

Effects of gamma irradiation on the protein characteristics and functional properties of sesame (*Sesamum indicum* L.) seeds

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Abstract

This study was aimed at investigating the effect of gamma irradiation at various doses (0.5, 1.0, 1.5 and 2.0 kGy) on protein characteristics and functional properties of sesame seeds. Gamma radiation at high doses (>1.0 kGy) significantly ($P \leq 0.05$) increased globulin and albumin fractions of sesame protein. Concomitant ($P \leq 0.05$) increase of in-vitro protein digestibility was noticed in irradiated sesame flour compared to non-irradiated sample. Maximum protein solubility was observed in sesame flour irradiated at 1.0 kGy. SDS-PAGE electrophoretic patterns of total sesame protein were not affected by irradiation process. Significant enhancement ($P \leq 0.05$) in emulsification capacity (EC) and emulsion stability (ES) was recorded after irradiation at a dose level of 1.0 and 1.5-2.0 kGy, respectively. Foaming capacity reached a significantly maximum value in sesame flour irradiated at 1.0 kGy while foaming stability was not significantly affected by gamma irradiation. It can be concluded that gamma radiation enhances the protein and functional properties of sesame flour and thus can be employed as an effective method of preserving sesame flour and its products.

Keywords: Gamma irradiation; Functional properties; Protein digestibility; Protein fractions; Sesame flour

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