

Prediction of in vivo amino acid digestibility of distillers dried grain with solubles (DDGS) from color, NDF, ADF, ADIN, soluble CP, ash, and starch

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Standardized ileal digestibility (SID) values by growing pigs of CP and AA in 37 samples of distillers dried grain with solubles (DDGS) were obtained from 5 ileal digestibility experiments. Minolta (M) and Hunter (H) color were expressed as L^* , a^* , and b^* . NDF and ADF were analyzed in all samples of DDGS using the Ankom procedure. Hemicellulose (Hem) was calculated by subtracting ADF from NDF. Acid detergent insoluble nitrogen (ADIN) was determined by analyzing nitrogen in the ADF fraction. Soluble protein (SolCP) was determined by the procedure of Licitra *et al.*, 1996. Starch in DDGS was analyzed in three fractions: total (TOT), insoluble (INS), and soluble (SOL). The INS was separated after washing the sample with 80% ethanol and 20% water. The SOL was calculated by subtracting INS from TOT. Particle size of DDGS (PS) was analyzed by ASAE procedure. Pearson product-moment coefficient (r) was calculated, prediction of digestible AA was performed by principal components regression analysis. Digestible CP (DCP) was correlated ($P < 0.05$) with L^* ($r = 0.48$ [M]; 0.38 [H]) and b^* ($r = 0.43$ [M]; 0.22 [H]). Digestible Lys (Dlys) was correlated ($P < 0.05$) with L^* ($r = 0.33$ [M]; 0.44 [H]) and tended ($P < 0.10$) to be correlated with b^* ($r = 0.31$ [M]; 0.44 [H]). There was no correlation between NDF, ADF, Hem, ADIN, PS, ash, Tot, Ins, and Sol and DCP ($r = -0.04, 0.09, -0.13, -0.04, 0.06, -0.06, -0.05, -0.16, 0.14$, respectively). Soluble CP was correlated with DCP ($r = 0.27$; $P < 0.05$). Digestible Lys was not correlated to any of the previous analyses. The prediction of DCP ($R^2 = 0.80$ [M]; 0.78 [H]) and digestible Trp ($R^2 = 0.79$ [M]; 0.74 [H]) from a multiple linear model including all in vitro measures was satisfactory ($P < 0.05$). However, the prediction of Dlys ($R^2 = 0.44$ [M]; 0.57 [H]) and digestible Thr ($R^2 = 0.65$ [M]; 0.54 [H]) was poor. In conclusion, prediction of DCP is possible from the above analyses, but they were of limited value to predict Dlys.

Key words: amino acid, digestibility, DDGS, in vitro, Minolta, Hunter color, ADIN