



Expression of cationic amino acid transporters, carcass traits, and performance of growing pigs fed low-protein amino acid-supplemented versus high protein diets

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ABSTRACT. Free amino acids (AA) appear to be absorbed faster than protein-bound AA (PB-AA). We conducted an experiment to assess the effect of feeding pigs with a partially free (F-AA) or totally PB-AA diet on expression of selected genes and performance of pigs. The expression of cationic AA transporters b^{0,+} and CAT-1 in intestinal mucosa, liver, and longissimus (LM) and semitendinosus (SM) muscles, as well as that of myosin in LM and SM, was analyzed. Twelve pigs (31.7 ± 2.7 kg) were used. The F-AA diet was based on wheat, supplemented with 0.59% L-Lys, 0.33% L-Thr, and 0.10% DL-Met. The PB-AA diet was formulated with wheat-soybean meal. Average daily feed intake was 1.53 kg per pig. The expression of b^{0,+} and CAT-1 was analyzed in jejunal and ileal mucosa, liver, LM, and SM; myosin expression was also analyzed in both muscles. Pigs fed the PB-AA diet tended to have

higher weight gain and feed efficiency ($P < 0.10$), and had thinner back fat ($P = 0.02$). The expression of b^{0+} was higher ($P < 0.01$) in jejunum but lower ($P < 0.01$) in the liver of pigs fed the F-AA diet; CAT-1 tended to be lower in liver but higher in LM of PB-AA pigs. Myosin expression was not affected. Intestinal AA absorption was faster in pigs fed the F-AA diet, but AA uptake by the liver seemed to be faster in pigs fed the PB-AA. Performance and expression of AA transporters and myosin suggest that the dietary content of free or protein-bound AA does not affect their availability for protein synthesis in pigs.

Key words: Pigs; Free amino acids; Protein-bound; Gene expression; Performance