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Effect of Different Dehydration Methods on Organoleptic Attributes and Quality of Pineapple Candy

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ABSTRACT

Drying is one of the dehydration methods used for preservation of fruits and vegetables from ancient time. In the recent years osmotic dehydration has been gaining popularity due to its effectiveness in enhancing the quality of the product and consumer acceptability. The main aim of the present study was to assess the effect of different dehydration methods on organoleptic attributes and shelf life of osmotic dehydrated pineapple candy. After soaking the 1.5 cm thickness pineapple slices in the 60^0brix sugar syrup for 24 hr. the slices were dried by following 2 treatments namely T1- solar dehydration under solar dryer and T2- sun drying. The Hedonic rating scale was administered to 30 panellists to assess the sensory attributes of dehydrated pineapple slices. The results indicated that dehydrated pineapple slices under solar dryer scored high in all six organoleptic attributes *i.e.,* colour, flavour, taste, texture, appearance and overall acceptability. From the study it was found that T1 have longer shelf life than T2.

Key Words: Organoleptic, Osmo-dehydration, Pineapple, Quality, Shelf life.

INTRODUCTION

The pineapple (*Ananas comosus* L. Merr) is one of the most popular tropical fruits of the world belongs to family Bromeliaceae, grown in hilly regions of Assam, Meghalaya, Tripura, Manipur, west Bengal, Kerala, Karnataka , Goa, Andhra Pradesh, Gujarat , Maharashtra. Pineapple is low in fat or cholesterol and rich in dietary fibre. It also contains phosphorus and minerals like calcium, magnesium, potassium and iron (Ahmed *et al*, 1995) It is highly relished by majority due its unique aroma taste and health benefits. But the shelf life of pineapple after harvesting is very less, hence to reduce post-harvest losses, pineapple was preserved in the form of dehydrated osmotic pineapple candy. Pineapple candy was prepared by dissolving pineapple slices in osmotic solution for 24 hr. and dehydrated in solar dryer. Osmotic dehydration of pineapple candy is one ways of processing fruits in a relatively simple preservation technique that does not require any sophisticated equipment (Ozdemir *et al* , 2008) and it is also one of the potential preservation techniques for producing high quality products (Rahman *et al*, 1990). Osmo-dehydrated pineapple pieces using 60° Brix sugar syrup concentration with 60°C drying temperature produced better quality product with respect to physico-chemical as well as sensory quality up to six months of storage period (Rosa *et al*, 2001). The product with low moisture content can be stored for longer period of time due to a considerable decrease in the water activity of the material with reduced microbial activity minimized physical and chemical changes (Vaidya *et al* ,2016; Chaudhary *et al,* 2019). It has received greater attention in recent years as intermediate step for drying of several fruits and vegetables (Kumar *et al* ,2009). Osmotic dehydration is a useful technique for the production

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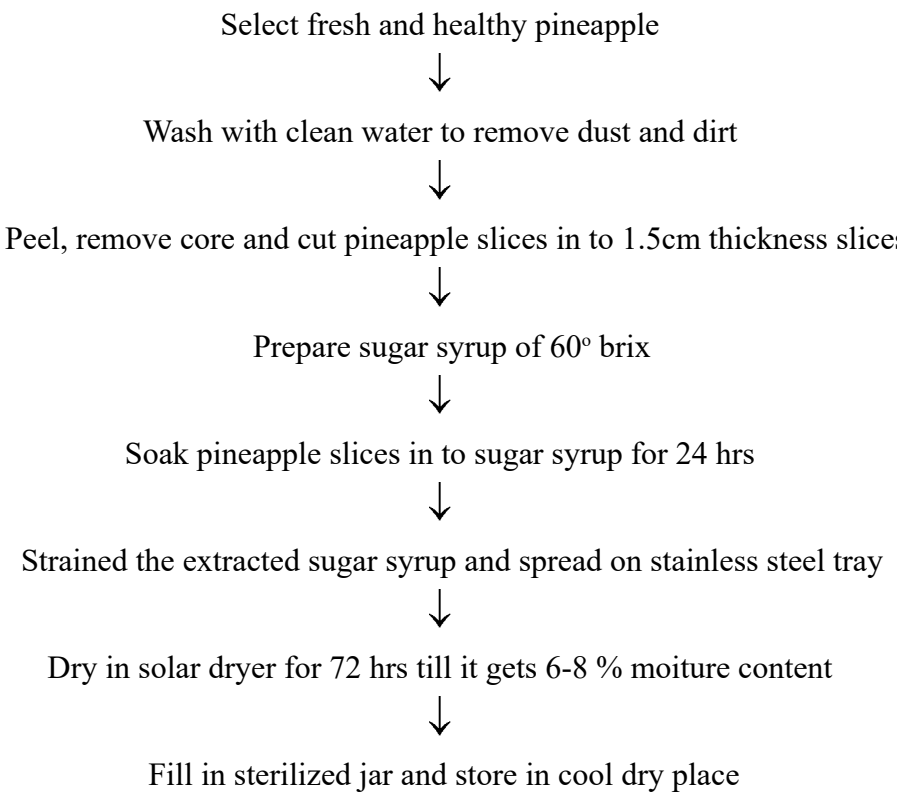
Table 1. Recipe for the formulation of dehydrated pineapple candy.

Ingredients	Pineapple	Sugar	Citric acid	Water	Steeping time
Quantity	1kg	600gm	5gm	1 litre	24 hr.

Fig. 1 . Flow chart for the preparation of dehydrated pineapple



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 (Gurumeenakshi *et al*, 2005; Dhingra *et al,* 2013). After that the pineapple slices were dehydrated by using solar dryer and open sun drying methods. Among dehydration methods, osmotic dehydration of pineapple candy is gaining popularity due to its easy and simple process. The present study focuses to see the effect of different dehydration methods on organoleptic attributes and quality of pineapple candy.

MATERIALS AND METHODS

Collection of materials

Matured, fresh and good quality pineapple were collected from local market Imphal, Manipur. Sugar, citric acid and packaging material were purchased from Imphal market.

Preparation of pineapple candy

Pineapples were washed thoroughly with tap water to remove dust and dirt. Peeled, remove core and cut pineapple into 1.5 cm thickness slices. Osmotic solution (Sugar syrup) of 60o brix was prepared by dissolving 600g of sugar and 5g citric acid in 1L water. Boiled the pineapples in 600brix

sugar syrup for 10 minutes and let it soak overnight. After that the pineapple slices were dehydrated by using solar dryer and sun drying methods. For maintaining proper moisture content dry the candy by turning upside down and continue the process till properly dried When cooled, fill in the sterilized packaging material and seal properly to maintain the proper moisture level. Flow chart for the preparation of dehydrated pineapple is shown in fig 1.and formulation of dehydrated pineapple is given in table1.

Sensory evaluation

Sensory evaluation of dehydrated pineapple candy by using 2 types of dehydration methods namely solar dehydration and sun drying method was evaluated by following nine points hedonic rating scale (Joshy, 2006) to assess the consumer acceptability of the product. A total number of 30 panellists who were expert in testing of food products were selected from women entrepreneur of Imphal, Manipur to evaluate the dehydrated pineapple products on six attributes namely, colour, appearance., flavour, taste, texture and acceptability. The rate of scores represented 1 - dislike extremely, 2- dislike very much, 3- dislike moderately, 4- dislike slightly, 5- neither like nor dislike, 6 - like slightly, 7-like moderately, 8- like very much and 9- like extremely.

Shelf life study

Visual observation was conducted for a period of 6 months to see any change in colour and fungal growth of the dehydrated pineapple candy.

Statistical analysis

Means of three replicates of the sensory score of 30 panellists werecalculated for all the six sensory parameters.

RESULTS AND DISCUSSION

Sensory Evaluation of dehydrated pineapple candy

The consumer's acceptability of the dehydrated pineapple candy with 2 treatments T1 -solar drying and T2 -sun drying was evaluated by a taste testing panel. The mean score of performance of dehydrated pineapple candy were presented graphically in fig.2. It was evident that the score observed for the colour attribute was high (8.2) in T1-solar dehydrated pineapple candy and 6.9 for T2- sun dried pineapple candy. The reason might be due to the fact that the colour of pineapple candy dehydrated by solar dryer was controlled by uniform drying temperature.

In appearance sun dried pineapple candy scored less (7.0) as compared with dehydration of pineapple candy with solar dryer (8.3). It may be due to time of harvesting pineapple as pineapples were harvested during rainy season (July and August), hence unavailability of proper sunlight for drying was the major constraint in sun drying which resulted in the shrinking of the dehydrated pineapple candy. The Score of texture (8.4), flavour (8.3) and taste (8.5) of treatment - 1 was high when compared to treatment 2 dehydration of pineapple candy by sun drying. The overall acceptability score of solar dehydrated pineapple samples was 8.3 followed by dehydration of pineapple candy by sun drying (7.6).

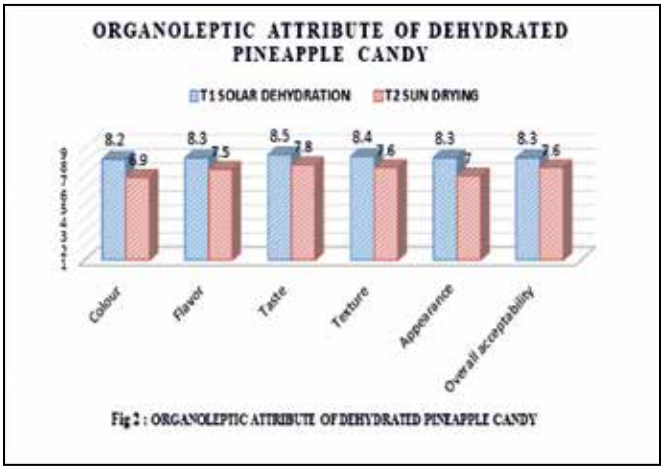
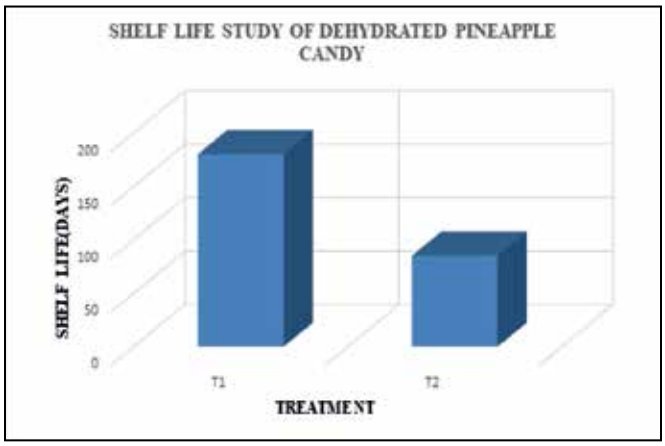


Fig 2 : ORGANOLEPTIC ATTRIBUTE OF DEHYDRATED PINEAPPLE CANDY

Shelf life studies of dehydrated pineapple candy

Pineapple candy dehydrated by solar dryer and sun drying were stored at room temperature. The deterioration of the product was observed at a regular interval of 15days up to 60 days and 30days interval for a period up to 180days. The change in colour, flavour and texture were observed for a period of 180 days. In case of treatment -1, no



change in colour, flavour, texture and taste up to 180 days. In case of T-2, change in colour, flavour and texture started from 85 days onwards. This may be due to improper drying which resulted in softening of candy due to accumulation of moisture in sundried pineapple candy. The results were in agreement to Ssemwanga *et al* (2020).

CONCLUSION

Osmo dehydration is one of the simple preservation techniques for processing of fruits which does not require any sophisticated equipment. So, the pineapple growers can use such type of technique and can convert pineapples into dehydrated form during the excess production during glut season and can reduce huge post-harvest losses. In the osmotic dehydration process, partial dehydration of the fruit pieces is accomplished by dipping in concentrated sugar syrup solution 60° Brix followed by dehydration under solar dryer and open sunlight. It is a useful technique for producing safe, stable, nutritious, tasty, economical and concentrated fruit products. The products prepared from pineapple by osmo-dehydration process possess high sensory score and remain good up to six months of storage at room temperature. Osmo-dehydrated pineapple candy drying under solar dryer produced better quality product with respect to sensory quality as well as shelf life up to six months of storage period than pineapple candy dried under open sunlight.

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