What does P-31 NMR tell us about phosphorus in dairy manures?. (S08-reeves061634-Poster)

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Abstract:

Solid-state P-31 NMR analysis with high power decoupling and cross-polarization transfer techniques was used to investigate the organic and inorganic forms of phosphorous (P) in intact dairy manures collected from dairy farms in the Northeastern United States. The total P concentration in the samples varied from 0.06-0.86% of DM. The dry ash content varied from 8-55% of DM. Our results showed that the total P present in dairy manures contained not only inorganic P but also organic P. Phytate P was detected in a significant fraction of the samples analyzed, and was the major component of P in some of the samples. In general, the samples with the lower ash contents showed a high fraction of organic P. This study suggests that dairy manures can contain significant amounts of non-digested phytates, which can be detected through solid-state NMR techniques in intact (non-chemically digested) samples. These results show that under some circumstances phytates can represent a significant source of P in dairy manures with the potential to contribute to soil P for crops or to contribute to ground water contamination caused by the presence of excess P.

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