Biogenic Phosphate Minerals in Poultry Litter and Implications for Preventing Eutrophication. (S11-good091117-Oral)

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Abstract:

Excess manure phosphorus applied to croplands has increased P losses in runoff and surface water eutrophication. When poultry litter (PL) and dairy manure (DM) were applied to the same soil at the same total P rate, the potential for P loss in runoff was greater from the DM. Poultry litter contains sparingly soluble calcium and magnesium phosphate mineral phases that control water-extractable P concentrations in PL-amended soil, while DM does not. Using scanning electron microscopy coupled with energy dispersive spectroscopy, we found mineral phosphates in PL that resemble biological calcium-magnesium phosphates such as kidney stones. Inositol hexaphosphate (phytate) may be associated with these particles. Our findings show that, in contrast to current models, different animal manures must be managed differently to minimize P losses.

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