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Effect of osmotic dehydration on chemical composition of grapes during raisin preparation

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ABSTRACT

The process of osmotic dehydration followed by tray drying was studied on grapes for raisin preparation. Grapes were dried out by osmosis using sugar syrup at grapes to sugar syrup ratio of 1:4, which were than dried in a commercial tray dryer maintained at 50^0C temperature to obtained raisin. The grapes were dipped in sugar syrup of 60, 65 and 70^0B concentration in beakers having fruit to syrup ratio 1:4 at 40, 45 and 50^oC temperature and time of immersion was 6, 7 and 8 h for osmotic dehydration. The effective diffusivity for water loss and solid gain were determined by Factorial Completely Randomized Block Design. From this it was concluded that, acidity and ascorbic acid decreases with increase in syrup concentration, temperature of solution and time of concentration and Total, reducing and non-reducing sugar increased with increase in syrup concentration, temperature of solution and time of immerssion.

Key words : Osmotic dehydration, Chemical composition, Raisin, Grape.

Grape (*Vitis vinifera* L.) is well known for its medicinal properties and refreshing fruit in the world. Grape is grown under a variety of soil and climatic condition in three distinct agro-climatic zones in India. The total world production of grapes is estimated to about 63 million tonnes, which amount to about 16 per cent of total fruit production. The area, production and the productivity of grapes in India is 42,600 ha, 1.1 million tones and 25.4 t/ha, respectively. Maharashtra is the leading state and rank first in area and production *i.e.* 27,000 ha and 67,000 tonnes, respectively.

The conventional raisin preparation includes the pretreatment of the grapes followed by shed drying in order to bring the moisture content of the final product upto 15-18 per cent from initial moisture content of grapes *i.e.* 70-85 per cent. This process requires very long period for drying that is about 15-21 days depending upon different weather condition (Anonymous, 2003).

Hence, the use of osmosis allows both ways of decreasing water activity in food to be applied simultaneously. The permeability of plant tissue is low to sugars and high molecular weight compounds; hence, the material is impregnated with the osmoactive substance in the surface layers only (Lewicki and Lenart, 1995).

Raisin not only provide sweetness, but are excellent source of dietary fibers at 5.9 per cent, broken down into a soluble non cellulose polysaccharide content of 59.3 per cent and an insolubic non cellulose polysaccharide and cellulose content of 10 per cent and 30.7 per cent, respectively. Raisin also have some flavour enhancing capacity due to their 2.2 per cent tartaric acid level and contain reducing sugar which acts as precursors of the mailard reaction, the process that causes non enzymatic browning. Raisin is also a good source of vitamin and minerals, as are other fruits. Raisin not only provides great flavour appeal and versatility, but health attributes as well. (Anonymous, 2000)

The osmotic dehydration of grapes followed by hot air drying is likely to result in to better quality with less drying time. In order to decide suitable levels of osmotic dehydration parameters the present investigation is undertaken. The effect of osmotic dehydration on quality of grapes was studied with specific objectives. To study the effect of syrup concentration, time of immersion and temperature of solution on chemical composition of raisin and to study the organoletptic quality attributes of raisins prepared by osmo-air drying.

METHODOLOGY

Grape varieties 'Arkavati' and 'Thompson Seedless' with a TSS of 22-24° Brix produced good quality raisins with low acid and high sugar content (Anonymous, 2003). Hence, the Thompson Seedless variety was procured from the grower. Fully ripe, fresh, healthy, green grapes were purchased. Then the uniformly riped clusters containing berries of uniform size, shape, colour and bloom were selected for experiment. The moisture content, acidity, ascorbic acid, sugars *i.e.* reducing sugar, non-reducing sugar and total sugars were determined for the fresh grapes. Australian cold dip method was used as a pretreatment since it was observed to be best during the study conducted by Gawade *et al.* (2003). Based on