

losses (BEL) of phosphorus (P) in growing pigs fed P-free diets with various cellulose concentrations. Twelve barrows with an initial mean BW of 49.6 kg (SD = 3.2) were individually housed in metabolism crates that were equipped with a feeder and a nipple drinker. Pigs were allotted to 4 experimental diets according to a crossover design. Experimental diets, based mainly on corn starch, sucrose, and gelatin, were formulated to contain 0, 4, 8, or 12% of cellulose. Each period consisted of a 5-d adaptation and a 5-d collection period. The marker-to-marker method was used for fecal collection. The feed intake and P intake were linearly and quadratically increased ($P < 0.05$) with increasing cellulose concentration in the diet. There were linear and quadratic increases ($P < 0.05$) in the feces output and feces output per feed intake with increasing cellulose concentration in the diet. However, the P content in the feces was decreased ($P < 0.001$) with increasing dietary cellulose concentration. The apparent total tract digestibility of DM and ash were linearly and quadratically decreased ($P < 0.05$) with increasing cellulose concentration in the diet. However, the BEL of P as mg per kg of DMI (ranged from 157 to 207 mg/kg of DMI) and total P output were not affected by the dietary cellulose concentrations. In conclusion, the dietary cellulose affects the digestibility of DM and ash, but the cellulose up to 12% does not affect the endogenous loss of P.

Key Words: cellulose, metabolic fecal phosphorus, swine

per treatment. The 4 dietary treatments were formed by increasing phytase (Optiphos 2000, Enzyvia LLC) to provide 250, 500, 1000, and 2000 phytase units (FTU)/kg. Diets were corn-soybean meal-based and contained 15% bakery meal and decreasing levels of dried distillers grains with solubles in each phase. Diets were fed in 4 phases from approximately 36 to 59, 59 to 82, 82 to 109, and 109 to 131 kg BW and all phases contained the same phytase concentrations. The first 250 FTU/kg of phytase was considered to provide 0.10% P release in meeting the dietary available P levels of 0.29, 0.28, 0.24, and 0.23% and STTD P levels of 0.32, 0.31, 0.27, and 0.27% in phase 1, 2, 3, and 4, respectively, with further additions exceeding the phosphorus requirement. All other nutrients were provided at or above requirement of the pigs as defined by NRC (2012). All data were analyzed as a completely randomized design with pen as the experimental unit. Overall (d 0 to 92) increasing dietary phytase did not influence ($P > 0.05$) ADG but reduced (cubic, $P < 0.01$) ADFI, resulting in increased G:F (cubic, $P < 0.01$). The cubic response occurred because ADFI was reduced and G:F increased with increased phytase inclusion from 250 to 500 FTU/kg with no response from 1000 to 2000 FTU/kg. Phytase addition to the diet did not influence ($P > 0.05$) carcass measurements. These results suggest that providing phytase up to 500 FTU/kg has the potential to improve feed efficiency.

Key Words: Finishing pigs, phosphorus, phytase

NONRUMINANT NUTRITION: GROW-FINISH NUTRITION AND MANAGEMENT

337 Influence of a superdose of phytase on finishing pig performance and carcass characteristics. J.

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A total of 1188 finishing pigs (PIC 337 × 1050; initially 36.4 kg) were used in a 92-d experiment to determine the influence of providing phytase above that needed to meet the P requirement for growth and carcass characteristics. At initiation of the study pens were randomly allotted to treatments based on initial BW. There were 27 pigs per pen and 11 replications

338 Influence of copper sulfate and tribasic copper chloride on feed intake preference in finishing pigs.

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When supplemented at 125 to 250 ppm, Cu has consistently been demonstrated to increase ADG, mainly through increased feed intake. A total of 150 pigs (initially 86.6 kg) were used in a 15-d study to determine if pigs have a preference to consume diets containing added Cu from either copper sulfate (CuSO₄) or tribasic copper chloride (TBCC, IntelliBond C; Micronutrients, Indianapolis, IN). Pigs were placed in pens by sex (5 pigs/pen), with each sex accounting for 15 pens. On d 0, pens of pigs were individually weighed and pens were randomly allotted to 1 of 3 dietary preference

Table 337.

Item	Added phytase (FTU)/kg				SEM	Linear	Quadratic	Cubic
	250	500	1000	2000				
d 0 to 92								
ADG, kg	1.04	1.03	1.04	1.02	0.008	0.25	0.27	0.54
ADFI, kg	2.64	2.53	2.61	2.57	0.028	0.49	0.72	0.01
G:F	0.393	0.409	0.400	0.398	0.004	0.88	0.20	0.01
BW, kg								
d 0	36.4	36.3	36.4	36.3	0.54	0.94	1.00	0.94
d 92	130.9	130.1	130.9	129.5	1.05	0.42	0.68	0.52