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Effects of electron-beam irradiation on fatty acids profile of *Agaricus bisporus* Portobello

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The knowledge about the composition of mushrooms used in food has been increasing in recent years, but their high perishability leads to immediate quality losses after harvesting, which is a drawback for the distribution and marketing of the fresh product. Furthermore, mushrooms have a great popularity all over the world, but data on alternative technologies to increase their shelf life of mushrooms are insufficient. Irradiation is a technique recognized as safe and effective for conservation, and is widely used to extend the shelf life of raw foods.
This work evaluates the effects of storage time (ST) (0, 4 and 8 days) and electron-beam (EB) irradiation on fatty acids profile (characterized by GC-FID) of fresh samples of *Agaricus bisporus* Portobello. The irradiation was performed with a 10 MeV energy irradiator at doses of 1, 2 and 5 kGy.
ST and EB irradiation had a cooperative effect (*i.e.*, the interaction among factors was significant, p-value < 0.05) over fatty acids profile. Comparing each factor individually, EB had a more noticeable effect than ST; in fact, the differences among fatty acids percentages for each EB dose were significant in all cases except C18:1n9c (oleic acid), while ST had no significant effects on C12:0, C13:0, C15:0, C18:1n9c, C18:2n6t, C18:3n3, C21:0 and MUFA. Linoleic acid (C18:2n6c) was the most abundant acid (≈78%), presenting slightly higher percentages in mushrooms irradiated with 1 kGy, showing in turn a minor decrease after 8 days of storage. Palmitic acid (≈8%) and stearic acid (≈4%), were the other main fatty acids in *A. bisporus*. Despite the detected differences, mushrooms presented a similar profile either within different EB doses, as well as along ST. Nevertheless, the 4-days storage maintains the fatty acids profile in higher extent than the 8-days storage; likewise, the best EB dose resulted to be 1 kGy.

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