

Bioaccessibility for Human Health Risk Assessment

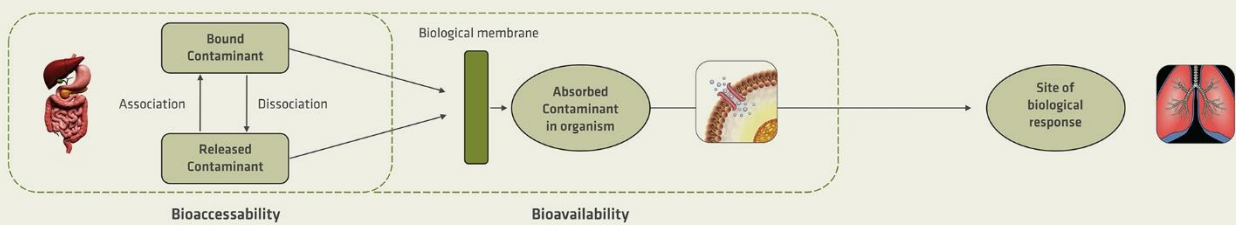


ANALYTICA
LABORATORIES

Analytica are now providing accredited testing for Bioaccessibility in Lead and Arsenic

Testing for heavy metals in soil samples normally quantifies the total metal content in the sample using a robust extraction procedure. This may overestimate the amount of that element that will be actually taken up by humans if soil is ingested.

Accredited Bioaccessibility testing of soils is now available from Analytica, along with calculated Bioavailability.

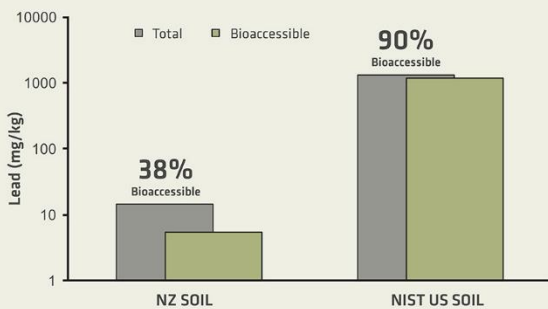


BIOACCESSIBILITY

Bioaccessibility testing estimates the amount of metal that will become soluble and available for absorption in the human digestive system. The test method involves drying the soil sample, and sieving to <2 mm. The sieved sample is extracted using a simulated gastric extraction – glycine/hydrochloric acid solution at 37°C – before analysis using ICP-MS.

LEAD BIOACCESSIBILITY

Comparison of the Total Lead vs the Bioaccessible Lead. This shows there is no fixed trend between the Total metal concentration and the Bioaccessible concentration.

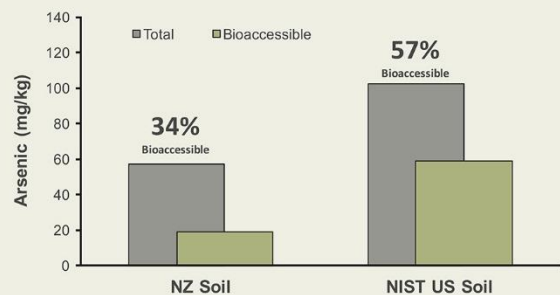


BIOAVAILABILITY

Bioavailability refers to the proportion of a contaminant that is actually absorbed into systemic circulation. It is accurately measured using in-vivo trials involving live subjects, but this is ethically challenging and expensive. A less accurate measure can be obtained by a calculation involving Total metal content and Bioaccessible metal content in a sample.

ARSENIC BIOACCESSIBILITY

Comparison of the Total Arsenic vs the Bioaccessible Arsenic. This shows there is no fixed trend between the Total metal concentration and the Bioaccessible concentration.



OPERATIONAL COMMENTS

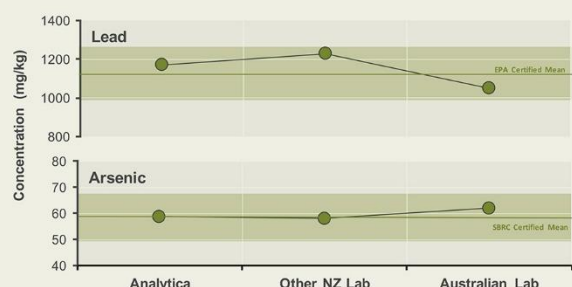
A low throughput method, meaning that it is best to plan ahead with the laboratory (especially if there are significant sample numbers).

Calculation of Bioavailability is free of charge, and uses an approach recommended by the EPA. It requires analysis of both Total and Bioaccessible metals in a sample.

IANZ audit completed and accreditation is pending. Likely to be in place pre-Christmas 2018.

INTER-LABORATORY COMPARISONS

Analytics performed within the certified limits of Standard reference Material NIST 2711A. Analytica performed well compared to another NZ and Australian lab.



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