



# CHUTNEYS AND SAUCES

## Introduction

The preparation of chutneys and sauces is a well known method of preserving fruit and vegetables. The basic principles of the preservation method are the addition of sugar and acid (acetic acid or vinegar) combined with concentration of the mixture by heating to reduce the water content. This technical brief describes how to make chutneys and sauces. Other technical briefs describe how to make lactic acid-fermented pickles.



Making chutney on a small scale in Bangladesh. Photo: Zul.

A range of fruit and vegetables can be used to make chutneys and sauces. Often tomatoes are used as a base ingredient as they are acidic. You can add other fruit and vegetables and a range of herbs and spices according to local taste and availability.

Chutneys and sauces are safe products that have a fairly long shelf life due to the combination of high acidity and low moisture content. They can be made without any specialist equipment so are suitable for preparation at the home level. A pulper or juicer is needed to make sauces. Both a pH meter and refractometer are useful pieces of equipment that are used to test for the acidity and total solids content of sauces. However they are not essential for making sauces and chutneys.

## Chutneys

Chutneys are thick, jam-like mixtures that are made from a variety of fruit and vegetables, with added vinegar, sugar and spices. They tend to be sweeter than pickles. The mixture is heated to reduce the moisture content. Any edible sour fruit or vegetable can be used to make chutney.

Vinegar and sugar are often quite expensive ingredients, which make the chutney expensive to make. Sometimes it can be more cost effective to make lactic acid fermented pickles that are made by adding salt to vegetables and allowing them to ferment (see the technical brief on lactic fermented pickles).

### Sauces, ketchup and pastes

Sauces and purees are thick viscous liquids made from pulped fruit and vegetables. Salt, sugar and vinegar are added to the pulp to preserve the product. The sauce is pasteurised to remove spoilage micro-organisms. If sauces and purees are heated further to remove more water, they can be made into paste.

### Quality control

When preparing a chutney or sauce, it is important that the correct levels of acidity and total sugar content are achieved, to ensure that the product does not spoil during storage. The **preservation index** is a measure of the combined acidity and total solids. It is calculated according to the following formula:

$$\frac{\text{Total acidity} \times 100}{(100 - \text{total solids})} = \text{not less than } 3.6\%$$

## Sauce and chutney – process details and quality assurance

### Selection and preparation of the fruit or vegetable

Sort the fruit and vegetables. Remove those that are over-ripe, rotten or bruised. Leave under-ripe products to ripen and use at a later date.

Wash the fruit and vegetables 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 into cold water.

Some fruits should be peeled before use. Chop the fruit and vegetables into various sized pieces according to the recipe.

### Preparation of the jars and lids

For glass jars: Wash the jars and lids and put them into a large saucepan. Fill the saucepan with water so that the jars and lids are covered and heat until the water boils. Boil for about 5 minutes. Remove the jars and turn upside down so that the water can all drain out.

**DO NOT** dry them with a dirty cloth.

If you are using recycled plastic jars, clean them with a solution of chlorinated water (100ppm). Turn upside down so all the water can drain out.

### Pulp/juice extraction – for sauce

Extract the fruit pulp with a manual pulper or a pulper-finisher that separates out the seeds and skins from the pulp. Pass the seeds and skin through the pulper a second time to obtain the maximum amount of juice and pulp from the fruit.

If you do not have a pulper or mouli, heat the fruit gently with a little water to extract the juice. Pass the fruit through a sieve or extract the juice using a muslin bag. The acidity of the pulp should be 4.0 or lower. The following recipes are all tried and tested so the pH does not need to be measured. If you are making your own chutney from a new recipe, you should check the acidity of the pulp with a pH meter or pH paper. If it is above 4.0, add lemon juice to reduce it.

### Added ingredients

#### *Spices*

You can add a range of spices to chutneys and sauces to suit your taste. Any spices you use should be clean and in good condition. Some need to be roasted before use. If you are making products for sale, you need to make sure that you use the same recipe formulation and add **EXACTLY** the same amount of spice to each batch that you make. Always use the same measuring spoon or container.

**Chemical preservatives**

Sodium benzoate is sometimes added to sauces and purees to help preserve the products after the bottle has been opened. Some consumers do not like additives such as this, so prefer to buy products that do not contain them. Make sure that you do not add too much benzoate as it gives the product a bad taste. All countries have maximum permitted levels for preservatives. The recommended level for benzoate is 0.2%.

**Heat treatment**

Heat the mixture of pulp and added ingredients in a large open pan over a low heat. An open pan is best as it allows moisture to evaporate more quickly. Once you have softened the fruit or vegetables, add the sugar and heat slowly to dissolve it, before increasing the heat to boil the mixture. Stir continuously with a wooden spoon during heating to prevent burning. The bright red colour of tomato sauces can be preserved by very slow heating.

**Filling and packaging**

Hot-fill the sauce or chutney into hot, clean jars or bottles. If the glass jars are cold, there is the risk of breaking when the hot liquid is added. It is preferable to use glass jars with new screw-on lids but if these are not available, you can use plastic jars covered with foil lids. These are less expensive, but have a shorter shelf life than glass packaging. Alternatively, the chutney can be cooled and filled into polyethylene bags or pouches which are heat sealed.



Figure 2: chutney packaged in satchets for sale in Bangladesh. Part of Practical Action's FoSHoL project. Photo: Zul / Practical Action.

**Pasteurisation**

Pasteurisation is an optional stage. It is not necessary if the chutney has a high concentration of sugar and has been boiled for sufficient time to reduce the moisture content. Sauces that are packed in glass bottles or jars can be pasteurised once they have been bottled to extend the shelf life. Immerse the jars or bottles in a large pan or water bath and heat. Both the time and temperature of pasteurisation are critical to achieve the correct shelf life and to retain the colour and flavour of the sauce.

**Cooling and storage**

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

The high acidity of sauces and chutney gives them a long shelf life of up to 12 months. The products should be stored in a cool dry place away from direct sunlight to prevent any changes in the colour of the products.

**Chutney and sauce recipes**

The following recipes are examples of different types of chutney and sauce. You can vary the recipe by adding your own spices and herbs according to local taste.

## Tamarind chutney

Tamarind chutney is a sour, spicy pickle that is eaten as an accompaniment to curries and other main meals. It is a mixture of tamarind and spices with a layer of oil on the surface. The product will store well for several months.

### Ingredients

Tamarind 1kg

Sugar 1kg

Spices (per kg pulp):

Coriander 40g

Cumin 50g

Black cumin 30g

Cloves 3-4 pieces

Cardamom 3-4 pods

Cinnamon 3-4 pieces

Chillies 10-12

Salt 30g

Vegetable oil 250ml

Caraway seeds 15g

Pepper 30g

### Process details

- Select fresh mature but unripe tamarind fruits. Discard fruits that are ripe, over-ripe, infected or damaged. Rinse well in clean water. Crack the pods by hand and separate the pulp from the broken shells.
- Peel and remove the fibres, shell pieces and seeds from the pulp. For dried tamarind, soak the fruit in water for up to 12 hours until the fruit has softened. Remove the stones and fibres and drain off the excess water.
- Add sugar to the pulp (1kg sugar per kg pulp)
- Heat the pulp and sugar. Stir continuously to prevent it burning at the base of the pan.
- Dry roast the individual spices and grind. Mix with the oil and salt to make a paste.
- Add the spice paste to the thick tamarind pulp. Mix thoroughly and continue to heat for 20 minutes.
- Pour the hot pickle into pre-sterilised jars and seal. Cool to room temperature, and label.

## Tomato sauce

### Ingredients:

Tomatoes (20kg)

Sugar (1.5kg)

Onions (finely chopped) (450g)

Salt (330g)

Vinegar (800ml)

Spices:

Mace (3.5g)

Cinnamon (9g)

Cardamom (11.25g)

Cumin (11.25g)

Ground black pepper (11.25g)

Ground white pepper (5g)

Ground ginger (5g)

A tomato chilli sauce can be made by adding 2.5g chilli powder to 10kg tomato pulp before processing.

## Processing notes

### Preparation of raw materials

Select good quality fully ripe red fruits that are free from infection, mould or rot. If available, choose the 'plum' type of tomatoes as these have a high solids content. Blanch in hot water for 3-5 minutes until the skin is loosened. Remove the skin. Chop or pulp the tomato in a hand grinder or a pulper, depending on what is available.

### Mixing ingredients

Tie the spices in a small muslin bag, add to the tomatoes with 500g of sugar and the chopped onions.

### Heating

Heat the mixture of tomato and spices to below boiling point in a heavy pan. Stir it continuously to prevent burning at the base of the pan. Continue to heat until the mixture has reduced to half the original volume. Remove the spice bag and add the remaining sugar, salt and vinegar. Continue heating for 5-10 minutes. Check the final total soluble solids (10-12%) with a refractometer.

### Filling

Let the sauce cool to about 80°C and hot-fill the sterilised bottles or jars. Close the lids tightly and cool to room temperature.

Label the product with the product name, date of manufacture, use by date, ingredients, weight, brand name and name of manufacturer.

### Store

If adequately packaged and stored in a cool place, the sauce can be stored for up to a year without any loss of flavour or taste. It should be stored out of direct sunlight to avoid any loss of colour.

## Lapsi pickle

Lapsi is a small tree fruit that is found in Nepal and India. It can be used to make pickle. The amounts of spices added can be varied according to local taste and preference.

### Ingredients:

Peeled and stoned lapsi (1kg)

Sugar (1 kg)

Salt 30g

Vegetable oil (250ml)

Spices:

Coriander 40g

Cumin 50g

Cloves (3-4 pieces)

Cardamom (3-4 pieces)

Chillies (10-12)

Pepper (30g)

Ground ginger (5g)

## Processing notes

### Preparation of raw materials

Select ripe fruits that are free from bruising and damage. Wash in clean water. Boil the fruit in water (lapsi:water = 2:1) until the skin of the fruit splits. Drain the water using a sieve. Remove the peel manually and take out the seeds from the centre of the fruit. Weigh the peeled and de-seeded fruit into a large pan.

**Heating and addition of spices**

Add sugar (1kg per kg fruit pulp) and boil until the mixture thickens.

Grind the spices to make a paste with the oil. Add the spice mix and salt (30g per kg fruit pulp) to the hot lapsi mixture and mix thoroughly.

Continue heating for 30 minutes. Stir constantly to prevent the mixture burning.

**Filling**

Let the pickle cool to about 80°C and hot-fill into sterilised jars. Close the lids tightly and cool to room temperature.

Label the product with the product name, date of manufacture, use by date, ingredients, weight, brand name and name of manufacturer.

**Store**

If adequately packaged and stored in a cool place, the pickle can be stored for up to a year without any loss of flavour or taste. It should be stored out of direct sunlight to avoid any loss of colour.

**Vegetable chutney****Ingredients (makes 3kg chutney)**

750g carrots	9 tea cups
600g cabbage	9 tea cups
100g capsicum	1 tea cup
450g onions	4 tea cups
120g chilli powder	3-9tbs
15g ginger powder	1 tbs
40g salt	3 level tbs
30g curry powder	6 level tsp
750ml sunflower oil	3 ¾ tea cups
300ml vinegar	1 ½ tea cups

If you do not have weighing scales, you can use a teacup to measure out the ingredients.

tbs = tablespoon (next size up from a teaspoon or equal to three teaspoons)

tsp = teaspoon (5ml)

**Selection and preparation of the vegetables**

Sort the vegetables and discard any unripe, over-ripe or damaged ones. Wash in clean cold water and drain.

Peel the onions and carrots. Chop the onions, cabbage and capsicum into small pieces about 5cm long. Do not use the core of the cabbage.

It is best to use a stainless steel knife to prevent marking the flesh of the fruit and vegetables, but if you do not have one, use a knife with a clean sharp blade.

Grate the carrots using the large holes on the grater.



Heating the mixture. Photo: Zul / Practical Action.

Weigh out the ingredients accurately. Use weighing scales if you have them. If not, use the same measuring cup or container each time you make the product so that it is the same from one batch to the next.

### Preparation of the jars and lids

For glass jars: wash the jars and lids and put them into a large saucepan. Fill the saucepan with water so that the jars and lids are covered and heat until the water boils. Boil for about 5 minutes. Remove the jars and turn upside down so that the water can all drain out. **DO NOT** dry them with a dirty cloth.

If you are using recycled plastic jars, clean them with a solution of chlorinated water (100ppm). Turn upside down so all the water can drain out.

### Mix ingredients

Mix the dry spices- chilli powder, ginger powder, salt and curry powder.

### Heat

Heat the dry spices in some of the sunflower oil (about 50ml). Stir well to prevent the spices burning. Add the onions to the spicy oil and fry until they are soft (about 5 minutes).

Add the rest of the oil and the vinegar. Stir well.

Add the cabbage and cook for 5 minutes. Stir to prevent burning.

Add the carrots and capsicum and cook for 5 minutes until the carrot is soft. Keep stirring to make sure the chutney does not burn.

### Filling and packaging

Hot-fill the chutney into clean sterile jars. Fill them to within 2cm of the top of the jar. Seal with a lid and cool to room temperature. Make sure that there is a layer of liquid from the chutney covering the vegetables or they will spoil when the jar is opened. Clean the outside rim of the jar and put on the lid. Close the lid as tightly as possible.

Slowly turn the jar upside down so that any bacteria on the lid of the jar or in the space at the top are killed. Leave the jar upside down until it is cold. When the jars are cold test each lid to make sure it has a good seal.

### Storage

Store the chutney in a cool dry place away from direct sunlight. It will store for up to 6 months.

### References and further reading

[Dry Salted Lime Pickle](#) Practical Action Technical Briefs

[Dry Salted Pickled Cucumbers](#) Practical Action Technical Briefs

[Fruit Vinegar](#) Practical Action Technical Briefs

[Green Mango Pickle](#) Practical Action Technical Briefs

[Lime Pickle \(Brined\)](#) Practical Action Technical Briefs

[Pickled Papaya](#) Practical Action Technical Briefs

[Pickled Vegetables](#) Practical Action Technical Briefs

[Pineapple Peel Vinegar](#) Practical Action Technical Briefs

[Preservation of Fruit and Vegetables](#): Agrodok 3, Agromisa, 1997

[Pickles of Bangladesh](#), Practical Action Publishing 1994

[Small scale Fruit and Vegetable Processing and Products](#), UNIDO Technology Manual.

[Marketing for Small scale Farmers](#), CTA

[Setting up and Running a Small Fruit or Vegetable Enterprise: Opportunities in Food Processing](#), CTA

## Useful organisations and contacts

Agromisa  
Postbus 41  
6700 AA Wageningen  
Netherlands  
Tel: +31 (0)317 412217  
Fax: +31 (0)317 419178  
E-mail: [agromisa@agromisa.org](mailto:agromisa@agromisa.org)  
Web: <http://www.agromisa.org/>

Agromisa is a Dutch non-profit organisation affiliated with the Agricultural University of Wageningen in the Netherlands. Agromisa provides information and advice on small-scale sustainable agriculture and related topics in order to support and strengthen self-reliance of the rural populations in the South.

C.T.A - Centre Technique de Coopération Agricole et Rurale ACP-EU  
P.O.Box 380  
6700 AJ Wageningen  
The Netherlands  
Tel: +31 (0) 317 467100  
Fax: +31(0)317 460 067  
E-mail: [cta@cta.nl](mailto:cta@cta.nl)  
<http://www.cta.int/>

Website: <http://www.anancy.net/>

Inhabitants of the ACP countries who are subscribers to the Publication Distribution Service can apply for certain publications free of charge. subscriptions are open to individuals and institutions involved in agriculture and rural development.

### Equipment suppliers

Note: This is a selective list of suppliers and does not imply endorsement by Practical Action.

This website includes lists of companies in India who supply food processing equipment.

[http://www.niir.org/directory/tag/z,,1b\\_0\\_32/fruit+processing/index.html](http://www.niir.org/directory/tag/z,,1b_0_32/fruit+processing/index.html)

### Pulpers and juicers

**Bombay Industrial Engineers**  
430 Hind Rajasthan Chambers  
D S Phalke Road, Dadar (C Rly)  
Mumbai 400 014  
India  
Tel: +91 22 2411 3999/2411 4275

**Eastend Engineering Company**  
173/1 Gopal Lal Thakur Road  
Calcutta 700 035  
India  
Tel: +91 33 2577 3416/6324  
Fax: +91 33 2556 6710/160

**Gardners Corporation**  
158 Golf Links  
New Delhi 110003  
India  
Tel: +91 11 23344287/23363640  
Fax: +91 11 23717179

**Geeta Food Engineering**  
Plot No C-7/1 TTC Area  
Pawana MIDC, Thane Belapur Road  
Behind Savita Chemicals Ltd  
Navi Mumbai – 400 705  
India  
Tel: +91 22 2782 6626/2766 2098  
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**Narangs Corporation**  
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New Delhi 110 001  
India  
Tel: +91 11 2336 3547  
Fax: +91 11 2374 6705

**Techno Equipments**  
Saraswati Sadan  
1<sup>st</sup> Floor, 31 Parekh Street  
Mumbai – 400 004  
India  
Tel: +91 22 2385 1258

**Kundasala Engineers**

Digana Road  
Kundasala  
Kandy  
Sri Lanka  
Tel: +94 8 420482

**Mark Industries (Pvt) Ltd**

348/1 Dilu Road  
Mokbazar  
Dhaka 1000  
Bangladesh  
Tel: +880 2 9331778/835629/835578  
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Email: [markind@citechco.net](mailto:markind@citechco.net)

**Servifabri SA**

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No 400 Urb Miguel Gau (Ex Pinote)  
San Martin de Porres  
Lima  
Peru  
Tel/Fax: +51 14 4811967

**Udaya Industries**

Uda Aludeniya, Welligalla  
Gampola  
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Tel: +94 8 388586  
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**Robot Coupe**

12 Avenue Gal Leclerc  
BP 134  
71303 Montceau-les-Mines  
France  
Tel: +33 3 85588080/85586666

**Lehman Hardware and Appliances Inc.**

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Kidron  
Ohio 44636  
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Tel orders: +1 877 438 5346  
Tel enquiries: +1 888 438 5346  
[info@lehmans.com](mailto:info@lehmans.com)  
<http://www.lehmans.com>

**Refractometers and pH meters****Fisher Scientific UK Ltd**

Bishop Meadow Road  
Loughborough  
LE11 5RG  
UK  
Tel: +44 1509 231166  
Fax: +44 1509 231893  
Email: [fisher@fisher.co.uk](mailto:fisher@fisher.co.uk)  
Web: [www.fisher.co.uk](http://www.fisher.co.uk)

**Gardners Corporation**

India (see above)

**International Ripening Company**

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Tel: +1 757 855 3094  
Fax: +1 757 855 4155  
Email: [info@QAsupplies.com](mailto:info@QAsupplies.com)  
Web: [www.qasupplies.com](http://www.qasupplies.com)

**Packaging and labelling machines****Acufil Machines**

S. F. No. 120/2, Kalapatty Post Office  
Coimbatore - 641 035  
Tamil Nadu, India  
Tel: +91 422 2666108/2669909

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<http://www.indiamart.com/acufilmachines/#products>

#### **Gurdeep Packaging Machines**

Harichand Mill compound  
 LBS Marg, Vikhroli  
 Mumbai 400 079  
 India  
 Tel: +91 22 2578 3521/577 5846/579 5982  
 Fax: +91 22 2577 2846

#### **Narangs Corporation**

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#### **Pharmaco Machines**

Unit No. 4, S.No.25 A  
 Opp Savali Dhaba, Nr.Indo-Max  
 Nanded Phata, Off Sinhgad Rd.  
 Pune – 411041, India  
 Tel: +91 20 65706009  
 Fax: +91 20 24393377

#### **Banyong Engineering**

94 Moo 4 Sukhaphibaon No 2 Rd  
 Industrial Estate Bangchan  
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140 Sarang Street  
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#### **Orbit Equipments Pvt Ltd**

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**technical brief**

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