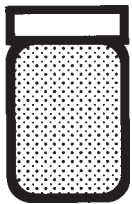


Canning and Freezing Tomatoes

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The recommendations given in this circular are based on research sponsored by the United States Department of Agriculture and conducted at the Extension Center for Excellence in Home Food Preservation, Pennsylvania State University. The resulting recommendations are published in "Complete Guide to Home Canning," Agriculture Information Bulletin 539, 1994 revision. These recommendations take into account numerous tomato varieties, including those described as meaty, solid, firm and with few seeds, and the recommendations also allow for various growing conditions. If a person does not wish to follow current recommendations, freezing is a safe alternative.



Safety

When canning tomato products it is important to measure accurately and follow recipes carefully.

For example, the spaghetti sauce recipe calls for 30 pounds of tomatoes and 1 cup of celery or green pepper. The proportions of tomatoes, the acid food, must not be decreased. Peppers and celery are low acid foods and their proportions cannot be increased if safety is to be assured. The low acid foods may be decreased or omitted.



General Considerations

Quality: Select only disease-free, preferably vine ripened, firm fruit for canning. **Caution: Do not can tomatoes from dead or frost-killed vines because the acidity of the fruit may be altered. Green tomatoes are more acidic than ripened fruit and can be canned safely with any of the following recommendations.**

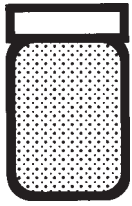
Acidification: To ensure safe acidity in whole, crushed, or juiced tomatoes, add two tablespoons of bottled lemon juice or $\frac{1}{2}$ teaspoon of citric acid per quart of tomatoes. For pints, use one tablespoon bottled lemon juice or $\frac{1}{4}$ teaspoon citric acid. Acid can be added directly to the jars before filling with product. Add sugar to offset acid taste, if desired. One to two teaspoons of sugar may be enough to enhance the flavor.

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Preparing Tomatoes: Wash tomatoes. Dip in boiling water for 30 to 60 seconds or until skins split; then dip in cold water. Slip off skins and remove cores.



Canning Procedure

Wash jars. Prepare lids according to manufacturer's instructions. Fill hot tomato products in jars. Remove air bubbles by inserting a flat plastic spatula between the food and the jar. Wipe sealing edge of jars with a clean, damp paper towel. Add lids and tighten screw bands. Process in a boiling water or pressure canner as directed.

Salt may be added if desired. In tomatoes and tomato products, salt seasons the food, but is not necessary to ensure safety.

To process in a boiling water canner, fill canner halfway with water and preheat to 180 degrees Fahrenheit for hot packs or 140 F for raw packs. Load sealed jars onto the canner rack and lower with handles; or load one jar at a time with a jar lifter onto rack in canner. Add water, if needed, to a level of 1 inch above jars. Cover canner. Turn heat to high and bring water to a boil. When water boils vigorously, lower heat to maintain a gentle boil and process jars for the time given in Table 1.

To process in a pressure canner, place jar rack, at least 2 inches of water and sealed jars in canner. Fasten lid, and heat canner on high setting. After steam exhausts 10 minutes, add weighted gauge or close petcock to pressurize the canner. Start timing the recommended process when the desired pressure is reached. Regulate heat to maintain a uniform pressure, and process the product for the time given in Table 2.

For more information on use of the pressure canner see HE-173 Home Canning Low-Acid Vegetables.

When processing is complete, remove canner from heat. Air-cool canner until it is fully depressurized. Slowly remove weighted gauge or open petcock, wait 2 more minutes, unfasten and carefully remove canner lid.

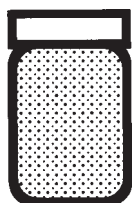
After processing is completed, remove jars from canner with a jar lifter and place on a towel or rack. Do not retighten screw bands. Air-cool jars 12 to 24 hours. Remove screw bands and check lid seals. If the center of the lid is indented, wash, dry, label and store jars in a clean, cool, dark place. If the lid is unsealed, examine and replace jar if defective, use new lids, and reprocess as before. Wash screw bands and store separately. Tomato products are best if eaten within one year and safe as long as lids remain vacuum sealed.

Table 1. Recommended processing times in a boiling-water canner.

Product	Pack	Jar Size	Minutes of processing time at altitudes of		
			0-1,000 ft	1,001-3,000 ft	3,001-6,000 ft
Tomato juice or tomato vegetable juice blend, standard tomato sauce	Hot	Pints	35	40	45
		Quarts	40	45	50
Crushed tomatoes	Hot	Pints	35	40	45
		Quarts	45	50	55
Whole or halved tomatoes packed in water	Hot and Raw	Pints	40	45	50
		Quarts	45	50	55
Whole or halved tomatoes packed in juice or without added liquid	Raw	Pints or Quarts	85	90	95
Tomato ketchup	Hot	Pints	15	20	20
Chile Salsa, Tomatillo Green Salsa, Tomato Salsa, Tomato/Green Chile Salsa, Tomato Paste Salsa, Tomato Taco Sauce	Hot	Pints	15	20	20

Table 2. Pressure canner processing times and pressures at designated altitudes.

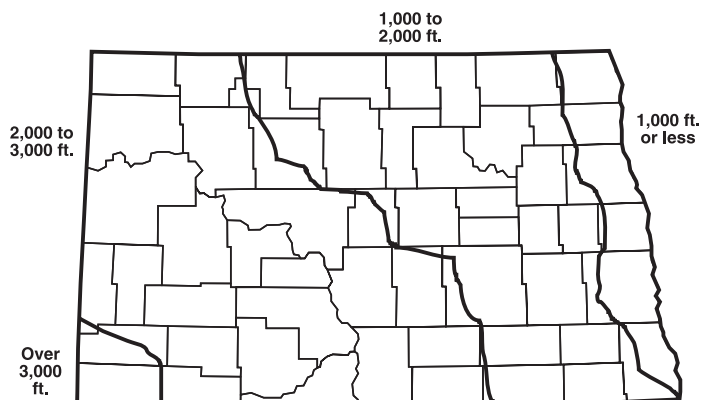
Product	Style Pack	Jar Size	Process Time	Canner Gauge Pressure at Altitudes of				
				0-2,000 ft	2,001-4,000 ft	4,001-6,000 ft	0-1,000 ft	Above 1,000 ft
Tomato juice, tomato vegetable juice blend, standard tomato sauce or crushed tomatoes	Hot	Pints or Quarts	20 min	----- for dial gauge -----			- for weighted gauge -	
			15 min	6 lb	7 lb	8 lb	5 lb	10 lb
			10 min	11 lb	12 lb	13 lb	10 lb	15 lb
Whole or halved tomatoes packed in water	Hot or Raw	Pints or Quarts	15 min	6 lb	7 lb	8 lb	5 lb	10 lb
			10 min	11 lb	12 lb	13 lb	10 lb	15 lb
			1 min	—	—	—	15 lb	Not recommended
Whole or halved tomatoes packed in juice or without added liquid	Raw	Pints or Quarts	40 min	6 lb	7 lb	8 lb	5 lb	10 lb
			25 min	11 lb	12 lb	13 lb	10 lb	15 lb
			15 min	—	—	—	15 lb	Not recommended
Spaghetti sauce without meat	Hot	Pints or Quarts	20 min	11 lb	12 lb	13 lb	10 lb	15 lb
			25 min	11 lb	12 lb	13 lb	10 lb	15 lb
Spaghetti sauce with meat	Hot	Pints or Quarts	60 min	11 lb	12 lb	13 lb	10 lb	15 lb
			70 min	11 lb	12 lb	13 lb	10 lb	15 lb
Mexican tomato sauce	Hot	Pints or Quarts	20 min	11 lb	12 lb	13 lb	10 lb	15 lb
			25 min	11 lb	12 lb	13 lb	10 lb	15 lb



Adjust for Altitude

As altitudes increase air becomes thinner, and this affects both pressures and boiling points in home canning. Using the water bath process times for canning food at sea level may result in spoilage if you live at altitudes of 1,000 feet or more. Water boils at lower temperatures as altitude increases. Lower boiling temperatures are less effective for killing bacteria. Increasing the processing time or canner pressure compensates for lower boiling temperatures. Select the proper processing time and canner pressure for the altitude where you live.

The altitude in North Dakota varies from 800 feet above sea level in the east to 3,000 feet in the west. The map below shows the approximate altitude of areas of North Dakota.



For more specific information regarding altitude in your county, contact your county office of the NDSU Extension Service

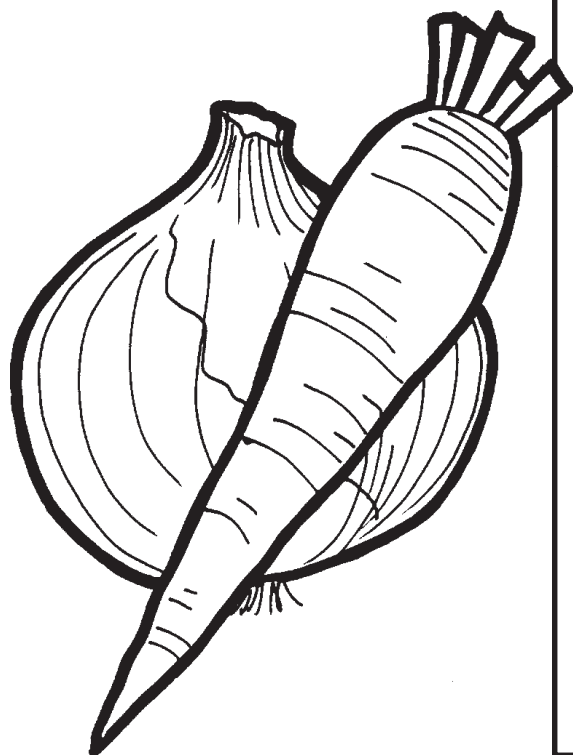
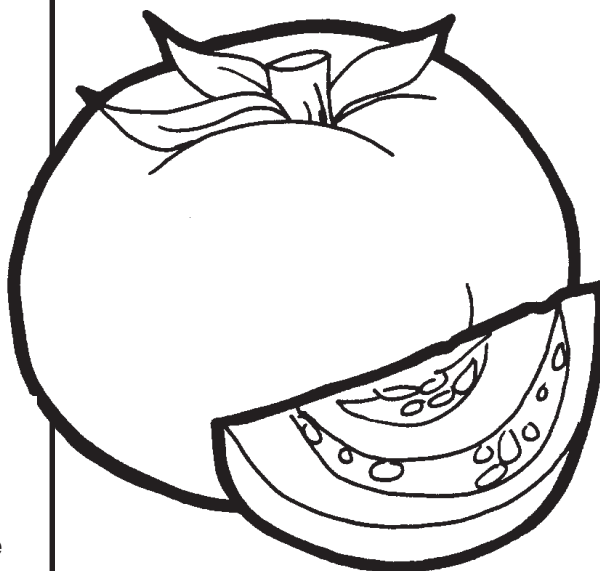
Tomato Juice

Quantity: An average of 3¼ pounds fresh tomatoes per quart.

Procedure: Wash, remove stems and trim off bruised or discolored portions. 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 freshly cut tomato quarters to the boiling mixture. Make sure the mixture boils constantly and vigorously while you add the remaining tomatoes. Simmer 5 minutes after you add all pieces.

If you are not concerned about juice separation, simply slice or quarter tomatoes into a large saucepan. Crush, heat and simmer for 5 minutes before juicing.

Press both types of heated juice through a sieve or food mill to remove skins and seeds. **Add bottled lemon juice or citric acid to jars; see acidification instructions (page 1).** Heat juice again to boiling. Add 1 teaspoon salt per quart, if desired. Fill jars with hot tomato juice, leaving ½-inch headspace. Adjust lids and process according to Table 1 or 2.

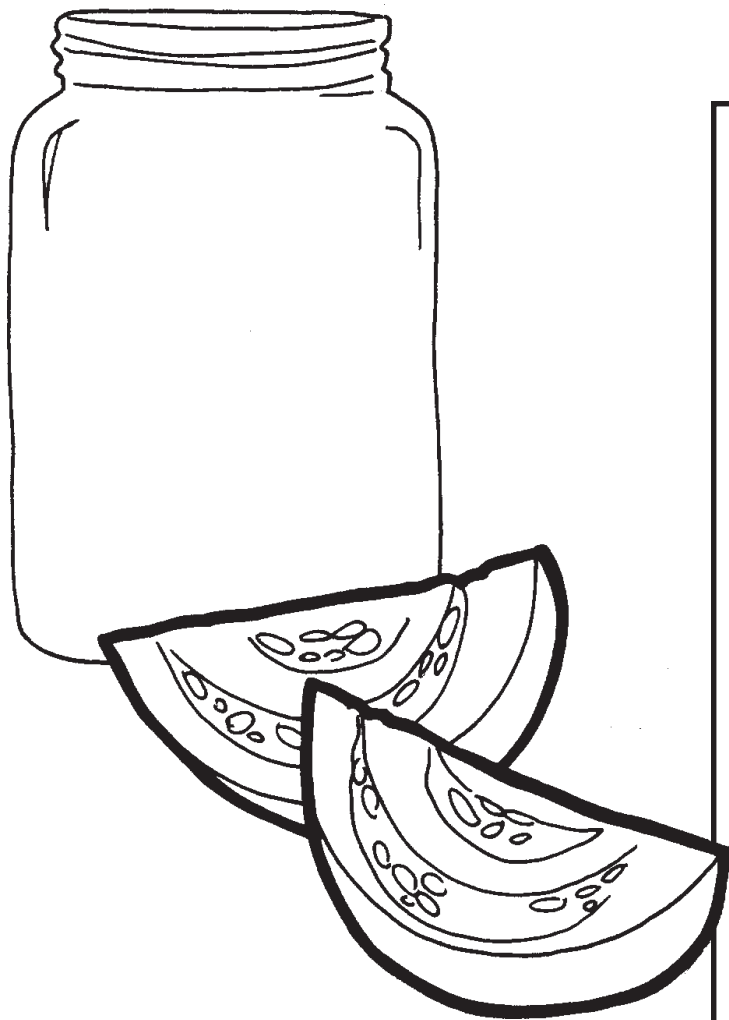


Tomato and Vegetable Juice Blend

Quantity: An average of 22 pounds of fresh tomatoes is needed per canner load of 7 quarts. Not more than 3 cups of other vegetables may be added for each 22 pounds of tomatoes.

Procedure: Crush and simmer tomatoes as for making tomato juice as above. Add no more than 3 cups of any combination of finely chopped celery, onions, carrots and peppers for each 22 pounds of tomatoes. Simmer mixture 20 minutes. Press hot cooked tomatoes and vegetables through a sieve or food mill to remove skins and seeds.

Add bottled lemon juice or citric acid to jars; see acidification directions on page 1. Add 1 teaspoon salt per quart, if desired. Reheat tomato-vegetable juice blend to boiling and fill immediately into jars, leaving ½-inch headspace. Adjust lids and process according to Table 1 or 2.



Tomatoes - Crushed (with no added liquid)

A high-quality product, ideally suited for use in soups, stews and casseroles. This recipe is similar to that formerly referred to as "Quartered Tomatoes."

Quantity: An average of 2³/₄ pounds per quart.

Procedure: Prepare tomatoes (see page 2). Trim off any bruised or discolored portions and quarter. Heat one-sixth of the quarters quickly in a large pot, crushing them with a wooden mallet or spoon as they are added to the pot. This will exude juice. Continue heating the tomatoes, stirring to prevent burning. Once the tomatoes are boiling, gradually add remaining quartered tomatoes, stirring constantly. These remaining tomatoes do not need to be crushed. They will soften with heating and stirring. Continue until all tomatoes are added. Then boil gently 5 minutes. **Add bottled lemon juice or citric acid to jars; see acidification directions on page 1.** Add 1 teaspoon of salt per quart to the jars, if desired. Fill jars immediately with hot tomatoes, leaving ½-inch headspace. Adjust lids and process according to Table 1 or 2.

Standard Tomato Sauce

Quantity: An average of 5 pounds per quart for thin sauce and 6½ pounds for thick sauce.

Procedure: Prepare and press as for making tomato juice (see page 4). Simmer in large-diameter saucepan until sauce reaches desired consistency. Boil until volume is reduced by about one-third for thin sauce, or by one-half for thick sauce. This may take approximately 2 hours. **Add bottled lemon juice or citric acid to jars; see acidification directions on page 1.** Fill jars, leaving ¼-inch headspace. Adjust lids and process according to Table 1 or 2.

Tomatoes – Whole or Halved (packed in water)

Quantity: An average of 3 pounds of fresh tomatoes per quart.

Procedure for hot or raw tomatoes filled with water in jars: Prepare tomatoes (see page 2). Leave whole or halve. Add 1 teaspoon of salt per quart, if desired. **Add bottled lemon juice or citric acid to jars; see acidification directions on page 1.** For hot pack, bring tomatoes to a boil in enough water to cover the tomatoes and boil gently 5 minutes. Fill jars with hot tomatoes and cooking liquid. Leave ½-inch headspace. For raw pack, fill jars with raw peeled tomatoes. Add hot water to cover, leaving ½-inch headspace. Adjust lids and process according to Table 1 or 2.

Tomatoes – Whole or Halved (packed in tomato juice or no added liquid)

Quantity: An average of 3 pounds of fresh tomatoes per quart.

Procedure: Prepare tomatoes (see page 2). Leave whole or halve. **Add bottled lemon juice or citric acid to the jars; see acidification instructions on page 1.** Add 1 teaspoon of salt per quart to the jars, if desired.

Raw pack – Heat tomato juice in a saucepan. Fill jars with raw tomatoes, leaving ½-inch headspace. Cover tomatoes in the jars with hot tomato juice, leaving ½-inch headspace or fill jars with raw tomatoes, leaving ½-inch headspace. Press tomatoes in the jars until spaces between them fill with juice. Leave ½-inch headspace.

Hot pack – Put tomatoes in a large saucepan and add enough tomato juice to completely cover them. Boil tomatoes and juice gently for 5 minutes. Fill jars with hot tomatoes, leaving ½-inch headspace. Add hot tomato juice to the jars to cover the tomatoes, leaving ½-inch headspace.

Adjust lids and process according to Table 1 or 2.

Spaghetti Sauce without Meat

30 pounds tomatoes
1 cup onions, chopped
5 cloves garlic, minced
1 cup celery or green pepper, chopped
1 pound fresh mushrooms, sliced (optional)
4½ teaspoons salt
2 tablespoons oregano
4 tablespoons parsley, minced
2 teaspoons black pepper
¼ cup brown sugar
¼ cup vegetable oil

Yield: About 9 pints

Procedure: CAUTION: Do not increase the proportions of onions, peppers or mushrooms. Prepare tomatoes (see page 2) and quarter. Boil 20 minutes uncovered in large saucepan. Put through food mill or sieve. Saute onions, garlic, celery or peppers and mushrooms (if desired) in vegetable oil until tender. Combine sauteed vegetables and tomatoes and add remainder of spices, salt and sugar. Bring to a boil. Simmer uncovered until thick enough for serving. At this time the initial volume will have been reduced by nearly one-half. Stir frequently to avoid burning. Fill jars, leaving 1-inch headspace. Adjust lids and process according to Table 2.



Tomato Ketchup

24 pounds ripe tomatoes
3 cups chopped onions
¾ teaspoon ground red pepper (cayenne)
3 cups cider vinegar (5%)
4 teaspoons whole cloves
3 sticks cinnamon, crushed
1½ teaspoons whole allspice
3 tablespoons celery seeds
1½ cups sugar
¼ cup salt

Yield: 6 to 7 pints

Procedure: Prepare tomatoes (see page 2). Quarter tomatoes into 4-gallon stock pot or a large kettle. Add onions and red pepper. Bring to boil and simmer 20 minutes, uncovered. Combine spices in a spice bag and add to vinegar in a 2-quart saucepan. Bring to boil. Cover, turn off heat and hold tomato mixture 20 minutes. Then, remove spice bag and combine vinegar and tomato mixture. Boil about 30 minutes. Put boiled mixture through a food mill or sieve. Return to pot. Add sugar and salt, boil gently, and stir frequently until volume is reduced by one-half or until mixture rounds up on spoon without separation. Fill pint jars, leaving 1/8-inch headspace. Adjust lids and process according to Table 1.

Freezing Tomatoes

Frozen tomatoes and tomato products do not need to be acidified. They should be cooled rapidly before freezing by placing the pan containing the hot product in cold water.

Juice and mixtures: Prepare products using recipes for canning. Cool. Pour into freezer containers, leaving 1½ inch headspace. Seal and freeze.

Whole or quarters: Prepare tomatoes as for canning by hot pack method. Cool. Pack into freezer containers. Leave 1-inch headspace. Seal and freeze. Use as canned tomatoes.

Frozen whole or sliced tomatoes become limp after thawing and are unsatisfactory to serve as fresh produce.

Spaghetti Sauce with Meat

Add 2½ pounds ground beef or sausage to the Spaghetti Sauce recipe on page 6. Omit the ¼ cup oil.

Procedure: To prepare tomatoes, follow directions for Spaghetti Sauce without Meat, page 6. Saute beef or sausage until brown. Add garlic, onion, celery or green pepper and mushrooms if desired. Cook until vegetables are tender. Combine with tomato pulp in large saucepan. Add spices, salt and sugar. Bring to a boil. Simmer uncovered until thick enough for serving. At this time initial volume will have been reduced by nearly one-half. Stir frequently to avoid burning. Fill jars, leaving 1-inch headspace. Adjust lids and process according to Table 2.



SALSA RECIPES

Several of the salsa recipes were developed by food specialists from the Pacific Northwest Extension Services

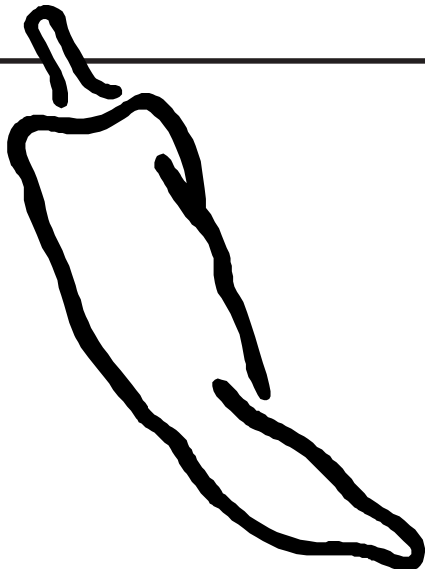
Directions for Handling Hot Peppers

Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Hot peppers, such as the jalapeno, do not need to be peeled but the seeds are often removed. Wash and dry. If you choose to peel peppers, slit each pepper on its side to allow steam to escape. Peel peppers using one of the following methods.

Oven or broiler method: Place chiles in oven (400°F) or broiler for 6 to 8 minutes until skins blister.

Range-top method: Cover hot burner, either gas or electric, with heavy wire mesh. Place chiles on burner for several minutes until skins blister.

Allow peppers to cool. Place in a pan and cover with a damp cloth. This will make peeling the peppers easier. After several minutes of cooling, peel each pepper. Discard seeds and chop peppers.



Tomatillo Green Salsa

5 cups chopped tomatillos
1½ cups seeded, chopped long green chiles
½ cup seeded, finely chopped jalapeno peppers
4 cups chopped onions
1 cup bottled lemon juice
6 cloves garlic, finely chopped
1 tablespoon ground cumin*
3 tablespoons oregano leaves*
1 tablespoon salt
1 teaspoon black pepper

Yield: 5 pints

Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face.

Prepare tomatoes (see page 2). Prepare peppers (see this page). Combine all ingredients in a large saucepan and stir frequently over high heat until mixture begins to boil, then reduce heat and simmer for 20 minutes, stirring occasionally. Ladle hot into pint jars, leaving ½-inch headspace. Adjust lids and process in a boiling water canner according to Table 1.

You may use green tomatoes in this recipe instead of tomatillos.

* Optional. Spice amounts may be reduced. Do not make other adjustments to the recipe.

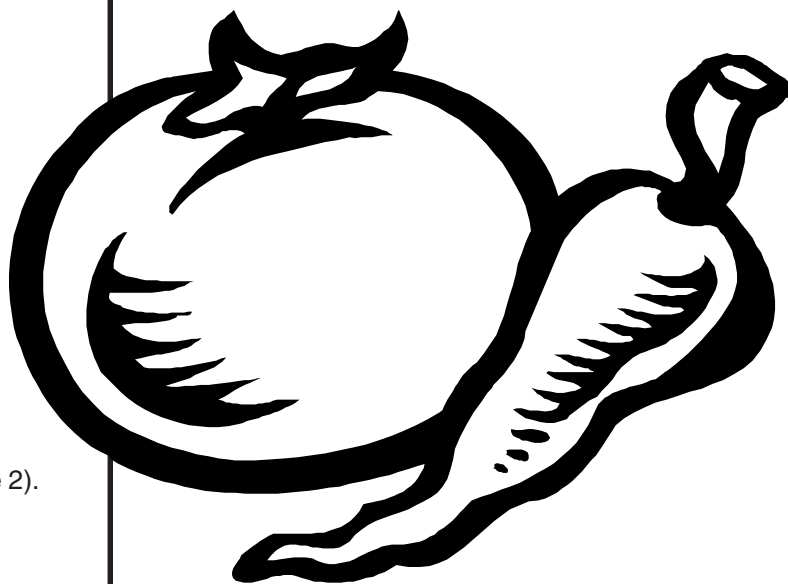
Chile Salsa (Hot Tomato-Pepper Sauce)

5 pounds tomatoes
2 pounds chile peppers*
1 pound onions
1 cup vinegar (5%)
3 teaspoons salt
½ teaspoon pepper

Yield: 6 to 8 pints

Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Prepare tomatoes (see page 2). Prepare peppers (see page 8). Coarsely chop tomatoes and combine chopped peppers, onions, and remaining ingredients in a large saucepan. Heat to boil, and simmer 10 minutes. Fill jars, leaving ½-inch headspace. Adjust lids and process according to Table 1.

* For a milder salsa: reduce pepper amount or use mixture of mild and hot peppers. Do not make other adjustments to the recipe.



Tomato/Green Chile Salsa

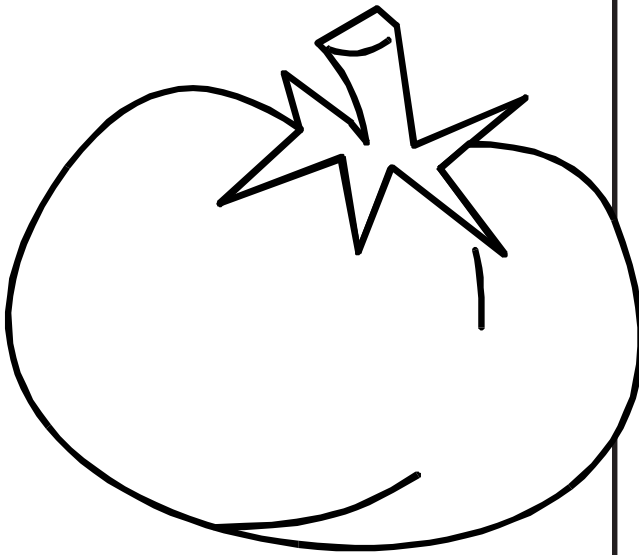
3 cups peeled, cored, chopped tomatoes
3 cups seeded, chopped long green chiles
¾ cup chopped onions
1 jalapeno pepper, seeded, finely chopped
6 cloves garlic, finely chopped
1 ½ cups vinegar
½ teaspoon ground cumin*
2 teaspoons oregano leaves*
1 ½ teaspoons salt

Yield: 3 pints

Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face.

Prepare tomatoes (see page 2). Prepare peppers (see page 8). Combine all ingredients in a large saucepan and heat, stirring frequently, until mixture boils. Reduce heat and simmer for 20 minutes, stirring occasionally. Ladle hot into pint jars, leaving ½-inch headspace. Adjust lids and process in a boiling water canner according to Table 1.

* Optional. Spice amounts may be reduced. Do not make other adjustments to this recipe.



Tomato Salsa (using paste tomatoes)

7 quarts peeled, cored, chopped tomatoes
4 cups seeded, chopped long green chiles
5 cups chopped onion
½ cup seeded, finely chopped jalapeno peppers
6 cloves garlic, finely chopped
2 cups bottled lemon juice
2 tablespoons salt
1 tablespoon black pepper
2 tablespoons ground cumin*
3 tablespoons oregano leaves*
2 tablespoons fresh cilantro*

Yield: 13 pints

Procedure: **Caution:** Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Prepare tomatoes (see page 2). Prepare peppers (see page 8). Combine all ingredients except cumin, oregano and cilantro in a large pot and bring to a boil, stirring frequently, then reduce heat and simmer 10 minutes. Add spices and simmer for another 20 minutes, stirring occasionally. Ladle hot into pint jars, leaving ½-inch headspace. Adjust lids and process in a boiling water canner according to Table 1.

This recipe works best with paste tomatoes. Slicing tomatoes require a much longer cooking time to achieve a desirable consistency.

* Optional. Spice amounts may be reduced. Do not make other adjustments to this recipe.

Tomato Taco Sauce

8 quarts peeled, cored, finely chopped paste tomatoes
2 cloves garlic, crushed
5 cups chopped onions
4 jalapeno peppers, seeded, chopped
4 long green chiles, seeded, chopped
2½ cups vinegar
2 tablespoons salt
1½ tablespoons black pepper
1 tablespoon sugar
2 tablespoons oregano leaves*
1 teaspoon ground cumin*

Yield: 11 pints

Procedure: **Caution:** Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Prepare tomatoes (see page 2). Prepare peppers (see page 8). Combine ingredients in a large saucepan. Bring to a boil, then reduce heat and simmer, stirring frequently until thick (about 1 hour). Ladle hot mixture into pint jars, leaving ½-inch headspace. Adjust lids and process in boiling water canner according to Table 1.

This recipe works best with paste tomatoes, as slicing tomatoes will yield a thin watery salsa. If you only have slicing tomatoes available, use the Tomato/Tomato Paste Salsa recipe.

* Optional. Spice amounts may be reduced. Do not make other adjustments to this recipe.

Tomato/Tomato Paste Salsa

3 quarts peeled, cored, chopped slicing tomatoes
3 cups chopped onions
6 jalapeno peppers, seeded, finely chopped
4 long green chiles, seeded, chopped
4 cloves garlic, finely chopped
2 12-ounce cans tomato paste
2 cups bottled lemon juice
1 tablespoon salt
1 tablespoon sugar
1 tablespoon ground cumin*
2 tablespoons oregano leaves*
1 teaspoon black pepper

Yield: 7 pints

Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Prepare tomatoes (see page 2). Prepare peppers (see page 8). Combine all ingredients in a large saucepan. Bring to a boil. Reduce heat and simmer for 30 minutes, stirring occasionally. Ladle hot into pint jars, leaving ½-inch headspace. Adjust lids and process in a boiling water canner according to Table 1.

* Optional. Spice amounts may be reduced. Do not make other adjustments to this recipe.

Mexican Tomato Sauce

2½ to 3 pounds chile peppers
18 pounds tomatoes
3 cups chopped onions
1 tablespoon salt
1 tablespoon oregano*
½ cup vinegar

Yield: About 7 quarts



Procedure: Caution: Wear rubber gloves while handling chiles or wash hands thoroughly with soap and water before touching your face. Prepare tomatoes (see page 2). Prepare peppers (see page 8). Coarsely chop tomatoes and combine chopped peppers and remaining ingredients in large saucepan. Bring to a boil. Cover. Simmer 10 minutes. Fill jars, leaving 1-inch headspace. Adjust lids and process in a pressure canner according to Table 2.

* Optional. Spice amounts may be reduced. Do not make other adjustments to this recipe.

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