Title Influence of Whey Protein Composite Coatings on Plum (*Prunus Domestica* L.) Fruit Quality

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Abstract

This study evaluated the quality of plums (*Prunus domestica* L.) coated with whey protein isolate (WPI) and WPI composite coatings containing 5 or 10% (w/w) flaxseed oil blended with beeswax. WPI and 10% lipid composite coatings were less susceptible to crack, flake, and blister defects during the 15 days storage at 5°C compared to the 5% lipid formulation. The firmness of plums, determined by the penetration force using a 10-mm probe, was not significantly affected by the coating types except for the WPI-coated samples, which showed a significantly higher penetration force because of the higher strength for WPI film. Mass loss of plums during storage was substantially reduced because of coating, especially when coatings of higher lipid content were used. This was consistent with the water permeability for the standalone films, which decreased considerably when flaxseed and beeswax were added. The incorporation of lipid phase to WPI also significantly weakened oxygen barrier and mechanical properties. Migration of plasticizer and lipid phase to the film surface was observed during water vapor permeability tests, especially when the films were exposed to elevated humidity conditions. Overall, sensory evaluation showed that the coated plums were more acceptable than the uncoated controls.

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