

POSTHARVEST TECHNOLOGY OF FRESH PINEAPPLES TO PROLONG STORAGE LIFE

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Introduction

The world demand for pineapples exceeds RM900 million annually, and Malaysia exports RM4 million to Singapore and the Middle East. Malaysia aims to export pineapples to the European market in the near future but this requires the extension of pineapple storage life to approximately 6-8 weeks. The main problems encountered during storage of pineapples are weight loss, fungal attack, internal browning when stored at low temperatures and the presence of white fruitlets when fruits were stored at the optimum temperature of 8-12°C. Weight loss can be controlled by storage at high relative humidity or by applying surface coating/ packaging together with low temperature storage. Ripening can be delayed by low temperature storage, surface coatings or chemical treatments. The objective of this study was to prolong the storage life of fresh pineapples for export to the European market.

Materials and Methods

Gandul and N36 pineapples, harvested at commercial harvest stage for export (all eyes are green with tinge of yellow between the eyes at the base), were cleaned by blow drying, weighed and given surface treatments, packed in boxes, followed by storage at 10 ± 1°C; 85-88% RH. Treatments were as follows: (a). control; (b). 20 % liquid paraffin; (c). 20% vegetable oil; and (d). 5% semperfresh (sucrose ester). For all types of surface coating solution, 200 ppm prochloraz manganese chloride 50% w/w, were added to control storage decay caused by *Thielaviopsis paradoxa* (Tv). Fruits were dipped from peduncle to base of the crown for 30 seconds in solution of surface coating materials. Fruits were analysed for weight loss; firmness; total soluble solids; ascorbic acid; titratable acidity; pH; sucrose, fructose, glucose, internal browning and sensory evaluation. Effect of preharvest treatment on fruitone on post harvest storage were investigated. Export trial to Europe were carried out after a simulation study were conducted in UPM.

Results and Discussion

Surface Coating N19 pineapple (Gandul) with 20% liquid paraffin, 20% palm oil and 5% semperfresh emulsion reduced the weight loss from 10.9% in control pineapples to 7.0%, 7.6% and 9.6%, respectively, after 5 weeks storage at 10 ± 1°C at 85-88% RH. The colour and appearance of shell and flesh were retained in paraffin and vegetable oil coated pineapples (Mohamed and Abdullah Khir 1993). The reduction of pulp firmness was improved by coating with paraffin and semperfresh. Liquid paraffin was able to significantly (P<0.05) increase the TA value and ascorbic acid content, but, reduce the pH and sugar content of Gandul. Panelists

preferred the appearance, colour, sweetness and overall acceptability of liquid paraffin coated pineapples; the odour, sourness and flavour of semperfresh coated pineapples and texture of control pineapples. The acceptance of panelist on Gandul decreased when the fruit started to show the symptoms of internal diseases such as leathery pocket, Internal browning and off-flavour due to chilling injury and fermentation. N36 pineapples can be stored for 9 weeks at 10 ± 1°C; 85-88% RH as compared to 4 - 5 weeks at ambient. N36 was found to be very resistant to internal browning caused by low storage temperature. All surface treatments were very effective in preventing this internal browning disorder in N36. However, vegetable oil coating was highly effective in maintaining the texture, weight loss and pH of cold stored N36 pineapples. The ascorbic acid content was high in vegetable oil and liquid paraffin treated N36 pineapples and they also received the highest organoleptic scores in all the parameters monitored (Othman et al 1997a). The proper postharvest handling system extended the storage life of fresh N36 pineapple for export purposes. Excellent quality pineapples were obtained during the export trial and showed better results when compared to the simulation study (Othman et al 1997b). There was significant (P<0.05) increase in pH, total acidity, ascorbic acid and total soluble solid in exported fruits for both surface coated and control pineapples compared to fruits stored in the simulation study. TSS and pH increased, and, TA decreased when N36 pineapples were coated with vegetable oil. Vegetable oil tended to maintain texture loss and pH, and increased the TSS and TA in the export trial. Coating also delayed the ripening of N36 pineapples. High acceptability of N36 pineapples was found up to 8 week after harvest for both the simulation and export studies. There were insignificant difference in consumer acceptance in both the simulation studies and export trial.

Conclusions

Surface coating N19 (Gandul) and N36 pineapples reduced weight loss and extended storage life for up to 5 and 9 weeks respectively at 10 ± 1°C, 85-88% RH, as compared to 1 and 5 weeks respectively at ambient. N36 was found to be very resistant to internal browning caused by low temperature storage. The surface treatments were very effective in preventing physiological and pathological disorders in N36, while vegetable oil coating was most effective in maintaining the texture, weight loss, ascorbic acid, pH and the organoleptic quality parameters of cold stored pineapples.

References

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