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# Indian Standard GUIDE FOR STORAGE OF MANGOES

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

# Indian Standard

# GUIDE FOR STORAGE OF MANGOES

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# Indian Standard

# GUIDE FOR STORAGE OF MANGOES

## 0. FOREWORD

- 0.1 This Indian Standard was adopted by the Indian Standards Institution on 28 October 1979, after the draft finalized by the Fruits and Vegetables Sectional Committee had been approved by the Agricultural and Food Products Division Council.
- 0.2 Mango (Mangifera indica L.) is the native of Assam Burma region and innumerable varieties of mangoes are cultivated. It is a seasonal crop and is highly perishable. Fruits picked at proper stage of maturity can be kept in fresh state for a few days only, under normal conditions. It is, therefore, necessary that fruits should be preserved under proper conditions so as to prolong their life for human consumption and processing.
- 0.3 Some guidelines for storing of important varieties of mangoes on scientific lines are given in this standard. It is hoped that these guidelines stipulating the conditions to be maintained for various important varieties would prove helpful in increasing the shelf life and in preventing the wastage of fruits. Refrigerated storage of mangoes has not been found successful in our country.
- **0.4** This Institution had earlier issued IS: 7252-1974\* which prescribes definitions and information concerning measurement of physical factors in cold stores.

#### 1. SCOPE

1.1 This standard describes methods for obtaining conditions for the successful storage of important varieties of mangoes (Mangifera indica L.) for table purposes and for processing them into various mango products.

# 2. CONDITIONS FOR HARVESTING AND PUTTING INTO STORAGE

## 2.1 Harvesting

2.1.1 Mangoes should be picked at full maturity stage, just before they start ripening. In case of mangoes stored for later conversion into

<sup>\*</sup>Guide for testing of physical conditions in cold stores.

pickles, picking may be done just prior to the maturity stage as the fruits advanced to full maturity should not be used for pickling. The principal criteria which may be used to determine the optimal maturity stage for harvesting are as follows:

- a) Firmness of fruits judged by fruit pressure tester. The fruit should be firm.
- b) Colour The stage when the colour of the skin just starts changing from deep green to light green. For pickles, green fruits are suitable as this maintains acidity.
- c) The age of the fruit This is expressed as the number of days lapsed since full flowering.
- d) Total soluble solids measured by a refractometer at 27°C.
  - e) Acidity measured by titrating the mango juice with alkali.
  - f) Flesh colour
  - g) Specific gravity
- 2.1.2 These criteria, may vary from variety to variety and for a single variety may vary from one region to another. Some of the physical and chemical characteristics of Alphanso variety are given below. These characteristics are also applicable to the Peter variety.

## Variety — ALPHANSO (BADAMI)

a) I to steat attail action control	
i) Colour of the skin:	Olive green with prominent white specks, white waxy bloom
ii) Development of shoulders at stem end:	<ol> <li>Not developed</li> <li>Partly developed</li> <li>Well developed         [The above (2) and (3) stages are preferred for harvesting]     </li> </ol>
iii) Mass of individual fruit	Over 200 g
iv) Texture	Firm

Cream

b) Chemical Characteristics

v) Flesh colour

a) Physical Characteristics

- i) Total soluble solids, 8 ± 1

  percent

  ii) Acidity (as malic acid ), 3:5 ± 6
- ii) Acidity (as malic acid), 3.5 ± 0.2 percent

2.2 Quality Characteristics for Storage — The fruits to be stored should be clean, sound, free from blemishes, bruises or obvious physiologic disorders. It should also be free from traces of water and dirt and any visible signs of fungal or bacterial attack.

#### 2.3 Various Treatments

a) The practice of pre-ripening should be forbidden.

b) Fruits may be dipped in a wax emulsion containing fungicide of suitable strength and dried in a current of hot air, in order to delay ripening.

### 2.4 Storage

- 2.4.1 The fruits should be stored as soon as possible after harvesting, since mature fruits start ripening just after harvesting.
- 2.4.2 The package should be of such kind and arranged in the storage in a manner as to permit free circulation of air. The size of the package should be such as to avoid crushing and damaging of fruits at the bottom due to the weight of the fruits on top.
- 2.4.3 The fruits should be packed into crates/cartons provided with lids or covers. Fruits may be packed in each case and the cases stacked on top of each other. The cases should not be packed to a height of more than 7 tiers. The container should be 550 mm long, 300 mm wide and 210 mm high. The cartons should be provided with round holes for adequate ventilation. The box may have 6 holes each on top and bottom, and 3 holes each on broad sides (breadthwise) and 6 holes each lengthwise. The holes may be about 30 mm in diameter. The packages should be stored in shade, and in a ratproof room.
- 2.4.4 The storage density between 250 to 300 kg per cubic metre of usable space is considered suitable. The use of box pallets may, however, increase the storage density by approximately 10 percent.

#### 3. OPTIMUM CONDITIONS OF STORAGE

- 3.1 Mangoes may be stored in well-ventilated premises at a temperature of 30  $\pm$  2°C. Relative humidity should be between 60 to 85 percent.
- 3.1.1 Storage Life The fruits may be stored until edible ripe. However, an indication of approximate storage period is given below:

70.10
Badami 12-16
Neelam 8-12
Peter (Raspuri) 8-12
Malgoa 8-12
Totapuri 16-20

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# STORAGE CONDITIONS FOR FRUITS & VEGETABLES

6669-1972	Guide for storage of apples
6670-1972	Guide for storage of potatoes
7191-1974	Guide for storage of tomatoes
7192-1974	Guide for storage of citrus fruits
7252-1974	Guide for testing of physical conditions in cold stores
7730-1975	Guide for storage of pears
7731-1975	Guide for storage of peaches
9303-1979	Guide for cold storage of table grapes
9304-1979	Guide for storage of mangoes
9311-1979	Guide for storage of onions

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