

ANIMAL SCIENCE

Title: Targeted use of mega-doses of phytase in late finishing pigs to improve overall growth performance and profits – **NPB #18-086**

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Scientific Abstract:

This project was designed to determine the impact of ultra-dosing phytase, especially during the late finishing period, on growth performance of pigs and to determine if the impact of phytase was dependent on the amino acid concentration of the diet. In Exp. 1, 1,762 pigs (initial BW was 84.3 kg) were randomly allotted to 3 dietary treatments within sex and initial BW blocks (77 pens; 22 to 23 pigs/pen). Treatments included: 1) control (2,250 FTU/kg of phytase); 2) diet with 4,500 FTU/kg of phytase; and 3) diet with 6,750 FTU/kg of phytase. In Exp. 2, 594 pigs (initial BW was 29.5 kg) were blocked by sex and BW and randomly allocated to pen and treatments within blocks (60 pens; 9 to 10 pigs/pen). Treatments were arranged in a 2 x 3 factorial randomized complete block design. Factors included: 1) amino acid concentration (AA; 85% or 100% of standardized ileal digestible (SID) lysine and 2) phytase supplementation (500, 3,000, or 6,000 FTU/kg). Pigs were fed a 4-phase diet program (1.05, 0.89, 0.76, and 0.68% and 0.89, 0.76, 0.65, and 0.58% standardized ileal digestible lysine for phase 1 to 4 for the control and reduced amino acid diets, respectively. In Exp. 1, ultra-dosing phytase decreased ($P \leq 0.05$) ADFI and ADG during the first 2 wk period. Phytase at 4,500 and 6,750 FTU/kg decreased feed intake ($P < 0.01$) for the 35 d period and for the marketing period when supplemented at 4,500 FTU/kg ($P = 0.027$), but not 6,750 FTU/kg ($P = 0.167$). In Exp. 2, reduced amino acid concentrations lowered ($P = 0.037$) ADG and BW during the initial 23 d period and increased ADFI during d 23 to 44 ($P = 0.008$), d 0 to 84 ($P = 0.030$) and d 0 to market ($P = 0.025$). Feed:gain increased with reduced amino acid supply for d 0 to 23 ($P = 0.042$), d 23 to 44 ($P = 0.048$), and d 0 to 84 ($P = 0.045$), but not for d 0 to market ($P = 0.104$). Phytase decreased ($P = 0.015$) feed intake for d 44 to 65 and improved feed efficiency ($P = 0.04$) during the initial phase. For the overall period until market, ultra-dosing phytase to control pigs had no effect on feed efficiency, but 6,000 FTU/kg of phytase improved feed efficiency in pigs fed the reduced amino acid diet (interaction, $P = 0.10$). Back fat depth, loin eye area, and percent lean were not impacted by amino acid supply, phytase, or their interaction. Results indicate that mega-dosing phytase had relatively small effects on growth performance, largely unrelated to dietary amino acid concentration, but slightly reduced feed intake which can save feed costs.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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