

Title Effects of UV-C treatment on inactivation of *Escherichia coli* O157:H7, microbial loads, and quality of button mushrooms

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Abstract

This study investigated the effects of ultraviolet-C (UV-C) light applied to both sides of mushrooms on microbial loads and product quality during storage for 21 d at 4 °C. Microflora populations, color, antioxidant activity, total phenolics, and ascorbic acid were measured at 1, 7, 14 and 21 d of storage. Additionally, the inactivation of *Escherichia coli* O157:H7 by UV-C was determined. Results showed that UV-C doses of 0.45–3.15 kJ m⁻² resulted in 0.67–1.13 log CFU g⁻¹ reduction of *E. coli* O157:H7 inoculated on mushroom cap surfaces. UV-C radiation also reduced total aerobic plate counts by 0.63–0.89 log CFU g⁻¹ on the surface of mushrooms. Although mushrooms treated with UV-C had more severe browning with increasing dosage after initial treatment, the control mushrooms also browned as indicted by lower *L** and higher *a** values after 21 d of storage at 4 °C. In addition, the UV-C treatments apparently inhibited lesion development on the mushroom surface. During the first 7 d, irradiated mushrooms had lower antioxidant activity, total phenolics, and ascorbic acid content compared to non-radiated samples. However, irradiated mushrooms reached similar amounts of these nutrients as the control after 14 d of storage at 4 °C. In summary, UV-C radiation could potentially be used for sanitizing fresh button mushrooms and extending shelf-life.