

Title: Improving pig performance and economic return by the application of ultra-high doses of phytase in finishing pigs – NPB #17-106

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Date Submitted: August 31, 2018

Revised

Scientific Abstract:

The objective of the current study was to determine the impact of fat and ultra-high inclusion levels of phytase on growth rate, carcass characteristics, and pig viability. A total of 2,150 gilts and barrows (31.4 ± 0.4 kg; Camborough derivative sows x TR-4 sire) were randomly allotted to 6 dietary treatments within sex and initial body weight blocks. Treatments included a control diet (500 FTU/kg of phytase) with no supplemental fat, the control diet with 3,000, 4,500, or 6,000 FTU/kg of additional phytase, the control diet with 4% choice white grease (CWG), and the 4% CWG diet with 3,000 FTU/kg of phytase. Diet phases were: 31 to 50, 50 to 73, 73 to 95, 95 to 113 kg, and 113 until all pigs had been marketed (4 marketing cuts; target market weight was 130 kg). Pigs fed supplemental fat were 2.3 kg heavier at the end of the study, had lower feed intake (4.4%) and improved feed efficiency (7.2%) compared to control pigs ($P < 0.05$). Similarly, hot carcass weight, carcass ADG, and carcass F:G were improved ($P < 0.05$) with the addition of fat to the diet. Supplementation of phytase (3,000 FTU/kg) to the fat-supplemented diet did not improve whole body or carcass performance parameters. Phytase mega-dosing improved whole body F:G (2.75, 2.72, 2.68, and 2.65 for 0, 3,000, 4,500, and 6,000 FTU/kg of phytase respectively; $P < 0.001$) and tended to improve carcass F:G ($P = 0.076$) in a linear manner. The largest improvement in F:G with phytase supplementation occurred during the 95 to 115 kg feeding period (3.76, 3.67, 3.48, and 3.41 for 0, 3,000, 4,500, and 6,000 FTU/kg of phytase respectively; $P < 0.001$) and this was also the case with fat supplementation (3.76 vs. 3.22 for control vs. fat-added). Fat supplementation increased backfat depth and decreased lean percent ($P < 0.001$). On the other hand, phytase supplementation linearly decreased backfat depth ($P < 0.02$) and increased ($P < 0.03$) lean percent. Phytase linearly decreased the percent of full value pigs ($P < 0.03$). The results of the present study suggest that a targeted application of phytase may be more cost-effective than continuous administration. The reduction in full value pigs (as a result of increased mortality and more light, cull pigs) with phytase supplementation needs to be further evaluated as this effect has not been observed in previous studies.

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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