

Title Ionizing radiation and marketing simulation on bioactive compounds and quality of grapefruit (*Citrus paradisi* c.v. Rio Red)

Author Jairam Vanamala, Greg Cobb, Julio Loaiza, Kilsun Yoo, Leonard M. Pike and Bhimanagouda S. Patil

Citation Food Chemistry, Volume 105, Issue 4, 2007, Pages 1404-1411

Keywords Grapefruit; Irradiation; Storage; Phenylalanine ammonia-lyase; Flavonoids; Terpenoids

Abstract

Bioactive compounds in citrus fruits have been shown to be protective against chronic diseases such as cancer and heart disease, but their levels may be affected by postharvest treatments such as storage and irradiation. In this study, grapefruits were exposed to gamma irradiation at 0, 150 and 300 Gy and then stored at 10 °C for 36 d, followed by an additional 20 d at 20 °C. Flavonoid content, terpenoid content, quality (acidity and total soluble solids) and phenylalanine ammonia-lyase (PAL) activity were evaluated at regular intervals during storage. Irradiation and storage affected ($P \leq 0.05$) the levels of bioactive compounds in grapefruit; however, the effect of storage was prominent. Irradiation differentially affected the flavonoid content of pulp and peel. Fruits exposed to 300 Gy had higher ($P \leq 0.01$) narirutin content in peel compared to control fruits at 12 and 56 d after storage. While storage increased the d-limonene and myrcene content in all treatments, control fruit had higher terpenoid content at the end of the storage. PAL activity was found to be in traces in the peel. In general, irradiation or storage had no considerable effect on total soluble solids; however, acidity decreased ($P \leq 0.05$) with storage.