the addition of phytase to pig diets at super-dosed levels catabolizes phytate, resulting in increasing concentrations of inositol and reduced concentrations of phytate.

Key Words: phytate, phytase, inositol

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239 Impact on growth performance and carcass characteristics of ìsuper-dosingî phytase in growing pig diets. C. L. Holloway*[1], R. D. Boyd[2], C. E. Zier-Rush[2], C. L. Walk[3], J. F. Patience[1], *[1]Iowa State University, Ames, [2]The Hanor Company, Inc., Franklin, KY, [3]AB Vista, Marlborough, United Kingdom.*

Previous research has shown that super-dosing phytase may improve pig performance; however the response in grow-out has been inconsistent. This experiment was conducted to determine if performance could be improved by feeding phytase at super-dosed levels, and whether this response would be achieved if energy and amino acids were limiting. Two-thousand two-hundred pigs (36.6 ± 1.0 kg) were split by sex and blocked by initial BW, and randomly allotted to 5 dietary treatments (10 pens per treatment per gender): a fully balanced positive control (PC; SID lysine set at 98% of asymptote; 250 FTU Quantum Blue 5G/kg), a negative control (NC; PC with 15% less SID lysine and 1.5% lower NE), and 3 super-dosing treatments applied to the NC for a total of 1000, 1750, and 2500 FTU/kg. Feed and water were available ad libitum. Data were analyzed using the PROC MIXED procedure of SAS (9.4) with pen as the experimental unit and treatment as a fixed effect. Barrows grew faster than gilts (1.06 vs. 0.90 kg/d; $P < 0.05$), were heavier at marketing (123.6 vs. 120.6 kg; $P < 0.05$) and had a higher dressing percent (74.4 vs. 73.8%; $P < 0.05$). Barrows ate more feed (3.09 vs. 2.62 kg/d; $P < 0.05$) and were less feed efficient than gilts on PC (0.347 vs. 0.360) but not on NC diets (0.338 vs. 0.335 kg/d; Interaction: $P < 0.05$). Barrows responded to super-dosed phytase with improved feed conversion while gilts did not (interaction: $P < 0.05$). Compared to the NC, pigs on the PC were heavier at marketing (125.2 vs. 120.1 kg; $P < 0.05$) and grew faster (1.01 vs. 0.96 kg/d; $P < 0.05$). There was no difference in feed intake between the PC and NC ($P > 0.10$). Super-dosing phytase tended to improve final body weight compared with the negative control ($P = 0.058$). There was no effect of super-dosing phytase on growth rate, feed intake or carcass yield ($P > 0.10$). Super-dosing phytase tended to improve gain:feed on a liveweight basis ($P = 0.08$) although the interaction between treatment and sex was significant ($P < 0.001$): barrows (0.338, 0.339, 0.343, 0.344) vs. gilts: (0.335, 0.338, 0.337, 0.336 for NC, 1000, 1750 and 2500 FTU/kg, respectively); this was also true when feed efficiency was expressed on a carcass basis. In conclusion, super-dosing phytase tended to improve efficiency of gain, suggesting possibly enhanced energy and/or nutrient utilization.

Key Words: super-dose phytase, barrows, gilts

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240 The effect of microbial phytase on the apparent and standardized total tract digestibility of calcium in feed ingredients of animal origin. L. A. Merriman*[1], C. L. Walk[2], H. H. Stein[3], *[1]University of Illinois, Urbana-Champaign, [2]AB Vista, Marlborough, United Kingdom, [3]University of Illinois at Urbana-Champaign, Urbana.*

An experiment was conducted to determine effects of microbial phytase on the apparent (ATTD) and standardized total tract digestibility (STTD) of Ca in meat and bone meal (MBM), meat meal (MM), poultry by product meal (PBPM), or poultry meal (PM). Four corn-potato protein isolate-based diets were formulated to contain 0.70% Ca using MBM, MM, PBPM, and PM as the sources of Ca. All diets also contained 0.33% STTD P with extra P being supplied by monosodium phosphate if needed. Four additional diets that were similar to the previous diets except that they contained 500 units of microbial phytase and a Ca-free diet were also formulated. Growing barrows ($n = 72$; initial BW = 14.91 ± 0.19 kg) were allotted to a randomized complete block design with 9 dietary treatments and 8 replicate pigs per treatment. Experimental diets were provided for 12 d with the initial 5 d being the adaptation period. Total feces were collected for 5 d using the marker-to-marker approach. Results indicated that if no phytase was used, the ATTD and STTD of Ca in PBPM were greater ($P < 0.05$) than in MBM and MM, but values for PM were not different from any other ingredients (Table 240). However, if phytase was added to the diets, no differences in ATTD or STTD of Ca among ingredients were observed. If no phytase was used, no differences among the 4 ingredients were observed for ATTD of P, but if phytase was added, the ATTD of P was greater ($P < 0.05$) for PBPM compared with MM. In conclusion, the addition of microbial phytase did not affect the digestibility of Ca and P in ingredients of animal origin, and only small differences among the 4 ingredients were observed.

Key Words: calcium, phosphorus, pigs

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Table 240. Apparent total tract digestibility (ATTD) of Ca and P and standardized total tract digestibility (STTD) of Ca in meat and bone meal (MBM), meat meal (MM), poultry product meal (PBPM), and poultry meal (PM).

Item	ATTD Ca	STTD Ca	ATTD P
Without phytase			
MBM	74.54[b]	76.83[b]	76.00[b]
MM	74.61[b]	76.97[b]	76.01[b]
PBPM	85.34[a]	87.76[a]	78.30[ab]
PM	80.74[ab]	82.41[ab]	80.12[ab]
With phytase			
MBM	79.66[ab]	81.94[ab]	80.48[ab]
MM	83.25[ab]	85.75[ab]	75.79[b]
PBPM	83.51[ab]	86.66[ab]	85.99[a]
PM	74.31[b]	76.06[b]	77.11[ab]

[a,b]Symbolize statistical significant differences.