



COMPARATIVE STUDY ON THE EFFECT OF GAMMA IRRADIATION ON THE QUALITY OF TILAPIA AND TUNA FISH FILLETS

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ABSTRACT

Gamma irradiation is a novel pasteurization method which is used to enhance the shelf-life of various food materials. The present study was conducted to evaluate the effect of gamma irradiation on microbial and chemical quality of tuna and tilapia fish varieties. Fish fillets were collected from local market and irradiated using 3 kGy dose of Cobalt-60 gamma source. Total Plate Count (TPC), lipid percentage, free fatty acid value and fatty acid composition of samples were analyzed before and after irradiation. TPC of non-irradiated tilapia and tuna samples were 1.635×10^4 cfu/ g and 8.035×10^4 cfu/ g, respectively. However, the counts of irradiated samples significantly ($p < 0.05$) reduced to 2.5×10^2 cfu/g and 7.78×10^2 cfu /g respectively. No any significant difference found in both irradiated tilapia and tuna samples in lipid percentage with respect to non-irradiated samples. Irradiated tilapia and tuna fish samples showed lower values of free fatty acid percentages (29.04% and 71.06 %) than non-irradiated samples (45.51% and 73.51%). Total saturated fatty acids of non-irradiated tilapia were increased from 43.84% to 46.52% after irradiation. Total polyunsaturated and omega-3 polyunsaturated fatty acids were also increased in both fish species with irradiation. However, omega -6 fatty acids were increased with the irradiation in tilapia but reduce in tuna samples, but no significant difference were found. The study revealed that the gamma irradiation reduces the bacterial counts and free fatty acids in both tuna and tilapia fish, but the variation of fatty acid composition needed to study further for final conclusion.

Keywords: Gamma irradiation, microbial, chemical, quality, fish

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