

Low-phytate barley or supplementation of phytase to a covered barley-based diet reduces phosphorus excretion in growing pigs

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Low-phytate barley and phytase supplementation may improve P utilization. In Exp. 1, eight 25-kg barrows were assigned in a repeated 4×4 Latin square to four 96%-barley diets in a 2×2 factorial arrangement: 1) covered barley (CB), 2) low-phytate CB (LPCB), 3) hulless barley (HB), and 4) low-phytate HB (LPHB). Inorganic P (iP) was added to diets 1 and 3 to meet available P (aP) requirement (NRC, 1998); diets 2 and 4 contained sufficient aP (>0.23%). Diets were fed at 2.5 × ME maintenance requirement. The apparent total tract digestibility (ATTD) of DM and OM, total excretion and retained P (g/d) were higher for hulless than covered barley diets. The ATTD of P was higher, total P excretion was 35% lower, and retained P (g/d) was lower for the low-phytate barley diets, confirming that low phytate barley improved P digestibility and requires further characterization to maintain P retention.

In Exp. 2, eight 25-kg barrows were assigned in a repeated 4×4 Latin square to one of four diets: 1) CB-soybean meal (SBM), 2) CB-SBM + iP, 3) CB-SBM + phytase, and 4) LPCB-SBM. Diets 1 and 3 contained a suboptimal level of aP and diets 2 and 4 contained adequate aP (>0.23%). The feeding regimen was similar to Exp. 1. Phytase supplementation to the CB-SBM diet increased ATTD and retained P (g/d) and decreased P excretion. Adding iP to the CB-SBM diet did not affect ATTD of P but increased retained P (g/d) and excretion. Pig fed LPCB-SBM and CB-SBM + phytase diets did not differ in ATTD, retention and excretion of P, but excreted 29 and 32 % less P, respectively, than pigs fed CB-SBM + iP.

Implications: Feeding low-phytate barley is as effective as phytase supplementation in improving P digestibility, thereby reducing P excretion.