leave it there. Wipe off the lips of the jars if you get any batter on them. If you don't the jars won't seal properly--you want them clean and dry. The batter is very thick.

Bake for 35-40 minutes, or until a cake tester inserted deep into the cakes comes out clean.

When cakes test done, using HEAVY-DUTY MITTS (the jars ARE HOT!) remove them from the oven one-by-one and place the lids and rings on them and screw down tightly. Keep the lids in the hot water until you're ready to use them. Place the jars on your counter to cool. You'll be able to tell if they've sealed, you should hear a "plinking" sound. If you don't hear the noise, check the jars once they've cooled by pressing down on the lids, they shouldn't move at all.

Store the jars in a cool, dry place, just as you would any canned goods. There's NO need to refrigerate the cakes, they keep in the pantry for about 6 months--maybe longer, they don't last that long around here. I start about now (late August) so I'll have plenty to give as Christmas gifts. Single folks love the cakes because each jar is enough for one or two people.

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LOAVES: Bake in a preheated 325-degree oven for about 1 hour,  
or until a cake tester inserted into the center comes  
out clean (can take up to 1-1/2 hours).

Cool in pan on wire rack.

From: linda.magee@burbank.com

One last comment...before giving the cakes or eating them,  
double check the jar seals to make sure they've not broken.  
The only time I've had the seals break is when I stored the  
jars in a cupboard which got too hot. It's cold out now, so  
I doubt it'll happen to anyone, but it's better to be safe  
than sorry.

Last one...

BROWNIE CAKES BAKED IN JARS

-----

- 3     12 oz   BALL (tm) QUILTED CRYSTAL JELLY JARS  
          (#14400-81400)
- 3           LIDS (DO NOT use old lids)
- 3           RINGS (old ones are OK)
- VEGETABLE SHORTENING (to grease jars)
  
- 1     cup    ALL-PURPOSE FLOUR
- 1     cup    SUGAR
- 1/2   tsp    BAKING SODA
- 1/4   tsp    GROUND CINNAMON (optional)
- 1/3   cup    BUTTER or MARGARINE
- 1/4   cup    WATER
- 3     TBS    UNSWEETENED COCOA POWDER
- 1/4   cup    BUTTERMILK

- 1            EGG, beaten
- 1/2     tsp    VANILLA EXTRACT
- 1/4     cup    WALNUTS, chopped

-----

Sterilize the jars, lids and rings by boiling them for 15 minutes. Remove the jars from the water and allow them to air-dry. Leave the lids and rings in the hot water until you're ready to use them.

Grease the cooled canning jars with shortening. DO NOT use Pam, Baker's Secret, butter or margarine. As the jars are tall and slender, use a pastry brush to grease them.

Preheat oven to 325-degrees. Place a cookie sheet onto the middle rack; remove the top rack.

In a small bowl stir together flour, sugar, baking soda and

cinnamon, if used; set aside.

In a medium saucepan combine the butter or margarine, water and cocoa powder; heat and stir until butter or margarine is melted and mixture is well blended. Remove from heat; stir in flour mixture. Add buttermilk, egg and vanilla; beat by hand until smooth. Stir in nuts.

Divide the batter among the three jars (they should be about 1/2 full) place them onto cookie sheet.

Bake for 35-40 minutes or until a cake tester inserted into the center of each jar comes out clean.

Remove the jars, one at a time from the oven; place a lid on, then a ring and screw down tightly. Use HEAVY-DUTY mitts, the jars are HOT!

Place the jars onto your counter top to cool. You'll know when they've sealed, you'll hear a "plinking" sound. IF you miss it, wait until the jars have cooled completely then push down on the lids, they shouldn't move at all.

You can bake ANY quick bread type cake (regular cakes don't work, they tend to fall when the jars seal) in canning jars. The only thing you have to figure out is how much batter to put into each jar. MOST recipes work by filling them 1/2 full. Some batters will rise higher than others. I'd suggest filling ONE jar 1/2 full and baking it. If it rises to within 1/4 to 1/2 an inch from the top of the jar, it'll work fine. If not, adjust accordingly (more or less).

Experiment with your favorite quick-bread recipe! Once you figure out how much batter to put into the jars WRITE it on the recipe so you won't forget (I do).

## 2. GENERAL EQUIPMENT QUESTIONS

A.2.1 [What kind of equipment do I need to can foods at home?

Don't you need a lot of stuff?]

If you cook, you probably already have most of the stuff that you need to can (jar) high-acid foods. Basically, you need canning jars and 2-piece lids (lids and rings), a large kettle or stock pot that you can boil water in, several saucepans, measuring cups and spoons, light tongs (to pick up the lids and rings), ladles, stirring spoons, an accurate timer, clean towels, a cake rack, and canning tongs. As you get more involved, other helpful tools are: canning funnel, clip on candy thermometer, boiling waterbath canner, and a pressure canner (not a cooker).

2-piece jars can be found in the grocery, supermarket, and hardware store, while canners, canning tongs, and canning funnels can be gotten at the local hardware store (or Walmart). Lots of equipment can also be obtained at yard sales, check out the Specific Equipment Question section for more information.

What you really need is a desire to can food, and a bit of a perfectionist streak. Carelessness, disorganization, and inattention cause most problems.

A.2.2 [My grandmother always reused commercial jars and sealed her jars using paraffin. Should I do this too?]

Nothing against your grandmother, but usually you don't want to use "one-trip" commercial jars for canning. Sealing jars with paraffin is also counterindicated, because mold and other spoilers can slip in

between the paraffin and the side of the jar. Even a common trick of turning the jar upside down to "sterilize" the top is not advised.

(Use a boiling waterbath for about 10 minutes instead.) Food preserving technique "rules" tend to change every few years, due to new knowledge about microbiology and mycology, and due to rigorous testing of food preservation recipes and techniques by many state extension services.

Keep up to date!

A.2.3 [What about zinc rings, rubber sealed jars, and other great, but antique, canning equipment?]

A great question. Check out the answer under II. Specific Equipment Questions.

A.2.4 [Ball or Kerr?]

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People have used both, and people have had problems with either.

In other words, whichever works for you.

from Wendy Milner <wendy@cnd.hp.com>

Canning jars such as those made by Kerr or by Ball, have special two piece lids. You should only use lids and jars made by the same company.

While in most cases you will get a seal when mixing brands, it is not guaranteed. Additionally, if you are using an oil mixture in your recipe do not use Kerr lids as the sealing compound on the lids has been shown to loose its effectiveness as the oil seeps into it.

A.2.5 [Rings on the jar, or off?]

In the opinion of this FAQ maintainer, its a matter of taste, so I'll give you pros and cons of each side.

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Pro ring: "looks" more natural, saves a weak seal, secures the lid if you are mailing canning jars, or storing leftovers in the refrigerator (I like the ring on when I mail/give something).

Con ring: can reuse ring quickly, rings don't rust on jar, doesn't hide dirty threads or a weak seal.

Other ring facts: rings have to be off if the canned good is to be judged at a county/state fair. Rings shouldn't be removed until the seal is allowed to fully develop, about 12-24 hrs.

A.2.6 [I'm really cheap. How can I reuse my canning lids?]

Penny-wise and pound-foolish. The botulism antiserum shot costs a \*lot\* more than the \$30-\$40 cost of a few dozen lids. As a public service, from the home office in Grand Rapids MI, the top ten

Things You Can Do With Old Canning Lids....

10. Windchimes

9. Coasters for the vacation house
8. Really boring mobiles
7. Palm protectors for smashing garlic cloves
6. Train your pet Chihuahua to catch teeny metal frisbees
5. 2 canning lids + 1 HD disk = yummy sandwich for your favorite  
USENET FAQ maintainer
4. With tinsnips, create several dollhouse-sized cookie sheets
3. Sharpen the edges, make the business end of a pizza cutter
2. Glue several canning lids into 1 slinky to contact those  
pesky Venusians
1. Several hundred canning lids, stitched together make the  
perfect dress for your Oscar acceptance speech...

(those brass Kerr ones look great, much better than AMEX cards!)

Seriously, there are some things you can do with old canning lids. You might not realize this, but lids and the mouths of jars/cans are of a fairly standard size. The Kerr lids for the narrow neck

pints/half pints fit many commercial jars, like spaghetti sauce and mayonaisse jars, even those medium size salsa jars. I've found that the wide mouth ones fit large tomato sauce cans. It means that if you store dried peas, lentils, beans, pasta, sugars, flours, nuts, seeds, your dried vegetables, dried fruit, jerky, dried herbs, fruit leather, etc. in reused commercial glass jars, you always have a lid. Poke many large holes in an old canning lid, use the lid/ring/jar as a jar strainer for bean and alfalfa sprouts.

If you're like me, and you cut the can lid off completely, but you don't use all the contents, you always have a lid. If your jars have great seals, and you have to completely destroy the lid of a particular can, you've got a spare lid when you put it in the refrigerator. If your SO has a workshop, and organizes screws, nails, loose change, spare RAM chips, matches, etc in glass jars, your SO has a lid.

Just don't can with them, and if you save old lids, mark 'em well so

you don't get confused. Scratches on the top with a corkscrew do it for me--you even get planned obsolescence that way. And for god sakes, don't pawn 'em off at a yard sale...

A.2.7 [How do I use a pressure canner safely and effectively?]

from Wendy Milner <wendy@cnd.hp.com>

As with the boiling water bath, you prepare your food according to a tested recipe, place the food in the jar, put on the two piece lid, and place the jars in the canner which has 2 to 3 inches of water in it. The water should be hot but not boiling. Place the lid on the canner. The petcock or vent of the lid is open. As the water boils, steam will rise out of the petcock. When steam is steady, wait 10 minutes before closing the petcock.

There are two types of gauge: weighted and dial.

The weighted gauge has three positions: 5 pounds, 10 pounds and 15 pounds. Always use the higher weight if the recipe calls for a weight in between one of these values. For example, the recipe calls for 12 pounds of pressure, use 15 pounds. The disadvantage to a weighted gauge is that food may be over processed. The advantage is that it is easy to hear the weight move during processing.

With a weighted gauge, place the gauge on the vent using the correct weight. Leave the temperature on high until the weighted gauge begins to rock. Lower the temperature. You will have to experiment a little with the temperature. You want the weighted gauge to rock lightly throughout the processing time. Start the processing time when the gauge is rocking at about 2 to 3 times a minute. [N.B. If your gauge refuses to rock, check to see if your stove is perfectly leveled.--the gang at r.f.p]

The dial gauge canner has a dial which registers from zero to 20 pounds. You should have your gauge tested every year by the local extension office. The advantage to a dial gauge is that you can see exactly what the pressure of the canner is during processing.

With a dial gauge, close the petcock and watch the dial. When the dial has reached the proper pressure, reduce the temperature. Maintain the pressure throughout the processing time. Start the processing time when the correct pressure has been met.

If you live above 1000' feet you must increase the pressure for processing. For every 1000' feet add 1/2 pound of pressure. You do NOT add time to the processing, only pressure.

At the end of the processing time, turn off the heat. Do not open the lid or vents. It will take about an hour for the pressure to

drop inside the canner. Wait till pressure reaches zero, or the safety valve drops before opening the lid. Open the lid away from you. There will still be steam rising from the water and it is easy to scald yourself.

Remove the jars from the canner. Place them on a towel on the counter and leave them alone for 12 to 24 hours before checking the seal. Do not check before the 12 hours as this could cause the jars to not seal. Sealing is the result of heating and then cooling the jars.

A.2.8 [I'm looking for sources of pectin, like bulk pectins or low sugar pectins.]

Bulk pectins, low sugar pectins, citric acid, from Dirk W. Howard  
<dhoward@novell.com>:

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Pacific Pectin Products/ P.O. Box 2422/ 40179 Enterprise Dr., 7B-D/  
Oakhurst, CA 93644 (209) 683-0303

Low sugar pectin, from Sandy Fifer <sandy@coho.halcyon.com>:

Pomona's Universal Pectin/ Workstead Industries/ P.O. Box 1083/  
Greenfield, MA 01302 (413) 772-6816

Another source for bulk pectin, from both Zlotka <zlotka@aol.com>

and Kai <qx01820@inet.d48.lilly.com>:

Home Canning Supply & Specialties/ PO Box 1158/ Ramona, California  
92065. (619) 788-0520 or FAX (619) 789-4745. 1 (800) 354-4070 for  
orders. They sell 10# of regular pectin for \$75.15 plus shipping (1995  
prices--LEB). Call and talk to them; nice folks.

A.2.9 [I'd like some sources for non-standard size jars, decorative  
bottles, unusual size rings, and other items that I just can't find

in the usual places.]

Zlotka <zlotka@aol.com>:

Berlin Packaging has a great catalog of containers for all manner of things. 1-800-4-BERLIN will get you a free catalog. Good customer service, too.

lost the attribution here, sorry..

You might try Glashaus. They have some big jar sizes, the largest rings I have from them are 4.25" at the outside. They are at Glashaus Inc./ 415 W. Golf Road, Suite 13/ Arlington Heights, IL 60005 (312) 640-6918 Fax (312) 640-6955

Plus they have really beautiful jars. The lids are held on by suction from canning, so it is extremely easy to tell if something didn't seal or has gone bad.

### 3. TROUBLESHOOTING

A.3.1 [My jars refuse to seal! Some of my preserved food is turning colors! What is happening?]

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#### PROBLEMS WITH HOME-CANNED FOODS

Even when you follow directions, occasionally you may have problems with home-canned foods. Many of these problems can be traced to use of non-standard canning jars, lids and rings or use of other-than-recommended canning equipment or procedures.

Checking your equipment and reviewing current canning recommendations can go a long way towards preventing potential problems. If you do have a problem, you may be able to determine the cause and prevent its reoccurrence by consulting this "trouble-shooter's guide".

1. Jars do not seal
  - a. Off-standard jars and/or lids.
  - b. Chipped or uneven sealing edge.
  - c. Using one-piece caps instead of two-piece lids.
  - d. Screwbands are rusty or bent providing poor contact.
  - e. Bands not screwed down tightly enough before processing.
  - f. Sealing edge not clean. Wipe edge well before placing lid on rim.
  - g. Liquid siphons out of jar during processing taking food particles on to the sealing edge.
  - h. Insufficient heat during processing--air not evacuated from jar, so a vacuum seal never forms.
  - i. Lids were improperly prepared before placing them on rims--most lid manufacturers require some pretreatment (heating, boiling, etc.).
  - j. Rapid, forced cooling of a pressure canner can cause a rapid pressure and temperature change inside the canner

causing the liquid to "boil" out of the jars, leaving particles on the sealing rim and unsealing the jars.

Canners should not be "forced" into cooling rapidly by submerging them in water or by adding ice.

- k. Insufficient processing of raw-packed food; the air may not have been completely driven out of the food leaving residual air in the jar so the seal does not form.
- l. Use of canning procedures which are not recommended such as open kettle canning, microwave canning, and oven canning. Use USDA recommended procedures.

## 2. Food spoils

- a. Processing at an incorrect temperature--can occur with:
  - 1. Inaccurate pressure canner gauge.
  - 2. Failure to exhaust canner.
  - 3. Failure to make altitude adjustment.

4. Heat source fluctuates--inaccurate pressure or fluctuating pressure.
  5. Water not at a rolling boil when jars are put into canner.
  6. Water not covering jar caps by 1" throughout processing.
  7. Water not at full boil throughout processing.
  8. Insufficient processing time.
  9. Use of canning procedures which are not recommended--recommended procedures (USDA) are based on the time it takes to achieve a temperature which will sterilize the food in the jar.
- b. Improper cooling of jars after processing.
1. Failure to remove jars from canner when processing time is up (or when pressure gauge reads 0).
  2. Failure to set jars at least 1" apart during cooling.

3. Covering jars which retains heat--vacuum does not develop.
  4. Attempting to cool either the canner or the jars very rapidly.
  - c. Using damaged (freeze damaged), spoiled, under ripe or over ripe food--the pH may not be correct for the type of processing you used (water bath versus pressure).
  - d. Very large number of microorganisms due to spoilage, bruising, etc. A very large number of microorganisms present on the food which are not destroyed in the usually recommended amount of processing time.
3. Food loses liquid during processing
    - a. Jars filled too full.
    - b. Fluctuating pressure in a pressure canner.

- c. Forced cooling of a pressure canner.
4. Food turns dark (not spoiled)
- a. Insufficient processing time.
  - b. Processing temperature too low (water not at a full boil at beginning of processing or drops below full boil during processing).
  - c. Water not 1" over jar lids.
  - d. Packing foods raw that should be precooked (pears).
  - e. Liquid loss during processing causing fruit at the top to be out of the liquid.
  - f. Lack of appropriate pretreatment for light-colored foods.
5. Fruit or tomatoes float or separate from the liquid
- a. Using overripe fruit.
  - b. Packing fruit too loosely.
  - c. Syrup too heavy.

- d. Processing too long--pectin damaged.
- e. Processing at too high a temperature (pressure canner).
- f. Raw packing--food contains a lot of air.
- g. Smashing or pureeing food prior to heating it activates enzymes which break down pectin in the juice so the food pieces are lighter and rise to the top. Heat or crush while heating any foods to be pureed or food to be packed in its own juice to help prevent separation.

Prepared by Susan Brewer/Foods and Nutrition Specialist/Revised, 1992

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#### PROBLEMS IN HOME-CANNED FRUITS

Fruit darkens at the top of the jar:

- a. Liquid didn't cover the fruit--pigments become oxidized.

- b. Fruit not processed long enough to destroy enzymes.
- c. Air left in jars permits oxidation (bubbles or too much headspace). Fresh fruit exposed to air oxidizes.
- d. Exposure to high temperatures and light during storage.

Color changes in canned apples, pears, peaches, quinces:

Pink, red, blue or purple color--natural enzymatic reaction (not harmful) which may occur during cooking, or a result of a chemical reaction between fruit pigments and metal ions (iron and copper). Use soft water, stainless steel cookware, plastic or wooden utensils.

Fruit floats in the jar:

- a. Fruit is lighter than syrup--use lighter syrup, cook fruit before packing.
- b. Improper packing--pack fruit tightly without crushing.  
Use hot pack method.

- c. Fruit is overprocessed--too much heat destroys pectin and acid, so the fruit loses its shape and floats.
- d. Fruit is packed too loosely.

Fruit Spoilage:

- a. Overpacking--heat penetration is poor and food does not become sterilized.
- b. Poor selection of fruit (over ripe, wrong pH, large bruises).
- c. Underprocessing--food is not sterilized.
- d. Unsanitary conditions--microorganisms are not removed from the food or larger numbers are added during preparation.  
Clean up as you go. Wash equipment, utensils and hand in hot soapy water.

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## COLOR CHANGES IN HOME-CANNED FOODS

The pigments in food which are responsible for their colors are sensitive to a variety of things which they may come into contact with during home food preservation. Acids (lemon or other fruit juices), anti-caking ingredients in table salt, minerals in water, metals in water and from cooking utensils, heat, and light are a few things which can affect these pigments causing them to change color. Most color changes which occur during home food preservation do not make the food unsafe to consume--however, if the food looks or smells bad or odd, do not take a chance, dispose of it without tasting it.

1. Blue garlic: Occurs in pickled products. Caused by using immature garlic or because table salt was used in place of canning salt. Not a safety hazard.

2. Yellow cauliflower: Cauliflower (or other white vegetable pigments) are white in acid but yellow in alkaline medium. Minerals in the water may have created a more-than-normal alkalinity. Not a safety hazard.
  
3. Yellow crystals in canned asparagus: the crystals are glucosides (rutin) which were in the asparagus cells before canning. The high temperature of pressure canning causes them to come out of the vegetables into solution, but when the food cools, the pigment precipitates out of solution onto the the asparagus. Occurs mainly in asparagus in glass jars. If asparagus is canned in tin cans, a pigment-tin complex form so the yellow pigment stays in the liquid. Not a safety hazard.

4. Pink pears: the light colored pigments in the pears convert to pink pigments due to overprocessing or due to enzymatic reactions. Not a safety hazard.
  
5. White crystals on tomato products: home-canned pureed tomato products may have crystals of calcium nitrate on the surface. They are hard and scaly unlike mold spots. Not a safety hazard.
  
6. White crystals on spinach leaves: calcium oxalate--not a safety hazard.
  
7. White or pink crystals in grape jelly: Grapes are high in tartaric acid which goes into solution during cooking but precipitates as crystals during cooling. Prevent crystals by extracting grape juice, cooling

overnight in the refrigerator and filtering juice

before canning or using for jelly-making. Not a safety hazard.

8. White, yellow, or pale red beets: the red pigments in beets (anthocyanins) are sensitive to high temperatures. Some beet varieties are especially sensitive. The pigments are converted to white or colorless derivatives. Not a safety hazard.
  
9. Blue pickled beets: the pigments in beets are pH-sensitive. They are red in acids and blue in alkalis. If the pigments are blue, the pH is too high for water-bath canning to be safe. Throw the beets away (handle according to spoiled food procedures).

10. Brown green beans: enzymatic color changes occurring before the enzymes are inactivated by heat cause the green-to-brown color change of chlorophyll. Blanching or hot-packing will inactivate the enzymes and help preserve the green color. Not a safety hazard.
  
11. Brown potatoes: storage of potatoes at temperatures below 45 F causes the potato starch to be converted to sugars. During high heat treatment of pressure canning, these sugars form dark brown pigments. Not a safety hazard.
  
12. Colorless crystals which look like broken glass in canned sea foods. Not harmful.

Prepared by Susan Brewer/Foods and Nutrition Specialist/Revised, 1992

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A.3.2 [My jams and jellies didn't set. How can I reprocess them?]

From: Barb Schaller <Schaller\_Barb@htc.honeywell.com>

Here are three ways to rescue syrupy jams or jellies.

>From General Foods, makers of Sure-Jell pectin products and Certo liquid pectin.

USING SURE-JELL FOR LOWER SUGAR RECIPES:

Prepare containers as you normally would have (hot jars and lids).

Prepare Pectin Mixture: Slowly stir contents of 1 package Sure-Jell for Lower Sugar Recipes (SJ-LSR) into 1-1/2 cups cold water in small saucepan. Bring to a boil over medium heat; continue to boil 2 minutes, stirring constantly. Remove from heat.

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Prepare Trial Batch: 1 cup your jam or jelly, 2 Tbsp. sugar, 1 Tbsp. Pectin Mixture. Measure jam or jelly, sugar, and the Pectin Mix into small (1-qt) saucepan. Bring to a full rolling boil on high heat; continue to boil 30 seconds, stirring constantly. Remove from heat. Skim off any foam with metal spoon. Quickly pour into prepared jar. Cover jar and let stand up to 24 hours to check set of Trial Batch. Store remaining Pectin Mix in fridge.

Prepare Remainder of Batch: DO NOT TRY TO REMAKE MORE THAN 8 CUPS OF JAM OR JELLY AT ONE TIME. If Trial Batch sets satisfactorily, follow the recipe above, using the listed amounts of Pectin Mixture and sugar for EACH 1 cup of jam or jelly. (Not going to repeat previous instructions.--BS) For convenience in measuring larger amounts of Pectin Mixture and sugar: 8 Tbsp. = 1/2 cup. 16 Tbsp = 1 cup. (Even I could do that math! :-) "Remember, if your jam or jelly still doesn't set, you can always use it as a glaze or syrup."

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USING SURE JELL POWDERED FRUIT PECTIN:

Prepare Containers as usual (hot jars and lids).

Prepare Pectin Mixture: Slowly stir contents of 1 package SJ and 3/4 cup cold water in small saucepan. Bring to a boil over medium heat; continue to boil 2 minutes, stirring constantly. Remove from heat.

Prepare Trial Batch: Same as for SJ-LSR instructions, above.

Prepare Remainder of Batch: Same as for SJ-LSR above. (Same comment about glaze, too. :-)

USING CERTO Liquid Fruit Pectin:

Prepare Containers: Same as usual (hot jars and lids).

Prepare Trial Batch: (Pay attention, this is different.....) 1 cup

your sorry jam or jelly, 3 Tbsp. sugar, 1-1/2 tsp. fresh lemon juice  
(I do use fresh), 1-1/2 tsp. Certo.

Measure jam or jelly into small saucepan. Bring to full rolling boil  
on high heat, stirring constantly. Immediately, stir in sugar, lemon  
juice and Certo. Bring to full rolling boil on high heat, stirring  
constantly. Remove from heat. Skim off foam, blah, blah, blah.

Quickly pour into prepared jar, blah, blah, blah. Store opened pouch  
of Certo in refrigerator. (Blah, blah, blah= follow standard procedure  
for sealing the jars, and for g'sakes, don't sneeze in the jar.--LEB)

Prepare Remainder of Batch: Do not try to make more than 8 cups of  
jam or jelly at one time. If Trial Batch sets satisfactorily, follow  
the recipe above, using the listed amounts of sugar, lemon juice, and  
Certo for EACH 1 cup of jam or jelly.

Measure jam or jelly, sugar, lemon juice and Fruit Pectin into large

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(6 to 8-quart) saucepot. Bring to a full rolling boil on high heat; continue to boil 1 minute, stirring constantly (this is DIFFERENT than trial batch.) Remove from heat, skim foam, ladle into jars, blah, blah, blah. After preparing remainder of batch, discard Certo in opened pouch. (Same commentary about glazes and syrup.)

For convenience in measuring larger amounts of sugar, lemon juice and Fruit Pectin: 3 tsp. = 1 Tbsp., 8 Tbsp. = 1/2 cup, 16 Tbsp. = 1 cup.

There! From "Gifts from the Harvest, Homemade Jams and Jellies, from the makers of SureJell and Certo." A 62-page booklet with beyond-the-basics recipes for sweet spreads. Got it as a freebie at our State Fair one year.

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(end of part 1)

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Newsgroups: rec.food.preserving

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Subject: Rec.food.preserving FAQ, version 2.3, part 2

From: lebasel@nando.net (lebasel)

Date: 1 Jan 1996 20:23:29 -0500

Part 2 of 6

Version 2.3

Freezing, Dehydration, and Pickling

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B. FREEZING

1. GENERAL QUESTIONS

B.1.1 [What do I \*really\* need to know about freezing?]

Freezing is preserving food using low temperatures--generally at temperatures around 0 F/-18 C. Freezing generally inhibits both microbial growth (doesn't generally kill, though) and many protease/enzyme actions in the food itself. You need to decide whether or

not to blanch or process food, how to wrap food to prevent freezer burn, what foods freeze well, and what to do when the power goes out.

## FROZEN FOODS

Food is safe from spoilage AS LONG AS IT STAYS FROZEN.

Microorganisms can start to grow as soon as food begins to thaw.

To keep microbial growth at a minimum, frozen foods should be thawed in the refrigerator. Thawed food may be refrozen IF ICE CRYSTALS ARE STILL PRESENT IN THE FOOD. Refreezing often changes the quality of food (texture, color, flavor). Foodborne illness causing microorganisms may not be killed by freezing, so the safety of the food will be no better than the condition of the food which was frozen.

(section taken from Susan Brewer)

B.1.2 [So what foods can be frozen well?]

from Wendy Milner <wendy@cnd.hp.com>

Freezing is not for all produce. Freezing will make mush of many soft fruits and vegetables. Depending on what you want to do with these soft fruits and vegetables, freezing may work. For example, you can freeze tomatoes and later use them to make a sauce, but you would not want to try and use the tomatoes whole after thawing. You can freeze apple slices and later make apple sauce or apple pie.

Harder vegetables such as green beans and corn do well in the freezer. These vegetables should be blanched first to kill mold spores and yeasts, dried well, and then placed in freezer bags or freezer containers. The vegetables should be cooled before placing in the freezer to prevent the freezer temperature from rising.

All meat can be frozen. If you are butchering your own meat, make sure it is clean of hair, feathers, blood shot meat, and any foreign matter. Meat should be cut into small slices such as you find in the grocery store. Do not attempt to freeze large sections of meat - such as a quarter of a beef - unless you have a commercial sized and very cold freezer. Meat should be wrapped in butcher paper to prevent freezer burn. You must thaw meat in the refrigerator. Meat left on the counter to thaw allows for the growth of bacteria which could be harmful.

### B.1.3 [What's this blanching stuff, anyway?]

Blanching is plunging your item(s) in boiling water for a short amount of time (30 sec to 5 min, check your recipe), cooling the items quickly, then drying off the items. You don't cook the item, but you kill off the surface bugs and you destroy several important

enzymes that brown and degrade foods.

B.1.4 [How do I freeze (your item here), and how long can I reasonably expect it to keep?]

from z@fybits.com (Z Pegasus), in rec.food.cooking

MMMMM----- Recipe via Meal-Master (tm) v8.02

Title: Freezing Cooked and Prepared Foods 5/5

Bobbi Zee

No Ingredients

RECOMMENDED STORAGE TIMES IN MONTHS

Months

Appetizers

: Cheese wafers and straws 2

: Deviled ham puffs 1

## Baked Products

### Cakes

: Angel food -- baked 4

: Chocolate -- baked 3

: Chocolate -- batter 2

: Frosted 3

: Fruit -- baked 4

: Plain -- baked 3

: Plain -- batter 2

: Sponge -- baked 4

### Cookies

: Brownies -- baked 4

### Cookies

: Brownies -- baked 4

: Chocolate chip -- baked 4

:	Filled -- baked	4
:	Peanut butter -- baked	6
:	Peanut butter -- dough	4
:	Refrigerator -- baked	6
:	Refrigerator -- dough	6
:	Sugar -- baked	6
:	Sugar -- dough	6

## Pies

:	Apple -- baked	4
:	Apple -- unbaked	4
:	Blueberry -- baked	4
:	Blueberry -- unbaked	4
:	Chocolate chiffon	2
:	Lemon chiffon	2
:	Mincemeat -- baked	2
:	Mincemeat -- unbaked	2
:	Mincemeat -- baked	2

: Mincemeat -- unbaked 2  
: Pumpkin -- baked 2  
: Pumpkin -- unbaked 2

## Quick breads

: Boston brown -- baked 4  
: Nut -- baked 2  
: Orange -- baked 4

## Yeast breads

: Rolls -- baked 4  
: Rolls -- dough 1 week  
: Swedish tea ring 2

## Combination Dishes

: Bakes beans with tomato sauce 4  
: Beef or veal stew 2  
: Chicken a la king 4  
: Italian rice 2

:	Rice Pilaf	4
:	Italian rice	2
:	Rice Pilaf	4
:	Shrimp Creole	4
:	Spanish sausage	2
:	Tomato sauce and meat balls	2

#### Combination Dishes - General Directions

INGREDIENTS AND COOKING TIME: Use only ingredients of the best quality. Prepare foods in the usual way but shorten the cooking time for most of them. Cook meat and vegetables until barely tender and take from the heat at once. The tissues will soften further during the cooling, freezing, and reheating.

If completely cooked before they are frozen, meat and vegetables may be too soft when served. Long cooking also causes unnecessary losses of flavor and aroma.

DO NOT INCLUDE POTATOES OR SOME TYPES OF RICE. Potatoes are not satisfactory in combination dishes which are to be frozen -- the texture is poor after freezer storage and reheating. It is better to cook and add them when the frozen food is prepared for serving.

In certain combination dishes quick-cooking rice and regular rice tend to be mushy when they are reheated after being frozen. Converted rice has been found to retain its shape and texture better.

COOL COOKED FOODS QUICKLY. After a food is cooked, cool it quickly to room temperature. Place the cooking pan in a larger pan of ice water or cold running water and stir occasionally. If the food is in a heavy kettle, you can cool it more quickly by transferring it to one of the lighter weights.

CLEANLINESS IS VERY IMPORTANT. Since freezing does not kill all microorganisms, strive to keep the number in the food as low as

possible during preparation. Use clean utensils and sanitary methods of handling food. Keep the food covered during cooking, and loosely covered during cooling. Package the product as soon as it reaches room temperature and freeze immediately.

PACKAGE CAREFULLY. Several types of containers are suitable for combination dishes. However, the longer the product is to be held in freezer storage the more moisture- and vapor-proof the package must be. Cylindrical cartons with slip-on lids and tub-type containers are easy to fill but they may not be air-tight. Rectangular cartons with plastic or plastic laminated foil bags which can be tightly sealed with paper-covered wire closures, rubber bands, or heat are more moisture- and vapor-proof. Glass jars designed as containers for freezing, tin cans, or plastic containers with tight-fitting lids afford good protection against moisture loss and are easy to use. Freezer-to-table cookware can be overwrapped with plastic or aluminum foil for a tight seal.

Some of the heavier plastic wraps now available are suitable for freezer storage. Those made with polyvinylidene chloride (such as Saran Wrap) have been rated as excellent and are suitable for long-term storage.

Those made with polyethylene (such as Glad and Handi-Wrap) are suitable for short-term storage. Those made with polyvinyl chloride (such as Reynolds Plastic) are poor choices because they are not moisture- and vapor-proof. Plastic-coated paper freezer wrap is suitable for solid foods. (For more details, see Consumer Reports, March, 1983.)

For food that is packaged solid be sure to leave space at the top of the container for the contents to expand during freezing. Leave 1/2 inch for a pint container, 1 inch for a quart.

**FREEZE IMMEDIATELY.** Put packaged foods in the home freezing unit without delay. The temperature in the home freezing unit should be 0 F or lower.

DO NOT STORE TOO LONG. The shorter the period of freezer storage, the more appetizing these foods will be. (See table of recommended storage times---above LEB) While some foods usually do maintain quality longer than is indicated, undesirable changes may take place during freezer storage. Some fats tend to become rancid rather quickly. Separation may occur in sauces and gravies. Onion and black pepper become stronger and salt loses flavor.

With all foods there is a gradual loss of flavor, aroma, and natural texture. Be sure to write the date of preparation on every package and make a record of the packages you put in the freezer so you will not leave them there too long.

PREPARE FOR SERVING. To reheat frozen cooked food, use the method which will affect its appearance and texture the least. A double boiler is best for combination dishes. A saucepan can be used if the food is partly defrosted and then heated carefully. With either

method do not stir food more than necessary. Plastic wraps can be used in microwave reheating only with foods that are low in sugar and fat. High-fat and high-sugar foods can become hot enough to melt the plastic.

Use all defrosted and reheated foods at the current meal. Further holding and reheating is not recommended.

#### COOKED MEAT AND VEGETABLES

Freezing cooked meat, except in combination dishes where a solid pack can be prepared for freezing, is not recommended. Work carried on in the foods research laboratory of the University of Illinois as well as in other foods laboratories indicates that higher quality is obtained if uncooked rather than cooked poultry and meat are frozen. Carefully controlled experiments have shown that this is true for deep fat and oven fried chicken, braised beef round steaks, ham patties and loaves, and rib and loin pork roasts. In general, poultry and meat roasted or fried have a more attractive appearance

and better flavor than that cooked before freezing.

Precooked frozen vegetables have been rated as being inferior to freshly cooked and to blanched frozen vegetables. The few exceptions are products that can be solidly packed such as vegetable purees and mashed potatoes. In the latter case freezing is not recommended because it takes almost as long to thaw and reheat mashed potatoes for serving as it would to prepare them fresh.

#### BAKED GOODS - GENERAL DIRECTIONS

Among the baked foods that can be frozen successfully are certain appetizers, breads, cakes, and pies. Freezing and freezer storage preserve the freshness of these products and having them at hand for emergencies is a convenience. The recipes included here are those which were found to give good results when they were tested in the University of Illinois laboratory. Probably many other products besides those described can be frozen satisfactorily.

PREPARING BAKED FOODS. Use standard recipes and methods for appetizers, breads, cakes and pies and select only ingredients of the best quality. Several of these products can be frozen before they are baked, the following precautions are necessary:

For cakes frozen in the batter state, use double-acting baking powder (SAS-phosphate) in order to assure good volume. Package batter and place in freezing unit immediately.

For fruit pies frozen before baking, use a little more flour to thicken juice, and do not prick the top crust. Apple slices should be blanched before they are put in a pit, so they will keep their color, texture, and flavor better.

Dough for rools must be wrapped and frozen as soon as the rools are shaped.

DIRECTIONS FOR PACKAGING. Except for cake batter, these products can be satisfactorily wrapped for freezing in moisture- and vapor-proof plastic wrap, heavyweight aluminum foil, or plastic freezer bags.

Heat-sealable plastic bags are excellent. Tight seals prevent loss of moisture and flavor during storage.

If you use aluminum foil, place product in center of sheet and fold two edges together over it. Roll or fold the seam tight against the product, taking care not to crush the product. Then press the ends of the package together and fold them close to the product.

Pressure or cold-storage tape can also be used to seal plastic wrap or aluminum-foil packages.

Plastic or waxed cylindrical freezer cartons with slip-on lids or glass freezer jars are suitable for packaging cake batter. The quart size holds enough batter for an 8-inch square cake and six cup cakes or for two 9-inch layers.

DO NOT HOLD TOO LONG IN FREEZER. As soon as baked products, batters, and doughs are packaged, place them in the home freezing unit. Do not, however, keep them in the freezer for long periods because quality is lost gradually during storage. The freezer space probably

can be used to better advantage.

#### APPETIZERS

Questions about the advisability of freezing canapes or tea sandwiches are frequently asked. Such products can of course be frozen and held in the freezer for about a week but the results are usually only fairly satisfactory. Freshness in appearance and flavor are apt to be lost, moisture content of bread may no longer be evenly distributed, and crackers or toast rounds tend to lose crispness. However, two appetizers which are baked after freezing can be recommended. Similar types among your favorite recipes may give equally good results.

#### ANGEL-FOOD AND SPONGE CAKES

Frozen baked angel-food and sponge cakes, when defrosted, are very similar in quality to freshly baked cake. Angel-food cakes seem a little more moist after they have been frozen and thawed. However,

both angel-food and sponge cakes are likely to shrink a little in freezer storage. (Angel-food cake made from frozen and defrosted batter is not as fine-grained as cake baked before it is frozen.)

Delicious angel-food cake can be made from frozen egg whites. Often freezing the whites is more practical than freezing the cake. A pint container will hold the right amount of whites for one cake. After defrosting by holding them overnight in the refrigerator or at room temperature for about 5 hours, use them in the same way as fresh egg whites.

#### FRUIT CAKE

Fruit cake can be baked and frozen. After freezer storage the thawed cake will be more like a freshly baked cake than if it had been stored at room temperature.

#### PLAIN AND CHOCOLATE CAKES AND FROSTINGS

These cakes can be frozen after they are baked or the batter can

be frozen. Storing batter has several advantages: it is easier to package, requires less freezer space, and the cake seems more moist, with a flavor more like that of a freshly mixed and baked cake. A frozen baked cake, however, required less time to prepare for serving after it is taken from storage. In addition a baked cake can be frosted before it is frozen and stored.

#### COOKIES

Freezing baked cookies and cookie doughs makes it easy to keep a variety on hand at all times. Many types of baked cookies can probably be frozen, as well as refrigerator cookie doughs. The enclosed recipes give good products, or you may use favorite recipes and methods to prepare cookies for the freezer.

#### PIES

Frozen pastry, ingredients for pie fillings, and certain frozen pies make excellent products. Apple, blueberry, mincemeat, and

pumpkin pies can be baked either before or after they are frozen. A pie baked after it is frozen is more like a freshly prepared and baked pie, and less time is needed to prepare it for freezing. But a pie that is baked and then frozen takes less time to prepare for serving.

Another possibility is to freeze the chief ingredients of fillings and pieces of rolled pastry of appropriate size separately. This procedure is more economical of freezer space than freezing unbaked or baked pies and may in some instances be more practical. Cherries and sugar or pumpkin puree can be frozen satisfactorily for use in pies.

Chiffon pies are completely prepared before freezing. Only lemon and chocolate pies have been tested but it seems probable that other chiffon pies will freeze equally well.

**FREEZING PASTRY.** Pastry may be frozen separately and used later. One way to package rolled-out pastry is to cut a piece of cardboard of

the same size as the pastry and cover it with waxed paper. Two pieces of waxed paper are put between each two pieces of pastry and several can be wrapped together. Use aluminum foil or plastic wrap for packaging or seal in a large plastic bag with as little remaining air space as possible. Pieces of frozen pastry can be removed as needed and allowed to that 10 to 15 minutes before using in the preparation of a pie.

#### QUICK BREADS

A few kinds of quick breads have been baked and frozen with satisfactory results. Probably others will freeze equally well. One advantage of freezing quick breads is to have several kinds available at one time without spending many consecutive hours in their preparation.

#### YEAST BREADS

Bread and rolls that are frozen and held in freezer storage do

not stale at the usual rate. Yeast rolls may be frozen after baking, or the dough may be frozen. The former method of preparation is preferred because it is more convenient and because the quality of the rolls is higher. The volume, texture, and flavor of the baked rolls are maintained for several months of freezer storage. Frozen dough should be thawed and baked within one week after it is frozen. Swedish tea ring, baked before freezing, was rated good after freezer storage. Other baked products made with sweet roll dough will probably be found to be suitable for freezing.

Source: Freezing Cooked and Prepared Foods. Frances O. Van Duyne. University of Illinois at Urbana - Champaign, College of Agriculture, Cooperative Extension Service. Circular 835. July, 1984

Typos by Bobbi Zee 1:230/73

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## C. DEHYDRATION

### 1. GENERAL QUESTIONS

#### C.1.1 [What do I \*really\* need to know about dehydrating food?]

Dehydrating food works on the principal that both microbes and enzymes in your food require free water to work. (To a lesser extent, this is how freezing works--the water is frozen instead of evaporated off.). Generally, you get rid of the water in food by gentle, even heat (sun, oven, dehydrator) and air movement (wind, open oven door, fan)--otherwise water just stays in the food or condenses on it. You especially need to be cautious, though, about several types of mold that produce mycotoxins (e.g. aflatoxin) while growing on the surface of your dried food.

DRIED FOODS

Dried foods which take more than 1 to 2 hours to rehydration or reconstitution should be rehydrated either in the refrigerator or in simmering water to prevent the growth of microorganisms. Once vegetables are rehydrated, they will support the growth of Clostridium botulinum so they must be handled safely. Any dried foods with signs of spoilage or mold growth should be discarded.  
(section taken from Susan Brewer)

C.1.2 [What foods dehydrate well?]

cscott@Starbase.NeoSoft.COM (Clint Scott)

Carrots dry very well. Most things do very well....except green beans, zuchinni and yellow squash. Oddly enought fresh asparagus tips do very well. The stalks are sort of 'barkey' but the tips re-hydrate nicely.

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from Anne Louise Gockel <alg@cs.cornell.edu>

I found that some foods aren't worth drying (blueberries; yuck, altho they might be useful for pancakes when camping) and others are just wonderful.

from snorthc@nswc.navy.mil (Stephen Northcutt)

Besides apples and peaches, I have found that green or mature onions, spinach, and squash (zucchini) dry well and make great additions to winter soups and stews.

In other words, try it. It'll either work for you, or it won't. If it doesn't work perfectly for you, it'll be great in some dishes (stew!).

C.1.3. [I intend to eat the nuts from my two eight year pistachio trees. By now the nuts are growing. Does somebody knows how to get those crispy, salty pistachios from the nut in the tree? Manuel

Lopez Mateos <mlopez@servidor.unam.mx>]

from H. B. Ghoddusi <afgrhdus@reading.ac.uk>, rec.food.historic:

1-Once you take the nuts from the tree, first get rid of the peel  
(the thin one).

2-Let them dry in sun (needs longer time and you need to have  
enough sunny days) or in oven (it's faster but be careful to avoid  
overheating).

3-Make a bowl of brine (not very concentrated) up 3-4% should be alright.

4-Put the pistachios in a pan and heat it over a cooker until browning  
and bumping starts. Keep on low heating for a while in this stage.

5-Add the brine (not soak the nuts, just make them wet) and keep on  
heating while stirring until the nuts become dry again, while the salt

is crystalized over them.

P.S I've never tried this procedure for pistachio, but I've done it several times with different seeds and it works very well.

#### C.1.4 [How do I make sundried tomatoes?]

(from an unknown source, posted in either rec.food.cooking or rec.food preserving)

First, a few notes. It takes about 7 pounds of fresh tomatoes to make a single pint of dried tomatoes (I'm not sure how much a pint of dried tomatoes weighs. A pint of water weighs 1 pound.). This is part of the reason they are so expensive (costing in the neighborhood of \$20/pound around here). The best tomato to use in this process is the Roma (also known as a plum, pear, or Italian) tomato, because it

contains less water and seeds. However, you can use any tomato. They will just take a little longer to dry.

Dried Tomatoes (yields about 1 pint)

Wash carefully and wipe dry:

7 or 8 pounds of firm, ripe (preferably Roma) tomatoes.

Cut out the stem and scar and the hard portion of core lying under it.

Cut the tomatoes in half, lengthwise. If the tomato is more than about 2 inches long, cut it in quarters.

Scrape out all of the seeds that you can without removing the pulp.

Arrange the tomatoes, with the cut surface up, on non-stick cookie sheets (glass or porcelain dishes are OK. They will have to withstand

temperatures of a few hundred degrees F if you are going to oven-dry the tomatoes). Do *\*not\** use aluminum foil, or bare aluminum cookie sheets. The acid in the tomatoes will react with the metal.

Mix together thoroughly:

1 tsp dried basil

1 tsp dried oregano

1 tsp dried thyme

2 tsp salt.

Sprinkle a small amount of this mixture on each tomato.

(You may customize this mixture to suit your own taste.)

Dry the tomatoes in the oven, dehydrator, or in the sun. Directions follow for each of these methods. However, no matter what method you choose, be aware that not all of the tomatoes will dry at the same rate.

They do not all have the same amount of moisture, nor do they experience the same temperature and air circulation while they are drying.

They are done when they are very dry, but still pliable - about the texture of a dried apricot. If dried too long, they become tough and leathery. If not dried long enough, they will mold and mildew, unless packed in oil. So watch them carefully while they dry. Try to remove them on an individual basis, before they become tough.

Here are the drying methods. There is a time listed with each method. This time is approximate, and can vary significantly depending on the moisture of the tomato. Do *\*not\** rely on this time as more than a rough guide.

Oven-drying (approximately 12 hours):

Bake, cut side up, in 170 F oven for about 3 hours. Leave the

oven door propped open about 3 inches to allow moisture to escape. After 3 hours, turn the tomatoes over and press flat with your hand or a spatula. Continue to dry, turning the tomatoes every few hours, and gently pressing flatter and flatter, until tomatoes are dry.

Dehydrator method (approximately 8 hours):

Place the tomatoes, cut side up, directly onto the dehydrator trays. Set dehydrator temperature to about 140 F. After 4 or 5 hours, turn the tomatoes over and press flat with your hand or a spatula. After a few hours, turn the tomatoes again and flatten gently. Continue drying until done.

Sun-drying (approximately 3 days):

Dry in hot weather, with relatively low humidity.

Place tomatoes, cut side down, in shallow wood-framed trays with nylon netting for the bottom of the trays. Cover trays with protective netting (or cheesecloth). Place in direct sun, raised from the ground on blocks or anything else that allows air to circulate under the trays. Turn the tomatoes over after about 1 1/2 days, to expose the cut side to the sun. Place the trays in a sheltered spot after sundown, or if the weather turns bad.

After the tomatoes are dry, store in air-tight containers, or pack in oil.

To pack in oil:

Dip each tomato into a small dish of white wine vinegar. Shake off the excess vinegar and pack them in olive oil. Make sure they are

completely immersed in the oil.

When the jar is full, cap it tightly and store at \*cool\* room temperature for at least a month before using. They may be stored in the refrigerator, but the oil will solidify at refrigerator temperatures (it quickly reliquifies at room temperature however).

As tomatoes are removed from the jar, add more olive oil as necessary to keep the remaining tomatoes covered.

The author notes that she has stored oil-packed tomatoes in her pantry for over a year with tremendous success. She also notes that she has tried a number of methods to pack the tomatoes in oil, but she says the vinegar treatment is the difference between a good dried tomato and a great one. It is also important from a food safety standpoint, as it acidifies the oil and discourages growth of bacteria and mold.

\*\*\*\*\* WARNING \*\*\*\*\*

Do **\*NOT\*** add fresh garlic cloves to oil-packed dried tomatoes, **UNLESS** you store them in the refrigerator. Garlic is a low-acid food which, when placed in oil, creates a low-acid anaerobic environment - the perfect growth medium for botulinum bacteria if the mixture is not refrigerated. Botulism poisoning is characterized by a very high mortality rate. Be safe and add your garlic to the dried tomatoes as part of the recipe for them **\*after\*** they come out of the oil.

C.1.5 [Unusual parched corn and bean recipes]

From: dsidwell@cc.usu.edu (David Sidwell)

Here is a wonderful recipe for parched corn. it is eaten by Hopi children and adults as a real treat. Speaking of parched corn, you can also parch beans. Small, white teparies work well, especially

if they are from last year's harvest or older. The Hopi make parched beans the same way they make parched corn.

1. Heat clean, fine sand in a cast iron pot until it becomes dark brown and hot. (water sprinkled on it should pop and sizzle).
2. pour in a cup or two of dried corn. (old corn will be crunchy, this year's corn will be harder).
3. Stir corn briskly, to keep it from burning, until it stops popping.
4. Remove corn from sand with a sieve and pour into bowl.
5. Sprinkle corn with salt water (1 T. salt in 1 C. water), and stir with a corn cob that has been dipped in the salt water.
6. Add pinon or peach nuts for variety.

Note: The Hopi nation has very sandy soil. it doesn't cling like many sands but falls away from toasted foods. You may want to experiment a bit with the sand from your area.

We put parched corn in stews, soups, salads, and we eat it plain. yum  
yum. Parched beans are often used as a snack.

## 2. GENERAL EQUIPMENT QUESTIONS

C.2.1 [I need some advice on a dehydrator. What should I look for?]

from Wendy Milner <wendy@fc.hp.com>

When looking for a dehydrator, consider volume. How much volume  
will you be using now, and how much in the near future?

Additionally, if you like fruit roll ups, look for a screen  
with a very fine mesh. This would be in addition to the regular  
sized screen. The fine mesh is also good for drying herbs.

I use a convection oven with dehydrate features. Very convenient  
since I don't have to pull out another appliance.

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from srtobin@mmm.com (Steven R. Tobin)

I just bought a Harvest Maid, also sold as American Harvest, and a friend has had one for a couple years and really likes it. The main thing is to look for one with a thermostat controlled heater. Don't be suckered into one like the Ronco, that doesn't have a heater. It took me 4 hours to dry a load of apples last night, while the other kind (w/o heater) will take days to do the same job.

from Gary Yandle <garyy@hpdmmhm.boi.hp.com>

The reason you want a temperature control on a dehydrator is that different kinds of food dry at different temperature. Herbs dry best at about 90 to 100 degrees fahrenheit. Vegetables at about 110 to 120 degrees fahrenheit. Fruit is best dried at 120 to 130 and meat from 135 to 145 degrees fahrenheit. The whole idea is to dry the food quickly so as to preserve as much of the flavor and vitamins as possible without cooking the food.

Another must have when buying a dehydrator is look for one that has a fan. Good air circulation is a must for fast drying. Also look for one that has trays that are easy to clean. If the trays have places on them that you cannot get a scrub brush into then you will never be able to get it clean. (Don't let anyone tell you that dehydrating food is a clean operation, cinnamon apples and beef jerky make a big mess).

Please take a look at the dehydrator sources/suppliers/more specific details in Specific Equipment Questions.

C.2.2 [I've heard you can make a dehydrator yourself. Got any info?]

Check out the plans in Specific Equipment Questions. You really are limited only by your own creativity. Take a read below.

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from Stephen Northcutt <snorthc@nswc.navy.mil>

Take an old dead fridge, cut holes in the top as vents. Cover holes with 2 layers of screen to keep bugs out. Put 100 watt lightbulb in bottom in ceramic receptacle. You can add additional shelves easily by screwing small woodstock to sides and sliding in net covered frames.

from Anne Louise Gockel <alg@cs.cornell.edu>

Also, the newest edition of Putting Food By includes information on building a smoker with a small fire pit, a ditch with stove pipe and a large 50-gal drum (from something like honey!). It's a pretty ingenious system.

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D. PICKLING

## 1. GENERAL QUESTIONS

### D.1.1 [What do I *\*really\** need to know about pickling?]

Pickling food encompasses several techniques, but usually involves equilibrating food in a salt solution, then one either adds an acid (vinegar), or allows the growth of free yeasts and bacteria to make lactic acid by fermentation. If you are trying to pickle food using fermentation, you need to insure that the salt concentration in your crock will support the microbes you need, and you need to control and monitor their growth. Since you are working with a salt and acid, you also want to make sure that you pickle in a non-reactive container (e.g. porcelain, glass).

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### PICKLES AND FERMENTED PRODUCT SAFETY

The acidity (pH) of a food is of great significance in

determining the type of processing required for safe preservation of a food. In the case of pickled products, the foods preserved are often low-acid foods (cucumbers, zucchini), but their acidity is adjusted to bring the pH into the high-acid range so that may be safely preserved using boiling water bath processing.

The most commonly used acid for pickling is vinegar, however some pickle products are produced by encouraging the growth of microorganisms which produce lactic acid from the naturally-occurring carbohydrates in fruits and vegetables. The lactic acid selects for another group of microorganisms which produce acetic acid that gives pickle products their flavor and helps to lower the pH into the range where these vegetables can be safely water bath canned.

The acidity of pickling solutions needs to be maintained below pH 4.5 if water bath canning is to be used. For this

reason, the amount and strength of the vinegar is critical.

## I. Types of Pickles

- A. Brined or fermented: Depends on selection of natural microorganisms which will produce acid. Selection is accomplished by using salt to inhibit unwanted microbes. Fermentation is usually for 3 weeks or more. Color changes from bright green to olive or yellow green and white interior becomes translucent. Examples: sour pickles, sauerkraut.
- B. Refrigerator dills: are fermented for one week.
- C. Fresh-pack or quick-process pickles: Cured for several hours or combined immediately with hot vinegar, spices and seasonings. Examples: pickled beets, bread and

butter pickles.

- D. Fruit pickles: Whole or sliced fruit simmered in a spicy, sweet-sour syrup. Examples: spiced peaches, crabapples.
  
- E. Relishes: Made from chopped fruits or vegetables which are cooked to desired consistency in a spicy vinegar solution. Examples: horseradish, corn relish.
  
- F. Pasteurized Pickles: Prepared pickles are placed in a canner half-filled with warm (120-140 F) water. Add hot water to 1" over jar lids. The water is then heated to 180-185 F and maintained there or 30 minutes. Temperatures over 185 F may cause softening of pickles.

USE THIS PROCEDURE ONLY WHEN THE USDA CANNING GUIDELINE

RECIPES ARE USED.

## II. Ingredients

### A. Vegetables or fruits for pickling

1. Fruits and vegetables should be ripe but firm, and in good condition with no evidence of microbial or insect damage.
2. Cucumbers should have a 1/16" slice removed and discarded from the blossom end.
3. Use unwaxed cucumbers for pickling so brine will penetrate.
4. Discard any cucumbers which "float"--they can make hollow pickles (use for relish).
5. Prepare fruits and vegetables within 24 h of

harvest.

6. Cucumbers: need 14 lb for 7 quart canner load, 9 lb per 9 pint canner load. One bushel weighs 48 lb and yields 16-24 quarts (2 lb / quart). Use 1 1/2" for gherkins and 4" for dills.

#### B. Vinegar

1. Vinegar needs to be of sufficient strength to assure that low-acid vegetables will be appropriately acid. The vinegar should be 5 to 6% acetic acid (50 to 60 grain), and should not be diluted except according to an approved recipe.
2. White vinegar is preferred with light colored fruits or vegetables.
3. Do not use homemade vinegar--there is no way to

know the strength (% acetic acid).

### C. Salt

1. Canning or pickling salt should be used--it contains no iodine (which can cause darkening) or anti-caking ingredients (sodium silicate or tricalcium phosphate) (which cause cloudiness of the brine).
2. Salt inhibits certain kinds of microorganisms and in fermented pickle products, it is required to prevent growth of spoilage and pathogenic microorganisms. Salt also draws water out of the cells making the pickled product more firm. Too much salt will cause shriveling.
3. Do not use "sour salt"--it is citric acid and does not have the same inhibitory effect on microbes.

4. Do not use reduced-sodium salt in fermented pickle recipes. Reduced sodium pickles can be made using quick pickle recipes given in the USDA Canning Guidelines. Fresh pack pickles, acidified with vinegar can be prepared with little salt but the flavor and texture will be affected.
5. Salt concentration in brined, fermented products must not be reduced for safety. Do not try to make sauerkraut or fermented pickles by cutting down on the salt.

#### D. Sugar

Either white or brown granulated sugar can be used.

#### E. Spices

1. Use fresh, whole spices in cheesecloth bag.

2. Powdered spices cause darkening and clouding.

F. Hard Water

1. Hard water minerals may interfere with acid formation and curing in fermented pickles. In addition, hard water may have a pH of 8.0 or higher.
2. Softening hard water: boil water for 15 minutes then allow to stand for 24 hours. Skim off any scum that appears. Pour out of container so sediment is not disturbed.

G. "Crisping Agents"

These products are not recommended as they may result in a product with a pH which is unsafe.

1. Lime (calcium hydroxide) which is sold as "slakelime", "hydrated lime", "builders lime", or "household lime". When called for in a recipe, it is added to the brine before pickles are soaked. When used, lime is added for 12-24 hours of soaking. It must be removed from pickles by soaking (1 hour) and rinsing three times in fresh water in order to make the pickles safe. The component of calcium hydroxide which firms up the pickles is the calcium--it cross-links the pectins making them insoluble.

DO NOT USE: agricultural lime, burnt lime, quick lime--these are not food grade products and are unsafe.

2. Alum (aluminum and potassium sulfates): Use no

more than 1/4 tsp of alum per quart of pickling solution. Excess will cause bitterness. Alum may be safely used--it does not improve the firmness of quick-process pickles.

3. Grape leaves: contain substances which inhibit enzymes that make pickles soft. Blossom removal takes care of this problem.
4. Hot process: pickle firmness may be improved by processing the pickles for 30 minutes in water maintained at 180 F. Water must not fall below 180 F--prevents spoilage (pasteurization).

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D.1.2 [What is the process for making dill pickles?]

You have two options, depending on time, tastebuds, and ethnic heritage. First option is brine curing, where you scrub small size whole pickling cukes clean; dissolve pickling salt into hot or boiling water to make a brine; pack cukes, spices, and dill seed heads in a very clean crock; pour brine over the cukes; weight everything down with a clean plate; place crock in a cool, dark place; skim yeast scum as it forms for several weeks, adding salt brine as needed. [Check out the Tips 'N Tricks section for a tip to make this job easier.] When done, you either refrigerate or pack your dill pickles into canning jars, waterbath process. BTW, don't even think of taking a vacation during this procedure; uncontrolled pickle crocks are the most disgusting things in food preservation.

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The second option is to make quick dill pickles by packing vegetable spears/chunks tightly in sterilized jars with dill seed heads, then heat a vinegar, water, salt, sugar, spice brine, then pour the solution into the packed jars. Seal, then waterbath process.

Check out some of the cookbooks cited in the back of this FAQ for recipes, and look at a couple of recipes at the back of this section. I have not tried any of these, YMMV.

D.1.3 [What makes pickles kosher?]

Check out the Real New York Pickle recipe for one poster's opinion. Also tells you what half and full sours are...

2. GENERAL EQUIPMENT QUESTIONS

D.2.1 [What does it take to make pickles? Do you need special equipment?]

The most specialized piece of equipment that you'll need is a crock, which is just a large, non-reactive, smooth container. You need a big container, because you might as well do a lot of pickles rather than just a few; you need a non-reactive one (see below) because you will be working with salts and vinegar, and you don't want metals in your pickles. You also want a smooth container, because a lot of microbial spoilers will cling to rough edges, making it hard to clean thoroughly.

Other things you'll need: waterbath canner, canning jars and lids, timer, wooden spoons, heavy plates, cheesecloth. One of the most important things for successful pickles is a cool place. The crock shouldn't get above 70 F, otherwise the pickle bacteria/yeast grow

too quickly and spoil the pickles.

D.2.2 [What's a non-reactive container?]

Non-reactive things: ceramic, glass, stoneware, food-grade plastic,  
wood, porcelain

Reactive: copper, zinc, cast iron, brass, aluminum, carbon steel,  
or galvanized anything

3. TROUBLESHOOTING

D.3.1 [I followed this pickle recipe, but they don't look like  
they do in the store. What happened? Can I still eat them?]

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PICKLE AND PICKLE PRODUCT PROBLEMS

Making home-made pickles is a time consuming and expensive operation. There are a variety of different steps along the road from cucumbers to sweet Gherkins, so there are a number of places where the process can break down. Pickle problems can usually be traced to the method by which the pickles, brine or syrup are prepared:

- a. Weather and growing conditions (quality of your vegetables).
- b. Kind of salt used (canning or pickling vs iodized table salt).
- c. Vinegar (5% acetic acid, or 50 grain).
- d. Temperature of storage conditions (fermentation).
- e. Pickling method (fermented, quick-pack).
- f. Time lapse between gathering and pickling the vegetables.

1. White scum appears during fermentation--the scum is a layer of yeast and/or mold: Safe
  - A. Vegetables are not submerged in brine.
  - B. Pickling container is not sealed.
  
2. Pickles or sauerkraut is soft or slippery: Unsafe
  - A. Brine is too weak (less than 10-12% salt)--allows growth of organisms which cause texture softening and sliminess.
  - B. Vinegar is too weak (less than 5% acetic acid)--allows growth organisms which cause texture softening and sliminess.
  - C. Temperature during brining was too high (over 75 F).
  - D. Too little brine--all cucumbers must be immersed.

- E. Salt is unevenly distributed on cabbage.
  - F. Air pockets due to improper "packing" of cabbage allow for growth undesirable microorganisms.
  - G. Failure to remove scum daily on surface of brine.
  - H. Failure to remove the cucumber blossoms--enzymes from the blossom will cause softening.
3. Pickles are hollow: Safe
- A. Improper curing: weak brine, pickles uncovered during curing, curing stopped short of full fermentation.
  - B. Too much time lapse between gathering and brining (ie. more than 24 hours).
  - C. Cucumbers have grown in an "abnormal" way.
  - D. Temperature too high during fermentation.
4. Shriveled pickles--caused by excessive loss of water from

the cucumbers: Safe

- A. Curing brine is too strong (more than 12% salt, vinegar more than 6% acetic acid).
  - B. Too much time lapse between gathering and brining (ie. more than 24 hours)-- cucumbers are dehydrated.
  - C. Pickling solution which is too "heavy", or contains too much sugar.
5. Pickles or sauerkraut is dark or discolored: Color development due to iron is safe to some extent but not with other metals.
- A. Using hard water for pickling solution--minerals in the water react with pigments in the cucumbers. Iron in the water is the worst offender.
  - B. Use of brass, iron, copper or zinc utensils during

pickle making--they contribute metal ions which react with cucumbers to form dark pigments.

- C. Use of ground spices will darken pickles.
- D. Whole spices were left in the pickles after packing.
- E. Vegetables (cabbage) is unevenly salted.
- F. Curing temperature is too high.
- G. Vegetables are making contact with the air--pigments oxidize.
- H. Use of cider vinegar with light colored vegetables.
- I. Use of brown sugar with light colored vegetables.

6. Sauerkraut turns pink: Unsafe

- A. Too much salt (over 2.25%) = yeast growth on surface.
- B. Uneven distribution of salt = yeast growth on surface.
- C. Kraut is improperly covered or weighted during fermentation = yeast growth on surface.

7. Moldy pickles or sauerkraut during fermentation: Unsafe

- A. Fermentation temperature is too high.
- B. Insufficient lactic acid production (too much salt).
- C. Failure to keep cloth on top of kraut clean during fermentation (may need to be replaced after skimming).

8. Pickles are strong or bitter tasting: Safe

- A. Used too much spice.
- B. Spices cooked too long in the vinegar.
- C. Vinegar is too strong (more than 6% acetic acid).
- D. If pickles are too acid increase the sugar, do not decrease the acid.
- E. Use of "old" or overmature cucumbers with tough, bitter skins.

9. White sediment occurs in the jars: Small amount of sediment normal. If pickles are soft and slippery---Unsafe.
- A. Yeasts grow on the pickle surface then settle to the bottom--they are harmless, but can be prevented by water bath processing filled jars.
  - B. Use of table salt instead of pickling salt--it contains anti-caking ingredients which settle out.
  - C. Poor temperature control.
10. Pickling liquid in the jars is cloudy: Unsafe
- A. Pickles are spoiled--discard.
  - B. Hard water minerals may cause clouding.
  - C. Use of table salt instead of pickling salt--it contains anti-caking ingredients which cause clouding.

- D. Use of unstrained brine (from fermentation) for pickling liquid may cause clouding.

11. Pickles or sauerkraut "spoil": Unsafe

- A. Use of unsterilized jars.
- B. Use of ingredients which have lost their strength (vinegar).
- C. Inaccurate measuring of ingredients.

12. Pickles are "dull" or "faded" in color: Safe

- A. Use of over-ripe or yellow cucumbers.
- B. Use of fruits with pale color.
- C. Overprocessing of beet pickles--pigments are damaged.
- D. Pickles exposed to excessive light.

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4. Collection of pickle recipes. Some typical, some odd, most ethnic. YMMV, email the contributor for details.

From: Wolfgang <capuano@deakin.edu.au>

RECIPE : Salt-Pickle Vegies

I should have submitted this to the FAQ, but I never got around to it. I like these pickles because I don't really like vinegar. Balsamic is fine, but pure white commercial stuff is foul (on my tastebuds). This recipe is the way pickle is made in Transylvania (spelling?). It was given to me by a non net person. You will need :

Salt

Water

Toasted Rye Bread

Jars that withstand pressure (I use Pasta Sauce jars)

Vegies : (can include)

- Gherkin Cucumbers (whole)
- Cabbage, sliced.
- Carrot (finely sliced)
- Raw Green Beans
- Cauliflower
- Garlic
- Sunchokes
- DILL, DILL, DILL and more DILL!!!!!! (A must)

Spices : (can include)

- Peppercorn (whole)
- Coriander (whole)
- Commercial Pickling Spice

Directions :

For every liter of water, add 40 grams of salt. Boil water and let cool (with lid on). Wash and dry jars. Prepare the vegetables. Place vegies in jar, tightly packed, and sprinkled with spices. Pour salt water over and place a small piece of toasted rye bread on top of vegies. Cap, and leave in a warm, dark place. You might notice bubbles forming and a thick white sediment. This is caused by the yeast fermentation that occurs in the jar. There are a few principles that give this sort of pickle a long shelf life.

- 1.) No oxygen. Yes, its starts of with oxygen in the headspace, etc, but the yeast fermentation uses that oxygen up.  
Remember, oxygen causes oxidation, which spoils the pickle.
- 2.) Salt. It stops many organisms growing, and keeps the vegetables fantastically crisp, and full of flavour.
- 3.) High Pressure. The yeast converts vegetable sugars into gas, this gas increases the atmospheric pressure, like

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a carbonated beverage. Not many organisms like high atmospheric pressures.

In 3 weeks, you can try your pickle. It will last much longer if you can put a few away. Taste your gherkin first, it will taste like a gherkin you have never had before. The carrot actually tastes like carrot, not a vinegar sandwich. Let me know what you think.

[A real New York deli Pickle?]

from Kurt Rieder <krieder@buffnet.net>

A good deli pickle (Kosher dill to some) is made without vinegar.

The process is a lactic acid producing fermentation.

You need a crock or wide mouth container, a board or plate, and a weight... like maybe a rock.

Scrub the cukes and put them in the crock.

For a 5 gal crock layer the following among the cukes: 3 1/3 oz sugar, 3/4 lb fresh dill, 3/4 oz allspice, 3/8 oz mustard seed, 3/8 oz black pepper corns, 1/8 oz bay leaf, 1 head garlic... broken into cloves.

Put the board on top and the rock on top of the board. Full the crock with 8% cool salt brine. An 8% brine will contain 3/4 lb salt per gallon brine. Store at 60 - 70 deg F. That's cooler than ambient this time of year in most places. Consider the basement or some other cool place. Every few days use a paper towel or cloth to clean any scum from the surface. Sample a pickle when you have the urge... after a few days. At first they will be half sours. A bit longer, 2-3 weeks, and they will become full sours.

Both are often sold in the deli. After they are done, lower the

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temperature if you can but don't allow to freeze. Most pickles, even sweet gerkins, that you buy in the store are made this way. They keep the brine and recover lactic acid from it. The brined cukes are bottled and covered with cheaper vinegar... and sugar, if sweet ones are wanted. This is why a deli pickle has it over all others.

[Kimchee]

from: Nicole Okun <ariadne@mindlink.bc.ca>

Herewith, a kimchee recipe:

Half a head of Chinese cabbage

1 large daikon

3 Tbsps salt

Shred the cabbage and daikon. Place the shredded veggies in a large bowl and mix in the salt with your hands. Cover with cold water. Cover the

bowl with a towel, and let it sit overnight.

In another bowl, mix together

1" ginger root, minced

5 cloves garlic, minced

dried hot pepper, crumbled, to taste

Take the cabbage and daikon out of the brine with a slotted spoon or one of those wire Chinese things, and mix together with the spices. Put the kimchee in a large jar or bowl (I use a gallon glass jar that gets about half-filled by this) and pour enough of the brine over to cover by about 2 inches. Cover with a cloth (I just set the lid of the jar on it without screwing it closed at all) and let the kimchee mature for about a week. Start tasting it after four days. When you like the taste, transfer to smaller jars and refrigerate.

[Zucchini relish--10 cups of grated zucchini condensed to 6-8 pints!]

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From: calhoun@gorge.net (Dave Calhoun)

Subject: Zucchini Relish

About 6 months ago there was a great discussion about food made from zucchini and I promised to post my grandmothers zucchini relish recipe. Here it finally is. I love it and hope you do also.

Ingredients:

10 cups ground zucchini

4 cups ground onions

5 tablespoons pure granulated salt

2 1/4 cups white vinegar

4 1/2 cups sugar

1 tablespoon each:

Nutmeg, dry mustard, turmeric & cornstarch

1/2 teaspoon pepper

2 teaspoons celery salt

1 each of sweet green & red peppers, chopped fine

Instructions:

put first 3 ingredients in large bowl and mix well. Let stand overnight. Drain and rinse in cold water; drain again & put in large kettle with remaining ingredients. Bring to boil & simmer, uncovered, stirring occasionally for 30 minutes or until desired consistency. Pour into 6 or 8 hot sterilized pint jars leaving 1/2 inch headspace & seal. Process 15 minutes in boiling water bath.

There you have it straight from my grandma. I love this stuff and a burger just isn't right without it. Let me know if you try it and like it.

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(end of part 2)

=====  
Newsgroups: rec.food.preserving

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Subject: Rec.food.preserving FAQ, version 2.3, part 3  
From: lebasel@nando.net (lebasel)  
Date: 1 Jan 1996 20:27:11 -0500

Part 3 of 6

Version 2.3

Curing/Smoking meats and vegetables, Root cellaring,  
Potting, Distilling, Dairy products

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E. CURING WITH SALT, SUGAR, OR LYE

1. [What do I \*really\* need to know about curing foods, and what makes this different from pickling?]

Sometimes the difference between pickling and curing is semantic, but generally curing is salting, etc, without the second acid step. Again, by adding the salt or sugar, you dehydrate the food sufficiently to stop microbial growth. Examples of salt

curing: salt pork, olives, anchovies, herring, lox; sugar curing: crystallized flowers, syrups, fruit "cheeses", Virginia ham. Lye (NaOH) treated foods include olives, hominy, lutefisk--perhaps lye changes the food sufficiently so that no self-respecting spoiler would grow on it (grin).

#### F. SMOKING

##### 1. [What do I \*really\* need to know about smoking food?]

Smoking food in order to preserve it is a bit different than smoking food on the barbeque. Generally, the meat or fish to be smoked is salt-cured, which preserves the tissue throughout, then is smoked either for flavor, or to preserve the surface of the meat. Other items can be smoked to preserve them and concentrate their flavors, e.g smoked hot peppers. Smoking provides the flavor, but dehydration preserves the pepper. If you

are smoking or curing meat, you need to be concerned the health of the animal (i.e. trichnae).

## 1. MEAT CURING AND SMOKING

Compliments of Richard Thead <rthead@rtd.com>

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--N.B. This is *\*not\** the most current edition of the meat curing/smoking FAQ. The most recent versions can be downloaded by anonymous ftp at ftp.rtd.com. Get /pub/rthead/msfaq.txt. It is also on the Web, link at URL <http://www.rtd.com/~rthead/msfaq.html>. I put this in simply to give the reader an idea of what the FAQ contains.--

----- I. Curing -----

[Why is meat cured?]

For a couple of reasons. One is safety. When meat is cold smoked its temperature often stays in the danger zone for several hours or days. Many environmental factors of this treatment are such that the growth of dangerous bacteria is greatly accelerated. The curing of the meat inhibits this growth.

The other reason is traditional preparation. There are many curing techniques that were developed in the days before refrigeration that are continued today for traditional reasons. A good example is corned beef.

Oldtime butcher shops closed every weekend. Ice, the only refrigerant available, could not dependably hold fresh meat for two days. To keep unsold meat from going to waste, the butcher soaked the meat in a strong

brine or covered it with coarse salt to trigger osmosis.

The grains of salt were called "corn" in England, and the name "corned beef" stuck with the product. [1]

[What is osmosis?]

Osmosis is the movement of water across a membrane from weak solutions toward strong solutions. [1]

[What is meant by "the danger zone"?)

The "danger zone" is the temperature range between 40 and 140 degrees F. When uncured meat remains in this range for more than 2 hours the growth of dangerous bacteria increases to a dangerous level.

[What other factors affect the growth of bacteria?]

When meat is smoked, the environment is robbed of most of its oxygen. If this is combined with temperatures between 40 and 140F, the growth of the bacteria that causes botulism is increased.

[What is botulism?]

Botulism is an intoxication of the bacteria *Clostridium botulinum*. This bacteria is anaerobic meaning that it requires an environment relatively free of oxygen to multiply. It also requires a moist environment and temperatures between 40 and 140F. The symptoms of botulism are sore throat, vomiting, blurred vision, cramps, diarrhea, difficulty breathing, and central nervous system damage (including paralysis). Symptoms usually occur within 12 to 36 hours. The fatality rate is up to 70%. [2]

[What are the commonly used curing compounds?]

Salt, sugar, sodium nitrite and sodium nitrate. Salt and sugar both cure meat by osmosis. In addition to drawing the water from the food, they dehydrate and kill the bacteria that make food spoil. In general, though, use of the word "cure" refers to processing the meat with either sodium nitrite or sodium nitrate.

Sodium nitrite and sodium nitrate are the basis for two commercially used products: Prague powders #1 and #2. Prague powder #1 is a mixture of 1 part sodium nitrite and 16 parts salt. The chemicals are combined and crystallized to assure even distribution. Even though diluted, only 4 ounces of Prague powder #1 is required to cure 100 lbs of meat. A more typical measurement for home use is 1 tsp per 5 lbs of meat. Prague powder #2 is a mixture of 1 part sodium nitrite, .64 parts sodium nitrate and 16 parts salt. It is primarily used in dry-curing.

One other commonly available curing product is Morton's Tender Quick. It is a mixture of salt, sodium nitrite, sodium nitrate and sugar. Ask

your butcher or grocer to stock it for you.

[Where can these compounds be obtained?]

If you are chummy with a local butcher who does curing, maybe (s)he will sell you a small quantity. Otherwise, the Sausage Maker offers all items mentioned here and elsewhere in this FAQ mail order. See the books section for a phone number where you can obtain a catalog.

[What is spray pumping?]

It is the process of injecting the meat with cure using a special purpose needle.

[What's trichinosis?]

It is an infestation of trichinae. The parasites invade the voluntary muscles causing severe pain and edema. It can be avoided by ensuring

that cooked pork reaches an internal temperature of 150 degrees F.

[If my cured pork doesn't reach a safe temperature, what about trichinosis?]

Trichinae can also be killed by freezing the pork according to the following chart:

Temperature	Grp1-days	Grp2-days
5 deg F	20	30
-10 deg F	10	20
-20 deg F	6	12

Group 1 comprises product in separate pieces not exceeding 6" in thickness or arranged on separate racks with the layers not exceeding 6" in depth.

Group 2 comprises product in pieces, layers or within containers  
the thickness of which exceeds 6" but not 27". [3]

[What about dry-curing sausages and meats?]

I'll leave this topic open for someone with real experience. The dry  
climate in Tucson makes it difficult to maintain the ideal 70% relative  
humidity required for dry-curing so I've never even tried.

----- II. Smoking -----

[What is the difference between smoke cooking and curing?]

Pretty simple; Smoke cooking is done at higher temperatures in order  
to cook the meat. Smoke curing is really just smoking cured meat or  
sausage.

[What are the proper temperatures for smoke cooking meat?]

I prefer to keep the temperature around 220F. This means the temperature \*at\* the meat. I use a large log burning smoking pit with an offset firebox so it's easy to maintain this. In an upright water smoker you will have trouble keeping the temperature this low, since the heat builds up at the top where the meat is. You can achieve decent results with a water smoker, but the cooking time will be shorter and the depth of smoke penetration will be less. My briskets and pork shoulders smoke for 20-24 hours; pork ribs and loin roasts take less time.

[How important is temperature control during smoke curing?]

Very. If you are smoking sausages, excess heat will melt the fat out and leave the final product dry and crumbly. This I know from

experience. Here, we're talking about temperatures around 140F, although it varies from recipe to recipe. This is very difficult to maintain in a wood burning smoker. Mine has a slow smoking section farthest away from the fire. With experience, I've learned to control the temperature in this section without overdamping the air inlet. Some other meats, like bacon and ham, are a little more tolerant of higher heat, but it can affect the quality of the final product.

The best solution is a thermostat controlled gas or electric slow smoker like those sold by the Sausage Maker (see sources). These are not good general purpose smokers, in my opinion. I just don't think they do nearly as well as a log burning pit for smoke cooking.

Unfortunately for the many water smoker owners, they just won't do for slow smoking--don't even bother trying.

[Is closing down the air inlet dampers a good way to keep the

temperature down?]

If you keep the temperature low by closing down the inlet dampers, the smoke gets thick and sooty and produces an unattractive and bitter coating on the surface of the meat. I prefer to keep the fire burning more freely and control the temperature by providing some draft between the fire and the meat.

[What are the various woods used for smoking?]

#### Alder

The traditional wood for smoking salmon in the Pacific Northwest, alder also works well with other fish. It has a light delicate flavor.

#### Apple and Cherry

Both woods produce a slightly sweet, fruity smoke that's mild

enough for chicken or turkey, but capable of flavoring a ham.

### Hickory

Hickory is the king of the woods in the Southern barbeque belt, as basic to the region's cooking as cornbread. The strong, hearty taste is perfect for pork shoulder and ribs, but it also enhances any red meat or poultry.

### Maple

Mildly smoky and sweet, maple mates well with poultry, ham, and vegetables.

### Mesquite

The mystique wood of the past decade, mesquite is also America's most misunderstood wood. It's great for grilling because it burns very hot, but below average for barbecuing for the same reason. Also, the smoke taste turns from tangy to bitter over

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an extended cooking time. Few serious pitmasters use mesquite, despite a lot of stories about its prevalence in the Southwest.

Oak

If hickory is the king of barbecue woods, oak is the queen. Assertive but always pleasant, it's the most versatile of hardwoods, blending well with a wide range of flavors. What it does to beef is probably against the law in some states.

Pecan

The choice of many professional chefs, pecan burns cool and offers a subtle richness of character. Some people call it a mellow version of hickory. [5]

[Rick, do you have any politically incorrect views about smoke cooking that you enjoy getting flamed about?]

Don't get me started.

-----III. Specific Foods -----

[Can I make a Smithfield Ham at Home?]

These are unique since the hams come from only peanut-fed hogs. They are worked with cure for 30-45 days. Then they are smoked for at least 7 days and left in the smokehouse for another 6 months. "The Smithfield ham or a reasonable facsimile is rather difficult to produce unless you have a steady supply of peanuts and a huge smokehouse 3-4 stories high."

[3]

[How do I make my own bacon at home?]

It is my experience that bacon is the easiest product to produce at

home and the results are as good as, or better than, the best commercially produced bacon.

I use Morton Tender Quick and brown sugar. Rub down a slab of fresh bacon (pork belly) with a liberal quantity of the Tender Quick. You can't really use too much but a cup or so should do. Then follow with a thorough rub of brown sugar (again, start with a cup or so). Then place the meat in heavy plastic and allow to cure for 7 days at 38F. I use a small refrigerator for this. I run a remote temperature probe inside and monitor the temperature, tweaking the thermostat when necessary. The temperature is important; too low (below 36F) and the curing action will cease, too high (above 40F) and the meat will begin to spoil. I also cut the pork belly in two and cure it with the meat surfaces face to face and the skin on the outside. It helps it fit in the fridge and improves the curing action. I then smoke it at 140-150F until the internal temperature of the pork reaches 128F (about 8 to 10 hours). I find it best to remove the skin about 3/4 of the way through the smoking

process. This way the fat is protected but still acquires some color.

Chill overnight before using.

If you are using Prague Powder #1, mix 2 oz with 1 lb of salt and use like the Tender Quick.

Other sugars can be used instead of brown sugar. Try honey or even some maple syrup.

[How do I make my own corned beef?]

For best results, use trimmed briskets.

Start with a curing brine. This recipe comes from [3] and makes enough for 25 lbs of meat.

5 quarts ice water (about 38-40F)

8 oz. salt

3 oz. Prague Powder #1

3 oz. powdered dextrose

Spray pump the briskets to about 12-15% of their original weight.

After pumping, the briskets are packed in a vat, and sprinkled with whole pickling spice. If more than one brisket is done at a time, pack them flesh to flesh with the fat sides out. Add enough brine to cover and allow to cure for 3-4 days at 38-40F. The meat is then ready to use (but still requires cooking).

[What is pastrami and how do I make my own?]

For best results, use trimmed briskets.

Start with a curing brine. This recipe comes from [3] and makes enough for 25 lbs of meat.

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5 quarts ice water (about 38-40F)

8 oz. salt

5 oz. Prague Powder #1

5 oz. powdered dextrose

1 Tbl garlic juice

Prepare and cure as for corned beef. After curing, remove from brine and rub liberally with cracked black pepper and coriander seeds. Smoke at 140F until the meat is dry and then increase smoker temperature to 200-220F and hold until internal temperature of meat reaches 170-180F. Chill overnight before using. This meat is fully cooked.

[How do I make beef jerky?]

There are a jillion recipes for jerky--take a look in the recipe archives. (you can find an archive at <ftp.rtd.com:/pub/rthead/jerky.rcp>)

--LEB)

I prefer a teriyaki-based marinade (use 1/2 tsp of Prague Powder #1 or 1 tsp of Tender Quick for safety) with other spices, lightly smoked. My recipe is not for publication, but it's nothing out of the ordinary. Experiment with your own combinations of spices and find something you like.

----- IV. Other Sources (besides this FAQ) -----

BOOKS:

Great Sausage Recipes and Meat Curing (1984). Ryttek Kutas.  
Self published. Can be obtained from the author at The Sausage  
Maker Inc./ 26 Military Road/ Buffalo NY 14207. (716)-876-5521.

----- V. References -----

- [1] Food Science--Osmosis, Rita Sorci Planey, "Fine Cooking",  
Aug/Sep 1994, pp 12,13
  
- [2] The New Professional Chef (1991). The Culinary Institute of  
America.
  
- [3] Great Sausage Recipes and Meat Curing (1984), Ryttek Kutas.
  
- [4] On Food and Cooking (1984), Harold McGee.
  
- [5] Smoke and Spice (1994), Jamison and Jamison.

Please direct questions, comments, criticisms, and contributions to:

Richard Thead

rthead@rtd.com -or-

rthead@igate1.hac.com

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## 2. VEGETABLE/FISH CURING AND SMOKING

### E.2.1 [How do I cure olives?]

MMMMmmm. Nothing I like better than a home cured olive, and they are very easy to make. All that's required is patience, yer olives, a rolling pin or a paring knife, and a non-reactive container.

You can cure olives at nearly any stage (really tiny green ones aren't worth it). Green, red ripe, black (or dead) ripe. You've got several choices, depending on your curiosity and your fanaticism.

Water curing. (For the most fanatic)

Generally you water cure the big green ones, right before they turn red. You pick the olives, crack each of them with a rolling pin, then

immerse them completely in cold water, changing the water \*each\* day for at least 25 days. Stir them up when you think about it. Immerse and change the water, etc, taste one after 25 days. If they are too bitter, keep up the regime until they are edible.

Brine curing. (A little less fanatic)

You usually brine cure olives that are either red-ripe or black-ripe. The red-ripe olives generally turn a grey green to pink, while the black-ripe ones keep their color, becoming a Kalamata-deep purple. Again, you pick the olives, or you shake the tree over a tarp, and collect the olives. Deeply slit each one using a sharp paring knife, then plunk them into a brine (brine is 1/4 cup canning salt in 1 qt water). Weight down the olives, make sure they are fully immersed. Cover your vat of olives, stir once in awhile, wait one week. Rinse, and change the olive brine once/week for at least 3 weeks. Taste, if still too bitter, keep changing brine 1/week. Mine usually take about 6 weeks. Scum will form on the top of the vat; its harmless

\*if\* olives are immersed, but get rid of it when you see it.

Lye curing. (No fanaticism necessary)

You always lye cure green olives. If you bubble air through the lye solution, the green olives turn black; the California black olive is born. You pick the olives, clean them. Save a few of your biggest olives for the top of your vat. Immerse all those olives in a lye solution (2 tablespoons flake lye in 1 qt water) for 12 hours.

Dispose of lye solution, reimmerse olives again in new lye solution for 12 more hours. Take and cut into some of your largest olives to see if the lye penetrated the olive (olive will be soft to the pit, easy to cut to the pit, and the flesh will be yellowish green when ready). Soak olives in water for 3 days, changing the water at least 3-4 times/day. Taste an olive on the fourth day. Should taste sweet and fatty, with no bitterness, a little like a tiny avocado. Immerse for 1 week in a light brine, about 6 Tbs salt in gallon of water.

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\*\*\*Lye is nasty, remember to wear rubber gloves, use lemon juice or vinegar to neutralize lye burns, and your olive vat shouldn't be plastic.\*\*\*

Can also make marinades for your cured olives, good flavors/herbs to use in various combinations are: garlic, bay leaf, oregano, thyme, dried chiles, fennel seed, peppercorns, coriander seed, orange peel, lemon peel, lemon slices, cumin seed.

--

E.2.2 [A friend of mine is looking for the recipe for "preserved eggs" or "1,000 year old eggs". Jim Kofler <jkofler@mayo.edu>]

from Katherine <pepersb@cuug.ab.ca>, rec.food.cooking

I just got a new Chinese cookbook - "The Chinese Gourmet" by William Mark. It has a detailed description of "Hundred-Year-Old Eggs", though not an actual recipe. I'll pass on what it says, in case it

may be of use/interest.

"Rather than being dug up from an ancient tomb, as the name might suggest, '100-year-old eggs', or as some call them '1000-year-eggs,' are actually preserved for only 100 days at most. Fresh duck eggs are mixed with various preservative compounds that permeate the shell and alter the consistency of the egg.

There are two main methods for preserving eggs in China: P'i tan are coated with an alkaline mud and then covered in ash, rice husks, or tea leaves, before storing in large crocks for 100 days. The yolk becomes creamy and very pungently flavored, the white turns an amber-gray color and coagulates into a firm, gelatin-like consistency.

They are shelled and the egg sliced to serve as an hors d'oeuvre with slivers of preserved ginger and a vinegar dip.

Hom tan are preserved in brine and saltpeter, or a mixture of finely ground charcoal and brine. The yolk hardens to a firm, grainy texture and acquires a pleasing salty taste. These must be cooked before they are ready to eat, as a snack with a splash of sesame oil and vinegar and a sliver of ginger, or to add, sliced, to congee. The yolks are an ingredient in the fillings of many sweet pastries.

Hundred-year-old eggs are valued not only for their taste, but also for their medicinal value. The preservation process raises their alkalinity, making them a good antidote for ulcers and other conditions caused by hyper-acidity.

They are also considered a cure for hangovers."

--

E.2.3 [After some discussion on posole (aka, hominy) on the Chile-Heads list, someone in France asked how you make hominy, since it isn't really

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available there. <mikeb@radonc.ucdmc.ucdavis.edu>]

from Justin M. Sanders <jsanders@orph01.phy.ornl.gov>, the Chile-Heads list...

Traditionally not lime, but \*lye\*. Here is a recipe paraphrased from a delightful recipe book called "Seems Like I Done It This A-way", by Cleo S. Bryan. (Mrs. Bryan was an Extension Home Economist in Oklahoma, and many of her recipes are traditional Native American recipes).

#### Hominy

2 qts. dry shelled corn (white or yellow)

8 qts. water

2 oz. lye

Boil the above 3 ingredients 30 minutes. Remove from heat and let stand 20 minutes. Rinse in cold water until all the skins and the

"eyes" on the corn are loose. Return to heat, cover with water, bring to boil for 5 minutes. Pour off the water, and repeat 2 more times (for a total of 3 five-minute boilings with fresh water). Cover again with water and cook 30 minutes and can. Process in a pressure cooker at 10 lbs. pressure for 70 minutes for quarts, or for 60 mins. for pints.

Apparently, if you don't wish to can the hominy, you can eat it after the 30 minute cooking period.

In more traditional recipes, the lye was obtained by straining water through hardwood ashes-- or by boiling the ashes along with the corn.

--

#### E.2.4 [How do I smoke chiles?]

Some recipes and techniques are available at the chile heads [www](http://www)

site. Check the Other Sources List for the URL.

from Garry Howard, <garhow@hpubmaa.esr.hp.com>, taken from the chile-heads list..

Americans who love the smoky taste and fiery bite of chipotles have recently been hit with high prices and a scarcity of product. With prices for these smoked jalapenos reaching \$15 a pound wholesale, home growers yearn to smoke their own. But the Mexicans have been fairly secretive about their techniques, and none of the books on chiles describe home smoking. After a trip to Delicos Mexico, I think I have solved this mystery -- but the process takes some dedication. First, let's look at how the Mexicans do it.

They use a large pit with a rack to smoke-dry the jalapenos. The pit containing the source of heat is underground, with a tunnel leading to the rack. The pods are placed on top of the rack where drafts of air

pull the smoke up and over the pods. The jalapenos can be whole pods or pods without seeds. The latter are more expensive and are called "caponos", or castrated ones.

It is possible to make chipotle in the back yard with a meat smoker or Weber-type barbecue with a lid. The grill should be washed to remove any meat particles because any odor in the barbecue will give the chile an undesirable flavor. Ideally, the smoker or barbecue should be new and dedicated only to smoking chiles.

The quality of homemade chipotle will depend on the maturity and quality of the pods, the moisture in the pods, the temperature of the smoke drying the pods, and the amount of time the peppers are exposed to the smoke and heat. The aroma of wood smoke will flavor the jalapenos, so carefully choose what is burned. Branches from fruit trees, or other hardwoods such as hickory, oak, and pecan, work superbly. Pecan is used extensively in parts of Mexico and in southern New Mexico to flavor chipotle. Do not be

afraid to experiment with different woods.

The difference between the fresh weight of the fruits and the finished product is about ten to one, so it takes ten pounds of fresh jalapenos to produce approximately one pound of chipotles. A pound of chipotles goes a long way, as a single pod is usually enough to flavor a dish.

First, wash all the pods and discard any that have insect damage, bruises, or are soft. Remove the stems from the pods before placing the peppers in a single layer on the grill rack. Start two small fires on each side of the grill with charcoal briquets. Keep the fires small and never directly expose the pods to the fire so they won't dry unevenly or burn. The intention is to dry the pods slowly while flavoring them with smoke. Soak the wood in water before placing it on the coals so the wood will burn slower and create more smoke. The barbecue vents should be opened only partially to allow a small amount of air to enter the barbecue, thus preventing the fires from burning too fast and creating too much heat.

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Check the pods and the fires hourly and move the pods around, always keeping them away from the fires. It may take up to forty-eight hours to dry the pods completely. The pods will be hard, light in weight, and brown in color when dried. If necessary, let the fires burn through the night. After the pods have dried, remove them from the grill and let them cool. To preserve their flavor, place them in a zip-lock bag. It is best to store them in a cool and dry location. If humidity is kept out of the bags, the chipotles will last for twelve to twenty-four months.

Buen apetito!

NOTES : From the article: The Chipotle, Mystery -- Solved at Last!

by: Dr. Paul W. Bosland, Agronomy and Horticulture Department

New Mexico State University

Chile Pepper Magazine - October, 1992

MasterCook formatted by Garry Howard, Cambridge, MA

garhow@hpubmaa.esr.hp.com

E.2.5 [What do I need to know about smoking a fish?]

from Doug Smart, <doug\_smart@hp-corvallis.om.hp.com>...

This isn't a recipe, but it is good information and does offer something on the strength of the brine:

Pacific Northwest Cooperative Extension publication PNW 238 advises the following (somewhat paraphrased) for safety in smoking fish:

- Fish must be heated to 160 F internal temp and held there for at least 30 minutes during the smoking process.
- Fish must be brined long enough to absorb adequate salt for preservation. A brine solution containing 1 part salt to 7 parts

water by volume for 1 hour will usually suffice.

- Oily fish such as salmon, steelhead, shad, and smelt take longer to absorb brine, but tend to absorb smoke faster.
- Fish should be air dried before smoking for better smoke absorption and to minimize the chance of spoiling during smoking.
- It is best to smoke at a low temp for 3-5 hours before elevating to the 160 F cooking temp. This helps eliminate "curd" formation as juices boil out. To avoid spoilage during smoking, the magic 160 F temp should be reached within 6-8 hours.
- Commercial smoked products must meet an FDA requirement of at least 3 1/2% water phase salt after smoking. Since most home smokers cannot make that measurement, refrigeration is essential for safe storage of home-smoked fish.
- Use only hardwoods for smoking. Maple, oak, alder, hickory, birch and fruit woods are recommended. DO NOT USE WOODS FROM CONIFERS.

[Smoked salmon]

from Brian Bigler <bigler@eskimo.com>...

I recently responded to a thread concerning oily versus non-oily fish by listing my recipe for smoked salmon. I figured it may be of use to others on this Usergroup, so I'm posting this to the group. I hope to hear from some of you who have improvements on this, but be advised, this recipe has received rave reviews from my colleagues in the salmon business:

First of all, the smoker you use will greatly effect the final product. I'm not familiar with all the various brands, but the hobbyist smokers that I've seen tend to be small, for the sake of shipping, and not really practical for the performance I need. I like to use cool smoking for cheeses, as well as warmer smoking for salmon or trout. I'll describe my ideal smoker at the end of this. [I put a copy of this under equipment sources--LEB]

SMOKED FISH

I use the following for at least two-six pound fish

Brine:

1 gal	water (at least a gallon, I use a couple)
1/2 lb (at least)	pickling salt
1/4 lb (at least)	brown sugar
3-4 tbs	pickling spice
2-3 tbs	paprika

Put the water on to boil, adding the entire 1/2 lb of salt, stir until salt is dissolved. Add sugar and stir. Add the pickling spice and paprika. You may not be able to get the sugar to dissolve, but if you can, add more salt.

Irrespective of the amount of water, you want to achieve a super-saturated saline solution with the salt and sugar. The mixture will be super-saturated when you have salt granules on the bottom of the

pot at a boil. Speaking to details, the sugar is absorbed by the meat much slower than the salt. I've used half salt/half sugar mixtures with great success, but the amount I recommend here will allow you to reach the point of super-saturation and keep the salt content down.

Boil the mixture (covered) for five or so minutes, and either set it aside to cool, or put it in a sink of cold water (change the sink water several times as it gets hot).

I cut my fish in fillets and then in pieces about two to three inches wide. Brine the pieces for 3.5 to 5.0 minutes, depending upon thickness. Timing is important, don't brine longer than 5 minutes, no matter the thickness of the meat. This brine time imparts salt/sugar/pickling spice flavors to the outer tissues, that then diffuse through the meat as it dries. I've tried the products of people who leave the meat in brine for so long all you taste is salt. Don't make that mistake, too little salt is MUCH better than too much.

Take the pieces from the brine and place on a paper towel-covered board. Allow to dry at least until a pelicle (hard outer surface) has formed. This could take up to two days if the weather is wet, alot less if you put it in the sunshine. I like to dry mine for a long time to attain a chewy texture, but you at least want the excess moisture to evaporate off.

Smoke the pieces, skin side up, alternating the ones on the lower racks with those on the upper racks between chip loads.

If your smoker is warm, the paprika will cause the meat to darken without your having to smoke the heck out of it. Too many hobbyists impart a creosote flavor to their meat in the attempt to make it LOOK like it's smoked. Paprika is a great way to make it look really well-smoked without having to leave it in too long. If your smoker is cool, the cooking will turn it dark.

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Remove the pieces to a cookie sheet and place in an oven that has been heated to 350 degrees. Put the cookie sheets in the oven, close the door, and turn off the oven. Leave the smoked meat in the oven for about 15-20 minutes, or until you can see that it's cooked.

I vacume pack mine, one to three pieces at a time, right out of the oven while it's still hot. At the least, use Freezer Bags to store your fish. I've had success with Freezer bags by closing the ziplock to one end and sucking out the air to mimic the vacume sealer. Vacume packing assures that the salt/sugar/pickling spice flavors will be difused through the meat.

I hate to have to freeze mine, but I do anyway out of necessity. My vacume packages will stay fresh if I referigerate, but freezing makes certain.

E.2.6 [Lox, Nova Lox, and Gravlax]

1. from Ray Goddard <rrayg@iconz.co.nz>:

Gravlaks(Norway)- buried or grave fish, for a modern version:-

Take a 6-7 lb salmon, 1 tablespoon brandy, 3/4 oz sugar, 1 1/2 oz salt, pepper, fresh dill.

Clean and wipe out fish (do not wash), fillet, sprinkle with brandy.

Mix sugar, salt and pepper and sprinkle over fish. Put one fillet skin down on plate, chop dill and spread it over, place other fillet on top skin side up. Cover with foil and place board on top and a weight (1lb) on top of that. Put in cool place 3 - 4 degrees C. Turn fillets twice a day and pour liquid back onto fillets. Remove weights after two days. Ready in three to four days. Serve cut in thin slices with more pepper and chopped dill, accompany with rye bread and butter.

2. from <> , by way of Leah Smith <>

Lox comes from the German word "lachs," which means salmon, and came here with German-Jewish immigrants. Note that true lox is not smoked, merely brined, although the smoked salmon called Nova is often

incorrectly referred to as lox. The name Nova comes from Nova Scotia, which is where that type of cold-smoked salmon first came from. Old-fashioned Jewish lox is saltier and oilier than Nova.

Here's a recipe:

1 - qty of VERY fresh, VERY fatty (with whole skin) salmon

1 - large earthenware crock (or wooden keg)

Kosher Salts (or rock salt)

Qty of clear flavorless oil comparable to the qty of salmon

- Skin the salmon keeping the skin as whole as possible.
- Cut the salmon meat into thin slices.
- Within the crock, (or keg), lay down a layer of salt to cover evenly.
- Place one side of the salmon skin scale side up flat onto the salt layer.
- Drizzle the oil lightly over the skin until shiny.
- Lay one salmon slice atop the oiled skin.

- Drizzle the oil lightly over the salmon slice until shiny.
- Layer the salts thinly atop the salmon slice to cover.
- Repeat the layers as above alternating salt, salmon, oil for all remaining slices.
- Before adding the final layer of salts, lay the other side of the skin scale side up atop the oiled salmon.
- Drizzle with oil until shiny.
- Layer salts atop the final layer of skin to cover.
- Cover entire crock (or keg) with multiple layers (3-4) of plastic wrap
- Weigh down the top of the sealed crock (or keg) with heavy stones.
- Store in a cool place 2 weeks prior to usage.
- Eat when ready!~

NOTE: This will keep almost indefinitely, however, refrigeration is recommended.

3.from <>:

CURED SALMON (Gravlacks - from Norway)

6-7 lb. whole salmon

1 1/2 oz. rock salt

3/4 oz. sugar

Pepper

1 bunch fresh dill

Carefully clean and bone fish. Do not wash fish, but wipe well. Leave skin on. You will have 2 half fishes when done.

Mix salt, sugar and pepper to taste. Scatter over the fish. Lay dill over one half and cover with the other half. (You'll have a "sandwich"; dill in the middle, skin on the outside.)

Place on china plate. Cover with foil and put a one pound weight on top. (Book suggests a board with a heavy can on it.)

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Leave in a cool place (38-40 degrees F). Turn fish twice daily, pouring pressed out liquid back between the fillets. After 2 days remove weights.

Gravlacks will be ready in 3-4 days. Serve sliced thin with more pepper and dill. (Or bagels and cream cheese!) :-)

BRINED SALMON (Lemrimmad Lax - from Sweden)

1 salmon (or thick pieces)

2 oz. kosher salt

2 c. water per pound of fish.

Clean and fillet fish as in earlier recipe. Dissolve salt in boiling water. Allow brine to cool. Put fish in china bowl and pour brine over. Leave in cool place for 2 days. Drain and dry fish and serve as above.

## G. POTTING

### G.1.1 [What is potting anyway?]

Potting generally involves preserving food (meat, cheese) by smothering it in a layer of oil or fat, much like paraffin wax is used to seal up a jar of jam or jelly. This method of preserving food is not for amateurs, or for folks who have to watch their fat intake.

### G.1.2 [How do I render lard? Which pieces of pork fat are used?]

from Imogen <imkastef@ottawa.net>.

Hi Jon, nothing simpler than making lard! The fresh fat from under the skin should be passed through a meatgrinder. Your butcher will do this,

when you have your meat cut. Take small portions and heat them in a large, shallow pot. Safety is very important here!

1. Keep a tightfitting lid handy in case the fat catches fire.
2. Use a stainless steel pot, if you have one. They are easiest to clean later.
3. Use a wooden scraper to constantly loosen the fat from the bottom of the pot. Plastic one's are no good as they will melt.
4. Keep a metal laddle and WARM, HEATPROOF jars handy to fill as the lard dissolves.
5. Continously remove liquid lard as it becomes available.
6. Try to push the raw fat under, so it can dissolve versus the rest spitting all over the place, while it starts to roast.
7. When all your fat is crisp and your lard out, remove pot from the hot element immediately.
8. Never try to refill your pot. ALWAYS do one batch at a time!
9. If you want to use the fried fat later, freeze it in small portions.

It is very greasy. Little portions go well though in spaghetti sauce

f. ex.

10. You should either pressure-can your lard or simply freeze it.

[In answer to pressure canning it, also from Imogen...]

When I pressure-can lard, I use the hot-pack method. The temperature of the lard should have at least 170 degrees Fahrenheit, when you seal the jars with new lids coming directly from a pot of boiling water. Always try to fill the jars as full as possible. You only fill as many jars at a time, as your pressure cooker will hold. I use the remainder of this batch of lard for freezing. That way, I don't have to reheat it.

As for time and pressure that I use, 120 mins. at 10 lbs (70 kpa).

The above mentioned informations are based on what I have read in several books on the subject of pressure-canning procedures for meat.

They all seem to agree on these figures. Nobody expressively mentions lard in their recipes though. Most have recipes for pork cuts of

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various sorts with the addition of either broth or lard. I want to mention, that I, for my part, never sell canned lard, only the freezer variety.

Besides for cooking purposes it tastes well as breadspread on Pumpernickel with cheese or just plain with a dash of salt.

11.Good luck and be careful. This advice comes to you from a porkfarmer!

12.NEVER leave the hot grease on the stove out of your sight!

Hope I didn't sound like a preacher, but over the decades that I have been doing this, I have seen too much go wrong. Besides some nasty little burns from spitting grease I have so far always been lucky.

From: mboddy@peg.apc.org

Subject: Re: Help with lard making???

No doubt you've been flooded with advice, but I might just as well have a go. Your request has brought back many pleasant memories. Rendering lard was the first cooking operation I can remember doing as a child. Watching the lard on the fuel stove, the bubble off of the water, and the rise of the cracklings.

The best lard is made from the leaf and kidney fat which is stripped from inside the carcass. Trimmings left from cutting are also suitable. You won't get a huge amount from baconers. In large, older pigs, backfatters, you can also use the excessive fat on the back.

The fat from the mesentery or caul (round the stomach), and the fat round the gut (ruffle fat) should be kept separate. The lard rendered from this is darker in colour than other lard and can often have an unpleasant odour. Makes good soap.

In any case, do not render the caul. Use pieces of caul to wrap up sausage meat and suchlike for slow frying or baking--an experience in itself, and rare these days.

In preparing the best fat for rendering, remove all skin and traces of muscle meat. Muscle will cause an unpleasant flavour in the lard, if burned during rendering.

To remove the skin from the back fat, etc., cut the fat into 25 mm (inch-wide) strips. Lay the strips on a table, skin side down. At one end of each strip, make a cut in the fat to the skin and pull the skin between the knife held flat and the table. Then cut the fat into 25 mm (one inch) cubes, or put it through a coarse mincer before putting it in the vessel for rendering. We find the mincing method well worth while. Cutting top quality back-fat from a good pig into cubes is a bastard.

You can render in a kettle or other vessel over a slow fire, or in a shallow dish in the oven. We much prefer the slow fire method-- it is more personal and interesting to do. And you can control it.

We often use an electric frypan, so that we can regulate the heat easily. One frypan doesn't hold much, so we do it in batches, or borrow a pan or two. If using a stove, set the pan at the back as the heat gradually rises, then move the pan to the hot-spot. But watch it! Overheated lard tastes peculiar and often darkens in colour.

Always add a little water to prevent burning before the fat melts. The water will boil off, and when it has boiled off, the lard is ready.

Bring fat and water up to heat gradually. Stir frequently and skim

off any cracklings (little cooked fragments of this and that) as they rise to the top. Press out the lard that remains in the cracklings. Cracklings are delicious, with a dash of salt, and can also be used in baking.

If you have a frying thermometer, you will find the optimum temperature to render the lard is about 120 Celsius (about 255 Fahrenheit), but watch carefully and don't push it. The cracklings will come to the surface, the water will bubble off, any cracklings left in the lard will sink again. The lard is ready. Strain the melted lard through clean cheesecloth into jars or other containers for storage. Cool quickly in order to obtain the best texture. We like to stir or whip the setting lard gently. Lard can become grainy as it sets. Stirring or whipping gently stops this. I also follow my grandmother and put a fresh sage leaf in each container.

Lard can be stored in the freezer for at least six months and probably longer without becoming rancid. If you wrap the lard, or seal the lard in its container so that no air gets to it, it will keep for a long, long time in the fridge as well.

Do you want uses of lard? It is the baker's friend. Makes excellent ointments (we used to make calendula). Fries potatoes. Cooked meat and solid meat sausages can be stored in lard. Melt lard in pot, put in meat, pour in more lard until meat is sealed off from air. Melt it again gently to get meat out and make sure the rest is still sealed off with lard. Much like the confits of duck and goose, done this way in the goose or duck fat.

Older recipe books, before people became panicky and paranoid about fat, are full of recipes using lard. The difference between your own rendered lard (done slowly!) and supermarket lard is marked. Home-made lard, stirred as it cools, is of a soft, creamy

texture and always used to fill me with wonder.

Other bits from the pig's inside are worth having--spleen, testicles, kidneys etc. In our time, we have cleaned the guts to make runners for the sausages, but it's a hell of a job. Any questions?

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## H. DISTILLING

### H.1.1 [What is distilling anyway?]

Distilling, in the strictest sense, is eliminating water from a water/ alcohol solution. I'd like to put in here other similar acts, such as preserving herb and fruit flavors in oils, vinegars, alcohols, cordials, fruits preserved in alcohol, making vinegars from wines, making unusual wines, etc.

H.1.2 [How do I make vinegar from wine?]

As the French vintners used to say, God loves to make vinegar...

----- Forwarded message -----

Date: Mon, 17 Apr 1995 13:35:18 -0400

From: EWhiteVHP@aol.com

To: london@sunSITE.unc.edu

Subject: FAQ Making Vinegar

These directions show how to make vinegar at home using readily available ingredients and supplies.

-----

In the late 1800s chemists learned to make acetic acid. Manufacturers added water to reduce its strength to 5%, colored it and sold it as vinegar. Imitation vinegar is still manufactured and by law the label must state that it is diluted acetic acid. Diluted acetic acid is inexpensive and lacks the

vitamins, minerals and esters found in fermented vinegar; its flavor and aroma are also inferior.

It takes good alcohol (wine or beer) to make fermented vinegar. The hit-or-miss method of making vinegar by allowing sugar and water to ferment is not wise. The fermentation of sugar to alcohol by wild yeast is followed by a conversion of the alcohol to acetic acid by wild bacteria. Chances of failure or undesirable tastes and aromas are high. Control the process by using great care in cleanliness and introducing chosen yeast and bacteria to obtain quality vinegar every time.

#### General Directions

Winemaking suppliers list acetobacter as "mother" or vinegar culture. These cultures convert alcohol to acetic acid (vinegar). Most suppliers sell red and white wine vinegar cultures. Some sell cider, malt and mead cultures as well. Any culture may be combined with any type alcohol to produce vinegar.

Vinegar should contain at least 5% acid as required for preserving or pickling. Specialty vinegar contains acid as high as 7%. Beer containing 5.5% alcohol will yield about 5% acid. Wine containing 11 to 12% alcohol must be diluted to 5.5 to 7% alcohol before using it to make vinegar.

Acid test kits, sold by winemaking suppliers, are used to determine the acidity of vinegar. Acid tests are easy to perform and instructions come with the kit.

#### Sanitize

Sanitize utensils and containers that will touch the vinegar by soaking them for 20 minutes in a solution of 2 tablespoons chlorine laundry bleach to 1 gallon water. Rinse everything well with hot tap water. Hot tap water is relatively sterile after being held at high temperatures for several hours in the hot water heating tank.

#### Vinegar Method I

3 measures beer, ale or vinegar stock (5.5 to 7% alcohol)

1 measure vinegar culture with active bacteria

#### Directions

Vinegar leaches molecules from iron and aluminum. Use sanitized glass, enamel, stainless steel or stoneware containers less than two-thirds full. Cover the container with a cloth or stopper it with cotton to keep insects out, while allowing air to freely reach the stock. Store the mixture in a dark place.

#### Temperatures:

Temperatures between 80 and 85 degrees are ideal. Low or fluctuating temperatures slow the process. At 75 to 85 degrees F, it will take 6 to 8 weeks for conversion. At 85 to 90 degrees F, it can take 4 to 6 weeks for conversion. Temperatures over 95 degrees F slow conversion; above 140 degrees F, the bacteria die.

An acetic film called "mother" will form. This smooth, leathery, grayish film becomes quite thick and heavy. It should not be disturbed. It often becomes heavy enough to fall and is succeeded by another formation. If the mother falls, remove and discard it. An acid test will indicate when all of the alcohol is converted to vinegar. Part of the vinegar may be withdrawn and pasteurized. The remaining unpasteurized vinegar may be used as a culture to start another batch. Living bacteria are in the liquid. A piece of the mother is not necessary to start a new batch.

Add beer or diluted wine to the culture every 4 to 8 weeks, depending on the temperature maintained and when most of the alcohol is converted to vinegar. Adding more alcohol to the culture keeps it alive, prevents spoilage and increases the quality of vinegar. If unpasteurized vinegar is exposed to oxygen without alcohol present, bacteria can convert the vinegar to carbon dioxide and water.

Vinegar Method II

2 measures dry wine (11 to 12% alcohol)

1 measure water (boiled 15 minutes and allowed to cool)

1 measure vinegar culture with active bacteria

Follow the directions in Method I. Purchased wine can be used, but some commercial wines contain sulfites or preservatives that could kill the vinegar bacteria.

### Vinegar Method III

(For winemakers only)

Wine containing less than 10% alcohol is subject to spoilage. This formula to make 7% alcohol is an ideal vinegar stock. Follow good winemaking procedures.

When the fermentation is complete (specific gravity 1.000 or below) this low-alcohol wine can be converted to vinegar as directed in Method I.

1 1/2 pounds weight honey (or any sugar source to obtain a specific gravity of 1.050)

2 teaspoons yeast nutrient or energizer

4 teaspoons acid blend (7.5 ppt tartaric acid with an acid test kit)

1/4 teaspoon tannin

wine yeast

add water to equal 1 gallon

#### Homemade wine

Dry wine containing 11 to 12% alcohol can be diluted after fermentation (specific gravity 1.000 or below). It's important that the wine contain no excess sugar. Excess sugar increases the chance of spoilage and formation of a  
a  
slime-like substance in the vinegar. The wine does not have to be clear as this is accomplished when the vinegar ages. At the last racking, do not add campden tablets or potassium sorbate. Dilute the mead as directed in Method II and follow the directions in Method I.

#### Preserving vinegar

To preserve vinegar, add 3 campden tablets per gallon of vinegar

or

Heat the vinegar to 155 degrees F and hold the temperature for 30 minutes. After pasteurizing vinegar add one tablespoon 80-proof vodka to each gallon and age it. If desired to enhance the bouquet, up to one cup oak or beech chips may also be added.

Pasteurized or sulphited vinegar can no longer produce more vinegar.

Pasteurizing kills vinegar bacteria and prevents the formation of "mother" which could lead to spoilage. Pasteurized vinegar keeps indefinitely when tightly capped and stored in a dark place at room temperature. Temperatures above 160 degrees F cause a loss of acidity, flavor and aroma.

#### Aging vinegar

Vinegar has a strong, sharp bite when first made. It becomes mellow when aged. The esters formed during aging, like those in wine, develop after a period of six months or more when stored at a cool, steady temperature (50 to 60 degrees F is ideal). This undisturbed rest also allows suspended solids to fall, making the vinegar clear and bright. Siphon the clear, aged vinegar off

the deposit of solids into sanitized bottles. Introduce as little oxygen as possible. Winemaking suppliers sell attractive vinegar bottles. Use corks or plastic caps to avoid vinegar contact with metal. If corks are used, the necks of the vinegar bottles should be dipped several times into melted wax to form an air-tight seal. The quality of vinegar improves for up to two years and then gradually declines. Fermented vinegar can be sold without the special permits or licenses required for alcoholic beverages. It costs the same as a good bottle of wine.

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This article is taken from "Super Formulas, Arts and Crafts: How to make more than 360 useful products that contain honey and beeswax" Copyright 1993 Elaine C. White. All rights reserved. ISBN 0-963-7539-7-5. This book is available by mail. Contact EWhiteVHP@aol.com for more information, or contact: Valley Hills Press, 1864 Ridgeland Drive, Starkville MS 39759 USA. In the US telephone 1-800-323-7102; other countries call 601-323-7100.

H.1.3 [How do you make flavored vinegars?]

I tend to want to make very powerfully flavored vinegars (you can always dilute), so I add a packed cup of herb/chile/fruit to 2-3 cup of vinegar. For delicate flavors such as delicate herbs and fruit, white wine vinegars, rice wine vinegar, or champagne vinegar are unobtrusive. Rice wine vinegar is probably the cheapest of your choices. For strong flavored herbs, chiles, and berries (e.g. blackberries), any vinegar will do. Combine, let sit for at least two weeks, depending how strong you want vinegar, then filter out the solids. A little heat, using either the stove or the sun is helpful to extract more flavor.

H.1.4 [How do you make flavored oils?]

H.1.5 [Garlic (chiles, herbs, dried tomatoes, etc.) in oil. How safe is it? How can I make them safely?]

You can flavor oils with garlic, etc. within reason. Frankly, garlic is best preserved as dried heads in a garlic braid, not in a garlic and oil paste. It has been tragically shown that garlic and oil pastes, and by extension garlic cloves in oil, provide a good anerobic medium, perfect for Clostridium botulinum to develop. You want to pickle garlic and other root vegetable flavorings in some sort of acid, either vinegar or citric acid. Check out the botulism questions in Section 4 for more information.

Here's another solution for garlic in oil flavoring..

From: kallisti@merle.acns.nwu.edu (Patrick Grealish)

Newsgroups: rec.food.preserving

Subject: Re: Garlic and spices in oil

I have been making garlic olive oil for a few years now. After

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I heard of the possible contamination troubles I didn't like the idea of using vinegar, so I, instead, roast my garlic which makes IMO an even better tasting oil. I roast a whole head of garlic double wrapped in aluminum foil for about 2 hours @ 250 F. Then squeeze out the garlic cloves into the oil. ~300 ml per one head of garlic. This may be too strong (or weak) depending on your like of garlic. Also i've tried adding dried herbs (rosemary, thyme and oregano) to the garlicked oil. It is very good. I hope this is helpful.

H.1.6 [Dandelion wine]

From: Nicole A. Okun <ariadne@mindlink.bc.ca>

Subject: Re: The dandelions won (wine recipe)

Mmmmm, dandelion wine! Ray Bradbury wrote a story with that title that was all warm and nostalgic.

In January, it is *\*so\** nice to open a bottle of dandelion wine: it's

golden and warm, just like the summer. Not to mention that it's quite potent and you'll get smashed before you realize it (\*hic\*!).

The recipe:

3 qts fully opened dandelion flowers

2 gallons very hot water

3-1/2 cups sugar

2 oranges

2 lemons

3/4 cup lemon juice

1 tsp grape tannin (get it at the brew-it-yourself store)

1 tsp yeast nutrient (get it at the above)

1 Campden tablet (ditto)

1 pkg all-purpose wine yeast (ditto again)

Wait for a warm morning when the sun is shining brightly and the dandelion flowers have all opened nicely. Pick a whole bunch,

then find a shady spot and start scraping the yellow petals out of the flower. The green bits will make the wine bitter, so avoid them. Your thumb will get quite brown and even a soaking in bleach won't \*really\* remove the stain, so think about this before you start. It takes about a week to get your skin colour back to normal, and the thumbnail just has to grow out.

Once you've got your masses of fluffy yellow bits, put them in a crock or other fermenting vessel, and pour a gallon of hot water on them. Stir to moisten all the petals. Cover the container tightly with plastic. Allow the flowers to steep for 5 days, stirring once daily. Be sure to replace the plastic tightly. This will smell bad (but not as bad as kimchee <g>). On the fifth day, strain the flowerheads and liquid through a cheesecloth or nylon straining bag into a crock. Squeeze as much liquid out of the flowers as possible.

Measure 2 cups of the liquid into a pot, add 3-1/2 cups of sugar and

bring to a boil. Cook, stirring, until the sugar is dissolved. Cool the syrup for 5 minutes, then add it to the rest of the liquid in the (large) crock (this is the primary fermenting vessel). Remove the zest from the oranges and lemons, cut off all the pith, and add the zest and mashed fruit to the primary. Stir in the grape tannin, lemon juice and yeast nutrient. Crush and add the Campden tablet.

When the mixture is about 75F, sprinkle the yeast over the top. Cover the primary tightly with plastic, and allow the yeast to work for 12 hours. Then stir the yeast in well and cover tightly again.

Allow this to ferment for about five days, stirring daily. Sterilize 2 gallon jugs and rack the must (that's what you've got) into them in equal amounts (a syphon is required for this), leaving behind the yeasty sediment.

Boil up 1 quart of water with 3-1/2 cups of sugar, cool the syrup

and top off the must to within about two inches of the top of the jugs. Put an airlock on each jug and let the wine ferment for about three weeks. At this point it will need to be racked again. Prepare another sugar syrup, syphon the wine into sterile jugs, leaving the yeasty sediment behind, and top up with cooled syrup. Attach airlocks again. Store the wine in a cool dark place for three months, at which time it should have cleared.

Rack it into clean gallon jugs again, using tepid tap water to top it up. It should now rest in a cool, dark place for 6 to 9 months. The wine is now ready to bottle. Taste it first to see if it requires further aging. If not, bottle and drink it whenever you want to. If so, bottle and let it remain in a cool, dark place for a few months (check a bottle every month or so to see how it's coming along). Last year's dandelion wine should be ready to drink in the late summer of this year, but it does it no harm to be kept for the long, dark nights of winter when its cheery colour and not-insubstantial kick brighten dull

evenings.

The flavour is indescribable (unless you've had it before!), the colour is like a pale white wine, the texture is a bit thicker than wine, perhaps more like sherry (because of the sugar content), and the sweetness is on par with dessert sherries.

-----

## I. ROOT CELLARING

### I.1.1 [What do I \*really\* need to know about root cellaring?]

Root cellaring is one of the simplest acts of food preservation. Many vegetables, especially root crops can be preserved in a dry, cool (just above freezing), dark place, such as root cellar. In some climates, one can even leave garden produce in place during

the winter. What you really need to know are the precise conditions needed for optimal storage, and know what cannot be stored next to what. Also, your pile of produce needs to be carefully monitored. Fruits and vegetables that ripen in the presence of ethylene can quickly age all of your produce. (The one rotten apple does what the old adage says it does.)

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## J. Food Preserving Dairy Products

[Looking for rennet for a cheese recipe?]

from Teresa Brucker <tamale@lamg.com>, rec.food.cooking..

Funny, I just bought a book on cheesemaking today as I still want to make that mozzarella. But the book talks about definately not using the rennet available in the grocery stores. There are a few choices as well: animal vs vegetable and liquid form vs tablets.

Take your pick. The liquid is more perishable. They give the following sources:

Caprine Supply 33001 West 83rd/ PO Box Y/ Desoto, KS 66018

Misc starter cultures, kits, molds, presses and equip. Specialize in dairy goat supplies.

Cumberland General Store Route 3, Box 81/ Crossville, TN 38855

Starter cultures, presses, boxes, cutters & tools

Lehman Hardware PO Box 41/ Kidron, OH 44636

Starter cultures, kits, dairy thermometers, presses, cheesecloth, butter churns, butter molds & colors. Catalog \$2.00

New England Cheesemaking Supply Co 85 Main Street/ Ashfield, MA 01330

Starter cultures (including direct set), rennet, wax, molds, presses, kits and miscellaneous supplies. Also workshops.

A newsletter was mentioned too:

Cheesemaker's Journal 85 Main Street/ Ashfield, MA 01330

bi-monthly with articles about making cheese and a large recipe section

[Recipes]

From: James Harvey <harvey@indyvax.iupui.edu>

How to make homemade Devonshire Cream

Devonshire cream is just another name for clotted cream (or perhaps just for clotted cream made in Devonshire?) Clotted cream is the richest form of cream at 55% butterfat by weight. A traditional way to eat it is loaded on scones already spread with fresh butter, and topped with blackcurrant jam. Here are two basic methods of making it:

\*\*\*\*\* Clotted cream, traditional method \*\*\*\*\*

Put the cream in an earthenware or enameled bowl, or a stainless steel milk pan. Heat gently over very low heat or in a basin of water for up to six hours until the cream has a rich wrinkled crusty look. You must never let it boil. Set the pan to cool overnight (in the refrigerator is OK but obviously not traditional :) In the morning, lift off the clout that has formed and store in jars or lidded pots in the refrigerator.

\*\*\*\*\* Clotted cream, quick method \*\*\*\*\*

This method requires a bain marie or double boiler, and a thermometer. Heat the cream until it reaches a temperature of 170 to 180 degrees Fahrenheit (76 to 82 degrees Centigrade). Stir it once to distribute the heat. Keep the cream at this temperature (not more than 190 degrees Fahrenheit (87 degrees Centigrade)) for an hour until it looks wrinkled and crusty. Cool quickly by standing in a bowl of cold water, then set the pan in the refrigerator overnight. In the morning lift off the clot that has formed and store in jars or lidded pots in the refrigerator.

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I have used the second recipe, starting with U.S. light cream (equivalent to British single cream, about 18% butterfat by weight) with good results. Of course, results using commercial cream will not be able to match the best products of particular farms.

From: Kim Pratt <pratt@olympus.net>

Stirred-Curd Cheddar Recipe

A few people requested this recipe for making Stirred-Curd Cheddar Cheese. By the way, it tastes great! This recipe assumes that you know the basics for making cheese. It uses 2 gallons of milk (can be doubled etc).

- 1) Heat milk to 90 degrees, stir in 1/2 cup cultured buttermilk, cover, let sit for 45 minutes at 90 degrees.
- 2) Add 1/4 tablet rennet, let sit for 45 minutes at 90 degrees.
- 3) Cut curds and let sit for 15 minutes.
- 4) Stir curds gently and warm to 100 degrees over the next 30 minutes.

- 5) Hold for 30 minutes at 100 degrees.
- 6) Drain curds, put curds back in pot without whey.
- 7) Add salt (2T) and work it into the curds.
- 8) Allow curds to sit at 100 degrees for 1 hour.
- 9) Press curd for 24 hours.
- 10) Air dry cheese for 2-3 days.
- 11) Age as long as you can stand it at 40 to 55 degrees.

If you eat this cheese at 3 weeks, it tastes like a Jack cheese. After about 2 months it starts tasting like Cheddar (mild). It takes about 6 months for it to be sharp.

(end of part 3)

=====

Newsgroups: rec.food.preserving  
Subject: Rec.food.preserving FAQ, version 2.3, part 4  
From: lebasel@nando.net (lebasel)  
Date: 1 Jan 1996 20:28:33 -0500

Part 4 of 6

Version 2.3

Specific Equipment Questions, Equipment sources, and Tips 'n Tricks

=====  
-----II. Specific Equipment Questions-----  
=====

A. CANNERS--PRESSURE AND WATERBATH, CANNING EQUIPMENT

A.1 [I see different sized canners for sale. Why should I get a big one?]

from Dirk W. Howard <dhoward@novell.com>

My wife and I have two All-American canners. One can do a double stack of pints and a single stack of quarts, and the other can do a triple stack of pints and a double stack of quarts.

I like the large capacity. It means that in a 75 minute processing time I can do anywhere from 9 to 18 pints in the "smaller" canner and up to 27 pints in the "large" canner. Total would be 45 pints if running both canners. As opposed to 375 minutes (3 hours 15 minutes) to process 45 pints in a single 9 pint canner. OK, this isn't fair since I did gauge two canners on one. Let's say that your goal was to process 36 pints of green beans. In a single stack canner that is four different batches. Just the processing time alone is 5 hours. This doesn't count the vent time and the cool down. A canner that can have a double stack of pints cuts the processing time down to 2-1/2 hours. This can be worth the extra price of the canner and the trouble (minimal) to work with.

A.2 [I got this pressure canner (not cooker!) for a gift. How do I take care of it?]

Preserving\_2004.txt

From: phillips@colum.edu (Gary Phillips x397)

The two largest US manufacturers of pressure canners for home use are Mirro and Presto. I imagine their products are available in Canada and if you can find a hardware or cooking supply store that handles either brand they will be able to special order these items for you even if they don't have them in stock.

My present canner is a Mirro. It does 7 quart jars at once, operates at a choice of 5, 10, or 15 psi, and cost me about \$50 in US currency six years ago. It was the least expensive model offered by a local hardware store from stock, and prices went up from there to as high as \$100. It has been well worth the investment.

Do NOT buy a pressure \*cooker\* for canning. Although most of them purport to be suitable for doing a few jars (3 or 4) at a time, in fact they can't hold the temperature and pressure evenly enough for really safe operation.

Preserving\_2004.txt

From: phillips@colum.edu (Gary Phillips x397)

>Yes I bet...I would love to find one at a garage sale. BTW if I  
>ever do, do you know what to look for to make sure it is still  
>operating safely?

Sure. Check the rim of both pan and lid to make sure there are no nicks or damage to the interlocking tabs. Make sure the safety pressure release (usually a rivet-like rubber plug) is still present and soft and moving freely in its slightly oversized hole. Check the gasket that goes between pan and lid for cracks or hardening. Make sure the pressure vent is clean and open, and that the seat for the pressure release weight is smooth and fits well. If there is a pressure gauge, it may need recalibration. Contact the manufacturer for information about that. It would probably be a good idea to order a new gasket and a safety release at the same time. (And an instruction manual if you didn't get one with the canner.)

When you are satisfied that everything is present and working, run a test with just water in the pan. Raise pressure to 5 psi and hold it for 15 or 20 minutes, watching carefully for leaks or drips that might indicate problems. If there is a safety interlock to prevent opening while pressure is present examine it to determine whether it has activated. Allow pressure to drop and make sure the interlock doesn't release (not by trying to open the pan under pressure, but by visual examination) until pressure is gone and you can remove the release weight without any steam escaping.

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#### Care Of Pressure Canning Equipment

To preserve low-acid foods which are safe, good tasting and nutritious, you need to correctly use equipment which is well-maintained and in good operating condition.

Safety Vents or Petcocks:

- Be sure the vent is clear and unobstructed. Use Q-tip or cotton string to clean.
- Be sure vent tubes are screwed tightly into lid.
- If it is a model with vent under the handle, be sure the lever is moving freely.
- If it is a model with a petcock, be sure it opens and closes freely, either by screwing or flipping the lever up and down.
- If there is a film from hard water on the petcock, and it can be unscrewed from the lid, soak the parts in vinegar, then wash and dry.
- A ball and socket type petcock can be cleaned with silver polish.

Safety Overpressure Plugs:

- If it is a metal alloy or composition metal plug that screws into the lid, do not try to remove it.
- If it is a rubber plug, use the thumbnail test to see if the rubber is still pliable enough. If pressure with thumbnail leaves a permanent dent in the rubber it is too brittle for safe use and should be replaced.
- If either type of plug has been blown out by overpressure in the canner, it must be replaced by a new plug. Do not try to reuse the plug that blew out.

Gaskets:

- Soak gasket in hot water for an hour to soften before the first use of the season.
- Insert gasket into its groove in lid. If it is either too shrunken to fit to the edge, or too stretched to

lie smoothly in the lid, it must be replaced.

- Use thumbnail test - if pressure with thumbnail leaves a permanent dent in rubber, it is too brittle and should be replaced. Rubber safety plug should be replaced at the same time, since it will probably be too brittle also.

#### Pressure Gauge:

- Have dial and pop-up gauges tested every year before canning season at your local Cooperative Extension Office. If it is inaccurate it must be replaced.
- Check entrance port and carefully remove any debris that may have accumulated.
- Be sure gauge is screwed firmly into lid. If it attaches with a nut on the underside of the lid, be sure the nut is tight.

Weighted Pressure Regulators:

- Have no moving parts so there is no need to have them tested for accuracy.
- Be sure they are clean, with no debris or food residue encrusted especially in the sockets where the weight fits over its vent.
- Be sure the entrance port and vent pipe are open and unobstructed.
- Be sure there are no nicks or damage to the weight or to the tip of the vent pipe where the weight fits.

Canner Lids:

- Be sure handles are securely attached.
- Be sure gasket fits smoothly into its groove in the

lid.

- Set lid on canner and turn to lock it into place. It should turn on smoothly and easily.
- If it does not turn on easily, check to be sure gasket is properly seated in its groove. Adjust if necessary.
- If the gasket is properly seated, check the lid. If the lid is warped or bent, it might be replaceable. Contact the manufacturer. If it is an old model or no longer manufactured, there may be no way to continue using it as a pressure canner. It may be used as a regular pot for cooking. If this is the case, remove the gasket, and if possible open or remove the gauge and overpressure plugs or petcocks, to avoid the possibility of pressure buildup.
- If there is no visible problem but the lid continues to be tight, a small amount of petroleum jelly or cooking oil may be applied to the gasket to lubricate it.

Canner:

- Be sure there is a rack in the canner.
- Check the bottom for flatness. Older model canners may warp if overheated. If the bottom is not flat or the canner will not sit flat on the heating element or burner of the stove, it should not be used for canning. Warped canners may be used for cooking. Once warped, the damage can not be reversed.
- Put 1 inch of water in the canner, close the lid, heat the water and pressurize the canner. Check to see if steam is escaping at any point other than the petcock or safety vent.
- If steam is escaping around the gasket and it seems to be properly in place, a small amount of petroleum jelly, or cooking oil, may be rubbed around the gasket.

This will soften it and help it to seat more securely.

Too much oil or jelly will over-soften the rubber, and will leave a sticky residue on the canner.

- With weighted gauge canners, if the weight only hisses continuously and does not rock or jiggle intermittently as the manufacturers' directions specify, check to see if the stove is level. This type of weight must hang in a centered position on a vertical vent. If the stove is not level the weight will not hang properly and steam will escape in a continuous stream from the side, and pressure will not build up properly.
- If steam is escaping around the base of any of the vents (dial gauge, weight vent, safety vent, petcock) where they screw into the lid, and if you can screw them out of the lid, the threads can be wrapped with

plumber's tape to seal them. Plumber's tape is a stretchy, non-sticky silicon tape used to seal threads. It is available in small rolls from a hardware store. Be sure to wrap the tape in the right direction, so that when you screw the vent back into the lid, the direction of the turning does not unwrap the tape.

#### Canner Use

- Follow manufacturers' directions for use of your particular model.
- Use canner on the appropriately sized burner. A canner should not hang over the edge of the burner by more than 2 inches on either side.
- Be sure to center the canner on the burner. Some ranges do not allow enough space to center a large canner on rear burners. [N.B. Those newfangled smooth-top

burners are a \*poor\* idea for either a waterbath or pressure canner, both appliances are too heavy, and don't heat the burner can't take it.--Diane Hamilton?]

- Be sure lid is securely locked on (turned on, or screwed down).
- If your canner has six or eight large screws and wing nuts to close it, screw them down in opposite pairs. If there are six, screw numbers 1 and 4 down part way, then 2 and 5, then 3 and 6, then return to the first pair to finish tightening continuing around the lid.
- For all models, be sure to vent the canner for 10 minutes on high heat with a full stream of steam escaping. This is necessary to remove air from the canner. Air remaining inside will lower the maximum temperature achievable, and may cause underprocessing of the food. After the 10 min. venting, close the

petcock, or place the safety weight or weighted pressure regulator on the vent. Allow the pressure to build to 10 psig, or to 5 or 15 psig if you are processing at those pressures. (psig means Pounds per Square Inch by Gauge, the measure of pressure.) Be sure that you use the proper time for the pressure level that you are using. Check the new USDA Home Canning Guide for safe recommendations.

- When canner reaches the specified pressure, begin counting the processing time.
- Reduce heat gradually to maintain the pressure without over-pressurizing. With a weighted pressure regulator, leaving the heat on too high will not increase the pressure, but will cause excess steam loss from the canner, since steam will be escaping continuously. Surpassing the specified pressure in a dial gauge canner will result in soft, mushy or darkened food, and

excessive vitamin loss.

- If the pressure drops below its proper level during processing, increase the heat to bring the pressure back up, then begin the timing over again from zero, for the full specified time.
- Never run cold water over a canner to cool it. While newer, lightweight aluminum canners will not warp the way old ones did, the full, slow cool-down time is necessary for adequate process time. Shortening the time by cooling the canner with water is unsafe. In addition, excessively rapid cooling may cause jars in the canner to crack or explode as the pressure in the canner drops more rapidly than the pressure in the jars.
- When the pressure has dropped to zero, wait another 1

minute before opening the canner. On some models the pressure drop will be visible when the overpressure plug drops back into the lid, the rubber plug is no longer bulged, or the dial gauge will read zero.

Smaller canners will take at least 30 minutes to cool, larger ones may take over an hour.

- Open the petcock or remove the safety weight carefully and wait until any rush of steam has stopped. Then open the lid and tilt the back edge up first, so that it directs the steam away from your face.
- Remove the jars immediately. Do not leave jars sitting in a hot canner overnight, spoilage may result.

#### Canner Storage:

- It is acceptable to leave clean water in the canner if you are going to be canning again the next day. However

if much juice from the jars escaped and the water in the canner is colored it should be discarded.

- Turn the lid upside down and rest it on the canner. The weight of the lid should not be resting on the gasket during storage as it could deform it.
- For long-term storage at the end of the season, wash and dry the canner well. Be sure all the parts (safety weight, rack, etc.) are in the canner. A few crumpled newspapers in the canner will absorb moisture and odors.
- If you unscrew the gauge or vents, coat the threads lightly with petroleum jelly to prevent rust and make them easier to replace.
- Coat the gasket very lightly with petroleum jelly or oil.

Burpee, Health, National Victory and Dixie canners are no longer manufactured, and no parts or service are available for these canners. Parts and service are available for Presto, Mirro and All American, and for some models of National Presto, Kwik Kook, Steamliner and Maid of Honor. If you need further assistance or have other problems, contact your local Cooperative Extension Office.

If you are thinking of buying a canner at a garage sale, check to be sure you can open and close the petcocks. Look for stains of drips down the sides or on the lid near the vents, they may indicate that the lid does not seal or leaks steam all the time. Check that the lid twists on and off easily. Check the condition of the gasket. Check that the base is flat. A rounded base indicates that the canner is warped. Check that there is a rack.

Buying any of the models listed above as having parts and service

available is a much better bet than one of the older ones.

Prepared by Mary A. Keith, Foods and Nutrition, August, 1991

Revised by M. Susan Brewer, Foods and Nutrition, June, 1992

EHE-704

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### A.3 [Other ways of cleaning a pressure canner..]

Compiled by Tracy L. Carter <pa150138@utkvm1.utk.edu>:

Here is a summary of the response I got for cleaning out my nasty looking pressure canner when I forgot to add vinegar.

1. Put in water and cream of tarter. Bring up to pressure for a certain number of minutes and let come back to room pressure naturally before removing lid. If you want the exact instructions, let me know, and I will go into my other account for them.

2. Scrub with a brillo pad. Thought about that, but didn't know if I should scratch the inside of it or not.

3. Cook a batch of tomatoes/tomato juice in the pressure cooker.

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A.4 [Where can I find canning equipment parts?]

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SOURCES OF CANNING EQUIPMENT

PRESSURE CANNERS

Liquid	Jar	Gauge	Parts	Repair
capacity	capacity	type	avail-	service
quarts	quarts pints		able	

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Mirro	12, 22	4	10	weight	yes	no
	(4,6,8 cookers)	7	20			
Presto	13,17,22	4	8	dial	yes	yes
		7	16	weight		
Wisconsin Alumin.	7,10,15	4	4	dial	yes	yes
"All-American"	21,25,30				yes	no

Dixie Canner (sells the All-American line)

Canners previously made, with no available parts or service:

National Victory            Health

Burpee                        Dixie

Note: replacements and testing also available Presto for  
spring-type "pop-up" pressure regulator.

Presto also services and carries parts for:

Steamliner

Maid of Honor, Model 620

Kook Kwik, Models "Best Made" and "Merit"

BOILING WATER CANNERS

	Volume capacity	Jar capacity	
		quarts	pints
Mirro	21	7	9
General Housewares	12, 21	7	8

Glashaus - Weck 8

11

(electric self-contained heating unit)

## JARS AND LIDS jar sizes

### Ball

jelly, 0.5, 1, 1.5 pint, quart, 0.5 gallon regular mouth

1, 1.5 pint, quart, 0.5 gallon wide mouth

### Golden Harvest

0.5 pint, pint, quart regular mouth

0.5 pint, pint, quart in wide mouth

### Kerr

jelly, 0.5, 1, 1.5 pint, quart regular mouth

1, 1.5 pint, quart wide mouth

Addresses for sources:

Mirro Aluminum Corp., P.O. Box 409, Manitowoc, WI, 54220-0409

(414) 684-4421 \*\* also sells Foley, Earthgrown brands

National Presto Industries Inc., 3925 N. Hastings Way, Eau  
Claire, WI, 54703 (715) 839-2209 {correction thanks to Lois  
Grassl ltg@quality.cray.com}

Wisconsin Aluminum Foundry Co., P.O.Box 246, Manitowoc, WI,  
54221-0246

(414) 682-8627

Dixie Canner Equipment Co., Box 1348, Athens, GA., 30603

(404) 549-1914

General Housewares, P.O. Box 4066, Terre Haute, IN, 47804

(812) 232-1000

Ball Corp., 345 S. High St., Muncie, IN, 47302

(317) 284-8441

Kerr Glass Manufacturing Corp., 2444 West 16th St., Chicago, IL,  
60608

(312) 226-1700 or (800) 331-2609

Anchor Glass Cont. Corp., One Anchor Plaza, 4343 Anchor Plaza  
Parkway, Tampa, FL 33634 (813) 884-0000 Golden Harvest jars

Glashaus Inc., 415 West Golf Road, Suite 13, Arlington Heights,  
IL, 60005

(708) 640-6918 Distributes Weck Products

Other Sources:

Lemra Products, 4331 North Dixie Highway, Suite 4, Boca Raton, FL  
33431

(407) 368-8781 Makes the Squeezeo juicer/press

NASCO, 901 Janesville Ave., P.O.Box 901, Fort Atkinson, WI,  
53538-0901

(414) 563-2446 (800) 558-9595 Home Ec.supplies

Robert Bosch Corp., Household Products Div. 2800 S. 25th Ave.,  
Broadview, IL 60153

(708) 865-5256 Electric juicer/press

Prepared by Mary A. Keith, Foods and Nutrition, August, 1991

Revised by Susan Brewer, Foods and Nutrition Specialist

EHE-703

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A.5 [What about zinc rings, rubber sealed jars, and other great, but antique, canning equipment?]

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#### Selecting Canning Jars and Lids

If you are going to invest the time, the produce, your own energy and your electrical energy in home canning, then it should be important to you to select the best containers for your food. Here are some pointers to guide you, or maybe to give you some answers about why the jars you have used in the past broke in the canner or did not seal.

The best jars to use are standard canning jars. There are several

brands on the market. They are all suitable. However, as in any mass-produced product, you may find a few mistakes. Be sure to check the rims, or sealing surfaces. Run your fingertip lightly around the circle to check for any chips or bumps. These will prevent the canning lid from sealing properly. Also look to see that the rim is circular. Occasionally a jar will stick momentarily in the mold and an oval jar is the result. These curiosities can not be used.

While the jars themselves will last for decades, until they are broken, their safe life for canning is much shorter. With the repeated heating and cooling of canning, the glass gradually becomes more brittle. Eventually, it becomes very sensitive to even light shocks. Older jars are often the ones that break in the canner for no obvious reason. Glass manufacturers generally say that a canning jar will have a reliable life of 12 to 13 years. After that their tendency to break increases, and they should be

replaced. This includes most of the blue glass jars. [N.B: In addition to being beautiful, some of those colored glass canning jars are valuable collectors' items.]

Many of the older jars were made for use with rubber rings and zinc lids. In this style of lid, the seal was not on the rim of the jar mouth but on the shoulder, below the threads. Therefore, the smoothness of the rim was not important. Many of these jars have rough rims, and rims of uneven thickness. These jars will not seal reliably with today's lids. They can be used to store grains and pasta, but are not a good choice for canning. (N.B: Zinc lids are an especially bad idea for processing pickles, since zinc is reactive in high salt and acid.--LEB)

Mayonnaise jars or "one-trip" commercial jars are considered by many canners to be the inexpensive alternative to buying canning jars. For some foods that is true. Mayonnaise jars may be safely

used for canning foods in a boiling water bath canner. They are generally reliable and will not break at that temperature. (N.B: this subject is controversial. Many people in r.f.p will disagree with the above statement.--LEB)

However, they should never be used in a pressure canner. The glass sides are slightly thinner than in a standard canning jar. When there is a pressure difference between the inside of the jar and its environment they may explode. This occurs when the canner cools while the contents of the jar are often still boiling. In addition, the rims of mayonnaise jars are often thinner than those of canning jars. This means that there is less space for the jar lid to properly seal onto. It is very important that the lid be carefully adjusted onto the jar and be exactly centered. Otherwise it may not seal.

Prepared by Mary Keith, June, 1991

Revised by M. Susan Brewer, June, 1992

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## B. DEHYDRATORS

### B.1 [Where can I find suppliers of premade dehydrators?]

Most of this information was compiled by Anne Louise Gockel <alg@cs.cornell.edu>. I thank her from the bottom of my heart.

Prices are dated.

From Sept/Oct 1992 Organic Gardening:

#### The Big-1

20 trays, \$200 ppd

10 trays \$170 ppd

5 trays \$130 ppd

Vita Mix

8615 Usher Rd  
Cleveland, OH 44138  
800-848-2649

Harvest Maid \$100 ppd (4 trays, can add 8 more)

Gardener's Supply Co  
128 Intervale Rd  
Burlington, VT 05401  
802-863-1700

when I bought my dehydrator, Harvest Maid had two products,

one was larger and expanded to up to ?30? trays  
and the other was smaller; this sounds like the  
product that was originally the smaller version

I found that liquid from foods drips down into the heating and  
fan area; I ruined one fan with excess juice that  
gummed it up. Total cost about \$25 to replace the fan  
(mail ordered the fan from a repair shop)

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Running the machine without the fan caused something else  
to burn out (another \$30) tho so be careful!

Nutri-Flow \$265 ppd with 6 large rectangular trays

and you can add up to 6 more; fan and heater mounted  
in the back and air flows horizontally; no need to  
rotate trays

Gardener's Supply Co

128 Intervale Rd

Burlington, VT 05401

802-863-1700

For various reasons, I suspect that the horizontal air flow is  
a better design. Some sources suggest that you get less  
"flavors mixing" with a horizontal flow too.

Dehydrator Companies:

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American Harvest

4064 Peavey Road P.O box 159

Chaska, Minnesota 55318

1-800-288-4545

(612) 448-4400

Thanks to [jmoffi@uoguelph.ca](mailto:jmoffi@uoguelph.ca) (Joshua H Moffi)

Dehydration Technology

PO Box 864

Coupeville WA 98239

Excalibur

6083 Power Inn Rd

Sacramento CA 95824

Harvest Maid

Alternative Pioneering Systems

7900 Computer Ave South

Minneapolis, MN 55435

800-624-2945

I'm pretty sure this address is no longer any good

Sun Pantry Enterprises

16182 Gothard St, Unit N

Huntington Beach, CA 92647

714-848-1686

B.2 [Where can I find plans for homemade dehydrators?]

These plans were painstakingly compiled by Anne Louise Gockel

<alg@cs.cornell.edu>. Prices are included, but are probably dated.

The last item is a post from Paul Ovitz in rec.food.preserving.

--Tabletop Dehydrator:

A Make it yourself dryer that is set on a table. Described in full in Circular #855 "How to Build a Portable Electric Food Dehydrator" by Dale E. Kirk, Agricultural Engineer, Oregon State University, Corvallis, Oregon.

Directions for building this dryer are also contained in USDA H&G Bulletin 217, "Drying Foods at Home", 1977.

This dryer offers about 8.5 feet of tray surface and handles about 18 lbs, of fruit or vegetables. Basically it is a plywood box that holds 5 screen trays above the heat source, which is nine 75 watt light bulbs. The heat is dispersed by a shield and forced upward through the trays of food by an 8" household fan.

--Solar Dehydrator Plans:

"Solar Energized Food Dehydrator" \$15.00

Solar Survival

Cherry Hill Rd

Harrisville, NH 03450

"How to Build a Solar Food Dryer" \$3.00

Benson Institute B-49

Brigham Young University

Provo UT 84602

"Drying Food"

Blair and Ketchum's Country Journal. Sept 1981

"Build PM's Solar Food Dryer"

Popular Mechanics, Jan 1979

"A Build-It Incubator/Dryer"

Organic Gardening, July 1979

"Solar Dehydrator"

Popular Science, Oct 1976

(I have this article; it's just a quick one-page description and a single illustration)

--Electric Dehydrator Plans:

"How to Build a Portable Electric Food Dehydrator" (EC #855, \$0.75)

Agricultural Communications Publications Orders

Administration Building #422

Oregon State University

Corvallis, Oregon 97331-2119

Reprinted in Horticulture, August 1980

(I think this is the set of plans I have; they are fairly complete and look like a good set of plans. They could be made by someone with reasonable handyman skills. It think it requires the cook to manually inspect the temperature and adjust the openings to adjust the temp.)

"Step By Step to a Food Dehydrator"

David Ashe. Better Homes and Gardens. July 1977

"Super Dehydrator Does Much More"

J Stephens. Organic Gardening and Farming, Aug 1977

"Build Your Own Fruit and Vegetable Dryer"

R. S. Hedin

Popular Mechanics, May 1976

(I have this article; this is a serious dehydrator. Uses two 600-watt heaters to maintain a temperature of about 120 degrees F and will dry a load in about 12 hours; twelve screens provide a drying area of 14.5 square feet. drying cabinet is made of 3/8" particle board. There's a blower and an "air safety switch" and this is one \*serious\* project.)

--Dryer Plans from University Extension Services:

1.Agricultural Engineering Extension

Preserving\_2004.txt

325 Riley-Robb Hall

/\* hmmm, does Riley Robb still exist?

Cornell University

Ithaca NY 14853

607-256-2280 /\* DEFINITELY a bad phone number!!!!

Plan No 6252: \$2.00: This "Cassette Fruit Drier" is a portable cabinet 18"x24"x21" and with a heater and fan to dry four aluminum screen trays of fruit. Isometric drawing is shown with door and hasp removed.

Notes specify 750 to 1500 watt heater with adjustable thermostat and independent operation of fan. 1 sheet.

Plan No 6244. \$2.00: Plan shows a "Solar Fruit Drier" which is tilted box 4'x4'x1' on legs with slots for natural ventilation. Four trays, 2" deep inside the black box, a vinyl or polyethylene box cover and joint details are shown. 2 sheets.

Plan No 6202. \$3.00: This "Fruit Drier" has two electrical core resistance

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heaters, an 80 cfm fan and five slide-out trays in a 2' cubicle plywood box. Shown are a general view, sections, back view with removable panel to plenum chamber and wiring diagrams. A bill of materials and suggested fruit drying procedure is included. 4 sheets.

2.I have this last one and it's "developed by the fruit substation, Clarksville, and the Agricultural Engineering Dept, University of Arkansas, Plan no 731001." This model has a thermostat that will turn the heaters on and off. It looks pretty sophisticated. However I don't think it has a temperature control, just an "on/off" control. It's 4 blueprint sheets of drawings and notes.

And finally, two proud innovators in rec.food.preserving...

: Sorry, I have no plans, but my husband and I built a good dehydrator  
: years ago. We solved the problem of relatively inexpensive trays by  
: having them fabricated at a glass shop around the corner. They used

Preserving\_2004.txt

: (not sure what it is called by pros) screen frame stock and screen  
: fabric. These were built in the size that we needed, and were stable  
: enough to support the drying foods. As I recall, they were quite  
: inexpensive, could have been even more so if we had bought the stock  
: and done the work ourselves. Let me know if you use this suggestion and  
: how it works for you.  
: Betty Kohler (using my son's account)

From: Paul Opitz <paul@tandy.com>

After building a plywood dehydrator cabinet (2 x 2 x 4 feet!), I, too,  
had a problem finding suitable trays that didn't cost the big bucks.  
Found a good solution: fluorescent light box diffusers. You can find  
these at lighting supply stores or at large building supplies (I found  
'em at Home Depot). These have a 1/2-inch grid, are plastic (but are ok  
for relatively high temperature), come 2 x 4 foot 'slats', and are easy  
to cut to size. Also, I've noticed absolutely no taste (like you can get  
from some metal screens) and you can just toss 'em in the dishwasher to

clean.

For smaller foods (peas, corn, ...) I place crochet 'cloth' (plastic sheets about 10 x 14 inches with tiny holes) I got at Cloth World over the main trays. For liquids I use a teflon-coated cookie sheet. I had one problem when I overloaded the tray and it broke (was spanning 2 feet with only end supports and put 4 lbs of beef for jerky on the tray). I added a center support to the dehydrator, and have had no problems since.

As to dehydrator design, I just made a cube out of plywood. The pieces are screwed into 2x2s (take the plywood away and it would look like a 2 x 2 x 4-foot cube wireframe made out of 2x2s). Added a hot plate I got for \$10 at Incredible Universe and a surplus 6-inch computer fan I had already. Temperature control is achieved using a modified electronic aquarium thermostat (range of 90 - 160 degrees).

Preserving\_2004.txt

Several holes drilled at top and bottom sides for some air exchange, and presto! The entire thing cost about \$80 (mostly for the plywood) and can simultaneously dehydrate a LOT of food.

I've made black bean soup, jerky, spaghetti sauce, vegetable soup, huevos rancheros casserol, fruit juice leather, fruit pemmican... All turned out much better than the freeze-dried stuff at the stores.

## C. SMOKERS

### C.1 [Where can I find plans for a homemade smoker?]

THE IDEAL SMOKER: from Brian Bigler <bigler@eskimo.com>...

I got introduced to smokers the same way most people do, but as a Fisheries Scientist with the Alaska Department of Fish and Game, I enjoy a nearly inexhaustable supply of salmon and other fish to experiment. The small smokers are okay, but the one I built is a

lot more versatile. Soon after I got introduced to smokers, I built my own from plywood. My present smoker is about two feet on each side, and about five feet tall. I have three racks scrounged from where I could find them, and a single-burner hot plate I got from Sears as a heat source. I fill a 1-pound coffee can with smoker chips intended for charcoal barbeques. The height of my smoker allows for smoking cheeses on the top rack where it's coolest, and warmer smoking closer to the heat on the lower racks. The hotplate has to be set carefully, to a point where there's just enough heat to smolder the chips within 5-8 minutes. I plug in the hotplate just long enough to see smoke wisping from the seams, then unplug the cord and allow the chips to smolder on their own. It takes two loads of chips for each load of fish.

BE CERTAIN TO PUT YOUR SMOKER AWAY FROM YOUR HOME!

Other smoker blueprint sources. These were all compiled by Anna Louise Gockel.

Preserving\_2004.txt

"Smoking Fish at Home" #2669, \$0.25

"Smoked Shark and Shark Jerky" #21121 \$0.25

Sea Grant MAP Extension

University of California

Davis, CA 95616

"Fishery Facts 5, Sportsman's Guide to Handling, Smoking and

Preserving Coho Salmon"

US Dept of the Interior

US Fish and Wildlife Service

Bureau of Commercial Fisheries

Washington, DC 20240

"Home Smoking of Fish" #B-78865-S \$1.00

"Smoke Your Own Poultry" #A 2732 \$1.00

Agricultural Bulletin Room #245

30 North Murray

Madison, WI 537151 (sic; the zip code is obviously a typo)

I've looked through a copy of the following. It includes making a smoker out of an old discarded fridge:

TITLE: The easy art of smoking food / Chris Dubbs and Dave Heberle;  
ill. by Jay Marcinowski; photos. by Gary Thomas Sutto.

AUTHOR: Dubbs, Chris.

PUBLISHED: New York : Winchester Press, 1977.

SUBJECTS: Smoke meat.

Smoked fish.

DESCRIPTION: v, 180 p. : ill. ; 23 cm.

NOTES: Includes index.

-----III. Tips 'N Tricks-----

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This section was created as a compendium of tips and tricks. In many cases, I have not seen any of these tricks in the book and pamphlets that I have. They can help you get around specific problems, or are easy ways to do what you have to do.

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From: Diana Hamilton <hamilton@umbc.edu>

The Fruit Fly Trap

Given that a lot of people here might be working with fresh fruit, here's an excellent way to keep the kitchen fruit fly population down. I learned this from my brother, who works in a research lab where escaped fruit flies are always a problem.

Materials: 1 glass jar; 1 piece of paper and a piece of tape, or a plastic

baggie and a rubber band; a little \*cider\* vinegar (not white vinegar), or wine or beer; a couple of drops liquid soap or detergent.

Procedure: Tape the paper together to make a funnel shape that will rest inside the mouth of the jar, but have a fairly broad opening. Or, tear a hole in the corner of a baggie, put it in the jar as a funnel, and secure it around the rim using a rubber band. Put cider vinegar (or wine or beer) in the bottom of the jar (1/4 inch or 0.5 cm or so). Add a couple of drops of detergent to the vinegar. Place the paper funnel on the jar. Set on the kitchen counter near the fruit.

How it works: Flies are attracted to the cider vinegar, which they interpret as decaying fruit. They go into the jar (the funnel makes entry easier than exit) and either fall onto or land on the surface of the liquid. The detergent decreases the normal surface tension, so they sink and drown. Easy and cheap!

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We tested this at our parents' house when the apple crop came in. A single trap caught >100 flies in 2 days.

Acknowledgement: Thanks to lank-mrc@tigger.jvnc.net who suggested the baggie method last time I posted this, and to others who suggested beer/wine. [Little bits of overripe fruit, and sherry are also irresistible to fruit flies.--LEB].

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From: Kate Gregory <xtkmg@blaze.trentu.ca>

Wax paper weight

Crumple up a square of wax paper, add the wax paper ball to the top of jars of pickled peppers, canned cherries, etc. to keep the food down in the brine. Seal with two piece lids, can process with wax paper ball in waterbath.

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From: Leslie Basel <lebasil@ag.arizona.edu>

Using cheesecloth to skim pickle brine

Skimming pickle brine is one of the most tedious tasks around, because you usually have to do it once per day, you should skim it nearly completely, and you shouldn't get rid of too much brine in the process. One trick that I found helpful is to make a cheesecloth handle. You set up your crock in the usual way, with pickles, herbs, and brine, then you place two large pieces of fine cheesecloth over your pickles. Make sure that you have enough cheesecloth that will overhang your crock by a foot or so. After the cheesecloth, you put on your plate and your weight. When it comes time to skim your pickles, take out the weight and the plate, then grab your cheesecloth by the ends and make a bag. Gently lift the bag up out of the brine. Nearly all of the scum should be trapped in the cheesecloth. The cheesecloth can be carefully washed and airdried for reuse; a rotation of three sets works well.

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from an unknown poster, the chile-heads mailing list...

Keeping outside fermenting items a secret from the neighbors

I learned to love -and make- kim chee while attending college in Hawaii. I encountered the same odor problem and was forced to come up with a solution or get into a shooting war with the neighbors. Obviously, tightly closing the fermentation container is a recipe for disaster. I actually just cover my crocks with an unbleached muslin stretched over the top. (Five gallon churns are the best "crocks" I have found.) However, I deal with the odor problem by putting six inches of charcoal in the bottom of a plastic trash can and setting the crocks on it. The charcoal I use is provided by a friend at the Jack Daniels distillery, but any "raw" or activated charcoal will work. Bagged charcoal briquets, even when crushed, are not really a good option, though. I use a large trash can and can actually get three crocks in at once without crowding. I then put several layers of burlap on top of the covered crocks. (I used laundered peanut bags, but feed sacks would work as well.) Finally,

I put the lid on the trash can. The lids for these cans fit fairly tight, but will allow for the equalization of pressure. You can still smell the kim chee working, but you must get very close to the trash can and sniff hard.

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From Michael Stallcup

Using Ascorbic Acid.

Citation from "Drying Fruit" pamphlet by Pat Kendall, Colorado State University Cooperative Extension foods and nutrition specialist and professor, food science and human nutrition; Lesta Allen, retired consumer and family education agent, Tri River Area Cooperative Extension. 8/94. ©Colorado State University Cooperative Extension. 1994.

"Ascorbic acid (vitamin C) is an antioxidant that keeps fruit from darkening. Pure crystals usually are available at drug stores. Prepare a solution of 1 to 2-1/2 teaspoons of pure ascorbic acid crystals to 1

cup cold water. Vitamin C tablets can be crushed and used (six 500 milligram tablets equal 1 teaspoon ascorbic acid). One cup treats about 5 quarts of cut fruit. Dip peeled and cut fruit directly in ascorbic acid solution. Soak for a few minutes, remove with a slotted spoon, drain well and dehydrate. Commercial antioxidant mixtures are not as effective as ascorbic acid but are more readily available in grocery stores. Follow directions on the container for "fresh cut fruit."

---

From: Jean P Nance <jpnan@prairienet.org>

Sealing Jam w/ Paraffin

Using paraffin sealing jam: Get a moderately large can, maybe large fruit juice. Put the paraffin in it. Put it in a pan of water and heat the water until the paraffin melts. Never take your eyes off it, spilling can cause a fire. Keep it warm until the jam is poured into hot sterilized jars. If you use jars with an overhang, be careful, the jam may shrink a bit, so you don't want your paraffin cap to be

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caught on the overhand. Pour paraffin carefully on top of each jar of jam. Sometimes it helps to pour one layer, then another in a few minutes. It is best to have caps for the jars to prevent mice, ants, etc. getting at the paraffin. Put away, preferably in a cool dark place. Check regularly. If you see mold under the paraffin, or jam oozing up above the paraffin, throw away moldy jam, but oozing jam can be refrigerated for immediate use. Or freeze if there is more than you can use soon. That's the way we did it for many years. Takes some fussing but it is economical, and you can use any kind of jars.

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From: Jean P. Nance <jpnan@prairienet.org>

How to reach the jelling stage/The Fork Test

There are a couple of other tests for "jelling". One is "when it sheets from a spoon", but I have found this confusing and sometimes deceptive. My favorite is "when it closes the tines of a fork". I have found that it really should be a silver plate fork, not stainless steel. Dip the

fork in, bring it out and observe. If the mixture stays in a sheet between some of the tines, the jam is pretty near done. I usually cook it a few more minutes just to be sure. At times my jam is a little stiffer than some people would like, but better than runny. Experiment to see how much "closing" means jam is at the stage you like.

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(end of part 4)

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Newsgroups: rec.food.preserving  
Subject: Rec.food.preserving FAQ, version 2.3, part 5  
From: lebasel@nando.net (lebasel)  
Date: 1 Jan 1996 20:29:55 -0500

Part 5 of 6

Version 2.3

Spoilage, especially Botulism.

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-----IV. Spoilage, Especially Botulism-----  
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IV.1 [Okay, I've got some bad jars. What's growing in them? How can I dispose of them?]

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HOME CANNED FOOD SPOILAGE--WHAT WENT WRONG??

1. Fresh food was decayed, unwashed, unpeeled or untrimmed. This results in a high microbial load. A larger than normal number of microorganisms can take a longer processing time for complete sterilization than is usually recommended.

2. Food packed too tightly in jars. Temperature in the geometric center of the jar was not high enough long enough to result in complete sterilization of the food. Pack food loosely, prepare according to USDA Guidelines (1/2 inch slices, halves, etc.) then use the recommended time, pressure, temperature.

3. Jars became unsterile soon after being filled. If lids are not placed on jars and processing is not started immediately after jars are filled, microorganisms may start to grow and reach very high levels prior to processing.

4. Inaccurate heat-processing time was used; this may occur if old recommendations are used (food is underprocessed) or if the timing was interrupted (power failure, pressure fluctuation, etc.)

5. Food was not processed at the correct temperature:

A. Pressure Canner (240 F, 115 C).

1. Failed to test dial gauge yearly.

2. Failed to exhaust canner 10 min with full steam flow.

3. Failed to make an adjustment for elevation (11 PSIG versus 10 PSIG in Illinois due to average 1000 above sea

level altitude)

4. Failed to keep pressure accurate (high enough).

B. Boiling Water Bath Canner

1. Water was not covering jar tops by 1" or more.

2. Water was not maintained at a rolling boil.

3. Processing time was too short.

4. Failed to make an adjustment for altitude (addition of 2 minutes for every 1000 ft above sea level).

6. Use of Open Kettle Canning, Microwave Canning, or Oven Canning Methods. These methods do not get the canned food hot enough long enough to destroy microorganisms so the food may spoil, may contain dangerous microorganisms and their toxins, or both.

7. Improper cooling of jars after processing:

A. Failure to remove jars from canner at the end of processing time or when gauge reads "0". As jars cool, they may suck water (containing microbes or spores) back into the food.

B. Failure to properly cool jars. Very slow or very rapid cooling may interfere with formation of a seal.

8. Use of paraffin to seal jelly jars. Paraffin is no longer recommended for sealing jams, jellies or preserves. Mold, which is the most common spoiler of sweet spreads, can send "roots" down along the edge of the paraffin and produce toxic substances into the spread.

9. Improper storage of home-canned foods:

A. Home canned foods which are exposed to temperatures in

excess of 95 degrees F may spoil. Sterilization recommendations used for home canning do not necessarily kill some of the "thermophiles" or heat loving microorganisms. These organisms tolerate high temperatures and will grow at high temperatures. If they are still present, they may grow and spoil the food, or alter the food so that other microorganisms can grow.

B. Home canned foods which are stored in the sunlight may get very hot inside--the light goes in, changes to heat as it is absorbed by the food, allows the air in the headspace to expand breaking open the seal allowing microorganisms to come in.

C. Keeping very acid foods (pickled or fermented products, some juices) for a long period of time may give the food acid time to eat away at and deteriorate the lid resulting in pinholes which allow microorganisms to get into the jar. Discard any home canned food with damaged or flaking metal on the lid.

D. Lids on home canned foods stored in a damp place may rust through allowing microbes to get into the food.

Prepared by Susan Brewer/Foods and Nutrition Specialist/Revised, 1992

EHE-669

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#### UNSEALED JARS AND SPOILED FOOD--WHAT TO DO

Occasionally even the most careful home canner has jars which become unsealed during storage resulting in food spoilage. Exposure to high temperatures or water during storage may cause the seals to break open or the lids to rust through allowing microorganisms access to the food inside. Any time a jar of home-canned food looks suspicious, treat it as though it were spoiled. Low-acid home-canned foods such as vegetables, meat, poultry and seafood are a special problem because of their

association with botulism, so spoiled in these food categories should be detoxified before they are disposed of.

1. Do not taste food from an unsealed jar or any food which appears to be spoiled. Presence of black discoloration, gas, swelling of the lid, unnatural odors, spurting liquid and mold growth (blue, white, black or green) indicate spoilage.
2. Spoiled, low-acid foods (including tomatoes) may have no evidence of spoilage, so if they are suspect:
  - A. Swollen but still sealed jars can be put in the garbage (in a heavy bag) or buried.
  - B. Unsealed jars should be detoxified.

3. Detoxification:

- A. Place containers and lids on their sides in a large pot (8 qt or more).
- B. Wash hands well.
- C. Cover containers with water to at least 1" over them.
- D. Put lid on pot and bring to a boil.
- E. Boil 30 minutes.
- F. Cool and discard (in trash bag or bury).
- G. Scrub all counters, containers, equipment (can

opener), clothing and hands that may have had contact with the food. Throw away sponges, wash cloths, etc. used in the clean-up.

ALTERNATE DETOXIFICATION METHODS:

Cover jar and food with chlorine bleach. Let stand 24 hours.

Dispose of as above.

Cover jar and food with a strong lye solution and let stand 24 hours. Dispose of as above.

NOTE: Do not mix chlorine bleach and lye (sodium hydroxide) together.

Prepared by Susan Brewer/Foods and Nutrition Specialist/Revised, 1992

EHE-680

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#### IV.2 [Botulism. What is it?]

The word from the FDA, courtesy of Henry Hilbreath, aka souris..

Food and Drug Administration Foodborne Pathogenic

Microorganisms and Natural Toxins 1992

##### 1. Name of the organism: Clostridium botulinum

Clostridium botulinum is an anaerobic, Gram-positive, spore-forming rod that produces a potent neurotoxin. The spores are heat-resistant and can survive in foods that are incorrectly or minimally processed. Seven types (A, B, C, D, E, F and G) of botulism are recognized, based on the antigenic specificity of the toxin produced by each strain. Types A, B, E and F cause human botulism. Types C

and D cause most cases of botulism in animals. Animals most commonly affected are wild fowl and poultry, cattle, horses and some species of fish. Although type G has been isolated from soil in Argentina, no outbreaks involving it have been recognized.

Foodborne botulism (as distinct from wound botulism and infant botulism) is a severe type of food poisoning caused by the ingestion of foods containing the potent neurotoxin formed during growth of the organism. The toxin is heat labile and can be destroyed if heated at 80 C for 10 minutes or longer. The incidence of the disease is low, but the disease is of considerable concern because of its high mortality rate if not treated immediately and properly. Most of the 10 to 30 outbreaks that are reported annually in the United States are associated with inadequately processed, home-canned foods, but occasionally commercially produced foods have been involved in outbreaks. Sausages, meat products, canned vegetables and seafood products have been the most frequent vehicles for human botulism.

The organism and its spores are widely distributed in nature.

They occur in both cultivated and forest soils, bottom sediments of streams, lakes, and coastal waters, and in the intestinal tracts of fish and mammals, and in the gills and viscera of crabs and other shellfish.

2. Name of the Disease:

Four types of botulism are recognized: foodborne, infant, wound, and a form of botulism whose classification is as yet undetermined. Certain foods have been reported as sources of spores in cases of infant botulism and the undetermined category; wound botulism is not related to foods.

Foodborne botulism is the name of the disease (actually a foodborne intoxication) caused by the consumption of foods containing the neurotoxin produced by *C. botulinum*.

Infant botulism, first recognized in 1976, affects infants under 12 months of age. This type of botulism is thought to be caused by the ingestion of *C. botulinum* spores which colonize and

produce toxin in the intestinal tract of infants (toxico infectious botulism). Honey is the only implicated food source for *C. botulinum* spores. The number of confirmed infant botulism cases has increased significantly as a result of greater awareness by health officials since confirmed infant botulism cases has increased significantly as a result of greater awareness by health officials since its recognition in 1976. It is now internationally recognized, with cases being reported in more countries.

Wound botulism is the rarest form of botulism. The illness results when *C. botulinum* by itself or with other microorganisms infects a wound and produces toxins which reach other parts of the body via the blood stream. Foods are not involved in this type of botulism.

Undetermined category of botulism involves adult cases in which a specific food or wound source cannot be identified. It has been suggested that some cases of botulism assigned to this category might result from intestinal colonization in adults, with in vivo production of toxin. Reports in the medical literature suggest the existence of a

form of botulism similar to infant botulism, but occurring in adults.

In these cases, the patients had surgical alterations of the gastrointestinal tract and/or antibiotic therapy. It is proposed that these procedures may have altered the normal gut flora and allowed *C. botulinum* to colonize the intestinal tract.

### 3. Nature of the Disease:

Infective dose - a very small amount (a few nanograms) of toxin can cause illness.

Onset of symptoms in foodborne botulism is usually 18 to 36 hours after ingestion of the food containing the toxin, although cases have varied from 4 hours to 8 days. Early signs of intoxication consist of marked lassitude, weakness and vertigo, usually followed by double vision and progressive difficulty in speaking and swallowing. Difficulty in breathing, weakness of other muscles, abdominal distention, and constipation may also be common symptoms.

Clinical symptoms of infant botulism consist of constipation that occurs after a period of normal development. This is followed by poor feeding, lethargy, weakness, pooled oral secretions, and wail or altered cry. Loss of head control is striking. Recommended treatment is primarily supportive care. Antimicrobial therapy is not recommended. Infant botulism is diagnosed by demonstrating botulinal toxins and the organism in the infants' stools.

#### 4. Diagnosis of Human Illness:

Although botulism can be diagnosed by clinical symptoms alone, differentiation from other diseases may be difficult. The most direct and effective way to confirm the clinical diagnosis of botulism in the laboratory is to demonstrate the presence of toxin in the serum or feces of the patient or in the food which the patient consumed. Currently, the most sensitive and widely used method for

detecting toxin is the mouse neutralization test. This test takes 48 hours. Culturing of specimens takes 5-7 days.

#### 5. Associated Foods:

The types of foods involved in botulism vary according to food preservation and eating habits in different regions. Any food that is conducive to outgrowth and toxin production, that when processed allows spore survival, and is not subsequently heated before consumption can be associated with botulism. Almost any type of food that is not very acidic (pH above 4.6) can support growth and toxin production by *C. botulinum*. Botulinal toxin has been demonstrated in a considerable variety of foods, such as canned corn, peppers, green beans, soups, beets, asparagus, mushrooms, ripe olives, spinach, tuna fish, chicken and chicken livers and liver pate, and luncheon meats, ham, sausage, stuffed eggplant, lobster, and smoked and salted fish.

6. Frequency:

The incidence of the disease is low, but the mortality rate is high if not treated immediately and properly. There are generally between 10 to 30 outbreaks a year in the United States. Some cases of botulism may go undiagnosed because symptoms are transient or mild, or misdiagnosed as Guillain-Barre syndrome.

7. The Usual Course of Disease and Complications:

Botulinum toxin causes flaccid paralysis by blocking motor nerve terminals at the myoneural junction. The flaccid paralysis progresses symmetrically downward, usually starting with the eyes and face, to the throat, chest and extremities. When the diaphragm and chest muscles become fully involved, respiration is inhibited and death from asphyxia results. Recommended treatment for foodborne

botulism includes early administration of botulinum antitoxin (available from CDC) and intensive supportive care (including mechanical breathing assistance).

#### 8. Target Populations:

All people are believed to be susceptible to the foodborne intoxication.

#### 9. Food Analysis

Since botulism is foodborne and results from ingestion of the toxin of *C. botulinum*, determination of the source of an outbreak is based on detection and identification of toxin in the food involved. The most widely accepted method is the injection of extracts of the food into passively immunized mice (mouse neutralization test). The test takes 48 hours. This analysis is followed by culturing all suspect food in an enrichment medium for the detection and isolation

of the causative organism. This test takes 7 days.

#### 10. Recent Outbreaks:

In the last 10 years, two separate outbreaks of botulism have occurred involving commercially canned salmon. Restaurant foods such as sauteed onions, chopped bottled garlic, potato salad made from baked potatoes and baked potatoes themselves have been responsible for a number of outbreaks. [Root crops, pattern?--LEB] Also, smoked fish, both hot and cold-smoke (e.g., Kapchunka) have caused outbreaks of type E botulism.

In October and November, 1987, 8 cases of type E botulism occurred, 2 in New York City and 6 in Israel. All 8 patients had consumed Kapchunka, an uneviscerated, dry-salted, air-dried, whole whitefish. The product was made in New York City and some of it was transported by individuals to Israel. All 8 patients with botulism developed symptoms

within 36 hours of consuming the Kapchunka. One female died, 2 required breathing assistance, 3 were treated therapeutically with antitoxin, and 3 recovered spontaneously. The Kapchunka involved in this outbreak contained high levels of type E botulinal toxin despite salt levels that exceeded those sufficient to inhibit *C. botulinum* type E outgrowth. One possible explanation was that the fish contained low salt levels when air-dried at room temperature, became toxic, and then were re-brined. Regulations were published to prohibit the processing, distribution and sale of Kapchunka and Kapchunka-type products in the United States.

Most recently, a bottled chopped garlic-in-oil mix was responsible for three cases of botulism in Kingston, N.Y. Two men and a woman were hospitalized with botulism after consuming a chopped garlic-in-oil mix that had been used in a spread for garlic bread. The bottled chopped garlic relied

solely on refrigeration to ensure safety and did not contain any additional antibotulinal additives or barriers. The FDA has ordered companies to stop making the product and to withdraw from the market any garlic-in-oil mix which does not include microbial inhibitors or acidifying agents and does not require refrigeration for safety.

Since botulism is a life-threatening disease, FDA always initiates a Class I recall.

The botulism outbreak associated with salted fish mentioned above is reported in greater detail in Mortality and Morbidity Weekly Report (MMWR) 36(49):1987 Dec 18.

A botulism type B outbreak in Italy associated with eggplant in oil is reported in MMWR 44(2):1995 Jan 20.

An incident of foodborne botulism in Oklahoma is reported in MMWR 44(11):1995 Mar 24.

[Link to recent Clostridium botulinum research.](#)

A Loci index for genome Clostridium botulinum available from

GenBank.

mow@vm.cfsan.fda.gov

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Botulism poisoning is due to ingesting toxin(s) produced by the anaerobic bacterium *Clostridium botulinum*. There are seven isoforms of botulism toxins (Types A-G). Botulism toxins are colorless, odorless, and tasteless, but highly potent neurotoxins. To explain the physiology of the toxin a little farther, you might remember that nerve impulses are electrical signals (charge gradient that runs along the length of an axon), while the connection between muscles and nerves are mediated by chemical signals. The end of an axon releases synaptic vesicles filled with chemical neurotransmitters. These synaptic vesicles travel a short distance to the synaptic plate on muscle cells, then bind and release neurotransmitters. Current research indicates that botulism toxins bind and cleave several proteins on the outside of synaptic vesicles.

Those vesicles cannot then bind to the next synaptic plate and unload the neurotransmitter. Thus, the connection between nerve and muscle impulses are cut biochemically, at the place where a chemical signal is delivered. Muscle control is lost, especially fine facial muscles.

Symptoms of botulism toxin poisoning usually occur within 12-36 hrs after ingestion. They include muscle weakness, slurred speech, blurred vision (all fine muscle movements); followed by an inability to hold up the head. Death occurs by respiratory failure.

If you recognize these symptoms after trying a canned food, call 911 immediately. Whoever is able should reclose the jar, wrap well, put in a ziploc bag, close, bring to the hospital. Wash your hands after this procedure!

Treatment for botulism is straightforward. Often the antisera to the toxin is given, and the victim is placed on a respirator.

Survival depends on the amount of toxin ingested, and how quickly the victim got treatment. Recovery is quite slow, taking months. The United States case/fatality rate has dropped in recent years, but the \*number of cases\* in the US increases slightly in proportion to the popularity of home canning. Interesting cultural comparison: botulism cases in Europe tend to come from cured meats, from Japan from salted fish, from the US from canned vegetables.

IV.3 [I'm confused about when the toxin is produced. Tell me more about the bacterium.]

There are three varieties of C. botulinum; 2 of these varieties (A, C) live and grow in soil under anerobic (without oxygen) conditions, while 1 variety (E) can be found in fresh and saltwater, also under anerobic conditions.

Under aerobic (oxygen) conditions, all varieties of C. botulinum encyst, producing a spore. Under normal *\*aerobic\** conditions, both oxygen and your immune system take care of the few dormant spores that you meet in everyday life. NOTE: This is the dormant spore, *\*not\** the bacterium. The bacterium is what you could find in a badly processed can. However, while the encysted, dormant form does *\*not\** produce the toxin (only the bacterium does), the C. botulinum spore is much more resistant to extreme conditions than the bacterium, making it harder to kill.

Deadly problems can occur in situations where you attempt to preserve food by creating an *\*anerobic\** state; namely, when you create a vacuum seal using heat and a 2-piece lid, sometimes when you preserve food in oil, or when you smoke meat. In each of those situations, the C. botulinum spores can develop ("hatch" is a good way of thinking of it) into the bacterium, which then produce the toxin in your canned goods, oil, or on your smoked meat. For this reason, C. botulinum spores

in canned/smoked food must be killed or must be kept dormant. You, as a food preserver, using good common sense and a bag of tricks can accomplish this.

IV.4. [How can I be absolutely, positively sure that those spores are killed?]

You know, I think someone could make a mint by inventing the "home botulism test kit" that would work in the same way that a home pregnancy test kit does. But...

Remember, that despite the bacterium's fearsome reputation, *C. botulinum* is still a microbe, and can be killed using a little basic microbiology. Preserving recipes utilize at least one of these 5 microbiological facts, good recipes often use several.

1. C. botulinum bacterium dies at 212 F/ 100 C.
2. C. botulinum spores die at 240 F/ 116 C.
3. Botulism toxin denatures at 185 F/ 85 C.

\*\*(All temperatures must be maintained for least 15 minutes, and the heat must be consistent throughout the food, fluid, and jar.)\*\*

4. C. botulinum spores cannot hatch in strong acid solutions of pH 4.6 or below. (Some sources claim pH 4.7.)

5. C. botulinum cannot grow, develop, or multiply in food with a water content of less than 35%. (Food dehydrators have another set of toxic pests to worry about.)

Common sense is a first step in the prevention of botulism.

For instance: 1.) C. botulinum bacteria and spores usually live in soil. Thus clean foods of soil, dust, grit, etc, using fresh, cold water. Change wash water often. Don't can "drops", fruit that has dropped to the ground. Pay special attention to cleaning

root crops (including garlic!), shucking skins or peeling that produce if need be.

2.) One variety of *C. botulinum* (E) lives in flat water. So, you want to make your brines, etc, with fresh cold water. Start with fresh, cold water if you are boiling to sterilize, or perform other operations.

3.) Botulism spores remain dormant under high acid conditions. Fruit is quite high in acid but also contains a lot of sugar, so the fruit still tastes sweet. Vinegar is added to vegetables to pickle them. You can can foods like this in a boiling waterbath. However, the concentration of acid (ionic strength) is also very important, so you want to use vinegars of a known strength (5% or 5 grain); add the recommended amount of vinegar, citric acid, or ascorbic acid described in your recipe; can just-ripe fruits. For safety's sake, you shouldn't cut down the amount of vinegar in a

recipe--take a cue from fruit and add a little bit of sugar to cut down the extreme acid taste. Vegetable pickles should be immersed in the vinegar or brine. \*BTW, finding out that honey is a source of botulism spores (infant botulism), means that I'm not thrilled about the idea of substituting honey for sugar, as the Rodale Institute appears to be.\*

4.) Botulism spores, bacterium, and the toxin are killed by high heat. However, all the contents of the jar has to get to the target temperature, no matter the volume, and the temperature should be sustained for about 15 minutes. Follow recipes exactly, including jar sizes and treatment of the jars. Process at least for the times indicated, but remember that you have to increase processing time or pressures depending on your altitude. (Water boils at lower temperatures the higher your altitude.) Note that larger size jars usually require longer processing time, because the heat has to penetrate through the jar.

Acid and heat are each used in canning things that are borderline acid, such as tomatoes, tomato vegetable mixes (like salsa and spaghetti sauce), vegetable relishes, and other vegetable mixes. The idea here is that you can't increase one thing to avoid other procedures. (You can't increase acid to avoid pressure canning).

5.) Botulism cannot grow or develop without water.

In making jams or jellies, enough sugar and pectin is added to form a gel, depressing the amount of free water available for bacteria to grow. This is one of the reasons why special care has to be taken if the jam or jelly is extremely runny.

Foods preserved in oil (raw garlic, chilis, dried tomatoes) create a special case. Oil contains no water, as it is centrifuged out during processing. If an item is dependably dry, under 35% water content, adding it to the oil should not cause problems, as long as your items

are well immersed (1 inch of oil covering). Dry herbs, seeds and spices, dried chiles, even sundried tomatoes should not cause problems. (N.B. Research from the Australian Extension Service--sundried tomatoes are more acid than hydrated ones: pH 4.0 for dried, 4.6 for hydrated--LEB) However, the dehydrated food must be properly dried, conditioned, and not case hardened (case hardened things are hard and crunchy on the outside, soft and gooey on the inside). The jury is out on wet herbs.

If you try to preserve a lot of "wet" items in oil (garlic cloves, chopped onions, ginger root, fresh chiles), you might have a heap of trouble. Oil doesn't contain much dissolved oxygen, so it is a good anerobic medium. Raw garlic, onions, ginger are all rootcrops, and each contain over 35% water. Chilis often are added to oil in a non-dried state. Generally, you want to "pickle", or at least allow your wet, raw item to take up some 5% vinegar for about 15-20 minutes before putting into the oil. Chunky items (i.e. garlic cloves) should be smashed, crushed, or chopped to get the vinegar

into the item.

Simple, but through, sauteing of your chosen flavoring in your oil can also get rid of spores, since they evaporate free water, and the oil can be heated to above 240 F. Yet another idea is to refrigerate your flavored oils, as bacterial growth is very slow below 40 F/4 C.

In addition, the garlic-in-oil botulism problem began when garlic pastes in olive oil were introduced in grocery stores. Many of the botulism poisonings occurred when these pastes were used in cold pasta, salads, and salad dressings. If you are going to be using your flavored oil for sauteing, stir fry, or deep fat frying you will easily heat your oil to above any of the target temperatures described above.

Since the toxin is denatured at 185 F/85 C, if you are concerned

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about a canned good the usual procedure is as described in the above section (to hard boil the contents for 15 minutes). NOTE: This will denature the botulism toxin. Other toxins, such as those caused by Staphococcus, will not denature until temps of 240 F/ 116 C are reached and sustained for 30 minutes. As a matter of fact, a hard boil in that case will break open the bacteria, and more toxin would be released into the food.

(end of part 5)

=====

Newsgroups: rec.food.preserving  
Subject: Rec.food.preserving FAQ, version 2.3, part 6  
From: lebasel@nando.net (lebasel)  
Date: 1 Jan 1996 20:30:46 -0500

Part 6 of 6

Version 2.3

Recipe troubleshooting, and a list of Other Resources.

=====

-----V. Recipe Cavaets and Troubleshooting-----

=====  
V.1 [I just got a recipe from rec.food.preserving that I'd like to try.  
Is it safe to make?]

To any food preserver, all preservation recipes are interesting.  
That said, not all recipes are safe, or even good to make. Being  
on USENET for a little while, we all know that an unmoderated  
group (r.f.p is unmoderated) can and will generate irresponsible  
posts and undesirable recipes. I, for one, can just imagine the  
alt.syntax.tactical team coming up with a "botulism in a jar"  
recipe with an innocent sounding name ;). However, you can develop  
a little healthy discrimination by looking at the material in  
this section.

0. Posters should be responsible for recipes posted, and if you  
are trying out a preserving recipe for the first time, extreme

caution should be taken. Your best source of information on a posted recipe is the poster's Email address. If the recipe poster doesn't answer your questions, that's a bad sign. I haven't tried most of the recipes in the FAQ (except the sundried tomato, and the curing olive ones), so I've included the email addresses for your convenience.

1. Recipes, if they came from a publication (book, pamphlet, magazine), that publication should be stated, preferably at the beginning. It would be very wise to note the copyright date, too. If the recipe is an old family recipe, it should also be posted, too. Of course, plenty of bad recipes get into cookbooks, so....
2. If you altered the recipe, you should post that. The best thing to post would be the original recipe, and your changes made to it.
3. Processing times for recipes are assumed to be for sea level.

Preserving\_2004.txt

You should know your elevation, and you must remember to increase the processing time the higher the altitude that you can at. If are posting an old family recipe, you really should post your altitude, too.

4. And remember, you can always make a refrigerator batch, by not sealing and processing, just refrigerating the results.

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V.2 [Most of the recipe measurements posted here are not metric. Can you help me?]

Some basic conversions. Check the rec.food.cooking FAQ for more of them.

\*Temperature\*.

F to C = temp-32 X (5/9)

C to F =temp X (9/5)+32

-20 F = -29 C

0 F = -18 C

32 F = 0 C

70 F = 21 C

165 F = 74 C      180 F = 82 C      212 F = 100 C      220 F = 105 C

240 F = 116 C

**\*Volume Measure\*.**

1 qt = 1 liter (L)

1 cup (C) = 250 mL ; 1/2 pt = 250 mL

1 pt = 500 mL

1 Tablespoon (Tbsp) = 15 mL

1 teaspoon (tsp) = 5 mL

1 fluid oz = 30 mL

**\*Weight Measure\*.**

1 lb = 454 grams or .454 kg

1 oz = 28.4 grams

**\*Weight to Cups (Sugar)\***

\*Pressure\*.

\*Length (elevation)\*.

1000 ft = 305 meters

\*Length (headspace measurement)

1 inch = 2.5 centimeter

V.3 [I got some recipes from my grandparents. Are they safe? How can I make them safe?]

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Evaluating Home Canning Recipes For Safety

What do you do when someone gives you "Aunt Tillie's Special" old favorite jam recipe? Or Uncle Willie's barbecue sauce? Or Cousin Millie's dill pickle recipe? In today's heightened awareness of food safety, how do you tell which are safe and which are not? There are no hard and fast rules, or secret formulas, to help you decide. But there are some priorities you

can use to help you balance the pros and cons. They depend on the factors that molds, yeasts and bacteria need to grow, and on the relative hazards that molds, yeast and bacteria present in foods.

### Factors Influencing Safety

In food preservation, the growth factors that are important are:

Sugar - enough sugar will stop the growth of most organisms

Salt - enough salt will stop the growth of most organisms

Acid -enough acid will stop the growth of most organisms

\*\* Too little sugar, salt or acid will permit spoilage.

Air - most organisms must have air to grow, BUT the most

dangerous bacteria in home food preservation,

*Clostridium botulinum*, will only grow without air.

Temperature - most dangerous microorganisms grow best at room temperature or a little above. But in preserving food, we are interested in killing the organisms and their spores, not just in slowing their growth.

The death rate of microorganisms depends on:

The microorganism - they die at different rates

The number of cells or spores present initially in the food

- the more there are, the longer it will take to kill them all

The medium (food) that they are in - most die faster in

acidic food than low acid food, and in wet food than dry food.

The temperature - in canning the important temperature is

the temperature at the coldest spot in the jar.

The length of time at that temperature - when we heat food, not all the organisms will die at the same time, they die gradually, and the full process time is necessary to be sure that all, even the most heat-resistant ones, have died.

These last two factors, temperature and time, depend on how much solid vs. liquid is in the jar, and on how tightly the food is packed. Heat from the steam or water in the canner penetrates into different foods at different rates. Liquids circulate in the jar and carry the heat into the center of the jar. Solids must heat slowly from the outside in. A process time for randomly packed green beans, which have spaces for water to circulate, will not be adequate for "tin soldier" green beans, when the tightly packed, vertically aligned beans leave no room for water to circulate.

The most important microorganism in home canning is *Clostridium botulinum*. The toxins it produces damage the nervous system, producing paralysis and possible death. The damage to nerve cells is permanent. Minute amounts of contaminated food can carry enough toxin to cause death. This bacteria produces spores which are very resistant to heat. It is also very sensitive to acid, and will not grow in acid foods. Other pathogenic bacteria are usually killed by much less heat and in a shorter period of time than *Cl. botulinum*. Most require air, so will not grow in a sealed jar. They are of less concern in home canning.

Molds and yeast are of concern because if they grow they can reduce the amount of acid present in the food. If that occurs *Cl. botulinum* may be able to grow. Some molds, particularly those that grow on fruits and fruit products are known to produce toxins that cause damage to the nervous system and kidneys, or cancer in research animals. The likelihood is that they will

cause some damage in humans if consumed often enough.

(Toxin-producing molds grow well on grains and peanuts, but these products are not home-canned.) Molds and yeasts will also spoil the taste, texture, color and overall appearance of the food, making it unfit for consumption.

#### Jams, Jellies, Sweet Spreads

In a jam or jelly recipe made with regular pectin, not the low or no-sugar variety: If the jam or jelly sets properly (stiffens into jam or jelly) it has enough sugar to inhibit the growth of bacteria and all but a few sugar-tolerant molds and yeasts. This will also be true for marmalades and preserves, and for jellies made the long-boil method without added pectin. The fruit blend used is not crucial.

However, mold growing on a fruit spread is a problem. It should not be scooped off, rather the entire product should be

discarded. To avoid mold problems, all jellies, jams and sweet preserves should be packed in pre-sterilized jars and processed 5 minutes or more in a boiling water bath canner. The exceptions are some of the sugar-free types which explicitly state on the package of jelling agent that they should not be processed. These contain preservatives to prevent mold growth, and the heat of processing would cause soft jelly. In addition, heat will cause the sweetener to break down and lose its sweet taste.

#### Pickles and Relishes

The pickle recipe is more complicated. The proportion of acid (vinegar) to the amount vegetable is crucial. Enough vinegar must be added to change the low-acid cucumber into a high-acid pickle to be safe. There is no formula or set proportion to decide if the recipe provides for adequate vinegar. The best thing to do is to find a recipe with similar procedures in the USDA Guide to

Home Canning and compare the amounts. This is especially true of pickle relishes or vegetable relishes where several vegetables are ground together.

Similarities to look for include:

1. Similar recipes will use the same presoak - soak in ice water, or in salt water, or no soak.
2. They will call for the same size cucumbers - 4", or 6", or 8", or specify small or large.
3. The maturity of the cucumber influences how much acid it will take to pickle it. Smaller, less mature cucumbers have the capacity to neutralize more acid per unit of weight than do larger, more mature ones.

4. Similar recipes will also specify similar procedures with the brine: Are the slices or spears packed in the jar raw and the brine poured over, are they merely heated in the brine, or are they simmered before packing? Is the simmering or boiling time the same? Each of these will influence how rapidly the acid penetrates the cucumber and how much the cucumber juice will dilute the acid.
5. Similar recipes will call for similar proportions of onion or other vegetables.
6. Quantities of salt are critical in fermented pickled products; proportion of salt to vegetable to vinegar should be very similar to USDA recipe to be sure that it will be safe. Proportions of spices are not crucial and may be adjusted to suit tastes without danger.

If too little salt is used the cucumbers will spoil, get slimy, float, smell foul, and the fermenting mixture may support the growth of hazardous microorganisms. If too much salt is used, there will be no fermentation, just shriveled cucumbers sitting in salt water. Either case is obvious: the recipe is not good.

In quick pack pickles the amount of salt is not critical. Salt may be omitted, or a reduced sodium salt-type product used. The flavor and texture may be noticeably different, and probably less acceptable but, the product will be safe.

All pickle products should be processed in a boiling water bath to reduce the likelihood of mold or yeast spoilage. Old recipes for whole or sliced pickles that have been used for generations without processing and without spoilage should at least be given a 10 minute process.

Pickle relish products must also adhere to the USDA proportions and process times. Quantities of vegetable and vinegar, heating prior to packing, and process time must be similar to a USDA recipe. An old, tested and trusted recipe may be used if the 10 minute process time is used. Other recipes may be changed, or the product refrigerated.

For comparison of quantities, note the following equivalencies:

- 1 lb 5" cucumbers = about 5 cucumbers
- 1 lb mushrooms = about 6 cups chopped = 1 1/2 cups sauteed
- 1 lb onions = about 3 cups chopped = about 4 medium
- 1 lb green peppers = about 3 C chopped = 8-9 peppers
- 1 lb sweet red peppers = about 3 cups chopped = 6-7  
peppers
- 1 lb celery = about 4 cups chopped)

1 lb tomatoes = about 3 medium = about 1 1/2 cups chopped

22-23 lb tomatoes = about 7 quart or 28 cups cooked juice

Other Ingredients:

The use of alum is unnecessary. The slight increase in crispness that it provides is lost after about 2 months of storage. Few pickles are consumed within 2 months of processing. However, since alum is usually used in very small amounts, its use does not constitute a safety problem.

The use of grape leaves might contribute slightly to flavor. They have no significant effect on safety.

Lime does cause a significant increase in the crispness of pickles. If it is used, all excess lime must be rinsed away before the vinegar is added since it will neutralize the

vinegar. After the soak in lime water, the cucumber slices should be soaked in fresh water then drained, re-soaked and drained two more times (3 rinses in fresh water).

Honey may be used safely, but quantities will need to be adjusted for taste, and color may be darker. One cup of sugar is equivalent to 3/4 C + 1 T honey (or 1 C less 3 T).

#### Tomato Products

Tomatoes and tomato products are very hard to categorize.

Tomatoes are borderline acidic. Lemon juice or other acid (vinegar, citric or ascorbic acid) must be added to all tomato products to insure adequate acidity. Added acid is necessary whether the product will be pressure canned or boiling water bath processed. Bacteria and spores die faster in an acidic environment, and the recommended process times for pressure

canning assume that the tomatoes are acidic. The times would not be reliably adequate to insure safety if the tomatoes were low-acid.

Green tomatoes are more acidic, and may be used safely in any recipe calling for red tomatoes. Overripe and frosted tomatoes are less acidic and can not be safely home canned. They can be frozen.

Addition of salt, while optional, does give an extra margin of safety. For dietary information, one teaspoon of salt added to 1 quart of juice or sauce adds about 526 mg sodium per cup.

Addition of low-acid vegetables to tomatoes decreases the acidity. The amount by which the acidity is lowered depends on which vegetables, how much, how finely they are chopped, if they are boiled in the tomatoes or not, if seeds and skins remain in

or are removed, and if the chunks of vegetable and tomato remain, if they are ground together or sieved out. The initial acidity of the vegetables and tomatoes depends on maturity, growing conditions, post-harvest holding conditions, and soil/location of growth.

It is impossible to test every recipe. It has so far been impossible to develop a set of proportions or an equation that would take into account all the variables and give a reliable assessment of the acidity or the necessary process times. The only safe recommendations can be made by comparing the recipe in question with the USDA guide recipes. If more vegetable or less acid (vinegar or lemon juice) is added than the USDA recipe, the recipe in question can be changed or the product should be processed according to the process times for the vegetables. Alternatively the product may be frozen or refrigerated.

These proportions of vegetables have processing times in the USDA

Home Canning Guide:

Tomato-vegetable juice	22 lb tomato	: 3 C chopped vegetable
Spaghetti sauce	30 lb tomato	: 8 C vegetable : no acid
Ketchup #1	24 lb tomato	: 3 C onion : 3 C vinegar
Ketchup #2	24 lb tomato	: 1 C peppers : 2.6 C vinegar
Ketchup #3	24 lb tomato	: 9 C vegetables : 9 C vinegar

Use the equivalencies above to convert the amount of vegetables to cups before a recipe is evaluated for safety.

The tomato-vegetable juice recipe specifies "chopped vegetables". Up to but no more than 3 cups of mixed vegetables may be safely added to tomatoes to make 7 qts of juice. Which vegetables are

used is not important, the margin of safety is large enough to tolerate the variations in this recipe. BUT, after boiling, this recipe is pressed or sieved, so the chunks are removed, and a smooth juice is canned. These proportions can not be used for a chunky sauce.

The spaghetti sauce is pressure processed, so the proportions can be different. The tomato acid and the long boiling prior to canning are sufficient. These proportions and procedures can be used with different spices to make a taco or barbecue sauce type products.

Ketchups 1 and 2 are pressed or sieved so skins and seeds are removed. The proportions are similar, #2 with less added vegetable has a little less added vinegar. Ketchup #3 is a blender ketchup, skins are not removed prior to canning. The amount of added vegetable and of added acid is much greater

relative to the amount of tomato.

If these proportions are maintained, the amounts of sugar and spices may be varied to suit one's taste without endangering the safety of the product, and processing times given in the USDA Guide can be used. If other proportions are used, if the product is canned chunky instead of sieved smooth, or blended raw (uncooked) or any other variation, the processing times are not valid: the recipe must be changed, or the product must be frozen or held refrigerated.

#### Fruits and Vegetables

These products may be safely canned only according to USDA guidelines. Piece size, packing density and process times must be followed. Grated carrots can not be safely processed

according to times for carrot chunks. Pumpkin puree can not be safely canned. The density varies too much, according to variety and preparation method, to give safe recommendations. Only pumpkin chunks may be canned. Addition of aspirin, salt, or "canning powders" will not increase the safety or allow for reduced process times. Deviations from the specified procedures might not be safe. The only safe recommendations that can be given for other procedures is to freeze or refrigerate the product.

Fruits and vegetables may be pickled. In this case the guidelines for pickled products should be used.

#### Jar Sizes

For all products, if the USDA Home Canning guide only offers

processing times for pint jars, then the product should not be canned in quarts. Usually this occurs for dense or tightly packed products such as cream style corn, or for heat-sensitive products such as jelly, mushrooms or pickle relishes. In all cases, the extra processing time that would be required to insure an adequate temperature for an adequate time in the coldest part of the jar would be so long that the quality of the product would be lost. Relishes would be soft and mushy, corn would be tough, jelly would be syrupy.

Packing food for canning in irregularly-shaped jars such as ketchup bottles or honey bears is not acceptable. The irregular shape and size might not allow for normal circulation and heat penetration, and cold spots might exist that would allow for the survival of bacteria.

If the product has all ready been packed and processed within the

last 24 hrs, it may be repacked and reprocessed in smaller jars, or refrigerated. If it has been longer than 24 hrs since the processing, the product should be discarded to ensure safety.

Food may be packed and processed in smaller jars, half pint instead of pint if desired, but the processing time to be used should be that specified for pints. There is no formula to determine how much less processing would still be adequate. Mayonnaise or other straight sided, regularly shaped, commercial packer jars may be used for boiling water bath canning only. They should not be used for pressure canning, due to the danger of breakage, particularly when the canner is opened. Flying glass is dangerous.

#### SUMMARY

##### 1. SWEET FRUIT SPREADS

If it was made with regular pectin, high sugar recipe:

Did it jell? If it jelled, it has enough sugar, so is safe.

Was it processed? If not processed, it should be refrigerated for added safety.

Is there visible mold? If so, discard the entire contents of the container.

If it was made with a low sugar or no sugar pectin product: Were the directions on the box, particularly the processing or refrigeration, followed exactly? If the directions were not followed, but there is no visible spoilage, the product may be refrigerated, or possibly frozen. If there is mold, if there are bubbles rising, or other signs of spoilage, the product must be discarded.

## 2. PICKLED VEGETABLE OR FRUIT:

Find a recipe that has similar ingredients and procedures, ie. presoak, size of pieces, maturity and size of

vegetables, treatment in brine.

If there is no similar recipe, you can make no judgement on the recipe. If it is an old recipe that has been used successfully for generations without spoilage, a 10 minute processing should be added.

If there is a similar recipe, compare the amount of acid to vegetable between the two.

If the recipe in question has less acid, either the acid can be increased or vegetable decreased to fit the USDA recipe.

If acid is increased, sugar may be increased to adjust the flavor.

If the product is all ready made and the recipe is unsafe:

If it was made less than 24 hrs previously, it may be refrigerated.

If it was made more than 24 hrs previously, it should be disposed of in a safe manner.

If the recipe is safe but the product was not processed:

If it was made less than 24 hrs previously, it may be processed, with new lids.

If it is cold, either empty the jars, heat product, repack, and put into hot water, or put cold, filled jars in cold water, heat together; process for full time.

It may be refrigerated, or frozen if feasible.

If it was made more than 24 hr previously, and has not been refrigerated, it should be disposed of in a safe manner.

### 3. TOMATO-VEGETABLE BLEND:

Find a similar recipe in the USDA Guide. Check ingredients, proportions, and procedures.

If there is no similar recipe, no processing times can be estimated. To err on the side of safety, do not use the recipe, or freeze the product.

If there is a similar recipe, check proportions of tomato to vegetable, and be sure there is added lemon juice or vinegar. Minor adjustments to quantities of ingredients may be made to fit the USDA recipe.

USDA recipes for juice can not be used to judge chunky sauce recipes, or vice versa.

Spices and seasonings are not crucial to the safety of a recipe and can be adjusted.

4. FRUIT OR VEGETABLE:

Only USDA procedures and processing times may be considered safe.

Products improperly processed less than 24 hours previously may be reprocessed, with new lids, or refrigerated or frozen.

Products improperly processed more than 24 hrs previously should be discarded as potentially unsafe.

5. Wrong JAR OR JAR SIZE:

If a larger jar or an irregularly shaped jar was used, and the food was processed less than 24 hours previously, it may

be reprocessed, with new lids, in smaller jars.

If more than 24 hours have passed, the food should be discarded.

Prepared by Mary A. Keith, Foods and Nutrition, September, 1991

Revised by M. Susan Brewer, Foods and Nutrition, June, 1992

EHE-705

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#### How To Evaluate Recipes - Procedures

Here are five sample recipes taken from two home canning cookbooks on the market. Use the questions and procedures from Fact Sheet EHE-705, Evaluating Home Canning Recipes For Safety, to evaluate them (see above--LEB). You will also need the USDA Complete Guide to Home Canning.

I. Pepper relish

2 C chopped sweet red peppers	4 C cider vinegar
2 C chopped sweet green peppers	4 C sugar
4 C shredded cabbage	4 T mustard seeds
2 C chopped onions	1 T celery seeds
3 small hot red peppers, chopped	4 T salt

Mix all the ingredients and let stand in a cool place overnight. In the morning pack in sterilized jars and seal.

II. Picnic Relish

12 sweet green peppers, seeded	6 C sugar
12 onions, peeled	2 t dry mustard
12 green tomatoes	1 t allspice
1/2 C salt	1/4 T red pepper

4 C cider vinegar

Put all the vegetables through the medium blade of a food chopper, sprinkle with the salt, and let stand 4 hr. drain, rinse in clear water, and drain again. In a kettle combine the vinegar and sugar. Bring the liquid to a boil, add vegetables and spices. Boil for 10 min. and seal in hot jars.

### III. Chili Sauce I

24 large ripe tomatoes	2 C cider vinegar
1 small bunch celery, chopped	2 T salt
6 onions, chopped	1 t pepper
3 cloves garlic, minced	1 t dry mustard
3 sweet red peppers, seeded and chopped	
2 T whole allspice, tied in a bag	1 1/2 C light brown sugar

Scald, peel, core, and quarter the tomatoes. Squeeze out the seeds and excess juice and chop the pulp finely. Put the pulp in a large kettle, bring to a boil, and boil rapidly until the tomatoes are soft. Ladle off the clear liquid that comes to the top of the tomatoes while they are cooking. Add the remaining ingredients and cook for 30 min. Discard the spice bag and continue to cook for about 1 hour longer, or until thick, stirring occasionally. Seal in hot sterilized jars.

#### IV. Chili Sauce II

4 qt ripe tomatoes, peeled and chopped	
1 C chopped onions	2 sticks cinnamon
1 1/2 C chopped red peppers	2 C vinegar
1 1/2 C chopped green peppers	1 C sugar
1 1/2 t whole allspice	3 T salt

1 1/2 t whole cloves

In a large preserving kettle, combine the tomatoes, onions, and peppers. Add the spices, tied in a bag, bring the mixture to a boil and cook until it is reduced to half its volume, stirring frequently. Add the vinegar, sugar, and salt and boil rapidly for 5 min., stirring constantly. Discard the spice bag. Pour into hot jars and seal.

V. Shirley's Sweet-Sour Sauce

10 C chopped, ripe tomatoes	2 C sugar
2/3 C chopped green peppers	2 C 5% acid cider vinegar
2 C chopped onions	2 T canning/pickling salt

Dip tomatoes into boiling water 1/2 min. to loosen skins.

Cool in cold water. Remove skins and cores. Blend or put through food chopper. Place in 8-qt. kettle. Remove stems, membranes and seeds from peppers and peel onions before chopping. Add to tomatoes; stir in sugar, vinegar and salt. Simmer, uncovered, stirring frequently, for 2 hours or until thick and sauce begins to round up on spoon. Ladle into 3 hot pint jars, filling to within 1/8" of jar top. Wipe jar rims: adjust lids. Process in boiling water bath 15 minutes. Start to count processing time when water in canner returns to boiling. Remove jars and complete seals unless closures are self-sealing type. Makes 3 pints.

## ANALYSIS OF THE RECIPES

### I. Pepper Relish

A. First, as it stands, there is neither cooking nor

processing. The recipe can not be used as is. Can it be made useable? Here's how to try.

B. What are the vegetable:acid proportions? Add the cups of vegetable. There are 10 C vegetables. The 3 small hot peppers are negligible so they do not need to be counted. There are 4 C vinegar. Notice that the recipe did not specify 5% acidity.

C. What is the most similar USDA recipe? While the Piccalilli recipe (p. 18) might look similar because they both have shredded cabbage, it really is not, because it has green tomatoes, an acid product, and the questionable recipe has no acid foods. So, the USDA recipe to use is the Pickled Pepper-Onion Relish (p.18).

D. What are the USDA proportions? Twelve cups of

vegetables to 6 C vinegar.

recipe 10 C veg : 4 C acid = 2.4 C veg : 1 C acid

USDA 12 C veg : 6 C acid = 2.0 C veg : 1 C acid

Therefore, this recipe does not have enough acid to be safe.

E. What recommendations can be made?

If the vinegar were increased to five cups, the ratio would then be 2 C veg : 1 C acid (10:5). So, to use this recipe:

- a. increase the vinegar to 5 C
- b. use 5% acidity vinegar
- c. boil the mixture for 30 min. to use USDA procedures
- d. presterilize jars

e. process the filled jars for 5 min. in boiling water

OR: f. make the recipe as directed, do not seal it,  
refrigerate.

Note that the recipe all ready has much more sugar (4C) than the USDA recipe, so the increased vinegar should still be acceptable. However, the sugar could be increased still further to counteract the vinegar increase if desired.

If the recipe is made in its original form, the jars should be covered but the lids should not be sealed. There should be no vacuum in the jars. Since nothing has been done to kill or inactivate any *Cl. botulinum* spores or cells, air should be left in the jar. The air will prevent its growth.

## II. Picnic relish

A. What is the most similar USDA recipe? In this case, the Piccalilli (p.18) is the reference recipe to use. Both the ingredients and the procedures are similar. It does have green tomatoes, it does call for soaking the vegetables in salt water and draining them, and it does call for simmering them before packing. So, while the times are not quite the same, the next step is to look at proportions.

B. What are the vegetable:acid proportions? With this recipe it is not as simple as adding the quantities, because this one only specifies numbers of peppers, etc., and not cups. Use the equivalencies table in fact sheet (705) to estimate how many cups of produce it uses.

12 peppers; 9 peppers = about 3 C,            so 12 = about 4 C

12 onions; 4 onions = about 3 C,      Preserving\_2004.txt  
so 12 = about 9 C  
12 tomatoes; 3 tomatoes = about 1.5 C,      so 12 = about 6 C

TOTAL VEGETABLES =                      19 C

4 C vinegar

TOTAL ACID=                              4 C

In the USDA recipe there are a total of almost 19 C of  
vegetables, but the vinegar amount is 4.5 C.

Recipe: 19 C vegetables : 4 C acid

USDA: 18.75 C vegetables : 4.5 C acid

C. So, to correct the proportions, the acid must be  
increased at least to 4.5 C, or better yet, to 4.75 C of vinegar.  
This recipe also has much more sugar than the USDA recipe, so the

increased vinegar might not be noticeable. If it is the sugar  
may be increased as desired.

D. What recommendations can be made?

- a. use 5% acidity vinegar
- b. increase the vinegar from 4 C to 4.75 cups
- c. mix the salt in, do not just sprinkle it on top
- d. increase the time of soaking from 4 hrs to 12 hrs
- e. increase the simmering time from 10 min to 30 min
- f. use presterilized jars
- g. process the filled jars for 5 min in boiling water

OR: h. use the recipe as is, do not seal, refrigerate the  
product

III. Chili Sauce I

A. The procedures in this recipe are so different that there are no USDA recipes to use for reference. It can not be considered safe.

B. Explanation and analysis:

When the juice is removed from tomatoes by mechanical means (squeezing, ladling off the clear liquid) the acid balance is changed. With the juice removed, it will take less time for the sauce to become thick when it is cooked. But, that means that there is less cooking time to kill bacteria and mold spores. Also, because it is thicker the heat will penetrate and kill the spores more slowly. So, the product going into the jar has a greater likelihood of still having live spores present. And, if it were processed, because it is thick, it would need more than the usual process time to kill them.

C. The only recommendation that can be made with a recipe of this type is to refrigerate the product without sealing, or freeze it. It can not be canned safely.

#### IV. Chili Sauce II

A. First look at the procedures in this recipe. The tomatoes and vegetables are boiled together until it is thick. But, the mixture is not sieved or put through a food mill. All the skins and seeds are left in. Therefore, this has to be considered in looking for a similar USDA recipe. There are several possibilities; the Spaghetti Sauce without Meat (p. 13), or any of the Ketchup recipes (p. 16-17).

B. So, go to proportions and see which matches best.

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	Chili Sauce	Spaghetti	Ketchups		
	?	Sauce	Regular	Western	Blender
tomatoes	16 C	30lb=45 C	24lb=36C	36C	36C
onions	1 C	1 C	3C	--	(2 lb = 6C)
red pepper	1.5 C	--	--	5chili	(1 lb = 3C)
grn pepper	1.5 C	1 C	--	--	(1 lb = 3C)
mushrooms	1 lb=6 C		--	--	--

TOTAL VEG:

4 C	8 C	3 C	0 C	12 C
-----	-----	-----	-----	------

TOTAL TOMATO

16 C	45 C	36 C	36 C	36 C
------	------	------	------	------

TOTAL ACID

2 C	--	3 C	2.6 C	9 C
-----	----	-----	-------	-----

C. Spaghetti sauce: the proportions do look the closest.

Half of each quantity is 4 C vegetables to 22.5 C tomatoes. However, looking at the directions, it specifically states: "Caution-do not increase the proportion of vegetables." So, for an exact match, the amount of tomatoes in the chili sauce recipe would have to be increased to 22.5 C. You might say "Yes, but the chili sauce has vinegar added." That is true, but there is no way of knowing if the added vinegar is enough to compensate for the fewer tomatoes. (Both are acid.) If you adapt to the spaghetti sauce recipe, the vinegar becomes optional.

Next, notice that the tomatoes in the spaghetti sauce are sieved to remove the seeds and thick pulp. This would have to be done for the chili sauce too. The skins have been removed in both recipes. Also, notice that the spaghetti sauce recipe only has directions for

pressure processing. Many consumers do not have or do not want to use a pressure canner for their tomato products. The other vegetables remain, so the sauce is chunky.

- D. So, if the spaghetti sauce recipe were used the recommendations would be:
  - a. increase the tomatoes to 22.5 C
  - b. sieve to remove the seeds of the tomatoes.
  - c. process in a pressure canner, 10 psig for 20/25 min.
  - d. the vinegar is optional, use it for flavor

All the chili sauce spices would remain the same, so the flavor should be quite similar to the original.

- E. Now, look at the proportions of the ketchup recipes

compared to the chili sauce in question.

chili	1 C veg.	:	4 C tomato	:	0.5 C acid
Regular	1 C veg.	:	12 C tomato	:	1 C acid
Western	- C veg.	:	14 C tomato	:	1 C acid
Blender	1 C veg.	:	3 C tomato	:	0.75 C acid

Of the ketchups, we can eliminate the Western, because it has no added vegetables at all. It is essentially spicy tomato sauce. The regular ketchup has a much higher proportion of tomato to vegetable, and more acid as well. This is what happens when the solids are removed (sieved out).

- F. What can be done with the blender ketchup recipe? The amount of vinegar would have to be increased from 2 C to 3 C. There are more tomatoes than needed, but that

only increases the safety margin. So, they do not have to be changed. The spices and cooking procedure could be left the same, with the exception of blending the tomatoes and vegetables together. This would insure that all the pieces are small enough to coincide with the USDA recipe. It becomes a smooth rather than chunky product but all the original solids are still present. And finally, the product would have to be processed.

- G. The recommended changes in the recipe would be:
  - a. specify 5% acidity vinegar
  - b. increase the vinegar from 2 C to 3 C
  - c. blend the tomatoes and vegetables together before cooking
  - d. process the product for 15 min in boiling water

OR e. use as is, do not seal, refrigerate or freeze the  
product

V. Shirley's Sweet-Sour Sauce

A. Begin with the procedures. The tomato skins are removed, the rest of the tomato is blended, the onions and peppers are chopped, added to the tomatoes, and the mixture is simmered until thick. It is not sieved. Of the USDA tomato recipes used in the previous section, the Blender ketchup is again the most similar in procedures.

B. Look at the proportions.

sweet-sour 2.6 C veg : 10 C tom : 2 C acid

or to reduce it to lowest common denominator (divide all by 2.6):

sweet-sour 1 C veg : 4 C tom : 0.75 C acid

Blender 1 C veg : 3 C tom : 0.75 C acid

So, this is an almost perfect match. The sweet-sour sauce has more tomatoes than necessary for minimum safety, the acid and vegetable are balanced correctly. The long boiling times match, the final processing times match.

C. What recommendations are necessary?

The only thing that could be said would be "Be sure the

vegetables are chopped finely, to approximate the blending used in the Blender ketchup." Most people wouldn't mind using a blender to chop the vegetables, so it is a minor change.

Remember, if there is no similar USDA recipe, the only recommendation can be to freeze or refrigerate the product.

Prepared by Mary A. Keith, Foods and Nutrition, September, 1991

Revised by M. Susan Brewer, Foods and Nutrition, June, 1992

EHE-705 Supplement

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-----VI. Other Sources (besides this FAQ)-----

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[This FAQ does not tell me what I need to know!]

Please put the question to the group, rec.food.preserving. Or...

GENERAL REFERENCE BOOKS:

N.B. I've attached a little code to describe the main contents of the books I have or know about. {c = canning/ f = freezing/ dr = dehydration/ s = smoking/ p = pickling/ cr = curing/ pt = potting/ d = distilling/ rc = root cellaring}

Putting Food By (1991). Janet Greene, Ruth Hertzberg, Beatrice Vaughan. ISBN 0-452-26899-0. If you only can afford one book on this subject, this is the one to get. {c,f,dr,s,cr,p,rc}

Stocking Up (1990). Carol Huppig. ISBN 0-671-69395. This is the book compiled by the Rodale Institute. Check for copyright dates, especially if you are curing meats. Early editions have

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meat curing protocols and recipes, the latest edition does not.

{c,f,dr,p,rc,d}

The Ball Blue Book: The Guide to Home Canning and Freezing (various).  
Ball Corporation. So important, it is its own question in the FAQ.  
Can order your copy using the coupon on the top of your next case of  
Ball jars. {c,f,p}

Kerr Kitchen Book, Home Canning and Freezing Guide (various). Kerr  
Glass Manufacturing Corporation. Can order your copy using the  
coupon on the top of your next case of Kerr Jars. {c,f,p}

Bernardin Guide to Home Preserving (various). Bernardin of Canada.  
Consumer Services/ Bernardin of Canada Ltd/ 120 The East Mall/ Etobicoke  
Ontario M8Z 5V5. ISBN 0-9694719-0-4. Also can order your copy via  
the coupon contained on side of the box of lids, also on top of the  
next case of Mason jars. Also printed in French.

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Complete Guide to Home Canning, Preserving, and Freezing (various).  
USDA. Dover Publication ISBN 0-486-27888-3. tip from Susan Hattie  
Steinsapir <hattie@netcom.com>

Sunset Home Canning Guide (1993). ISBN 0-376-02433. Now you know  
I'm posting west of the Mississippi; this book can be hard to find  
in the eastern United States. {c,f,p}

#### SPECIFIC TECHNIQUES AND INTERESTS

Arranged in alphabetical order. If your favorite book isn't here,  
talk about it in r.f.p, and I'll put it on the list...

The Art of Accompaniment (1988). Jeffree Sapp-Brooks. ISBN 0-86547-  
346-3. {c,p,d}. Some of the most unusual jam/chutney/sauce recipes

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I've seen. Love the dried fig jam recipe, still thinking of trying out the carrot/date marmalade. Lots of quick pickle recipes, a kimchee recipe, even a recipe for pickling grape leaves for dolmathes..

Better Than Store Bought: Authoritative Recipes for the Foods that Most People Never Knew They Could Make at Home (1979). Helen Witty, Elizabeth Schneider Colchie. ISBN 0-06-014693-1. Recipes in this book include those for crystallized violets, tomato ketchup, German-style mustard, pickled okra, chutneys, mustards, jellies and jams, gravlax, three recipes for corned beef, and smoked meats and fish. While you're waiting for the fish to smoke, you can whip up some pudding mix, or make marshmallows or fig newtons. Recipes do not appear to be excessively difficult--some, like those for mustards and flavored liqueurs, are simple--and descriptions of ingredients and finished products are clear and understandable. Thanks to: kvj@mcs.net (Kevin Johnson)

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Canning (1983, also various). Bill and Sue Demming. HP Books.

ISBN 0-89586-185-2. {c}.

Canning and Preserving Without Sugar (1993). Norma M. MacRae.

ISBN 1-56440-163-4. {c}

Clearly Delicious (1994). Elizabeth Lambert-Ortiz, Judy Ridgway.

ISBN 1-56458-513-1.

The Country Kitchen (1979). Jocasta Innes. Frances Lincoln Publishers LTD, London. ISBN 0-906459-01-X This book also contains recipes for scones and blackcurrant jam, besides many others, many of which touch on preservation topics, including curing hams and bacon, salting and smoking fish, making pickles, chutneys, preserves, butter, cheeses, etc.  
review from James Harvey <harvey@indyvax.iupui.edu>

Don Holm's Book of Food Drying, Pickling, and Smoke Curing (1992).

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Don and Myrtle Holm. ISBN 0-870004-250-5. {dr,p,s,cr}

Dry It - You'll Like It (1974). Gen MacManiman. Published by MacMan-  
iman, Inc., P.O. Box 546, Fall City, WA 98024. from <pata@aa.net>. {dr}

European Peasant Cookery: The Rich Tradition (1986). Elizabeth Luard.  
Corgi Publishing. ISBN 0-552-12870-8.

The Fancy Pantry (1986). Helen Witty. ISBN 0-89480-094-9. {c,p,d,pt}.  
The first food preserving book I ever bought. I still use a lot of the  
recipes in it. The pear honey recipe is sinful, so is the green tomato  
mincemeat. Cornichon, sundried tomato, pepper flavored vodka, pepper  
jam, herb jellies...Excuse me while I go get my waterbath canner..

Farm Journal's Homemade Pickles and Relishes (1976). Betsy  
McCracken. Library of Congress Catalog Card Number 76-14048. {p}

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Feast of the Olive (1993). Maggie Beth-Klein. ISBN 0-8118-0523-9.

Several olive curing techniques listed here, also everything you've wanted to know about different olive oils. {cr}

Fruits of the Desert (1986). Sandal English. ISBN 0-9607-758-0-3.

Preserving fairly exotic fruits, such as kumquats, loquats, fresh figs, cactus fruits, olives. {c,p,cr,d,dr}

The Glass Pantry: Preserving Seasonal Flavors (1994). Georgeanne Brenner. ISBN 0-8118-0393-7. {c,p,dr,d,pt}

Great Sausage Recipes and Meat Curing (1984). Ryttek Kutas.

Self published. Can be obtained from the author at The Sausage Maker Inc./ 26 Military Road/ Buffalo NY 14207. (716)-876-5521.

{s,cr}

The Herbal Pantry (1992). Chris Mead, Emelie Tolley. ISBN 0-517-

58331-3. {c,p,d}

Herbal Vinegar (1994). Maggie Oster. ISBN 0-88266-843-9. {d}

How to Dry Foods (various). Deanna DeLong. HP books. This book is highly recommended by Anna Louise Gockel, and several other folks in r.f.p. {dr}

Keeping Food Fresh (1989). Janet Bailey. ISBN 0-06-272503. This book will also give you tips on how to select produce from either the supermarket or garden. {f,rc}

Keeping the Harvest (1990). Nancy Chioffi and Gretchen Mead. ISBN 0-88266-650-9.

Making and Using Dried Foods (1994). Phyllis Hobson. ISBN 0-88266-615-0. {dr}

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Mary Bell's Complete Dehydrator Cookbook (1994). Mary Bell. ISBN 0-688-13372-X. {dr} from Paul Opitz <rpo3352@omega>

Native Harvest (1979). Barrie Kavasch. Vintage Books. Native American preserving recipes, including pemmican. {dr}

Out of the Sugar Rut (1978). HAH Publications/ Box 2589/ Colorado Springs, CO 80906. Low sugar canning recipes, from Jean Sumption <sumption@HIInet.Medlib.Arizona.edu> {c}

Preserving Today (1992). Jeanne Lesem. ISBN 0-364-58653-0. {c,dr,p}

Root Cellaring (1994). Mike and Nancy Bubel. ISBN 0-88266-703-3. {rc}

Smoking Salmon and Trout (). Jack Whelan. ISBN 0-919807-00-3. Aerie Publishing, Deep Bay, Vancouver Island R.R.1, Bowser, B.C. V0R 1G0.

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This is probably the best resource for smoking fish that I've ever seen.

It is where I learned the art of cold smoking using a forced draft smoker.

Plans on how to build various smokers are in the book. Also has the best

description on the whys and therefors of marinades and brining that I've

ever read. review from Kai <qx01820@inet.d48.lilly.com> {s}

Summer in a Jar: Making Pickles, Jams, and More (1985). Andrea Chessman. ISBN 0-913589-14-4 Review: This book has basic canning instructions but also some inventive recipes. It has a section on single jar recipes (although why anyone would go to the trouble to can one jar of something is beyond me). The single jar recipes are, however, successfully increased to make a reasonable batch. The jam recipes are easy and unusual - they don't require that you use pectin or make your own apple pectin. My favorite is peach maple jam - low sugar and very tasty. It also has lots of recipes for vegetable pickles. (from Rachel Beckford <beckford@scsn.net>) {c}

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--N.B. Many standard cookbooks, such as Joy of Cooking, will give you information on preserving food and recipes. Check for the most recent edition and the copyright dates. Ethnic cookbooks often have food preserving or condiment recipes that can be preserved (refrigerate or freeze if in doubt about canning them). Also, the Foxfire series (especially Foxfire 1) has some information on food preserving techniques as they are practiced in the southeastern US.--

#### BOOKS AND GUIDES TO EQUIPMENT:

"Red Book No. 6 The Collector's Guide to Old Fruit Jars" by Alice M. Creswick. This is one of two by Creswick on fruit jars. A purchase address is Alice Creswick, 0-8525 Kenowa Sw., Grand Rapids, Michigan 49504. Thanks from: Emily Dashiell <antem@PEAK.ORG>

#### FOOD PRESERVING BOOKS OF HISTORIC INTEREST:

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The Domostroi: Rules for Russian Households in the Time of Ivan the Terrible (original 1550's, current English translation 1994). edited and translated by Carolyn Johnston Pouncy. ISBN 0-8014-2410-0. You think preserving food is a lot of work nowadays, imagine being a Russian house steward in 1550...

Michel de Nostradame (Nostradamus) apparently published a collection of jelly recipes. Boy, I'd love to get my hands on this!  
(From Cecil Adams, \_The Straight Dope\_)

From zoeholbr@rs6a.wln.com (M Zoe Holbrooks) in rec.food.historic:  
I've just gotten word that Louis & Clark Booksellers (P.O. Box 5093, Madison, WI 53705) has a complete set of the Mallinckrodt Collection of Food Classics for sale. The set of 6 volumes includes: Nicholas Appert (The Art of Preserving All Kinds of Animal and Vegetable Substances for Several Years; 1812); Frederick Accum (A Treatise on

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Adulterations of Food, and Culinary Poisons; 1820); Denys Papin (A New Digester or Engine for Softening Bones; 1681); H. Jackson (An Essay on Bread; 1758); Platina (De honesta voluptate; 1475); and Kenelme Digbie (The Closet of the Eminently Learned Sir Kenelme Digbie Kt. Opened; 1669). Most of these works are difficult to find. If interested, please contact them directly (tel# 608-231-6850). They are not yet online (maybe later this year). My personal experience with them has been pleasant and rewarding. They put out a catalog at least once a year and it never fails to include something I "can't live without"!

PAMPHETS:

Consumer Information Center, Department EE, Pueblo CO 81009. Ask for the Consumer Mailing List Catalog. Can order those nifty USDA pamphets from this catalog.

Heinz Successful Pickling Guide, P.O. Box 57, Pittsburgh PA 15230.

(That PO Box is easy to remember, eh?)

The Pleasures of Pickling (1986). 46 pg. Older editions appeared as the Pampered Pickle, each are from Sifto Salt Division of Domtar Inc. Write to: Sifto Canada Inc./ 5430 Timberlea Blvd./ Mississauga, Ontario/ Canada L4W 2T7/ 1-800-387-8580 (from Brenda Sharpe, at aj @.freenet.carleton.ca)

Home Meat Curing Guide. Morton Salt. can get at the Cumberland General Store, Rt 3, box 81, Crossville TN 38555. 32 pg. 15 meat recipes and various techniques for curing hams with Morton salt products: dry cure, dry/sweet pickle cure combination, aged/non-aged cures.

So Easy to Preserve. Agriculture Business Office, 203 Conner Hall, Cooperative Extension Service, University of Georgia, Athens GA, 30602.

Check for pamphlets when you purchase new equipment. I recently found a multi-lingual pamphlet (English, French, German, Spanish) on canning with a new waterbath canner.

Seed Catalogs have ordering information for canning supplies, and food preserving information. Catalogs to check for this include Johnny's Select Seeds, Gurney's Seed Nursery, Burpee, Henry Fields. Tip 'o the hat to Joan Lane [jml@prairienet.org](mailto:jml@prairienet.org)..

Check your extension service office for pamphlets, which can usually be bought for a dollar or so. Especially important for high altitude canning, getting recipes specific for locale, even information on U-Pick sites and local farmers' markets.

MAGAZINES:

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(These are all hit or miss. To the best of my knowledge, no magazine specific to food preserving exists.)

The Herb Companion	Sunset
Mother Earth News	Saveur
Organic Gardening	Martha Stewart's Living
Better Homes and Gardens	Farmer's Almanac (various)

PHONE: (non-modem)

Kerr Hot Line 1-800-654-6249

Ball Hot Line 1-800-240-3340

Mrs. Wages 1-800-647-8170

Kraft General Foods Corp. 1-800-431-1001

Sifto Canada, Inc. 1-800-387-8580

your extension service--check your local university directory,

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especially if its a Land Grant College; look under Government

Services, under Dept. of Agriculture.

Master Preservers--similar to Master Gardeners or Master Composters.

#### ELECTRONIC:

ftp ftp.ucdavis.edu pub/extension/4h-youth fp001.zip-fp008.zip

gopher dale.ucdavis.edu Look for Food Preservation pointer.

Files are eight lessons in food preservation, written for 4H students.

They are compressed, written in Word Perfect 5.1 or Post Script format.

gopher cesgopher.ag.uiuc.edu Point to Food-and-Nutrition, then

Food Preservation. 30 files here, ranging from pressure canning to

pawpaws. A good collection of M. Susan Brewer's fact sheets, some

of which are reprinted here.

gopher tinman.mes.umn.edu:70+/11/.Nutrition/Safety Here's a gold

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mine of food safety, food storage, and food preservation information from the University of Minnesota. Has a lot of good files on freezing food, and has some unusual entries like on how to treat wild game, preserving nuts, preserving seeds (sunflower seeds, popcorn). Also has files about Listeria, E. coli, Salmonella.

[gopher.etc.s.missouri.edu](http://gopher.etc.s.missouri.edu), look for the Food Preservation pointers. 11 files of the Lets Preserve It! electronic magazine published by the University of Missouri extension service. Lots of good information here, especially on freezing food. Also, this site contains a food preservation FAQ, different than this one. That FAQ contains 39 very basic questions answered very simply.

<http://www.colostate.edu/Depts/CoopExt/>

Colorado Extension on-line. They also have a LOT of other good food preservation publications (all in Adobe .pdf format). From Michael Stallcup <[michael\\_stallcup@ed22qm.msfc.nasa.gov](mailto:michael_stallcup@ed22qm.msfc.nasa.gov)>

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`ftp.rtd.com:/pub/rthead/msfaq.txt`

`http://www.rtd.com/~rthead/msfaq.html`

These are the addresses and URLs for the current version Rick Thead's Meat Curing and Smoking FAQ. An early version of that FAQ is contained in this FAQ, but the current version has more recipes and advice.

`telnet to sunSITE.unc.edu cd pub/academic. Check out the rec.gardens herb.faq, which contains advice on preserving herbs. And now we have:`

`email HeK@hetta.pp.fi. Ask Henriette Kress nicely for a current copy of her culinary herb FAQ, or wait for her to post it on rec.food.preserving. The culinary herb faq has ideas and recipes for preserving herbs--check out the recipes for garlic and lavender jelly, herbal syrups, candied and sugared rose petals. Also contains info on drying`

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herbs, herb vinegars, etc.

<http://vm.cfsan.fda.gov/~mow/intro.html> The FDA's Home Page and Bad Bug Book. If we haven't scared you, maybe they can. From Ron Meisenheimer <ronm@ns.net>.

Email [chile-heads-request@chile.ucdmc.ucdavis.edu](mailto:chile-heads-request@chile.ucdmc.ucdavis.edu) Write a one line message containing the command SUBSCRIBE to this listserve address. This is the chile heads mailing list, which has info on preserving chile peppers.

<http://chile.ucdmc.ucdavis.edu:8000/www/preserve.html> Point to this www site for information on preserving chile peppers. Includes recipe classics like drying (make your own ristra!), pickling, smoking, and pepper jam; also has novel recipes like honey preserved chiles, chiles in sherry, and salted chiles.

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<http://www.accessone.com/~sbcn/index.htm> The homepage of the Solar Cooking Archive, with an article describing solar canning and solar dehydration. From Tom Sponheim <[tsponheim@accessone.com](mailto:tsponheim@accessone.com)>. [N.B. Solar Canning has not been tested for safety by the USDA, and should only be tried with high acid fruits and jams. The info's out there, and for the adventurous, its your call.--LEB]

<http://me-www.jrc.it/htbin/cook?tag=sections/canning-preserving>  
This is a www site with a few (very few) preserving recipes mostly taken from [rec.food.recipes](mailto:rec.food.recipes).

[gopher.rincewind.mech.virginia.edu](mailto:gopher.rincewind.mech.virginia.edu)

[gopher.gs1.gac.peachnet.edu](mailto:gopher.gs1.gac.peachnet.edu)

Two sites containing food preserving recipes from both [rec.food.preserving](mailto:rec.food.preserving) and [rec.food.recipes](mailto:rec.food.recipes). If you contributed a favorite food preserving recipe in these two groups, it might well be here.

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Please direct questions, comments, criticisms, and contributions to:

dferrrell@eleven.uccs.edu

lebasel@nando.net // lebasel@unity.ncsu.edu

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One last quote:

"And here, without secrecy anywhere or of any kind, are some recipes which seem to have outlived the nineteenth century, our Golden Age of Pickling. Like most family jewels, they are called Sarah's This and Maggie's That, and in one way or another all of these people were witches, so I have carefully tested their brews, and often, to prove them honest... There are shades of exotic and ethnic backgrounds in them, but basically they are still living proofs of the passionate romance between Midwestern housewives and the Mason jar, which filled shelves with gleaming beautiful vessels of cooked fruits and vegetables, all dirt cheap in season and as rare as toad gems in the long winters fed on potatoes, cabbages, and parsnips..."

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--MFK Fisher, With Bold Knife and Fork (1968)

(end of large faq)