

Title Effect of ultraviolet-C light dose on quality of cut-apple: Microorganism, color and compression behavior

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Abstract

The present study was aimed to: (1) examine the effect of UV-C irradiation at different doses on the surface color of fresh-cut-apple discs stored in refrigeration for 7 days; (2) explore the use of some pretreatments (hot water blanching, dipping into a solution containing ascorbic acid and calcium chloride) to minimize browning of UV-C irradiated apple slices, (3) investigate the effect of UV-C light at different doses (with or without anti-browning pretreatment) on survival of some inoculated microorganisms and native flora, and (4) examine the compression behavior of apple discs subjected to UV-C irradiation with or without pretreatments. The color and compression parameters were found to be dependent on UV-C dose, storage time and type of pretreatment. At the end of storage, samples exposed to only UV-C light turned darker (lower L^* values) and less green (higher a^* value) when compared to fresh-cut-apple slices or to samples on day 0 and this effect was more pronounced at the greatest UV-C dose. Light microscopic images showed breakage of cellular membranes in UV-C treated samples which may explain the increase in browning of irradiated apples. Both pretreatments helped in maintaining the original color of apple slices after UV-C light exposure. Natural microflora counts were higher in untreated UV-C than in UV-C treated samples along the whole storage. Survival patterns of inoculated microorganisms (*Listeria innocua* ATCC 33090; *Escherichia coli* ATCC 11229 and *Saccharomyces cerevisiae* KE 162) depended on the UV-C dose, the type of microorganism and the apple pretreatment.