
NATURAL RADIONUCLIDES IN FOOD AND WATER FROM A HIGH BACKGROUND RADIATION AREA IN A BRAZILIAN SOUTHWEST REGION

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Objective

- The objective of this work is to determine the radioactive elements of the natural series which are radiologically relevant and present in the diet of the population in a southeastern region of Brazil, that is an area of high background radioactivity.

Methodology

- Gamma Spectrometry – ^{40}K
- Ultra Low Level Alpha and Beta Total Counting – ^{210}Pb , ^{226}Ra , and ^{228}Ra
- Alpha Spectrometry – ^{210}Po , ^{232}Th , ^{230}Th , ^{228}Th , ^{234}U , ^{235}U and ^{238}U

Summary of Results

Radionuclides	Dose Coefficient (mSv/Bq)	Effective Dose (mSv/day)
⁴⁰ K	6.20×10^{-6}	7.53×10^{-4}
²¹⁰ Pb	6.80×10^{-4}	4.18×10^{-4}
²¹⁰ Po	2.40×10^{-4}	6.26×10^{-5}
²²⁶ Ra	2.80×10^{-4}	4.41×10^{-5}
²²⁸ Ra	6.70×10^{-4}	2.24×10^{-4}
²²⁸ Th	7.20×10^{-5}	1.54×10^{-5}
²³⁰ Th	2.10×10^{-4}	9.99×10^{-7}
²³² Th	2.20×10^{-4}	9.79×10^{-7}
²³⁴ U	4.90×10^{-5}	8.28×10^{-7}
²³⁵ U	4.60×10^{-5}	2.63×10^{-8}
²³⁸ U	4.40×10^{-5}	5.42×10^{-7}
Total		1.52×10^{-3}
Total Effective Dose (mSv/year)		5.55×10^{-1}

- The total effective dose acquired by ingestion, of the urban population in the Poços de Caldas Plateau, presented a total value of 0.555 mSv/year, and such values do not cause any health damage.