عنوان مقاله:

Spatial distributions of natural radionuclide concentrations of bottled mineral water: doses estimation and health risk assessment

محل انتشار:

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خلاصه مقاله:

Background: Evaluation of the various types of water reveal that groundwater comprises 99% of the earth’s available fresh water. Many factors affect the type and degree of mineralization, as well as the natural radionuclides content in these types of water. The consumption of bottled natural mineral water, which comes from groundwater, among Iranians is gradually increasing. Therefore, the detection of high concentrations of radionuclides, associated with consumption of groundwater, is proposed as a public health problem in several areas. Methods: In this study, the activity concentration of natural radionuclides such as 226Ra, 228Ra, 210Pb, and 40K, annual effective dose for three age groups (<1 year, 7-12 years, and >17 years), and excess lifetime cancer risk due to the ingestion of natural radionuclides present in 70 different commercial bottled mineral waters from most provinces of Iran, were evaluated. Activity concentrations were measured using gamma spectrometry and a high purity germanium detector (HPGe). Results: The results showed that the activity concentrations of natural radionuclides were higher than those reported in the same studies in other countries. Also, the annul effective dose for the three age groups was much higher than the recommended value (0.1 mSvyr-1), as reported by the WHO. The excess lifetime cancer risk for three radionuclides, 226Ra, 228Ra, and 40K, were less than the acceptable value of 10-3 for radiological risk, while the risk for 210Pb was higher than the recommended value. Conclusion: According to the results of this study, the frequent

.use of bottled waters produced in different provinces of Iran possess health hazards to consumers

کلمات کلیدی:

Mineral waters, Spectrometry, Gamma, Radium-226, Potassium-40, Iran