INCREASING PHOSPHORUS DIGESTION IN PIGS WITH PHYTASE

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The phosphorus (P) in vegetable sources is bound as phytate P, and as such the degree of availability depends on phytase activity naturally found in feed ingredients (Pointillart et al. 1987). The amounts of P available to pigs from feeds of plant origin are usually insufficient to obtain high levels of performance and pig diets are often supplemented with inorganic P (Jongbloed et al. 1991). However, the P component of piggery effluent is an environmental concern and therefore the continued supplementation of pig diets with inorganic P is clearly not an acceptable practice for sustainable agriculture. The hypothesis for this experiment was that the supply of available P could be maintained in low-P diets by supplementation with biologically active forms of the phytase enzyme.

Female pigs (45 kg liveweight) were fed either a standard grower diet containing 0.40% total P (Control) or a diet formulated to contain the same energy and amino acids but only 0.32% total P (Low-P). A third group (Low-P + Phy) received the low-P diet to which 200 g/t of phytase had been added (Natuphos). Pigs were fed at 3 x maintenance and P digestibility was determined over a 7-day collection period following a 12-day period of adaptation.

Treatment	Control	Low-P	Low-P + Phy	s.e.d
No. of pigs	6	7	6	
P intake (g/day)	7.91^{a}	6.32^{b}	6.66^{b}	0.48
P output (g/day)	5.04^{x}	3.16^{y}	3.11^{y}	0.33
P retention (g/day)	2.86	3.17	3.56	0.40
P digestibility (%)	38.1^{a}	48.1^{b}	53.3^{c}	3.81

means not followed by a different superscript differ significantly (a,b,c $P<0.01$; x,y $P<0.001$)

The digestibility of P was increased when pigs were fed the low-P diets, and this was further enhanced by the addition of phytase. As a result, P retention increased linearly, being maximal when pigs were fed diets containing phytase, although these differences were not significantly different. There was a trend for nitrogen digestibility and retention to be increased when the diet contained phytase although these differences were non significant. The addition of phytase to a diet containing a low concentration of P had a beneficial effect on the digestibility and retention of P, and meant that total P excretion from a piggery could be reduced by approximately 60% when this feeding strategy was applied to the grower/finisher herd. The effect that these diets have on performance when fed for an extended period, especially to pigs kept for breeding purposes, requires further investigation.

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