

**TITLE:** Effects of exogenous phytase on the apparent total tract digestibility of energy and phosphorus, and on the standardized total tract digestibility of P in corn, DDGS, HP DDG, and corn germ – NPB #10-073

**Investigator:** Hans H. Stein, Department of Animal Sciences,

**Institution:** University of Illinois.

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## SCIENTIFIC ABSTRACT:

An experiment was conducted to measure the effects of graded levels of microbial phytase on the digestibility of energy and on the standardized total tract digestibility (STTD) of P in corn, distillers dried grains with solubles (DDGS), high protein distillers dried grains (HP-DDG), and corn germ. A second objective was to develop regression equations to predict the response of adding phytase to each of these ingredients. Four corn based diets, 4 DDGS based diets, 4 HP-DDG based diets, and 4 corn germ based diets were formulated. The 4 diets with each ingredient contained 0, 500, 1,000, or 1,500 phytase units (FTU) per kg (Optiphos 2000, Enzyvia, Sheridan, IN). A P-free diet was also formulated to measure the basal endogenous losses of P. A total of 102 pigs (initial BW:  $18.2 \pm 2.1$  kg) were individually housed in metabolism cages equipped with a feeder and a nipple drinker and a screen floor that allowed for total collection of feces. Pigs were allotted to the 17 diets in a randomized complete block design with 6 replicates per diet. Phytase did not have an effect on the digestibility of energy. Supplementation of microbial phytase increased (linear,  $P < 0.01$ ; quadratic,  $P < 0.05$ ) the STTD of P in corn from 40.9 to 67.5, 64.5, and 74.9%, tended to increase (linear,  $P = 0.07$ ) the STTD of P in DDGS from 76.9 to 82.9, 82.5, and 83.0%, increased (linear,  $P < 0.01$ ; quadratic,  $P < 0.05$ ) the STTD of P in HP-DDG from 77.1 to 88.0, 84.1, and 86.9%, and increased (linear and quadratic,  $P < 0.01$ ) the STTD of P in corn germ from 40.7 to 59.0, 64.4, and 63.2% in diets supplemented with 0, 500, 1,000, or 1,500 FTU/kg of phytase, respectively. Regression equations were developed to allow the calculation of the STTD of P with any level of phytase (Optiphos 2000, Enzyvia, Sheridan, IN) for each of the test ingredients. Therefore, results of this experiment allow the prediction of the amount of digestible P in corn and corn germ containing any level of phytase between 0 and 1,500 FTU.

**Key words:** digestibility, energy, endogenous losses, energy, phosphorus, phytase, pig

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**For more information contact:**

**National Pork Board** • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • [pork.org](http://pork.org)

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