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# Effects of Cattle Diets on Nutrient Concentrations in Fecal Patches and Runoff from Small Plots

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High concentrations of N and P in cattle feces stemming from supplemental feed may lead to elevated nutrient levels in runoff. To evaluate nutrient concentrations in artificially induced runoff events, we obtained feces from a previously conducted intake experiment comprised of the following diet treatments: bermudagrass hay (HAY); soybean hulls (LSH); dried distiller's grain (LDG); and an iso-energetic mixture of LSH and LDG (MIX). Average N and P concentrations (%) in feces resulting from each diet were, respectively: HAY (2.4, 0.6), LSH (4.3, 0.5), LDG (3.4, 1.5), and MIX (3.0, 1.8). Fecal material was stored in a freezer at -4°F until being thawed in a refrigerator at 39°F prior to plot application in form of round patties with a diameter of 12 inches and a weight of 4.85 lbs. Plot size was 7 × 3.5 feet. Rain at 2.75 inches/h was applied immediately after feces application (D0) and again after 2 and 7 d on the same undisturbed fecal patch. Ensuing runoff was collected each time after 30 min of rain from the lower end of the plots at a distance of 56 inches away from the fecal patch. Concentrations of N in runoff water were similar for all diet treatments (6.2-6.3 mg/L) except hay (3.8 mg/L; $P<0.05$). Diet treatments did not interact ($P>0.05$) with time of rain. Rain application on d 7 resulted in higher ($P<0.05$) N concentration (6.9 mg/L) than on D0 or d 2 (5.3 and 4.7 mg/L, respectively); no differences between the first two rain applications were observed. Similar to N, P concentrations were independent ($P<0.05$) of time of rain application, but both LDG and MIX (~2.0 mg/L) were higher ($P<0.05$) than HAY and LSH (0.9 and 1.1 mg/L, respectively). In comparison to N, P concentration in runoff after D0 was higher (2.1 mg/L) than on d 2 or d 7 (1.3 and 1.2 mg/L, respectively). Proportions of N and P in fecal patches and runoff followed closely those in diets, but results do not allow speculation regarding the ultimate quantity of edge-of-field losses of these nutrients.

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