

Title Effect of antioxidant content on color change of fresh-cut apples coated with whey protein-beeswax edible coating

Author M.B. Perez-Gago, M. Alonso and M.A. Del Rio

Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16 July 2004, Las Vegas, Nevada, USA. 321 pages.

Keywords apple; fresh cut produce; edible coating

Abstract

Enzymatic browning is a major problem reducing shelf-life of fresh-cut products. Whey protein-beeswax (BW) emulsion coatings with no antioxidants incorporated into the formulations have been shown to reduce browning of fresh-cut apples compared to uncoated samples. However, these coatings should be improved with the addition of antibrowning agents. The objective of this work was to study the effect of antioxidant type and amount of whey protein concentrate (WPC)-BW-antioxidant based emulsion coatings in postponing enzymatic browning of fresh-cut apples. WPC-BW emulsion coatings at 16% solid content and with 20% BW content (d.b.) were prepared. Glycerol was added as plasticizer. Sodium ascorbate at 0.5% and 1% content, cysteine at 0.1%, 0.3% and 0.5% content, and hexylresorcinol at 0.005% and 0.02% were incorporated in the formulations as antioxidants. Golden apples were cut, immersed in citric acid and sanitized in sodium hypochlorite solution. Apple pieces were dip-coated in the WPC-BW-antioxidant emulsion coatings or only in antioxidant solutions at the above concentrations. Finally, samples were stored at 5 °C for 11 d in open trays or 13 d in sealed trays. Color (CIE L*, a*, b*, and browning index) was measured during storage. The incorporation of the antioxidants to the WPC-based coatings reduced browning of the samples compared to the application of the antioxidants alone. Hexylresorcinol was the least effective reducing browning, even when incorporated into the WPC-based coating. Increasing ascorbate and cysteine content decreased browning of coated samples. The most effective treatments were WPC-BW based coatings with 1% ascorbate and 0.5% cysteine. Apples pieces treated with cysteine solution at levels below 0.5% showed a reddish appearance, whereas this effect was not shown when similar levels of cysteine were incorporated into the WPC-BW based coating. These results indicate that incorporation of antioxidants to WPC-based can reduce browning on fresh-cut apples compared to the use of antioxidants alone.