

Threonine (THR) requirement is higher in pigs fed barley vs. casein diets

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We previously established a method to determine amino acid requirement in individual pigs. This method involves feeding varying levels of a test amino acid and measuring the oxidation of an indicator amino acid (IAAO), in response to changes in protein synthesis. Barley increases intestinal THR output, via mucin, compared to casein and therefore barley diets may require greater THR intake. We compared THR requirement of pigs fed barley vs. casein.

Study Design: Six pigs received diets containing both 12% casein and 50% barley and 6% casein. Feed intake was restricted to 5% body weight (BW). Pigs were adapted to the casein and the barley-casein diets for at least 7 days followed by determination of THR requirement by IAAO. Diets were formulated on true ileal digestibility basis, with all amino acids, except for THR, provided at 150% of NRC (1998). Casein diets provided intakes of 0.206, 0.279, 0.355, 0.389, 0.462, 0.539 g THR/kg BW, Barley-casein diets provided intakes of 0.199, 0.272, 0.349, 0.382, 0.455, 0.532 g THR/ kg BW (as analyzed and adjusted for true ileal digestibility). Diets were fed in random order to each pig for at least 2 d followed by IAAO. Two-phase linear regression crossover analysis was used to determine breakpoint for requirements. The requirement for casein diet was 0.355 (SE 0.01) g THR/kg BW. For 2 pigs fed barley-casein diets, no requirement could be determined because a 2-phase response was not observed. The remaining 4 pigs had a THR requirement of 0.378 (SE 0.04) g THR/kg BW.

Implications: THR is the second limiting amino acid in many feedstuffs. An accurate determination of THR requirement and true availability for body protein synthesis is necessary to maximize performance and reduce feed cost. This is especially important in feedstuffs with high anti-nutritive content.

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