


Detection Limit

ND: Abbreviation of "Not Detected"

ND = The measured value was less than the detection limit.

 The measured value was zero.

The measurement result "ND" means that
the measured value was less than the detection limit.

Detection limits vary depending on measurement time and the sample amount.
Detection limits are set by each measurement laboratory in accordance with the purpose
of the measurement.

◆ The longer the measurement time is, the
lower the detection limit becomes.

The measurement time is increased by X times.

→ The detection limit becomes $\frac{1}{\sqrt{X}}$ times.

Example 1: When the measurement time is doubled,
the detection limit becomes $\frac{1}{\sqrt{2}}$ times.

Example 2: In order to lower the detection limit from
60 Bq/kg to 30 Bq/kg, the measurement time needs
to be increased by four times.

◆ The larger the sample amount is, the lower
the detection limit becomes.

Example: If the detection limit is 200 Bq/kg when the
sample amount is 0.2 kg, increasing the sample
amount to 1 kg leads to lowering the detection limit
to 40 Bq/kg.

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https://www.maff.go.jp/j/syouan/seisaku/data_reliance/maff_torikumi/pdf/rad_kensyu.pdf (in Japanese)

Results of the measurement of radioactivity or dose rates are sometimes indicated as "Not Detected (ND)."

This does not mean that there is no radioactive material but means that the measured concentration of radioactive materials is below the measurable detection limit.

Detection limits vary depending on the measurement time and the sample amount, and in general, the longer the measurement time is and the larger the sample amount is, the lower the detection limit becomes. When setting a detection limit lower, even a small amount of radioactive materials can be detected, but required time and cost are larger and this may lead to a decrease in the number of samples to be tested. Accordingly, detection limits are set by individual analytical laboratories in accordance with the purpose of the measurement.

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