Element Speciation in Poultry Litter Leachates. (S02-jackson164237-Oral)

Authors:

- B.P.Jackson - *University of Georgia*
- J.C.Seaman - *University of Gerogia*
- C.W.Wood - *Auburn University*
- P.M.Bertsch - *University of Georgia*
- M.L.Camberato - *Clemson University*
- M.L.Cabrera - *University of Gerogia*

Abstract:
High concentrations of trace elements are found in poultry litter (PL), raising concern over subsequent soil loading. Trace metal solubility may be enhanced by complexation with dissolved organic carbon (DOC). Mineralization of organo-arsenic compounds may result in toxic As(III) and As(V). Speciation of these elements in PL should assist in predicting their fate in soil. Forty PL samples from the Southeast were collected and elemental concentrations were determined. Water soluble extractions (WSE) were performed and anionic and cationic trace element fractions were assessed using ion exchange cartridges. Seven As species were identified and quantified by IC-ICP-MS. Total As concentrations ranged from 1-39 mg/kg, mean total Cu and Zn concentrations were 479 and 373 mg/kg, respectively. Arsenic, Cu, Ni and Se were relatively soluble from PL, (70%, 49%, 41%, and 40% WSE, respectively) while only 6% of Zn was water soluble. Furthermore approximately 40% of soluble Ni and Cu were present as anionic species. Roxarsone was the major As species in 50% of PL samples. For P, 24% was water soluble, and 65% of WSE P was present as phosphate, which

increased to 90% after enzymatic extraction with phytase.

Corresponding Author Information:

Brian Jackson
University of Georgia
P.O Drawer E
Aiken, SC 29802

phone: 803-725-0854
fax: 803-725-3309
e-mail: Jackson@srel.edu

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