

DL-Methionine is more Bioavailable for Protein Deposition in Growing Pigs than Equimolar Amount of Methionine-Hydroxy Analogue

A.K Shoveller¹, S. Moehn¹, Meike Rademacher² and R. O. Ball^{1,3}

¹Swine Research and Technology Centre, 4-10 Agriculture/Forestry Centre, Univ. Alberta, Edmonton, AB T6G 2P5; ²Evonik Degussa GmbH, Feed Additives, 63457 Hanau, Germany; *Email:* ron.ball@ualberta.ca

Methionine (MET) is supplemented in swine diets using DL-methionine (DLM) or methionine-hydroxy analogue free acid (MHA-FA). The bioavailability of MHA-FA is under debate. The objective of this experiment was to determine the bioavailability of MHA-FA for protein synthesis, relative to DLM, using the indicator amino acid oxidation (IAAO) technique in a slope-ratio assay.

Six barrows (mean BW 21.1 kg) were allocated to dietary treatments with all pigs receiving all diets, in random order, at an intake of 95g/ kg^{0.75} BW. The basal diet (BD), based on corn, whey, spray-dried plasma and soybean meal, contained 0.187% MET, 1.21% lysine and 15.1% crude protein. Dietary treatments included: 1) BD, 2) BD + 0.02% DLM, 3) BD + 0.05% DLM, 4) BD + 0.07% DLM, 5) BD + 0.029% MHA-FA, 6) BD + 0.078% MHA-FA and 7) BD + 0.107% MHA-FA, as analyzed. IAAO was determined using L-[1-¹⁴C]phenylalanine. Slopes of indicator oxidation for DLM and MHA-FA were determined simultaneously ('proc mixed' SAS 2002) using IAAO (% of dose) as dependent variable, and MET intake above BD (nested within MET source) as the independent variable. Added MHA-FA at the first level supported a decrease in IAAO not different to added DLM, but was less effective at higher levels of inclusion. The linear decrease in IAAO was greater (P = 0.012) for DLM (1.488 ± 0.215% per mmol) than for MHA-FA (1.107 ± 0.152% per mmol) addition to the BD. The ratio of the slopes indicated a bioavailability of 74.4% for MHA-FA, relative to DLM, on an equi-molar basis and 65.7% on a product basis.

Implications: Bioavailability of MHA-FA in growing pigs, determined using the IAAO method in a slope-ratio approach, was 74.4% on an equimolar basis and 65.7% on a product (wt/wt) basis, relative to DLM. (Supported by Degussa AG.)