

A Case Study :

Effect of sucrose concentration and temperature on osmotic dehydration of pineapple slices

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ABSTRACT

A study was conducted to investigate the effect of sugar concentration (40, 55 and 70⁰B) and temperature of sugar concentration (30 and 60⁰C) on osmotic dehydration of pineapple. Weight loss during osmotic dehydration of pineapple has been studied with respect to the sugar concentration, temperature and sample to sugar ratio 1:2, with soaking duration of the osmotic solution 8, 16 and 24 hours. It was observed that weight loss was higher at 40⁰B sugar concentration and 30⁰C soaking temperature treated for 8h. Ascorbic acid content of osmotically dehydrated pineapple slices at 40⁰B sugar concentration and 30⁰C soaking temperature treated for 24 h soaking duration was having 18.33% increase of ascorbic acid content over fresh pineapple slices. Reducing sugar content of osmotically dehydrated pineapple slices at 40⁰B sugar concentration and 30⁰C soaking temperature treated for 8h soaking duration was having 47.89% increase of reducing sugar content over fresh pineapple slices.

Key words : Pine apple, Sucrose concentration, Temperature, Osmotic dehydration.

The pineapple (*Ananas comosus*/ Linn/ Merr) is one of the commercial fruit crops of tropical world. It consists of numerous fruit lets or eyes developing from single flower of the inflorescence, which as a whole gives rise to the fruit (Shrinivasan, 1977). India produces about 1 million tone of pineapple fruits has a share of 8% in the total world production. Area under pineapple is highest in Assam, followed by Manipur, West Bengal, Meghalaya and Kerala.

Pineapple fruits have characteristic pleasant flavour, distinct aroma, exquisite taste and absence of seeds, which qualifies it as one of the choicest fruit throughout the world. Pineapple fruit is a good source of carotene (vitamin 'A') and ascorbic acid (vitamin 'C') and is fairly rich in vitamin 'B' and 'B₂'. Pineapple fruits are mainly consumed as fresh or canned slices. Fruits are also processed into products such as juice, syrup, jams, squash, RTS beverages and dehydrated slices and tidbits (Man et.al, 2007). The percentage share of different products of pineapple are pineapple slices 36 to 38%, pineapple juice 41 to 42%, pineapple pulp 6 to 8%, pineapple jam 5 to 6%, pineapple squash 3%, others 3%. Pineapple slices and Pineapple juice has a major share among the different forms of processing. (Shrinivasan, 1977)

Osmotic dehydration technique of preservation is

promising method for the preservation and value addition for pineapple fruit. Osmotic dehydration is a useful technique for the production of safe, stable, nutritious, tasty, economical and concentrated food obtained by placing the solid food, whole or in pieces in sugar or salt solution of high osmotic pressure (Rashmi *et al.*, 2005). The storage life of such product has been increased along with retention in quality and stability of products. The sugar syrup has a protective effect on colour and flavour and this quality survive by the hot air dehydration process. This makes it possible to produce dried fruit of high quality. Sugar syrup is used for the removal of moisture from the fruit, which acts as osmotic agent to reduce the weight of the fruit to about 50%. Studies were conducted to investigate the influence of sucrose concentration and temperature on the osmotic dehydration of pineapple.

The pineapple mature fruits from the local market were used for the study. Fruits were washed and peeled with stainless steel knife. The edible fruit portion was cut into circular size slices of about 6 mm thick. Core was removed. The experiment was performed for three sucrose concentrations (40, 55 and 70⁰Brix) and three levels soaking durations (8, 16 and 24 h) at two soaking temperatures (30⁰C and 60⁰C). Air oven was used to maintain the soaking temperature.

Pineapple slices of 6 mm thick were dipped into sucrose solution at the proportion of 1: 2 (slice : solution) for the treatment of osmotic dehydration. Fruit slices were