



## RESEARCH IN FOOD PRESERVATION TO REDUCE POVERTY

### PRACTICAL GUIDE

#### POST HARVEST HANDLING AND PRIMARY PROCESSING OF MANGO FRUITS.



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## Introduction

Mango is one of the commonest and widely consumed tropical fruits. It is good source of vitamin C and B-Carotene. Mango fruits in their fresh forms are highly perishable after harvest particularly under hot tropical conditions. During the peak season, farmers sell their mangoes at throw-away prices and substantial quantities go to waste because mango is highly perishable. To extend the shelf-life, mango can be processed into various products for sale or use at home. The fresh mango can also be packaged for extended storage period. The problems with mango involve fruits maturing about the same time and dropping from the tree hence resulting in massive wastage. Primary processing can reduce this wastage of the fruits.

## Unwholesome Mango

Sign of Spoilage	Causes of spoilage	Possible Uses Spoilage
Rotting	<ul style="list-style-type: none"><li>• Mechanical injury.</li><li>• Changes in Metabolic Activities</li><li>• Damage by Microorganism.</li></ul>	Feed for swine.
Colour Degradation	<ul style="list-style-type: none"><li>• Loss of Moisture.</li><li>• Improper handling and storage.</li><li>• Attack by microorganisms and insects.</li></ul>	Feed for swine. Production of dried chips.
Shrinkage	<ul style="list-style-type: none"><li>• Loss of Moisture.</li><li>• Immature fruits</li></ul>	Can be processed into dried chips.

## Types of Fruits

- Some mango maintain green colour while some change colour when ripe.
- Some mango cultivars have fruits with less fibre and when ripe can be soaked like orange while some have thick pulp with varying levels of fibre.
- All of them can be stored and processed but the varieties with thick pulp can be processed into chips for further processing in future.

### Harvesting Wholesome Fruits



- Harvest mango fruits when they are still green but mature.
- As much as possible harvest by hand picking the fruits, to avoid mechanical injury.
- Load in crates – (see types of crates for transporting mango fruits) and transport to a cool shed.
- Wash fruits with potable water to remove heat and gummy sap which could stain and reduce market value.
- Remove diseased or damaged fruits from the lot before the application of wax that would extend the storage life of the fruits.

### Packaging the Fruits

- This is to provide protection against all forms of injury.
- Pack fruits in crates but leave some space on top of fruits to discourage pressure bruising from the overhead container.
- Mango fruit can be packaged in a mechanical packaging line. Transport crated fruits in ventilated lorry.
- For short period storage, store crated fruits in fruits shed but for a longer period storage, you can store in evaporative coolers. There are various coolers for fruits developed by NSPRI for storage examples are Pot-in-Pot, Tin-in-Pot, Metal-in-Wall and contact NSPRI for coolers.



### **Extending Shelf-Life of Mango by Delaying Ripening**

- This a technical method usually adopted if mango fruits are to be transported for a long distance.
- It involves sealing mango fruits in polyethylene bags of thickness of 0.04mm and adding the ethylene absorber that have been made from potassium permanganate.
- In the sealed bags the potassium permanganate will absorb the ethylene produced by the fruits for ripening hence reducing the process of ripening of fruit
- You can contact NSPRI on this technology.

## **Process Mango into Dried Chips**

- Mango fruits can be processed into juice, jam or marmalade, leather, caddie, dried chips etc. We shall concern ourselves with process of producing dried chips.
- Select mature, wholesome fruits that are about to ripe.
- Wash fruits in clean water. Peel the fruits with stainless steel knives.
- You can dry sliced fruits in solar tray dryers but to obtain the best quality dried chips, you must use a dryer that will guarantee continuous drying.
- Then use the multipurpose or hybrid dryers developed by NSPRI.
- Packaged dried chips in polyethylene bags and seal.
- Pack bags into cardboard boxes to prevent bleaching of the colour by light.
- Store in cool dry place.
- Dried chips can be eaten as snacks, it can be further processed into juice, jam, can be added into baby formular.
- The peel and seed of Mango are also useful.
- You can dry the peel in the sun and use as animal feed (swine feed) and the kernel processed into very valuable oil while the cake can be eaten by man or be used as one of the components of animal feed.





## Production of Mango Chips

Freshly harvested mango fruits (about to ripe)



Washing



Peeling



Slicing



Drying



Packaging



## High quality mango chips

For further information you can contact the addresses listed below:

- **Nigerian Stored Products Research Institute,**  
(Headquarters)  
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