

Effect of Gamma Irradiation on Microbiological and Physicochemical Properties of Dehydrated Carrot (*Daucus carota L.*) and Dehydrated Ripe Jackfruit (Waraka) (*Artocarpus heterophyllus L.*)

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Dehydrated ripe Jackfruit (waraka) and carrot have a high demand in the local and export market due to their health benefits and the use as ingredients for the food industry. The study was carried out to evaluate the effect of different gamma irradiation doses on physicochemical parameters and microbial quality of dehydrated waraka and carrot in Sri Lanka. Dehydrated waraka and carrot samples were collected and irradiated at doses of 0 kGy, 2 kGy, 4 kGy, 6 kGy, 8 kGy, and 10 kGy by industrial Co-60 gamma irradiator at dose rate 5.3 of Gy min⁻¹. Under physical parameters, water activity and moisture content were measured for each of the treatments. Total plate count, yeast, and mold count and coliform counts were determined by using ISO modified method. Antioxidant content by following DPPH free radical scavenging method, total phenolic content by following Folin- Ciocalteu (FC) method, and beta carotene content by using AOAC 1980 method was analyzed in all the irradiated samples and non-irradiated samples and all physicochemical and microbial treatments were replicated in three times. The average moisture content of irradiated waraka and carrot samples was 97.04±0.09% and 96.37±0.09% respectively. The average water activity of irradiated waraka and carrot samples was 0.49±0.00 and 0.50±0.00 respectively. Antioxidant activity and total phenolic content of the waraka and carrot samples showed no significant difference (P>0.05) among different-irradiation doses. However, the content of beta carotene has been reduced (P<0.05) with the increase of irradiation-dose. Both irradiated waraka samples and carrot samples showed a reduction (P<0.05) of total plate count with the increase of irradiation dose. There was no growth of yeast and mold and *Escherichia coli* in all the gamma-irradiated samples. It was concluded that the most preferable irradiation doses for preserving the physical and nutritional quality and microbial safety of dehydrated waraka and dehydrated carrot were 2 kGy and 4 kGy.

Keywords: Dehydration, Waraka, Carrot, Gamma irradiation, Dose