

Conventional trypsin inhibitor levels of soybean meal and protease supplementation affect digestibility in broilers

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Trypsin inhibitor (TI) analysis is considered the best in vitro method to predict anti-nutritional factors in soybean products. TI in solvent-extracted soybean meal (SBM) can vary according to genetics, under-processing, over-processing, etc, and high levels are associated to outbreaks of feed passage with consequent decrease in broiler performance. The objectives of the study were: 1) determine the impact of Brazilian commercial SBM with different levels of TI on digestibility of broilers; and 2) evaluate a protease enzyme [CIBENZA® DP100, Novus International, Inc. (PROT)] as a tool to mitigate the deleterious effect of TI on digestibility. A total of 17 samples of SBM were obtained from large companies of Brazilian poultry industry and analyzed for TI with five selected for the in vivo trial. The experiment was conducted with 624 Cobb male broilers reared in cages and fed a common corn-SBM diet from day 1 to 21. Test diets were fed from day 22 to 28 with birds submitted to five treatments (12 replicates each) with SBM (used as the sole protein source) varying in TI levels from 3.30 to 4.24 mg/g. The SBM with 4.24 mg/g TI was also fed along with PROT added at 500g/MT. SBM samples were standardized for particle size to avoid its influence on digestibility. Ileal digesta was collected on day 28 and digestibility data analyzed by ANOVA and Tukey test. The contrast between treatments with vs without PROT was also analyzed. Response curves were fitted using linear, quadratic and broken-line models. PROT use improved apparent digestibility coefficients of all AAs (except for Trp and His) on average 5.2% and gross energy from 74.3 to 79.9% (P<0.05). Digestibility decreased quadratically with increased levels of TI for Tyr, Ser, Trp and Leu while for Met, Cys, Thr, Ile, Val, Arg, Phe, Ala and gross energy the digestibility coefficients best fitted to broken-line model. There was a decrease in digestibility with increased levels of TI that reached the plateau between 3.47 to 3.99 mg/g TI depending on the AA. In summary, commercial TI levels affected broilers digestibility and the protease CIBENZA® DP100 was effective in mitigating risks related to variations in commercial SBM quality by increasing digestibility of high trypsin inhibitor-SBM.

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