

# EFFECT OF DIETARY ENZYME ON BARLEY ENERGY DIGESTIBILITY

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## Summary

Nutrient digestibility in barley diets fed to grower pigs can be improved with dietary enzymes. The response to enzymes depends on the specific barley sample included in the diet. Ingredient evaluation and enzyme supplementation should be integrated to optimize overall nutrient utilization and to maximize benefits of enzymes.

## Introduction

A 20% range exists in DE content of barley, which is caused primarily by changes in concentrations of fibrous fractions. Supplemental enzymes that digest fibrous fractions might thus be beneficial in reducing differences in DE content in barley.

## Experimental Procedures

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<sup>TM</sup> Excel; 500 U  $\beta$ -glucanase/kg diet) fed to grower pigs.

## Results and Discussion

In Exp. 1, dietary enzyme improved apparent total tract energy-digestibility 7% for barley 2 and 3% for barley 1 (Figure 1), and apparent ileal energy-digestibility 13% for barley 2 and 8% for barley 1, indicating that barley DE content can be improved up to 7% using supplemental enzymes.

In Exp. 2, dietary enzyme improved apparent total tract energy-digestibility 2% for barley 1 (Figure 2), 3% for barley 2, and 2% for hull-less barley, but not for barley 3. Enzyme supplementation improved apparent digesta energy-digestibility 7% for barley 2 and 6% for hull-less barley but not for barley 1 or 3, and apparent digesta total-essential AA-digestibility 3% for barley 2. Overall, hindgut fermentation diminished the increase in energy-digestibility at the distal ileum.

## Implications

Dietary enzyme 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.

## Acknowledgements

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*Enzyme supplements can be effective, depending on the quality of the barley.*

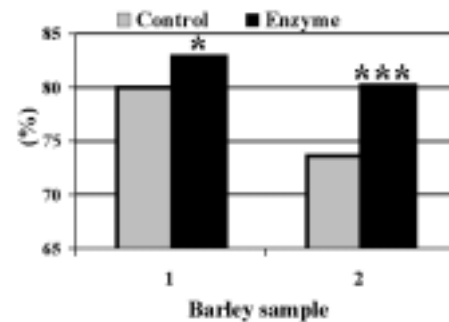


Figure 1. Apparent total tract energy digestibility for two barley samples.

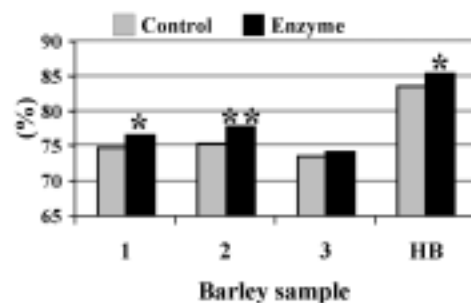


Figure 2. Apparent total tract energy digestibility for three diets including barley and one diet including hull-less barley (HB).

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