

عنوان مقاله:

Radiological Assessment of the Artificial and Natural Radionuclide Concentrations of Wheat and Barley Samples in Karbala, Iraq

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خلاصه مقاله:

Introduction: Artificial and natural radionuclides exist in the environmental materials, such as water, soil, rocks, and plant as well as in animals and human body tissues. Therefore, human being and environment are at constant radiation exposure. Regarding this, the present study aimed to determine the specific activities of radionuclides and perform the risk assessment wheat and barley samples in Karbala, Iraq. Materials and Methods: In this study, natural and artificial radioactivity concentrations were determined in wheat and barley samples, as well as their surrounding soil, using gamma ray spectrometry method by means of a high-purity germanium (HPGe) detector with 88% relative efficiency. According to the measured specific activities of radionuclides in food samples and according to annual consumption of wheat and barley by adult person excess lifetime cancer risk due to ingestion of radionuclides was calculated. Results: Specific activities of ^{226}Ra , ^{232}Th , ^{40}K , and ^{137}Cs in the soil samples varied within the ranges of 29.37-38.86, 23.24-45.70, 291.15-549.78, and 1.25-10.82Bq/kg, respectively. The excess lifetime cancer risk due to the ingestion of wheat and barley were calculated as 0.013×10^{-3} and 0.006×10^{-3} , respectively, which are lower than the maximum acceptable value (10^{-3}). Conclusion: As the findings of the present study indicated, the specific activities of natural radionuclides in the soil were close to that of the world average. The observation of artificial radiocaesium, which is released by nuclear accidents or weapon test, in all soil samples was indicative of the pollution of the studied regions by radioactive dust.

کلمات کلیدی:

Barley, Dose, Radionuclides, Soil, Wheat

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