

# SAUCES-CHUTNEYS





# Fruit processing toolkit



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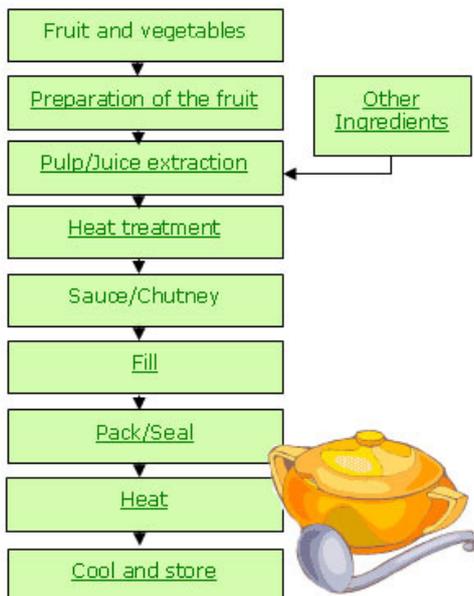
### 1.- General information

Chutneys are thick, jam like mixtures made from a variety of fruits and vegetables, spices, sugar and sometimes vinegar. Any edible sour fruit can be used as a base for chutney to complement the sweet taste from the sugar. The high sugar content has a preservative effect and vinegar is not always necessary, depending on the natural acidity and maturity of the fruits that are used. Most chutneys are boiled, which produces a caramelised syrup and alters the taste, colour and thickness of the product. Boiling also helps preserve the product through pasteurisation.

Sauces and purees are a mixture of vegetables (generally tomato based), spices, salt and sugar that are heated to evaporate water and concentrate the mixture. They are thinner than chutneys and tend to be more acidic. Sauces and purees can be further heated to concentrate them and make pastes. A semi-processed form of tomato puree can be prepared when there is a glut of tomatoes. This can be further processed into sauce and paste later in the season.



### 2.- Processing details



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### 2.1.-Preparation of the fruit

Only ripe fruit should be used to make sauce. Under-ripe fruits should be left to ripen and used at a later date. Chutneys are often made from fruits that are slightly under-ripe. Over-ripe or rotten fruits should not be used. Fruit and vegetables should be washed in clean water.

Some fruits, particularly tomatoes, are blanched in hot water for up to 5 minutes to soften the skin and to destroy enzymes and microbes. After blanching, they should be cooled by plunging in cold water. Fruits should be peeled with a stainless steel knife to prevent discolouring the flesh. They are chopped into various sized pieces according to the recipe.

Accurate scales are needed to make sure that the correct amounts of ingredients are used each time. Two sets of scales are needed - one with a large capacity for fruit and a smaller set for spices.

### 2.2.- Pulp juice extraction

Fruit pulp is extracted either by using a manual pulper or a pulper-finisher that separates out the seeds and skins from the pulp.

The seeds and skin can be passed through the pulper a second time to obtain the maximum amount of juice and pulp from the fruit.

The acidity of the pulp should be checked using a pH meter or pH paper. If it is above 4.0, lemon juice should be added to reduce it.

Sodium benzoate can be added to the pulp (0.3g per 10kg pulp) to preserve the product after opening.

### 2.3.-Added ingredients

#### Spices

Spices should be clean, mature and not infected with mould.

The proportions of spices added can be varied to create different products, but the same formulation must be used for each batch of the same product.

Therefore, the quantities should be accurately weighed each time.

Spices not only add flavour, some of them also have a preservative effect.

#### Chemical preservatives

Sodium benzoate is sometimes added to sauces and purees to help preserve them after the bottle has been opened. Sodium benzoate is added to semi-processed fruit and vegetable puree to hold it for processing at a later date.

The permitted levels of preservative are strictly controlled by the law in many countries. Check with the local authorities for the local regulations.



## 2.4.-Heat Treatment

The pulp is heated in a large open pan over a low heat. An open pan is best as it allows moisture to evaporate more quickly.

The product must be stirred continuously during heating to prevent burning.

The bright red colour of tomato sauces can be preserved by very slow heating.

The end of boiling is determined by checking the soluble solids content with a refractometer.

Sauce/puree 10-12%

Simple concentrate 16%

Double concentrate 29%

Triple concentrate 30-32%

## 2.5.-Filling

Sauces and chutneys are hot-filled into hot, clean jars or bottles. If the glass jars are cold, there is the risk of breaking when the hot liquid is added. Alternatively, the chutney can be cooled and filled into polyethylene bags or pouches.

## 2.6.-Packaging

It is preferable to use glass jars with new metal lids. Paper, polythene or cloth lids can also be used, but they look less professional and there is more risk of spoilage.

Plastic containers with foil lids can also be used if available as these tend to be cheaper than glass.

## 2.7.- Heating

Sauces are pasteurised in the jar after filling. The jars or bottles are immersed in a large pan or water bath and heated. Both the time and temperature of pasteurisation are critical to achieve the correct shelf life and to retain the colour and flavour of the juice.

## 2.8.-Cooling

After heating, the bottles are cooled to room temperature by immersing them in clean cold water. If the bottles are cooled too quickly they will crack and break.

## General

All equipment must be thoroughly cleaned each day to prevent contamination by insects and micro-organisms.

## 3.- Basic sauce-chutneys recipes

The following basic recipes are guidelines for the production of sauces and chutneys. The ingredients can be varied according to consumer taste and local availability of fruits, vegetables and spices.

### 3.1.-Italian-style tomato sauce

Reference: FAO, 1997

Fresh tomatoes: 5kg of 4.2 to 4.5° Brix

1 medium onion per kg of tomato

5 medium garlic cloves per kg tomato

salt to taste

pepper to taste

1kg carrots per 5kg tomato

50-100ml vegetable oil

Dried oregano, fresh basil, chilli pepper (optional)

1. Select ripe tomatoes. Discard any tomatoes that are under-ripe, over-ripe or rotten.
2. Wash in clean water and drain. Cut each tomato in half and discard any that are rotting inside.
3. Chop the onion in small cubes. Cut the garlic cloves into quarters. Add oil to a pan and fry the onion and garlic over a low flame until the onion turns pink. Take care not to burn the onion and garlic.
4. Place the cut tomatoes in a large pan and heat over a low flame. Add the cooked onion and garlic, salt, pepper and chilli pepper if using. Increase the heat and boil for 40 minutes, stirring constantly until it reaches 10-12° Brix.
5. Add fresh basil or dried oregano according to taste. Boil for a further 5 minutes and remove the pot from the heat.
6. Pass the sauce through a pulper to remove the seeds and skin
7. Cook the sauce for 10-15 minutes and check that the Brix is 10-12°.
8. Fill the hot sauce into clean sterile glass jars or bottles. Fill them to the top and immediately close with clean lids. Alternatively, allow the sauce to cool then pour into polyethylene bags that are heat sealed.
9. Place the glass containers into a water bath that is at the same temperature as the bottles. The water must cover the jars. Sterilise in boiling water for 45 minutes from the time that the water starts to boil.
10. Remove the water bath from the heat. Gradually add cold water to slowly cool the water bath. Or, leave the jars to cool in the water bath until the following day.
11. Dry the jars, add labels and store in a cool dry place away from light. The product should be stable for at least 12 months.

### 3.2.-Tomato Juice

Reference: FAO, 1997

Fresh ripe tomatoes of 4.2-4.5° Brix

Lemon juice

Salt and pepper to taste (optional)

This tomato juice can be used as a beverage or for cooking when fresh tomatoes are not available.

1. Sort the fruit and select ripe tomatoes. Discard any over-ripe or mouldy fruits. Save the under-ripe fruits for a later batch.
2. Wash in clean water and drain. Cut the tomatoes into quarters, discarding any that are rotten inside.
3. Place the tomatoes in a large pot and cook over a medium heat, stirring with a wooden spoon occasionally.
4. Add two tablespoons of lemon juice for every kg of tomatoes. Add salt and pepper to taste (optional).
5. Continue heating until the total solids measure 6.5-6.8° Brix (using a refractometer). Remove from the heat and allow to cool slightly.
6. Extract the juice by passing the sauce through a pulper. Pass the skins and seeds through the pulper a second time to remove as much juice as possible.
7. Place the sauce back on the heat and cook until it begins to boil. Check that the Brix is 10-12°
8. Fill the hot sauce into clean sterile glass jars or bottles. Fill them to the top and immediately close with clean lids. Alternatively, allow the sauce to cool then pour into polyethylene bags that are heat sealed.
9. Place the glass containers into a water bath that is at the same temperature as the bottles. The water must cover the jars. Sterilise in boiling water for 45 minutes from the time that the water starts to boil.
10. Remove the water bath from the heat. Gradually add cold water to slowly cool the water bath. Or, leave the jars to cool in the water bath until the following day.
11. Dry the jars, add labels and store in a cool dry place away from light. The product should be stable for at least 12 months.

### 3.3.-Tomato puree and simple concentrate

Reference: FAO, 1997

Fresh ripe tomatoes

Salt (optional)

This pulp-based concentrate can be concentrated to different levels of total solids to give a range of products:

Puree 10° Brix

Simple 16° Brix

Double 29° Brix

Triple 30-32° Brix

The double and triple concentrates are prepared using a vacuum evaporator.

1. Sort the fruit and select ripe tomatoes. Discard any over-ripe or mouldy fruits. Save the under-ripe fruits for a later batch.
2. Wash in clean water and drain. Cut the tomatoes into quarters, discarding any that are rotten inside.
3. Place the tomatoes in a large pot and cook over a medium heat, stirring with a wooden spoon occasionally. Add salt to taste if desired.
4. Continue heating until the total solids measure 6.5-6.8° Brix (using a refractometer). Remove from the heat and allow to cool slightly.
5. Extract the juice by passing the sauce through a pulper. Pass the skins and seeds through the pulper a second time to remove as much juice as possible.

To make the puree

6. Place the sauce back on the heat and concentrate until it is 10° Brix. Stir occasionally with a wooden spoon to prevent burning.
7. Add 1% salt, continue heating until it has dissolved, then remove from the heat.
8. Fill clean, sterile glass jars to the top with the hot puree and cover with clean lids.
9. Place the glass containers into a water bath that is at the same temperature as the bottles. The water must cover the jars. Sterilise in boiling water for 45 minutes from the time that the water starts to boil.
10. Remove the water bath from the heat. Gradually add cold water to slowly cool the water bath. Or, leave the jars to cool in the water bath until the following day.
11. Dry the jars, add labels and store in a cool dry place away from light. The product should be stable for at least 12 months.

To make the simple concentrate proceed as follows:

6. Concentrate the sauce until it reaches 16° Brix.
7. Add 2% salt, dissolve and remove from the heat.
8. Fill clean, sterile glass jars to the top with the hot puree and cover with clean lids.
9. Place the glass containers into a water bath that is at the same temperature as the bottles. The water must cover the jars. Sterilise in boiling water for 45 minutes from the time that the water starts to boil.
10. Remove the water bath from the heat. Gradually add cold water to slowly cool the water bath. Or, leave the jars to cool in the water bath until the following day.
11. Dry the jars, add labels and store in a cool dry place away from light. The product should be stable for at least 12 months.

### 3.4.-Tomato paste

Reference: Fellows, 1997

Ripe tomatoes

Lemon juice

Salt

This pulp-based concentrate can be concentrated to different levels of total solids to give a range of products:

This is a thick, bright red paste that is used to prepare many traditional sauces and soups. It can be sold from bulk containers, in jars, polythene bags of cans and has a shelf life of several months.

1. Sort the fruit and remove any under-ripe, mouldy or rotten tomatoes.
2. Wash in 8 litres of clean water per 10kg tomatoes.
3. Blanch in a waterbath at 80°C for 5 minutes. The tomatoes are blanched to soften the skins for peeling and to destroy enzymes and micro-organisms.
4. Pass through a pulper-finisher fitted with a 1mm sieve. This removes the skins and seeds from the fruit.
5. Measure the acidity of the pulp. If the pH is 4.0 or below, no lemon juice is needed. If the pH is above 4.0, lemon juice should be added until the pH falls below 4.0.
6. Add 0.3g sodium benzoate per 10kg pulp to preserve the product after the bottle has been opened.
7. Concentrate the pulp by one of two methods:
  - a). Traditionally this is done by heating slowly in an open pan, stirring constantly to prevent burning. If this is done carefully, the bright red colour can be retained. Heating is continued until a paste with 30% total solids is obtained. This is measured by a refractometer.

b). An improved method of concentrating is to place the pulp in a white cotton sack that is hung up for one hour to allow the water to drain out. The pulp loses half its weight. Add 2.5% salt by weight of concentrate and mix thoroughly. Re-hang the sack for one hour until the pulp is one third of its original weight (until it is 30% total solids).

8. Fill the paste into bottles or cans, seal the containers.
9. Pasteurise the bottles at 90°C for 45 minutes. Cool to room temperature.
10. Dry the bottles, label and store in a cool dry place away from direct sunlight.

### 3.5.-Tomato sauce or ketchup

Reference: Fellows, 1997

20kg tomatoes

1.5kg sugar

450g onions, finely chopped

3.5g mace

9g cinnamon

11.25g cumin

11.25g cardamom

11.25g ground black pepper

5g ground white pepper

330g salt

800g vinegar

This is a red sauce made from fresh tomatoes. It is a thick sauce with a sweet taste that is commonly used in cooking and as a table relish. It has a shelf life of more than one year in glass bottles when the container is unopened. The recipe can be varied by adding different spices. For example, 2.5g chilli powder per 10kg tomato pulp can be added before processing. It is important that the ratio of ingredients is carefully monitored and controlled for each batch to produce the desired taste, consistency and flavour each time.

1. Select good quality, fully ripe, red fruits without infection, mould or rot. It is preferable to use a variety of tomatoes that has a high solids content.
2. Wash in clean water and leave to drain.
3. Blanch in hot water for 3-5 minutes until the skins are loosened. Remove from the heat and plunge into cold water to cool.
4. Remove the skin and core of tomatoes.
5. Chop into pieces and pulp, either by hand or with a pulper-finishing machine.

6. Add 500g sugar, the onions and the spices, tied loosely in a muslin bag.
7. Heat to below boiling point in a pan with continuous stirring, until the volume has reduced by half.
8. Remove the spice bag. Add 1kg sugar, the salt and vinegar. Continue heating for 5-10 minutes until the final total solids is 10-12% (measured by a refractometer).
9. Hot-fill into clean, sterilised jars at 80°C. Close the tops with lids.
10. Cool to room temperature. Label the jars. Store in a cool dry place away from direct sunlight.