# As, Cd and Pb bioavailability in contaminated soils: method development and application to soil remediation

**LENA Q. MA[1,2], HB LI[1], J LI[1], SW LI[1], AND AL JUHASZ[3]**

[1]Nanjing University, School of the Environment, Nanjing, China; lqma@ufl.edu
[2]Soil and Water Science Department, University of Florida, USA
[3]University of South Australia, Future Industries Institute, Mawson Lakes, Australia

When considering metal exposure via incidental ingestion of contaminated soils, its daily intake is influenced by bioavailability. Although preferable, cost and ethical considerations limit use of animal models to determine metal bioavailability. Therefore, in vitro assays have been developed to determine metal bioaccessibility including SBRC, IVG, DIN, PBET, and UBM assays. The objectives of this study were to select proper animal model to determine metal bioavailability and develop in vitro assays to determined metal bioaccessibility in contaminated soils.

Different animal models (swine and mouse), different feeding schemes (blood AUC and SSUE) and different endpoints (liver, kidneys, and femur) were used to determine As, Cd and Pb bioavailability in contaminated soils. Based on our data, mouse SSUE model using kidneys as endpoint is suitable to determine As, Cd and Pb bioavailability in contaminated soils. The As, Cd, and Pb bioavailability in contaminated soils were 6.4-73%, 37-84% and 7.0-84% respectively. Based on strong correlation between in vivo and in vitro data, PBET, IVG and UBM assays can be used to determine As, Cd, and Pb bioaccessibility respectively. It is important to determined metal bioavailability in contaminated soils to minimize the cost of soil remediation as well as select proper method for soil mediation.