

# Effect of gamma irradiation on the physicochemical properties of pistachio (*Pistacia vera* L.) nuts

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## Abstract

The effects of  $\gamma$ -irradiation at doses of 0, 1, 1.5, 2, 4, and 6 kGy on the physicochemical and sensory properties of pistachio nuts were investigated. The results showed that the total phenol content and antioxidant activity of the pistachio samples enhanced significantly with increasing  $\gamma$ -irradiation dose up to 2 kGy, whereas their values significantly reduced at doses of 4 and 6 kGy. A similar trend was observed for sensory attributes of pistachios and the highest scores were recorded at 2 kGy. The irradiation reduced the soluble protein content and affected the soluble protein profiles, either in the pattern or in the intensity of the protein bands. The irradiation at each dose reduced the chlorophylls and carotenoids levels, and brightness parameters of pistachios color; higher doses caused a notable loss in pigments and the pistachio became darker. The number and concentration of volatile components isolated and identified significantly exhibited with increasing the irradiation doses. The irradiation also caused the alteration of the fatty acids composition of pistachios, which was a remarkable increment in the relative amounts of saturated fatty acids and a decrement in the unsaturated fatty acids. In conclusion, the data showed dose-dependent differences in characteristics studied. Overall, it is recommended that mild  $\gamma$ -irradiation ( $\leq 2$  kGy) promised the quality of pistachios without affecting the physicochemical, structural properties, and sensory acceptance.