



# GREEN MANGO PICKLE

## Product description

Green mango pickle is a hot, spicy pickle with a sour taste that is eaten as a condiment. It is made from unripe green mangoes that are fermented with lactic acid bacteria. Preservation is through a combination of salt, increased acidity (lactic acid) and to a small extent the added spices.

## Ingredients

10kg green mango  
4kg salt  
100g turmeric  
Spices to taste (0.2-0.4kg mustard seed, roasted to a light brown colour; 0.2-0.4kg fenugreek roasted to a light brown colour; 0.2-0.5kg chilli powder; 1.0-1.25kg edible oil; roasted asafoetida to taste)



Figure 1: Mangoes in Bangladesh. Photo: Practical Action / Zul.

## Raw material preparation

Select fresh, firm, fully mature but unripe mangoes. The best pickles are obtained from fruit at early maturity when the fruit has reached almost maximum size. Soft ripe mangoes cannot be used to make this fermented pickle as they are sweeter and have the wrong texture – they can be used for fruit chutney, jam or fruit leather (see the relevant technical briefs).

Sort the green mangoes and remove any damaged fruit. Wash well in clean potable water and drain. Remove the stone. Cut the fruit into small, uniform sized pieces. Hold the cut pieces in a salt solution (2-3%) to prevent browning. Sharp knives with preferably stainless blades should be used. Iron or copper equipment should be avoided as this stains the flesh of the fruit. A single stroke should be used during the cutting process to ensure minimum damage and avoid mushiness in the final product.

**Mango pickle flow sheet**

Fruit	↓	The mangoes must be green and unripe
Sort	↓	Remove damaged and over-ripe fruit
Wash	↓	With clean water.
Drain	↓	
Cut	↓	Remove stones and cut into uniform pieces. Hold in a 2-3% salt solution to prevent browning
Soaked in brine	↓	20% salt solution. Ferment for 4-5 days
Drain	↓	
Add spices	↓	Spices to taste
Pack		Pack in containers and add oil

**Fermentation**

There are two methods of making mango pickle – dry salting or using a ready made brine.

**Dry salt fermentation**

Mix the turmeric (100g per 10kg mango pieces) with the mango pieces. Pack the mango pieces and salt in layers in pre-sterilised jars. Use 1.5-2.0kg salt per 10kg mango pieces. Make sure that the top layer is salt. Place the jars in the sun to ferment. The salt will gradually turn into brine as the juice is extracted from the mango and the mango piece will turn pale yellow. Make sure that the pieces of fruit are submerged in the brine during the fermentation. Leave to ferment for about 4-5 days.

Mix the ground roasted spices to taste and add them to the fermented pickle. Mix well. Pour a layer of oil on top of the pickle to seal it. Good quality vegetable oil such as sunflower oil should be used and finely ground chilli powder can be added to the oil for flavour and colour. Cover with a lid, label the jar and store in a cool place away from direct sunlight.

**Brine fermentation**

Use a large non-metallic pot for the fermentation – a clay pot or a plastic bucket with a lid is ideal. Mix the turmeric (100g per 10kg mango pieces) with the mango pieces. Soak the chopped mangoes in a 20% brine solution (add 200g salt per litre of brine). Do **not** use chlorinated water to make the brine as this will prevent the fermentation taking place. You must use clean, potable water - use boiled water if the local water is not suitable for drinking. Sodium metabisulphite (1000 ppm) and 1% calcium chloride can be added to the brine if desired. Sodium metabisulphite acts as a preservative – it should be used with caution as high levels of the chemical taint the pickle. Calcium chloride is added to the brine to improve the texture of the mango pieces.

Make sure that all the mango pieces are in the brine – use 2 litres per kg mango. The mango pieces will float when you first put them in the brine so you must place a clean plate or similar heavy object on top to submerge the pieces.

You can add a starter culture – a small amount of fermenting liquor (brine) that is left over from a previous fermentation – to speed up the fermentation.

Cover the containers and place in a warm place (about 21°C) to allow the fermentation to take place. It is important to cover the containers to prevent contamination by dust, dirt and other air-borne bacteria. Store until the fermentation is complete (when no more bubbles of carbon dioxide are seen in the brine).

Drain off the brine. Mix spices with the mango pieces and pack.

#### **Packaging and storage**

Pack the mixture into sterilised jars and pour oil onto the surface of the mixture. The mangoes should be firmly pressed down in the container. Good quality vegetable oil such as sunflower oil should be used and finely ground chilli powder can be added to the oil for flavour and colour. Mango pickle can be packed in small polythene bags and sealed or in clean jars and capped. Mango pickle keeps well if stored in a cool place. If it is processed well, it can be kept for several months. Due to the high acid level of the final product, the risk of food poisoning is low.

#### **Other products made using this method**

A range of pickles can be made using different vegetables and spices to taste. Usually, green, hard under-ripe fruits are used for fermentation.

#### **Jack-fruit pickle**

Young green jack-fruit is pickled in India and Sri Lanka.

Select young green jack-fruit. Remove the skin, take out the fruit pieces and cut into uniform pieces (1.2 to 1.8 cm thick).

Place the slices in a large (non-metallic) container with brine (8% salt solution). Weigh down the pieces of fruit to ensure they are submerged under the brine.

Increase the strength of the brine solution by 2% every day until it reaches 15% (Add more salt to the brine each day to increase the concentration).

Leave to ferment for 8-10 days in the brine.

Add vinegar and spices to the fermented fruit pieces. Package in clean, sterilised jars or polyethylene pouches.

#### **References and further reading**

[\*Pickles and vinegars\*](#) selection of Practical Action Technical Briefs

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

[\*Pickles of Bangladesh\*](#) S Azami & M Battcock, Practical Action Publishing, 1996

## Useful organisations and contacts

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

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.

This document was produced by Dr. S Azam Ali for Practical Action January 2008. Dr. S Azam-Ali is a consultant in food processing and nutrition with over 15 years experience of working with small-scale processors in developing countries.

Practical Action  
The Schumacher Centre  
Bourton-on-Dunsmore  
Rugby, Warwickshire, CV23 9QZ  
United Kingdom  
Tel: +44 (0)1926 634400  
Fax: +44 (0)1926 634401  
E-mail: [inforsew@practicalaction.org.uk](mailto:inforsew@practicalaction.org.uk)  
Website: <http://practicalaction.org/practicalanswers/>

Practical Action is a development charity with a difference. We know the simplest ideas can have the most profound, life-changing effect on poor people across the world. For over 40 years, we have been working closely with some of the world's poorest people - using simple technology to fight poverty and transform their lives for the better. We currently work in 15 countries in Africa, South Asia and Latin America.

# technical brief