



Expression of genes coding for selected amino acid transporters in small intestine, liver, and skeletal muscle of pigs fed excess branched-chain amino acids

M. Cervantes¹, N. Arce¹, H. García¹, M. Cota¹, J.K. Htoo² and A. Morales¹

¹Instituto de Ciencias Agrícolas,
Universidad Autónoma de Baja California, Mexicali, México
²Evonik Industries AG, Nutrition Research, Hanau, Germany

Corresponding author: A. Morales
E-mail: adriana_morales@uabc.edu.mx

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ABSTRACT. Excess Leu reduces the availability of Ile and Val in pigs likely by reducing absorption of the latter amino acids (AA). Twenty-four crossbred pigs were used to evaluate the effect of excess Leu alone or with surplus Ile and Val on the expression of cationic ($b^0,+AT$ and CAT1) and neutral (B^0AT1) AA transporters in the small intestine, liver, and skeletal muscle. Dietary treatments included: 1) basal diet; 2) basal plus 0.43% L-Leu (excess Leu); 3) basal plus 0.43% Leu, 0.20% L-Ile, and 0.25% L-Val (excess Leu, Ile, and Val). The basal diet contained 0.90% standardized ileal digestible Lys, as well as crystalline L-Lys, L-Thr, DL-Met, L-Trp, L-Leu, L-Ile, L-His, and L-Val. Diets 2 and 3 contained 52% more Leu and diet 3 contained 42% more Ile and Val compared with the basal diet. Excess Leu or excess Leu, Ile, and Val reduced $b^0,+AT$ expression in the jejunum ($P < 0.05$) but had no effect in the ileum and liver. Excess Leu increased CAT1 expression in the ileum but reduced expression in the liver ($P <$

0.05). Excess Leu, Ile, and Val increased ($P < 0.05$) B⁰AT1 expression in the jejunum and tended to increase ($P = 0.10$) expression in the ileum. In general, b^{0,+}AT expression was higher but CAT1 expression was lower in the jejunum than in the ileum; B⁰AT1 was similarly expressed in the jejunum and ileum. Excess Leu or any branched-chain AA affects AA transporter expression, which may affect the absorption and availability of AA for animal growth.

Key words: Amino acid transporter; Branched-chain amino acid; Pigs; Gene expression