

EXPOSURE DUE TO RADIONUCLIDES IN FOOD OTHER THAN
DURING A NUCLEAR OR RADIOLOGICAL EMERGENCY.
PART 1: TECHNICAL MATERIAL

SAFETY REPORTS SERIES NO. 114

(STI/PUB/1996)

CORRIGENDUM

1. page 99 – Figure captions
 - **Current text:** FIG. 14. Radon226 activity in food confidence interval for the arithmetic mean and 95th percentile values.
 - **Correct text:** FIG. 14. Radium226 activity in food confidence interval for the arithmetic mean and 95th percentile values.
2. page 128 – unit of number
 - **Current text:** WHO has set screening levels of 500 mBq/L for gross alpha activity and 1000 Bq/L for gross beta activity.
 - **Correct text:** WHO has set screening levels of 500 mBq/L for gross alpha activity and 1000 mBq/L for gross beta activity.
3. page 173

Annex II

STATISTICAL ANALYSES OF NATURAL
RADIONUCLIDES IN FOOD

A large volume of data has been collated on natural radioactivity in food from the scientific literature and from Member States (Section 5.2). Statistical analyses have been conducted for ^{210}Po , ^{210}Pb , ^{226}Ra and ^{228}Ra in various foods to determine the variability of the naturally occurring radionuclides in foods and, in some cases, to derive the upper 95th percentile of the population. A full description of the statistical approach is provided in Section 5.3. The results from the statistical analyses of ^{238}U

and ^{232}Th are not reported, given the inherent issues with the measurement techniques used (Section 5.3.3.1).

The results from the statistical analyses are presented in the tables in Section 5.3.3. Statistical analyses could not be conducted on all radionuclide–food subcategories due to time constraints, and some samples did not have a sufficient sample size for appropriate analyses. The determination of an appropriate sample size was based on a consideration of the power of the goodness of fit tests that were used to check log-normality and also on the accuracy of the estimates produced, in particular for the confidence intervals for the mean and the 95th percentile values. The median values of the radionuclide–food subcategories where statistical analyses were not performed are outlined in Table II–1.

In some cases, the median values reported have been derived from a very small number of data points ($N \leq 15$); this is denoted by an ‘L’ in the table (Limited Data). In other instances, the data available for analysis was heavily reliant on data from a single study; that is, more than 90% of the data was from a single study, or all of the data was from a single study. This is denoted by an ‘S’ in the table. Therefore, the limitations associated with these median values need to be considered if this data is to be utilised for further research or surveys.

TABLE II.1 MEDIAN ACTIVITY CONCENTRATIONS OF RADIONUCLIDE- FOOD SUBCATEGORIES NOT INCLUDED IN STATISTICAL ANALYSES.

Food Subcategory	Median activity concentration (Bq/kg, fresh weight)								
	²¹⁰ Pb	²¹⁰ Po	²²⁶ Ra	²²⁸ Ra	²²⁸ Th	²³⁰ Th	²³² Th	²³⁵ U	²³⁸ U
Beverages	0.115 ^L	0.042 ^S	0.211	0.415 ^L	4.650 ^L	—	0.025 ^L	—	0.004
Bivalves	*	*	*	*	0.253	0.204	0.129	0.133	0.210
Crustacean	*	*	*	0.418 ^L	0.070	0.156	0.770	—	0.048
Eggs	0.090 ^L	0.069 ^L	0.121	0.094	0.061 ^L	0.249 ^L	0.005 ^L	—	0.081 ^L
Freshwater Fish	*	*	*	*	0.655 ^L	0.330	0.325 ^L	0.106 ^L	0.029 ^L
Fruit	*	*	*	*	0.032	0.030	0.008	0.001 ^{L S}	0.012
Grain	*	*	*	*	0.090	0.002 ^L	0.435	0.025 ^L	0.160
Herbs	0.591 ^L	1.000	0.320	0.180	2.900 ^L	0.455 ^L	0.058 ^L	0.003 ^L	0.133 ^L
Honey and Sugar	0.112 ^L	0.230 ^S	0.049	0.188 ^L	0.142 ^L	0.014 ^L	0.002 ^S	—	0.008
Non-root Vegetables	*	*	*	*	0.042	0.040	0.041	0.014 ^L	0.030
Liquid Milk	*	*	*	*	0.013	0.230	0.078	0.011 ^L	0.04
*: Statistical Analyses conducted, see Section 5.3.3									
—: No Data									
L: Limited Data (≤ 15 data points)									
S: Analysis reliant on > 90% of data from a single study									

TABLE II.1 MEDIAN ACTIVITY CONCENTRATIONS OF
RADIONUCLIDE- FOOD SUBCATEGORIES NOT INCLUDED IN
STATISTICAL ANALYSES.

Food Subcategory	Median activity concentration (Bq/kg, fresh weight)								
	²¹⁰ Pb	²¹⁰ Po	²²⁶ Ra	²²⁸ Ra	²²⁸ Th	²³⁰ Th	²³² Th	²³⁵ U	²³⁸ U
Milk Products	0.444	0.150	0.084	0.139 ^{L S}	0.110 ^{L S}	0.020 ^L	0.150 ^L	0.002 ^L	0.013
Mushrooms	*	0.550	0.300 ^L	0.260 ^L	—	0.073 ^L	0.048 ^L	0.007 ^L	0.037 ^L
Non-bivalve molluscs	*	*	0.087	0.039	0.605 ^S	0.754 ^S	0.380	0.314 ^S	0.825
Nuts	0.126 ^L	0.101 ^L	0.280 ^L	13.115 ^L	12.600 ^L	0.011 ^L	9.408 ^L	—	0.006 ^L
Offal	0.520 ^L	0.719 ^L	—	—	—	—	0.026 ^L	—	0.023 ^L
Root Vegetables	*	*	*	*	0.042	0.008	0.143	0.010 ^L	0.100
Saltwater Fish	*	*	*	*	0.026	0.001 ^L	0.052	0.002	0.030
Seaweed	*	*	0.360 ^L	0.140 ^L	0.389 ^{L S}	0.044 ^{L S}	0.031	—	0.375

*: Statistical Analyses conducted, see Section 5.3.3
 —: No Data
 L: Limited Data (≤ 15 data points)
 S: Analysis reliant on > 90% of data from a single study