

ENVIRONMENT

Title: Genetically Modified Corn and Soybean Meal and Microbial Phytase as Means of Reducing Phosphorus Excretion by Swine - **NPB# 99-068**

Investigator: Gary L. Cromwell

Institution: University of Kentucky

Date Received: 8/4/2000

Abstract

Four studies were conducted with growing pigs to assess recent technologies including the use of microbial phytase in swine diets and the feeding of genetically enhanced corn and soybean meal containing reduced amounts of indigestible phytate phosphorus (P) and greater amounts of inorganic P. The genetically modified corn contained the mutant *lpa1* gene and the soybean meal was from genetically modified soybeans that were low in phytate and oligosaccharides. The phytate P content of the genetically enhanced corn and soybean meal was approximately half of that present in the near-isogenic corn and near-isogenic soybean meal.

The studies provided clear evidence that the P in low-phytate corn and low-phytate soybean meal is three to four times as bioavailable to pigs than the P in conventional corn and soybean meal, which results in lower amounts of supplemental P needed in diets. Phytase addition to the diet tended to improve growth and bone mineralization to a greater degree in diets containing normal corn than in those containing low phytate corn. Phytase added to normal corn-soybean meal diets resulted in a 35% reduction in P excretion. The combination of phytase and low-phytate corn resulted in a 51% reduction in P excretion. Feeding a combination of low-phytate corn and low-phytate soybean meal with no added inorganic P resulted in optimal performance and bone traits. In addition, pigs fed this diet excreted 53% less P in their manure, compared with pigs fed conventional corn and soybean meal. When used in combination with microbial phytase, the reduction in P excretion would be even greater. The use of these genetically enhanced feedstuffs will enhance the environmental aspects associated with application of swine manure to cropland.

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 This report has not been peer reviewed

For more information contact:

National Pork Board, P.O. Box 9114, Des Moines, Iowa USA

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** <http://www.porkboard.org/>