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Name : Mohd Zahid Bin Abidin, *PhD*
Title : Optimisation Of Emulsion-Based Edible Coating And Development Of Coating Applicator Machine For Postharvest Life Study Of Guavas (Psidium Guajava L.)
Faculty : Applied Sciences
Supervisor : Associate Prof. Dr. Cheow Chong Seng (MS)
Associate Prof. Dr. Norizzah Binti Abd Rashid (CS)

Application of edible coating represents a method that can extend the shelf life of picked guava by minimising the weight loss mainly due to natural migration process of moisture and gases. Response surface methodology (RSM) was employed to search for best composition of edible coating comprised of three variables namely palm stearin, palm kernel olein and beeswax. The RSM was also used to investigate the influence of temperature of coating emulsion and dipping time on the coating pickup for the optimisation of coating process condition. From the RSM-generated model, optimum coating composition for minimising guava weight loss was 4.5% (w/v) palm stearin, 1% (w/v) palm kernel olein and 1% (w/v) beeswax. The RSM predicted and experimental weight loss (7%) were not significantly different from each other. The weight loss of uncoated guava was 19% or 2.7 times higher than the coated guava as measured on the 7th day at ambient storage (25-27^{O}C, RH 80-90%). The optimised process condition for coating application was at 63^{O}C temperature of coating emulsion and 15 s dipping time in minimising the coating pickup to 0.15% by the coated guava. A coating applicator was designed, fabricated and evaluated based on dipping technique. It was built as a model to meet the functional requirement of coating application on guava fruits based on the optimised coating emulsion and process condition. The machine comprises of 7 major components, namely conveyor chain, motor, dipping tank, heater, blower, controller and receptacle. The coating applicator had an estimated coating capacity of at least 270 fruits/h and coating emulsion usage of 1 kg/1740 guava fruits. Delay in senescence and metabolic activities of coated guava were indicated by lower changes in weight loss, firmness, surface colour development, titratable acidity, total soluble solid as well as CO2 concentration compared to uncoated guava. In terms of sensory evaluation, the panellists significantly ($P<0.05$) preferred the colour and texture of the coated guava and the sweetness and taste of the uncoated guava. However, the overall acceptability of the coated and uncoated guavas was comparable to each other evaluated on the 7th and 12th days at cold storage (12-13^{O}C, RH 80-90%). Coated guavas could be stored for up to 10 days at ambient condition and 30 days in cold storage. Application of emulsion-based edible coating developed in this study, in combination with coating applicator machine and cold storage seems to be a promising way to extend the storage life and marketability of the guava cultivar Vietnam/Cambodia; however, further work needs to be carried out on large scale trials prior to its commercial use.