The effect of feed intake on amino acid digestibility in growing pigs

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Six growing barrows (Initial BW: 108 kg) were used in an experiment to determine the effect of level of feed intake on the digestibility of CP and AA. All pigs were equipped with a T-canula in the distal ileum. Two experimental diets were formulated. Diet 1 was a soybean meal cornstarch-based diet. Diet 2 was a cornstarch dextrose-based N-free diet used to estimate the endogenous flow of CP and AA to the distal ileum. Chromium oxide (0.25\%) was included in both diets as an inert marker. Each diet was fed at a level calculated to equal the maintenance requirement of the pig (M1), at two times the maintenance requirement (M2), and at three times the maintenance requirement (M3) providing for a total of six different dietary treatments. The pigs were arranged in a 6 x 6 Latin square design with six periods and six dietary treatments. Each period lasted 7 d with the initial 5 days being an adaptation period to the treatment. Samples of ileal digesta were collected for two 12-h periods on d 6 and 7. Results of the experiment showed that the apparent ileal digestibility coefficient (AID) for CP and all indispensable AA except lys, met, and val were higher ($P < 0.05$) for pigs fed at M2 as compared to M1. Higher AID for M2 compared to M1 were also calculated for cys, gly, ser, and try ($P < 0.05$) while there were no differences ($P > 0.05$) between the two feeding levels for the remaining dispensable AA. Likewise, there were no differences in AID for CP or any of the AA between M2 and M3 ($P > 0.05$). The endogenous flow to the distal ileum calculated as g per kg DMI decreased linearly ($P < 0.01$) for CP and all AA except pro as feed intake increased from M1 to M3. Likewise, the standardized ileal digestibility coefficients (SID) for diet 1 decreased linearly ($P < 0.05$) for CP and all AA except arg, trp, asp, pro, and tyr as feed intake increased from M1 to M3. In addition, the SID for CP and all indispensable AA except arg, his, and trp were lower ($P < 0.05$) at M3 than at M2. The current results demonstrate that the level of feed intake significantly influences the calculated values for AID, SID, and endogenous losses. Therefore, pigs used to measure AA digestibility coefficients and endogenous losses should be fed at a level that is close to what is used under practical conditions.

Key Words: AA digestibility, Feed intake, Endogenous losses