

Ileal digestibility of an enzyme-treated soybean meal for milk replacer in pre-weaned dairy calves.

Our objective was to measure and compare apparent (AID), standard (SID), and true ileal digestibility (TID) of protein and AA in milk replacers (MR) containing all milk proteins (CON) or an enzyme-treated soybean meal-based (ESBM) protein. A T-cannula was placed in the ileum of 9 Holstein calves at 15 d of age. After 2 wk post-surgery calves were randomly assigned to a 3 x 3 replicated Latin square with 5-d periods. Calves were fed 2X daily at a rate of 2% (DM) of BW, adjusted weekly. No starter was offered to minimize rumen development. Digesta samples were collected continuously during 12 h on d 4 and 5 of each period. Basal endogenous losses of AA (AA_{endo}) and CP (CP_{endo}) were estimated by feeding a nitrogen-free MR to each calf during 1 period. Total (basal + specific) AA_{endo} and CP_{endo} were estimated by multivariate regression of the χ^2 distances between digesta and reference protein AA profiles. Ileal digesta pH with the ESBM (7.27) diet was lower ($P = 0.01$) than with CON (7.51). According to the piecewise nonlinear model of pH fluctuation, digesta pH during ESBM decreased slower after feeding and reached its nadir later than with the CON diet. Diet did not affect ($P = 0.45$) ADG, but calves on the ESBM diet showed a bigger increment of withers height (0.89 vs 1.61 cm) and lower mean fecal scores (2.81 vs 1.71). Basal ΣAA_{endo} and CP_{endo} were 13.9 and 22.4 g/kg of DMI, respectively. Total ΣAA_{endo} (24.6 vs 32.1 g/kg DMI) and CP_{endo} (28.2 vs 37.1 g/kg DMI) were higher ($P < 0.05$) with ESBM than with CON. Accordingly, AID and SID of most AA, CP, and ΣAA were lower or tended to be lower with ESBM. However, TID did not differ between diets for CP and all AA except Ala and Ile; TID for Arg tended ($P = 0.07$) to be greater with ESBM. According to the estimation model, the differences of protein endogenous losses were caused by an increase of gut bacterial protein rather than by host protein. In fact, we found that flows of digesta DNA were greater ($P < 0.01$) with ESBM (3.2 vs 4.7 ng/kg DMI), but the estimated mucin flow (calculated using glucosamine concentration as a marker) did not differ (2.1 vs 1.8 g/kg DMI). Adjusting digestibilities of AA in MR by endogenous losses is crucial when comparing alternative proteins to milk proteins. Keywords: Amino acid, ileal digestibility, calf.