

Little or No Supplemental Phosphorus is Needed for Growing-Finishing Pigs Fed Corn and Soybean Meal-Based Diets

Y. Shen, A. Ajakaiye, T. Archbold and M.Z. Fan*

Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada

Correspondence author: (519) 824-4120, ext. 53656; E-mail: mfan@uoguelph.ca

Background

Recent research suggests that true phosphorus (P) digestibility is a reliable predictor of bioavailability of P in feed ingredients for pigs, whereas apparent P digestibility and P availability measured with the slope-ratio assay underestimate P bioavailability in feed ingredients for pigs.

Objective: The objectives of our series of experiments were to determine true P digestibility in conventional corn and soybean meal (SBM) - the major feed ingredients commonly used in Ontario for weaned (10 - 20 kg) and growing-finishing (20 - 110 kg) pigs.

Methods and Procedures: Four digestion trials were conducted with weaned and growing-finishing pigs. Chromic oxide was used as a digestibility marker. True fecal P digestibility in corn and SBM was determined for weaned and growing-finishing pigs by using the regression analysis technique (Fan et al., 2001).

Results:

- As compared in Table 1, P availability, as compiled by NRC (1998), considerably underestimate true P bioavailability in corn and SBM for weaned and growing-finishing pigs.

Table 1. Comparison of true P digestibility and P availability compiled by NRC (1998)

P bioavailability (%)	Weaned pigs	Growing-finishing pigs
Corn - NRC (1998)	14	14
Corn - Our results ^{1,2}	50	60
SBM - NRC (1998)	31	31
SBM - Our results ^{3,4}	49	51

¹Shen et al. (2002) J. Nutr. 132:1199-1206; ²Shen et al. (2003) Proc. the 9th Int. Symp. Dig. Physiol. Pigs. Vol. 2, pp. 395-397; ³Fan et al. (2001) J. Nutr. 131:2388-2396; ⁴Ajakaiye et al. (2003) J. Anim. Sci. 81:2766-2775.

- True digestible P supply for weaned and growing-finishing pigs fed corn and SBM-based diets are compared with the available P requirements as suggested by NRC (1998, Table 2). Corn and SBM can provide all of the available P requirements for finishing pigs.

Table 2. True digestible P supply and available P requirements suggested by NRC (1998)

P requirements (%)	Weaned pigs	Growing pigs	Finishing pigs
Body weight range	(10-20 kg)	(20-50 kg)	(50-110 kg)
NRC (1998)	0.32	0.23	0.19-0.15
True digestible supply ^{1,2}	0.21	0.21	0.21

¹Weaner diets assuming 40%SBM + 56%corn; ²Grower diets assuming 30%SBM + 66%corn

Take Home Messages

- Corn and SBM can provide majority of the available P requirements for growing pigs and all of the available P requirements for finishing pigs. Little or no supplemental P is needed for growing-finishing pigs fed corn and soybean meal-based diets.

Financial support from NSERC, and OMAF-University of Guelph Animal and Resources Management and Environment Research Program is appreciated.