Attaphol Phoosanaphong 2009: Development of Edible Coating for Extending Shelf Life of Fresh-Cut Mangoes. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging Technology. Thesis Advisor: Associate Professor Ngamtip Poovarodom, Ph.D. 160 pages.

Carragenan and alginate (3% w/w) were selected to be used as edible coatings for fresh-cut mangoes due to their appropriate permeability to oxygen for developing modified atmosphere conditions and their mechanical strength. The coating films were easily peeled off without breakage. It was found that ascorbic acid and cysteine (2% w/v) could effectively reduce enzymatic browning on mangoes with no effect on consumer acceptance. The incorporation of these anti-browning agents into the coating solutions gave no adverse effect on their film permeation or mechanical properties. It was observed that dipping mangoes directly in the coating solution caused dramatically cell damage. Therefore, edible films were prepared by casting and then applied on mangoes. Edible coatings incorporated with both anti-browning agents delayed color change on mangoes more effectively than with only one of them and alginate coating showed better result than K-carrageenan. Edible coatings could reduce the respiration rate of mangoes by 2.5 times, weight loss 2 times and firmness loss by 20%. They also reduced microbial number by 3-3.5 log CFU/g. In addition, total soluble solid (TSS), titratable acidity (TA), pH, and TSS/TA were not significantly different among the treatments ($p > 0.05$). While the ethanol content increased slightly over the storage period but did not affect consumer's acceptance as compared with uncoated mangoes. Edible coating could extend the shelf life of fresh-cut mangoes to 12 days at 5°C, comparing to 6-8 days for uncoated samples. The appearance of coated mangoes was well accepted by 98% of consumers who preferred additionally alginate coating to K-carrageenan.

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