

## Natural Radioactivity in Foods Consumed in Turkey

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**Abstract :** This study aims to determine the natural radioactivity levels in some foodstuffs produced in Turkey. For this purpose, 48 different foods samples were collected from different land parcels throughout the country. All samples were analyzed to designate both gross alpha and gross beta radioactivities and the radionuclides' concentrations. The gross alpha radioactivities were measured as below  $1 \text{ Bq kg}^{-1}$  in most of the samples, some of them being due to the detection limit of the counting system. The gross beta radioactivity levels ranged from  $1.8 \text{ Bq kg}^{-1}$  to  $453 \text{ Bq kg}^{-1}$ , larger levels being observed in leguminous seeds while the highest level being in haricot bean. The concentrations of natural radionuclides in the foodstuffs were investigated by the method of gamma spectroscopy. High levels of  $^{40}\text{K}$  were measured in all the samples, the highest activities being again in leguminous seeds. Low concentrations of  $^{238}\text{U}$  and  $^{226}\text{Ra}$  were found in some of the samples, which are comparable to the reported results in the literature. Based on the activity concentrations obtained in this study, average annual effective dose equivalents for the radionuclides  $^{226}\text{Ra}$ ,  $^{238}\text{U}$ , and  $^{40}\text{K}$  were calculated as  $77.416 \mu\text{Sv y}^{-1}$ ,  $0.978 \mu\text{Sv y}^{-1}$ , and  $140.55 \mu\text{Sv y}^{-1}$ , respectively.

**Keywords :** foods, radioactivity, gross alpha, gross beta, annual equivalent dose, Turkey

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