

ABSTRACT

Postharvest Technology of the Carambola (*Averrhoa carambola*)

Frankie Balkissoon

A study with a view to optimising the storage temperature of the carambola was conducted. Fruits were harvested at the first signs of yellowing and stored at 5, 10, 15 and 28°C. Storage and testing proceeded for as long as ten (10) weeks at the lowest temperature. The effect of film wrap packaging on the shelf life of the fruit was also investigated.

From the results of the study it was concluded that if the carambola is to be consumed as a fresh fruit then the optimum storage temperature is 10°C. At this temperature fruits harvested at the first signs of yellowing, can be stored for a maximum of seven (7) weeks without marked decay or qualitative losses. For short term storage, carambolae can be stored a maximum of four (4) weeks at 15°C and two (2) weeks at 28°C (ambient).

If the carambola is to be used as a processed fruit then the storage temperature can be lowered to 5°C. At this temperature there is no deterioration of flavour, only unsightly surface discolorations may be present. The fruits can be stored for as long as ten (10) weeks at this temperature.

Film wrap packaging is not critical to the storage of carambola fruit as the waxy cuticle of the fruit appears to be an effective natural moisture barrier. Packaging had only a marginal effect on reducing weight loss and shrivelling and in the maintenance of fruit firmness.

In addition to preservation of the fruit in the fresh state through refrigeration, carambola can be preserved through drying. Studies were therefore conducted on the drying characteristics of both the fresh and candied fruit in sections of 1, 2, 3, and 4cm thicknesses as well as whole fruits, at temperatures of 40, 50, 60 and 70°C. Both natural and forced convection drying were explored with the fresh fruit while with the candied fruit, investigations were limited to natural convection drying.

The results indicated that both temperature and particle size were critical to the drying rate of this fruit. The higher the temperature and the smaller the particle size, then the more rapid was the rate of drying. Also, while forced convection did produce a more rapid rate of drying when compared to natural convection, the speed of the drying air did not significantly influence the drying rate.

Drying of this fruit proceeded exclusively in the falling rate period and the drying mechanism was governed by the internal rate of diffusion of moisture to the surface of the fruit. With the fresh fruit sections under natural convection drying, the drying behaviour was best described by two falling rate periods while with the candied fruit sections, a single drying rate period was adequate.