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Impacts of gamma irradiation on microbial and chemical quality of Tilapia *(Oreochromis sp.)* fish fillets

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The study was carried out to evaluate the impact of gamma irradiation on the microbial and chemical quality of tilapia (*Oreochromis sp*.) fish fillets. Fish samples were collected from the Mahakanadarawa tank in the Anuradhapura District, degutted and filleted. The samples were irradiated at 5 kGy, 7 kGy and 10 kGy by a Co-60 gamma source. Influences of the irradiation on total plate count (TPC; n=5), free fatty acid value (FFA; n=2) and peroxide value (n=2) were investigated with respect to non-irradiated (control) samples. TPC showed that bacterial growth in fish fillets were greatly affected by irradiation. The bacterial load of control sample was the maximum (3.611×10^5cfu/g) followed by 5 kGy irradiated fish fillets (1.266×10^3cfu/g).The 7 and 10 kGy irradiated samples showed sterilized conditions that resulted in very low bacterial growth. All irradiated samples showed significant reduction of bacterial load with respect to non-irradiated samples. Non-irradiated samples showed the lowest peroxide value (42.44±2.83 m.eq/1000g) while irradiated samples showed higher values. Seven and 10 kGy irradiated samples showed significant increment of peroxide value with the control samples. Peroxide values of 5 kGy irradiated samples were not significantly different from the control samples, however were significantly increased in the 7 and 10 kGy irradiated samples. Non-irradiated samples showed 8.58±0.54 % FFA while 5, 7 and 10 kGy samples showed 4.31±0.73 %, 11.86±0.14 % and 1.41±0.12 %, respectively. Seven kGy irradiated samples showed the highest FFA value while 10 kGy irradiated samples showed the lowest. The microbiological results indicated that tilapia fillets can be preserved with gamma irradiation with no significant chemical effect.

Keywords: Gamma irradiation, tilapia, FFA, TPC, peroxide value

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