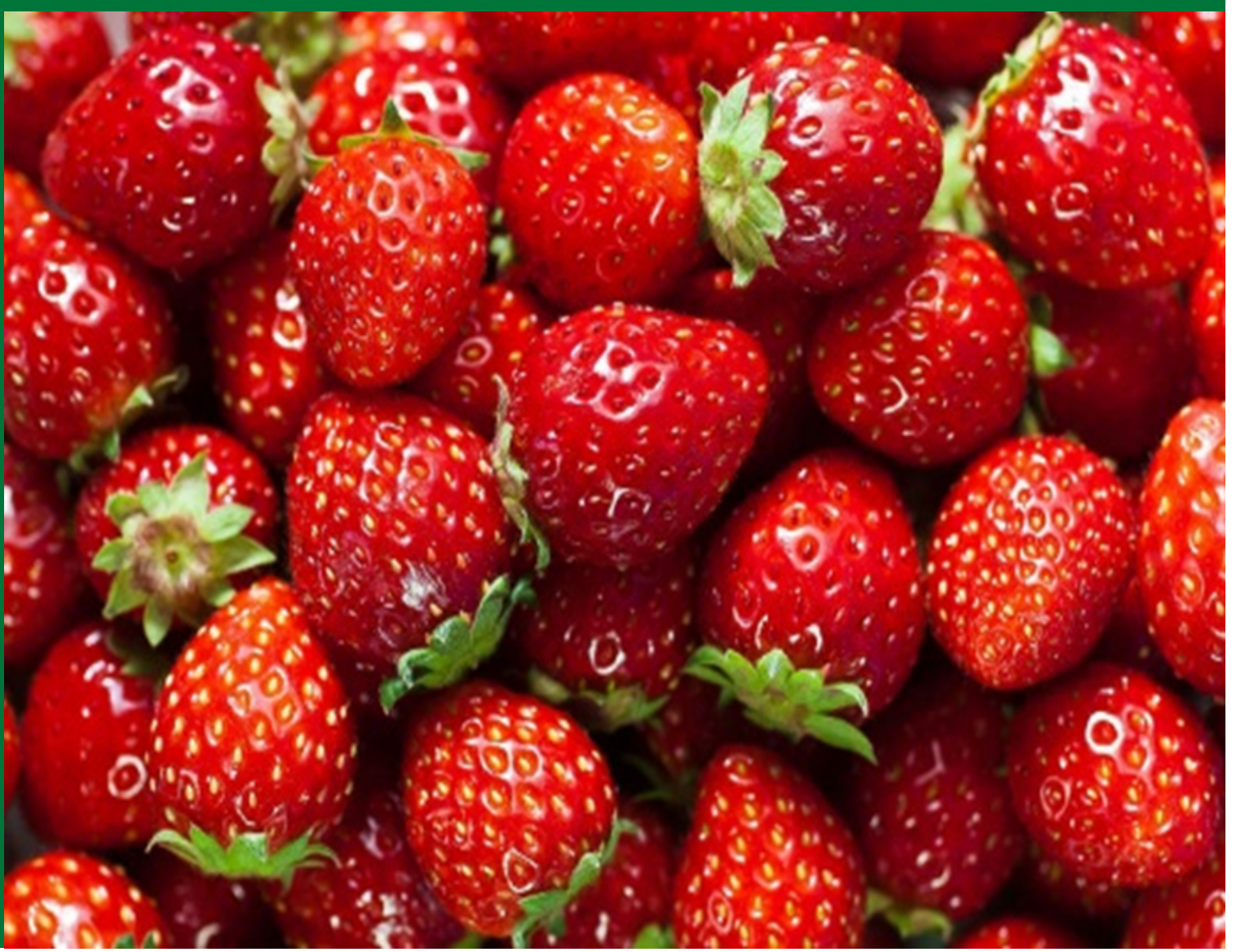
Developing and Exploring the Role of Edible Coatings to Improve the Quality and Shelf Life of Whole and Minimally Processed Fruits



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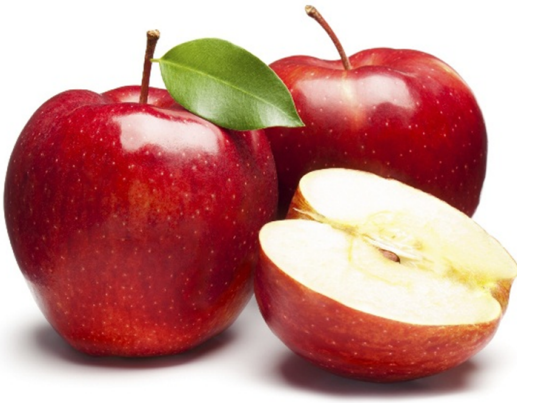
It has been estimated that approximately 25 to 40% of fresh horticultural produce is lost because of inappropriate management and storage resulting in irretrievable economic loss. Moreover, only 4-5% of the horticultural produce is exploited for value addition in the country. Furthermore, increasing consumer demand for fresh fruit with improved shelf life has evoked the processing industry to develop novel methods that maintain nutritional quality and extend shelf life. Hence, there arises a need to promote safe, easily implementable andcost effective techniques to preserve the quality of the fresh fruits. In this context, edible coating has stemmed out as a promising preservation stratagem. These are thin layers of transparent edible material covering the fruit surface thereby acting as a barrier against moisture and gas transfer from or to the commodity. The process involves dipping of fruits in coating solution or spraying it on the surfaces of the commodities. The application of edible coatings has emerged as an innovative preservation technique to improve the quality and extend the shelf life of various fruits.

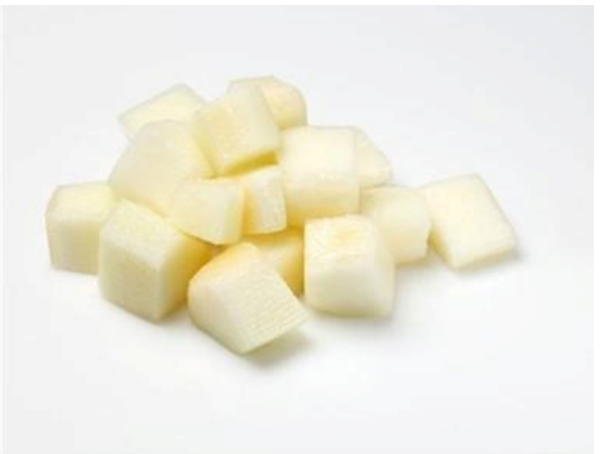
In the present research, Biodegradable edible coatings were optimized to study their effects on the storage quality and shelf life of whole and minimally processed fruits.

The outcome of this innovative preservation technology deems to help strengthen our exports and value added products. Purposely, carbohydrate (chitosan, alginate and starch) and protein (soy and whey) based edible coatings were applied at various concentrations on strawberry, mango, melon, apple and apricot fruits followed by the assessment of their quality characteristics during storage.

Key Findings



- The shelf life of strawberry was extended up to fifteen days. In this context, soy based edible coating was observed to be more beneficial in effectively resisting moisture loss from the coated strawberries and preserving its sensory quality.
- The weight loss in apricots is appreciably controlled by soy protein based edible coatings as compared to carbohydrate based coatings.
- With regard to apple, the chitosan based coating formulations resulted in better control of weight loss during storage.
- Fresh cut melon was better preserved with chitosan and alginate based coatings in contrast to protein based coatings.
- Weight reduction due to moisture loss in minimally processed mango was effectively controlled through chitosan and alginate based coatings which preserved the overall quality attributes of the mango dices.



Edible coating of fresh horticulture produce is a potential tool that enables processors and exporters to develop value added products. This innovative technique will help to address postharvest losses and uplift exports that in turn promote foreign trade. Likewise, availability of fruit with improved shelf life will lessen the demand and supply gap and help better socioeconomic status of individuals. Additionally, being an economical preservation technique, edible coating has potential to attain food and nutritional security as well.