

Studies on the shelf life of minimally processed sweet oranges

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ABSTRACT

Sweet Oranges (*Citrus sinensis* Osbeck) were minimally processed and kept in different packaging materials like PolyPropylene and PolyEthylene bags of various gauges. The samples were air packed and vacuum packed and stored under ambient and refrigerated conditions. The effect of storage on the quality of the fruits under different packaging materials and atmosphere was analysed. Results suggest that storage of vacuum packed Sweet Oranges in 88 micron PE bag up to ten days at refrigerated condition is commercially feasible. Biochemical analysis of various quality parameters such as ascorbic acid, titrable acidity, total soluble solids etc. revealed that the vacuum packed sample in 88micron PE stored at refrigerated condition retained its quality to a greater extent compared to other samples. The overall acceptability of vacuum packed Sweet Oranges in 88micron PE bag was on the higher side according to Hedonic rating showing much preference over the other samples.

Key words : Sweet oranges, Minimal processing, Shelf life, Packaging materials, Quality.

INTRODUCTION

Minimally processed horticultural products are prepared and handled to maintain their fresh nature while providing convenience to the user. Growth in demand has led to increased marketing of fresh horticultural products in lightly processed form.

Citrus fruits are very useful for human beings. They are not only delicious and refreshing but have a great nutritive value containing vitamins, minerals and other substances. Many of the vitamins found in citrus fruits are daily needed by human beings. They are an important source of vitamin C, which is very much essential for normal teeth and bone. Sweet Orange is one of the varieties of citrus fruits. Sweet Orange juice is given in fever and jaundice. The fruits have a rind of medium thickness and difficult to peel. The peel of citrus fruit is generally thought to retard deterioration during storage, and the present investigation focused on the feasibility of storing Sweet Oranges after they were peeled. A series of experiments were undertaken using qualitative and hedonic testing to determine the shelf life of peeled Sweet Oranges.

MATERIALS AND METHODS

Sample preparation:

The fruits used in this study were purchased from a local fruit market. The fruits were first washed in water containing chlorine (100ppm). They were then air dried

and wiped clean with tissue paper to remove the surface moisture. The fruits were then peeled by a stainless steel knife. The peeled whole fruits were packed in different packaging films such as polyethylene of various thickness (38,75 and 88 micron) and polypropylene bag of 38 micron thickness and air sealed. In another set of experiments, the peeled whole fruits were vacuum packed in 75 and 88 micron thickness of polyethylene bags, since lower thickness packaging materials could not withstand vacuum. The shelf life of both air packed and vacuum packed fruits in different packages were studied under ambient ($28 \pm 2^{\circ}\text{C}$) and refrigerated ($5^{\circ} \pm 1^{\circ}\text{C}$) conditions. The quality of the samples was analysed periodically the results of which are tabulated.

Sample Analysis :

The various quality attributes like acidity, total soluble solids, pH, juice content and physiological weight loss of the samples were assessed at periodic intervals during storage. Titrable acidity was estimated according to the standard procedure (Sadasivam and Manickam, 1992). Total Soluble Solids ($^{\circ}\text{Brix}$) was found using a hand refractometer of (0-32) range. pH was found using a digital pH meter. By recording the weight of fruit during the storage period, the physiological weight loss was found.

Sensory analysis of fruits packed in different packages, method of packaging and storage environment was carried out using Hedonic testing of 9-scale. (Ranganna, 1986). Judges conveyed their degree of liking by marking with the terms "like extremely" to "dislike extremely".

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