# **Application and Limitations of In Vitro Gastrointestinal Methods for Estimating Bioavailable Cd, Pb, and As in Contaminated Soil. (S11-basta082229-Oral)**

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### Abstract:

Soil ingestion by children is an important exposure pathway in the assessment of public health risk from contaminated soils. Because soil ingestion often drives the risk, gastrointestinal (GI) heavy metal bioavailability becomes a public health soil quality parameter. Several inexpensive in vitro chemical extraction methods have gained popularity as a surrogate method to estimate relative bioavailable Pb, As, Cd. In vitro GI methods are correlated with in vivo bioavailable As, Pb, and Cd in untreated contaminated soil. They have also been used to evaluate the efficacy of remediation treatments. In this paper, limitations where accurate measurement of GI metal bioavailability is most likely are discussed. These limitations include protocol conditions (extraction pH), diet (fasting vs. non fasting), and solid waste matrix. In vitro extraction pH greatly affects Pb but not As availability and results suggest gastric extraction pH of 2 to 2.5 are the most accurate for treated soils. The presence of food decreases in vitro GI Pb and Cd but not As. Research required to define limits and ensure accurate application of in vitro GI methods will be presented.

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