Title Effects of UV-C, red light and sun light on the carotenoid content and physical qualities of tomatoes during post-harvest storage

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Abstract

Mature-green (breaker-stage) tomatoes were harvested and treated daily with short bursts of UV-C, red light or sun light for up to 21 days. Control untreated tomatoes were kept in the dark for the same period. The effects of the treatments on the levels of the major tomato carotenoids, skin colour, tissue firmness and total soluble refractive solids were evaluated throughout storage. Results indicated that the concentration of lycopene in tomato exocarp was significantly increased after 4 days and dramatically enhanced by UV-C or red light treatments. However, the concentration of β-carotene was not affected by UV-C or red light treatments, and decreased by sun light treatment during 21 days of storage, compared to the control samples. The colour (*a** and *b** values) and force required to penetrate the tomatoes was, to a small but significant extent, influenced by the light treatments. However, the total soluble refractive solids of all tomato samples remained the same throughout storage. The findings reported here could be employed to improve tomato nutritional qualities lycopene content without inducing significant changes to the physical properties of tomatoes during post-harvest storage.