

**Title** Surface decontamination of fresh-cut apple by UV-C light exposure: Effects on structure, colour and sensory properties

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### **Abstract**

The effect of UV-C light treatments at 1.2, 6.0, 12.0 and 24.0 kJ/m<sup>2</sup> was studied with reference to germicidal efficiency and changes in fresh-like appearance of fresh-cut apple. Independently of UV-C light fluence, all treatments imparted the same germicidal effect with 1–2 log reduction in total viable counts. Treatments at a fluence exceeding 1.2 kJ/m<sup>2</sup> caused the loss of compartmentalisation of surface apple cells, activating dehydration and oxidative phenomena. By contrast, mild treatments resulted in apple slices much more stable than the untreated control in terms of microbial growth and development of browning and off-flavours. These effects were attributed not only to the direct inactivation of spoilage microorganisms and enzymes by UV-C light, but also to the formation of a thin, dried film on the surface of the product. This edible protective film inhibited microbial growth and hindered dehydration during storage but was too thin to be perceived by consumers. UV-C light exposure was demonstrated to be an effective non-visible technology for food surface decontamination, but only if applied at mild intensity.