

## Osmo-Dehydrated Pineapple Fruit Slices

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### Abstract

Osmotic dehydration of fruits has increased significantly in recent years. Pineapple is one of the fruits most suitable for osmotic dehydration due to its characteristic pleasant flavour, distinct aroma, exquisite taste and nutritional value. In India, it is one of the commercial crops grown in an area of 1.04 lakh hectares with an annual production of 17.11 lakh metric tonnes. Osmo dehydration is one of the preservation techniques in which fruit pieces are partially dehydrated by dipping them in a concentrated sugar syrup solution followed by hot air dehydration. It is a simple technique and does not require any sophisticated equipment. Pineapple growers can use this technique to convert pineapples into dehydrated slices during surplus production and reduce substantial post-harvest losses. The technique helps produce stable, nutritious, high-quality, economically viable processed fruit products. The quality of osmotically dehydrated pineapple fruit slices remains stable for up to six months of storage at room temperature.

### Introduction

Fruits and vegetables are vital sources of essential minerals, vitamins and dietary fibre and play an important role in human nutrition. In India, pineapple is one of the commercial crops grown in an area of 1.04 lakh hectares with an annual production of 17.11 lakh metric tonnes [1]. West Bengal, Assam, Karnataka, Tripura, Bihar, Manipur, Meghalaya, Nagaland, Kerala, Arunachal Pradesh, Andaman and Nicobar Islands, Goa, Jharkhand, Madhya Pradesh, Mizoram, Odisha, Sikkim, Tamil Nadu and Uttarakhand are the prominent pineapple producing states in India. Consumers appreciate pineapple fruit for its pleasant flavour, distinct aroma and exquisite taste. It is a good carotene and ascorbic acid source, rich in vitamins B and B<sub>2</sub> [2]. It also contains minerals like phosphorus, calcium, magnesium, potassium and iron. Furthermore, the fruit contains bromelin, a proteolytic enzyme that reduces inflammation and

supports good digestion. Pineapple squash and canned pineapple are the most popular processed products of pineapple. Product diversification is the need of the hour. The value addition of pineapple through the preparation of osmotically dehydrated slices increases its processing potential and improves farmers' livelihoods. Osmotically dehydrated slices can be used as confectionery in ice cream, fruit salad, cakes and bakery products. The product will have firm texture, low water activity, microbiologically safe and stable product with longer shelf life and reduction in bulk density. It has good colour and flavour retention in the end product. It provides high calorific value (Kcal energy), high solid density and good nutrition.

### Osmotic dehydration

Osmo dehydration is one of the preservation techniques in which fruit pieces are partially dehydrated by dipping them in a concentrated sugar syrup solution followed by hot air dehydration. The mechanism is the molecular diffusion of water through semi-permeable membranes and water loss from fruit tissues [3]. The process stops when osmotic pressure inside the tissue reaches equilibrium with the osmotic pressure of the surrounding syrup. Recently, this method has gained greater attention as an intermediate step for dehydrating several fruits and vegetables. It is simple and does not require any sophisticated equipment. The technique helps produce stable, nutritious, high-quality, economically viable processed fruit products.

### Osmo-dehydrated pineapple

Pineapple growers can use osmo-dehydration technique to convert pineapples into dehydrated slices during surplus production and reduce substantial post-harvest losses.

### Ingredients

Pineapple fruit – 3 kg, sugar – 1.50 kg, water – 1.50kg, citric acid – 9g and potassium meta bisulphite (KMS) – 1 g/ kg of fruit

## Methodology

Select 80 per cent matured pineapple (variety kew) fruits. Peel the outer skin, followed by brown eyes. Decore the peeled fruit and cut the fruits into 10 mm slices. Prepare sugar syrup by dissolving sugar in water. Apply heat for complete dissolution of sugar in water. Dissolve the citric acid in sugar syrup. Filter the syrup by passing through the muslin cloth. Blanch the pineapple fruit slices in sugar syrup for five minutes. Add potassium meta bisulphite to the sugar syrup and incubate the blanched pineapple slices in sugar syrup for 15 minutes. Drain the pineapple slices from sugar syrup, dry them in an electric tray dryer at 60 °C for eight hours, and pack them in polyethylene or aluminium pouches. Store in a cool and dry place.

## Quality of osmo-dehydrated pineapple

The osmo-dehydrated product will be soft, sweetish in taste, and yellowish in colour, with good flavour retention. At ambient conditions, these slices will have a shelf life of five months.

The sugar syrup used could be recycled up to six times, and in the end, it could be converted into pineapple syrup with quite an acceptable flavour and easily marketed. During the preparation of the osmo-dehydrated pineapple product, about 10-15 per cent of juice will be available as a byproduct, which could also be easily marketed as juice or utilized to prepare osmotic syrup. Physico-chemical composition of osmo-dehydrated pineapple is mentioned in the table below;

**Table 1: Physico-chemical composition of osmo-dehydrated pineapple [4]**

Particulars	Osmo-dehydrated pineapple
Moisture (%)	12.72
Acidity (%)	1.50
Ascorbic acid mg 100g <sup>-1</sup>	25.77
Carotenoids µg 100g <sup>-1</sup>	603.75
Total sugar (%)	65.64
Reducing sugar (%)	38.34
Non-reducing sugar (%)	27.33
Sugar: acid ratio	43.85

The Central Food Technological Research Institute, Mysore, has a technology for commercial preparation of osmo-dehydrated pineapple slices having a capacity of 80-180 kg/day. The commercial preparation unit requires a syrup tank, fruit slicer, steam jacketed kettles, steam boiler, cabinet hot drier with perforated trays (SS) and heat sealer [5].

## Conclusions

Conversion of pineapples into osmodehydrated slices during surplus production and a market glut will reduce substantial post-harvest loss. This technique helps produce shelf-stable, nutritious, high-quality, economically viable osmo-dehydrated pineapple slices and improves farmers' livelihoods.

## References

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