

Effect of Supplemental Enzyme in Barley with Low, Medium and High DE Content fed to Grower Pigs

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A 20% range exists in DE content of barley, which is caused primarily by changes in concentrations of fibrous fractions. The project was designed to determine if responses in dietary energy (E) and AA digestibility in grower pigs to supplemental enzymes that degrade fibrous fractions depend on the specific barley sample. Samples of barley with a predicted range of DE content and hull-less barley were selected using chemical characteristics and a near infrared spectroscopy calibration. In two studies, barley samples were included at either 96% (Exp. 1) or 66% of the diet with 25% soybean meal and 5% canola meal (Exp. 2), with or without enzyme Rovabio™ Excel; 500 U β -glucanase/kg diet). Grower pigs were cannulated at the distal ileum; feces and ileal digesta were collected in three periods (n = 6). In Exp. 1, enzyme supplementation improved apparent fecal E-digestibility 7% for medium-DE (P<0.01) and 3% for high-DE barley (P<0.05), and apparent digesta E-digestibility 13% for medium-DE (P<0.01) and 8% for high-DE barley (P<0.05). Enzyme supplementation improved apparent digesta total-essential AA-digestibility 10% for medium-DE (P<0.01) and 8% for high-DE barley (P<0.05). In Exp. 2, enzyme supplementation improved apparent fecal E-digestibility 2% for barley 1 (P<0.05), 3% for barley 2 (P<0.01), and 2% for hull-less barley (P<0.05), but not for barley 3 (P>0.10). Enzyme supplementation improved apparent digesta E-digestibility 7% for barley 2 and 6% for hull-less barley (P<0.01) but not for barley 1 or 3 (P>0.10), and apparent digesta total-essential AA-digestibility 3% for barley 2 (P<0.05). Overall, hindgut fermentation diminished the increase in E-digestibility at the distal ileum.

Implication: Enzyme supplementation improved digestibility of energy and amino acids; however, responses depended on the specific barley sample. Thus, enzyme supplementation should be integrated with ingredient evaluation to maximize benefits of enzyme supplementation.