

ABSTRACT

Post-harvest Storage Technology of the Breadfruit

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Breadfruit (Artocarpus altilis) is widely grown and consumed in the fresh form in the Caribbean Islands. It is well known as a fruit of poor post-harvest quality with a very short post-harvest life of 2-3 days under ambient conditions. This severely restricts local marketing and the potential for its export. Through experimental studies on the breadfruit in ambient, refrigerated, modified and controlled atmosphere storage systems, the shelf-life and post-harvest fruit quality were measured in terms of physical, chemical and sensory parameters.

In the first storage trial, 72 breadfruits were stored at 28°C (ambient), 16°C, 12°C and 8°C in normal air (control), in water, packaged (using 100 gauge polyethylene bags), and waxed (with a food grade wax). This trial was conducted with a view to defining an appropriate storage system viz:- storage temperature and medium.

In the second storage trial, an attempt was made to optimise the refrigerated storage temperature of the breadfruit and also to confirm the results of the previous trial. Forty-five breadfruits were stored under refrigerated conditions of 13, 16 and 19°C with the storage treatments being air (control), packaging using polyethylene bags and waxing.

Using the results of Trials 1 and 2, and having established the appropriate storage temperature for the breadfruit under refrigerated conditions, a third storage trial was conducted in order to evaluate the potential of fruits in controlled atmosphere (CA) storage.

Breadfruits stored under ambient conditions (28°C) showed rapid losses in weight, volume, firmness and decreases in pH as well as rapid increases in soluble solids, sugar/acid ratios and with considerable changes in skin colour. Fruits stored in air exhibited a shelf-life

of 2-3 days whereas fruits stored in water increased in weight and volume with a maximum shelf-life of 5 days. Packaged fruits exhibited minimal losses in weight and volume and a shelf-life of between 5-7 days was possible. Waxed fruits stored best under ambient conditions with a shelf-life of 8 days.

Storage of breadfruits under refrigerated conditions (8, 12, 13, 16 and 19°C) resulted in considerable reductions in the rate of change of the physical and chemical parameters associated with fruit quality when compared to ambient storage. However skin browning was very apparent in refrigerated storage and was the limiting parameter. At 16°C this effect was significantly reduced and minimised compared to all the other temperatures. Fruits stored in air at 16°C exhibited a storage life of 8-10 days in trials 1 and 3, and 5 days in trial 2, while those in water exhibited off-odours and were unacceptable within 5 days of storage. Packaged fruits at 16°C exhibited a further reduction in skin browning and a shelf-life of about 2 weeks (trials 1, 2 and 3) was possible for such fruits. Waxed fruits at 16°C were able to store for about 18 days in the first trial and about 10 days in the second trial as external browning limited acceptability in storage.

The results showed that at 16°C browning was severely reduced for fruits. Additionally, the use of cling-film wrap (Trial 3) was preferred over the polyethylene bags (Trials 1 and 2) as packaging material as it improved the green external colour of fruits. Storing breadfruits in atmospheres of 5% oxygen and 5% carbon dioxide at 16°C delayed ripening of such fruits as the green fruit colour and firmness of fruits were maintained. Other characteristics of CA stored fruits included a delay in the development of soluble solids, citric acid and considerable reductions in losses of weight and volume. CA storage enhanced the storage life of breadfruits to 25 days as up to this time fruits remained in a very acceptable condition.