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EFFECT OF GAMMA RADIATION ON MYCOTOXINS SOLUTIONS

Calado T.¹, Antonio A.L.^{2,3}, Rodrigues P.², Cabo Verde S.³, Abrunhosa L.¹,
Venâncio A.¹

¹IBB - Institute for Biotechnology and Bioengineering – Universidade do Minho, Braga, Portugal

²CI/MO/ESA- Instituto Politécnico de Bragança, Bragança, Portugal

³Campus Tecnológico e Nuclear, Instituto Superior Técnico, Universidade Técnica de Lisboa,
Sacavém, Portugal

avenan@deb.uminho.pt

Due to the high toxicity of mycotoxins, many methods have been used to reduce or eliminate them from food and feed. Gamma radiation is one technique that has been investigated with some promising results in degradation of some mycotoxins from food. The aim of this study was to clarify the effect of gamma irradiation on aflatoxin B1 (AFB1) aflatoxin B2 (AFB2), aflatoxin G1 (AFG1) and aflatoxin G2 (AFG2), ochratoxin A (OTA) and zearalenone (ZEN). The effect of the presence of moisture during the irradiation process was evaluated. Solutions with the same initial mycotoxin concentration were submitted to gamma radiation doses ranging from 0 to 10.0 kGy, at distinct moisture level – dehydrated, in water, and in methanol:water solution. Mycotoxins levels were determined by high-performance liquid chromatography with fluorescence detection (HPLC-FL), and photochemical post-column derivatization (for aflatoxins). The results showed degradation of mycotoxins with doses above 3.0 kGy, but only when irradiated in aqueous environment. With dehydrated samples, no significant reduction was observed. The results showed that gamma radiation was effective in reducing the mycotoxins concentration, but the presence of water (mainly due to the formation of hydroxyl radicals) had a very significant effect.

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