

**Title** Effect of  $\gamma$ -irradiation on the physicochemical and sensory properties of raw unpeeled almond kernels (*Prunus dulcis*)

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### Abstract

The present study evaluated the quality of raw unpeeled almonds as a function of irradiation dose in order to determine dose levels causing minimal undesirable changes to almonds. Physicochemical (color, peroxide value, hexanal content, fatty acid composition, volatile compounds) and sensory (color, texture, odor, taste) properties of almonds were determined as a function of irradiation dose.

Results showed a ten-fold increase in peroxide value (PV) after irradiation at a dose of 7 kGy. A small but statistically significant ( $p < 0.05$ ) change was observed in hexanal concentration as a result of irradiation. No statistically significant ( $p > 0.05$ ) changes were recorded in polyunsaturated fatty acids (PUFA) up to a dose of 7 kGy while monounsaturated fatty acids (MUFA) decreased manifested as a respective increase in saturated fatty acids (SFA) up to 3 kGy. Volatile compounds such as aldehydes, ketones and alcohols increased with increasing irradiation dose indicating enhanced lipid oxidation. Color parameter  $L^*$  decreased ( $p < 0.05$ ) at doses  $> 3$  kGy while color parameters  $a^*$  and  $b^*$  remained unaffected by irradiation. Sensory analysis showed that almonds remained organoleptically acceptable up to a dose of 3 kGy.

*Industrial Relevance:* Irradiation is very efficient in controlling insects and growth of aflatogenic *Aspergillus spp.* in dry nuts.