

The Effect of Nano-Silver Packaging on Quality Maintenance of Fresh Strawberry

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Abstract : Strawberry is one of the most favored fruits all along the world. But due to its vulnerability to microbial contamination and short life storage, there are lots of problems in industrial production and transportation of this fruit. Therefore, lots of ideas have tried to increase the storage life of strawberries especially through proper packaging. This paper works on efficient packaging as well. The primary material used is produced through simple mixing of low-density polyethylene (LDPE) and silver nanoparticles in different weight fractions of 0.5 and 1% in presence of dicumyl peroxide as a cross-linking agent. Final packages were made in a twin-screw extruder. Then, their effect on the quality maintenance of strawberry is evaluated. The SEM images of nano-silver packages show the distribution of silver nanoparticles in the packages. Total bacteria count, mold, yeast and *E. coli* are measured for microbial evaluation of all samples. Texture, color, appearance, odor, taste and total acceptance of various samples are evaluated by trained panelists and based on 9-point hedonic scale method. The results show a decrease in total bacteria count and mold in nano-silver packages compared to the samples packed in polyethylene packages for the same storage time. The optimum concentration of silver nanoparticles for the lowest bacteria count and mold is predicted to be around 0.5% which has attained the most acceptance from the panelist as well. Moreover, organoleptic properties of strawberry are preserved for a longer period in nano-silver packages. It can be concluded that using nano-silver particles in strawberry packages has improved the storage life and quality maintenance of the fruit.

Keywords : antimicrobial properties, polyethylene, silver nanoparticles, strawberry

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