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Detection of irradiated foods using TL, ESR and GC/MS

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Food irradiation technique is extremely effective at reducing food-borne illness as well as losses caused by pathogenic microorganisms. However, there is a need to detect the use of food irradiation to ensure that food is labeled correctly. In present, several methods are available to detect irradiated food. Among them, thermoluminescence(TL), electron spin resonance(ESR) and gas chromatography/mass spectrometry(GC/MS) detection are the leading techniques. The aim of this study is to set up applicability for foods which are not allowed to be irradiated in Korea. The groups of dried fruits and seeds were collected. The results showed that it is possible to apply TL method to all foods with mineral. In ESR method, food containing sugar showed radiation-induced crystalline sugar radicals, but the others did not exhibit radiation-induced radicals. In case of seeds, GC/MS method was applied and radiation-induced hydrocarbons were observed. According to the conclusion based on our experimental results, TL, ESR and GC/MS methods were successfully applied to examine irradiated and non-irradiated foods.

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