

Potential perspectives of CMC-PET/ZnO bilayer nanocomposite films to improve the shelf life of mushroom (*Agaricus bisporus*)

Seyedeh Leila Nasiri, Mohammad Hossein Azizi, Farnaz Movahedi, Nahid Rahimifard and Hamid Tavakolipour

Journal of Food Measurement and Characterization 16: 849–856. (2022)

Abstract

In this study, the effects of PET-CMC bilayer nanocomposite films containing 3% zinc oxide nanoparticles and PET-CMC films on the physicochemical and microbial properties of fresh mushrooms were investigated during storage at 4 °C for 12 days. Unpackaged mushrooms were used as the control. The results showed that mushrooms packaged with PET-CMC film containing 3% ZnO NPs, reduced weight loss and soluble solids in comparison to control samples from, 17.18 to 11.73 and from 8.03 to 5.03 after 12 days of storage, respectively. Also, this film maintained a high level of firmness in comparison to control samples from 13.02 to 13.72, and delayed browning after 12 days of storage. However, increased brightness compared with control. Packaging of mushrooms with nanocomposite film containing ZnO NPs was capable to keep 55–60% of the mushrooms in a closed cap state up to day 6. Also, the film exhibited antimicrobial activity on mushrooms during storage. In general, the use of nanocomposites films for packaging of mushrooms, while increasing antimicrobial properties, improved the textural properties of the mushroom and prolonged its shelf life as active packaging, and increased its preservation quality.