

Development of Potato Starch Based Active Packaging Films Loaded with Antioxidants and Its Effect on Shelf Life of Beef

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Abstract : The effects of 5% BHT and green tea extracts (GTE) on the physical, barrier, mechanical, thermal and antioxidant properties of potato starch films were investigated. Results showed both BHT and GTE significantly lowered solubility of films. Addition of BHT significantly decreased water vapour transmission rate. Both BHT and GTE promoted significant increase in the elastic modulus but a decrease in % EAB, however BHT was more effective in increasing elastic modulus. Increase in glass transition temperature (Tg) and enthalpy of transition (ΔH) of films was observed with the incorporation of GTE and BHT. Scanning electron microscopy (SEM) revealed smooth surface of the films. The DPPH radical scavenging ability of both BHT and GTE films were stronger in fatty food stimulant (95% ethanol). The GTE and BHT films were individually applied to fresh beef samples and were stored at 4 °C and room temperature for 10 days. Metmyoglobin formation and lipid oxidation (TBARS) were monitored periodically. The addition of GTE extracts and BHT resulted in decreases in metmyoglobin and TBARS values. We conclude that extracts of GTE and BHT have potential as preservatives for fresh beef.

Keywords : starch film, WVTR, tensile properties, SEM, thermal analysis, DPPH scavenging activity, TBARS, metmyoglobin

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