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## **Dietary Phosphorus Availability In Ruminants Varies By Plant Species**

Barry D. Lambert, Nichole Cherry and James P. Muir

### Abstract Text:

Phosphorus (P) excretion in manure and has become a major problem facing dairy producers in much of the United States. Excess P released into the environment may pollute surface waters leading to eutrophication and excess algal growth. One approach to reducing P excretion is to avoid excess dietary P. Data regarding P availability in feedstuffs is limited and more precise ways of measuring P availability in the digestive tract are needed. In this experiment the mobile nylon bag method was used to determine the disappearance of dry matter (DM) and P in ground corn, corn silage, alfalfa hay, coastal bermudagrass hay, and Tifton-85 bermudagrass hay in steers after ruminal (24 hrs), ruminal + pepsin/HCL (rumen + PH), and ruminal + pepsin/HCL + intestinal (rumen + PH +I) incubation. Ruminal degradation of both P and DM differed ( $P < 0.05$ ) between feedstuffs, and by site of incubation. DM total-tract (rumen + PH + I) availability for ground corn, corn silage, alfalfa hay, coastal bermudagrass hay, and Tifton-85 bermudagrass hay were 90.35, 51.89, 41.66, 69.04, 71.79% respectively. Total tract (rumen + PH + I) P availability for ground corn, corn silage, alfalfa hay, coastal bermudagrass hay, and Tifton-85 bermudagrass hay were 99.22, 92.22, 94.81, 84.55, and 85.36%, respectively. The variability in the availability in P (~15%) indicates that inclusion of a P availability coefficient in ration balancing software could have a measurable impact on subsequent P excretion from dairy cattle. More data concerning P availability as affected by feed ingredient or plant species, maturity and quality are needed to more accurately define P availability in dairy cattle feeds.

### Impact Statement:

This project seeks to decrease phosphorus excretion from ruminant animals through improvements in diet formulation. Our goal is to define differences in phosphorus availability to animals in order to maximize efficiency of phosphorus use in animal systems. Even small decreases in phosphorus excretion on a per cow basis could have large impacts when extrapolated to the watershed level.