RANGE IN DIGESTIBLE ENERGY AND TRUE ILEAL DIGESTIBLE LYSINE CONTENT OF AUSTRALIAN BARLEY SAMPLES

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Nutritionists have a limited ability to account for variation that can exist in the nutritional quality of feed ingredients (van Barneveld, 1999). To demonstrate the range in nutritional quality that can exist within a widely used feed grain such as barley in a single year, the digestible energy (DE) and true ileal digestible lysine (TIDL) content of 11 samples were assessed.

Eleven samples of barley were collected from across Australia representing 10 cultivars, one of which (Schooner) was obtained from two sites (Junee and Forbes). Diets were formulated to contain 940 g/kg of the test grains, the remainder consisting of dicalcium phosphate, salt, minerals, vitamins, choline chloride and celite®. The DE content of the samples was determined using 44 Large White male pigs (25 kg body weight, BW) based on an allocation of four pigs per diet and using total faeces collection techniques. True ileal digestible lysine was determined in four separate experiments (2-3 test grains/experiment) using Large White male pigs (35-40 kg BW) fitted with simple T-piece ileal cannulas. Tantangara barley was used as a control in each experiment and diets were provided based on a 5x5 Latin square design. The fifth diet contained enzymically-hydrolysed casein so that endogenous amino acid losses (mean values for all pigs used in the experiment) could be determined for true ileal digestibility calculations. Diets were fed for 7 d (3 x maintenance i.e., 0.5 x $BW^{0.75}$) prior to 8 h digesta collections over 2 consecutive days. Digestibility values from each experiment were compared using an analysis of variance with treatment means separated by least significant difference.

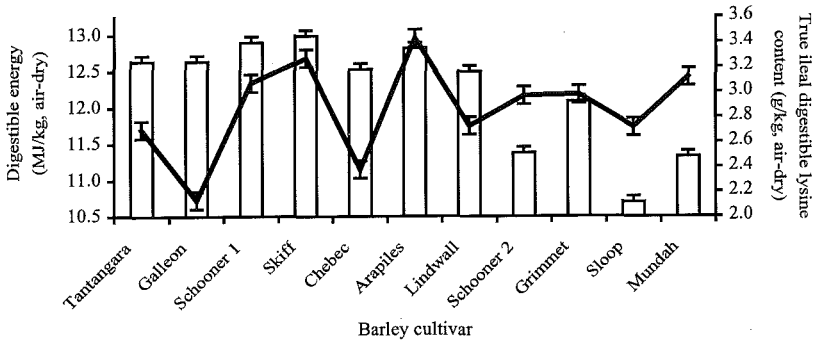

Figure 1. *Comparison of the digestible energy (DE, MJ/kg;▭) and true ileal digestible (TID) lysine content (g/kg, —) of 11 samples of barley (Schooner 1, Junee; Schooner 2, Forbes).*

Barley DE values ranged from 10.70-12.99 MJ/kg, air-dry, representing a highly significant difference ($P \leq 0.001$) of 2.3 MJ/kg (Figure 1). Control barley TIDL values in one experiment were significantly different ($P > 0.05$) to values obtained in the other experiments and hence this data has been excluded. Values for TIDL varied significantly ($P \leq 0.001$) from 2.13-3.43 g/kg, air-dry, with no apparent relationship between TIDL and DE content of the grains. The level of variation observed in this experiment demonstrates that tabulated estimates of DE and TIDL content are far from adequate for diet formulations.

Reference

VAN BARNEVELD, R.J. (1999). *Australian Journal of Agricultural Research.* **50**:667-687.