

Effect of Particle Size and Enzyme Supplementation on Nutrient Excretion of Growing Pigs

M.A. Oryschak^{1,2}, R.T. Zijlstra¹, and P.H. Simmins³

¹ Prairie Swine Centre Inc., P.O. Box 21057, 2105-8th St East, Saskatoon, SK S7H 5N9, ² Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK S7N 5B5, ³ Finnfeeds International Ltd., Marlborough, U.K.

The effect of particle size (PS) and enzyme supplementation on N and P excretion of growing pigs was investigated by comparing three particle sizes (400, FPS; 700, MPS; and 850 μ m, CPS) and four enzyme treatments (control, CON; β -glucanase/xylanase, CHO; phytase, PHY, and CHO+PHY) for a total of twelve treatments. Diets (70% barley, 25% peas) were formulated to contain 3250 kcal/kg, 1.6 g digestible Lys/Mcal and 0.12% available P, and were fed in wet mash form at 3 x maintenance DE. Sixty pigs (25.3 \pm 1.4 kg) were housed in metabolism pens to obtain five observations per treatment. For dry matter and crude protein digestibility, an interaction between PS and enzyme treatment was observed. Total N excretion was reduced by 6.8% with FPS compared to MPS (9.97 vs. 10.64 g/d; P<.05). Increases in DE of 2% and 2.7% were observed with FPS (3655 kcal/kg; P<.05) compared to CPS (3581 kcal/kg) and MPS (3558 kcal/kg), respectively. Supplementation of CHO did not affect N or P excretion. Total N excretion was reduced by 5.5% with PHY compared to CON (10.02 vs. 10.58 g/d). Fecal and total P excretion were reduced by 35 and 22% with PHY (1.48 and 1.48 g/d) and CHO+PHY (1.76 and 1.77 g/d) respectively, compared to CON (2.27 and 2.28 g/d; P<.05). ADG was not significantly affected by treatment. Results suggested that PS had a greater effect on N excretion, while PHY supplementation affected P excretion. Also, PS and PHY/CHO supplementation did not appear to interact for total N or P excretion.

Implication:

With the expected expansion of the hog industry in the western provinces in the near future, successfully managing the nutrient output from intensive hog operations will be key in ensuring the sustainability and long-term viability of the industry. Investigating practical means of reducing N and P excretion should prove beneficial to the individual producer towards achieving this goal.