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**Effect of gamma irradiation on physico-chemical and sensory properties of a high energy cereal bar**

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Gamma-irradiation is a preservative technique that has a growing trend of application in the modern food production systems. Sterilization using gamma irradiation causes lethal effects of ionizing radiation on microbial populations through penetrative power of Cobalt-60. The objective of this study was to develop a high energy cereal bar with an extended shelf life using gamma irradiation, to be used as an emergency food targeting security forces and people affected by environmental disasters.

Three formulations of high energy cereal bars were developed using different local ingredients. The best cereal bar formulae was selected based on the proximate composition and high calorific value. Samples were packed in selected commercial grade packaging and subjected to three treatment doses of gamma irradiation at 10 kGy, 20 kGy and 30 kGy. The untreated sample (0 kGy) was considered as the control and its protein, fat, crude fiber, moisture, carbohydrates and energy value were 19.77%, 13.58%, 2.34%, 5.32%, 56.45% and 427.20 kcal, respectively. The sensory properties of treated and untreated energy bars were determined using a 9 point hedonic scale with 12 trained panelists. Gamma irradiation showed significant differences ( $p < 0.05$ ) in the sensory properties of taste and odour at 20 kGy and 30 kGy compared to 10 kGy and control. Peroxide value was significantly ( $p < 0.05$ ) high at 20 kGy and 30 kGy. Protein content decreased with increasing irradiation dose. Present study indicated that the best irradiation dose to preserve the nutritional and sensory properties of formulated high energy cereal bar was 10 kGy.

Keywords: Cereals, energy bar, gamma irradiation, irradiation doses

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