Amino acid digestibility and measurement of blocked lysine in five samples of distillers dried grains with solubles in growing pigs.

A. A. Pahm*, D. Hoehler, C. Pedersen, D. Simon, H. H. Stein.
South Dakota State University, Brookings, SD, Degussa Corp., Kennesaw, GA.

An experiment, which is a part of a two-phase study, was conducted to determine the application of the furosine procedure as an in vitro method to predict the standardized (SID) ileal digestibility of Lys in five sources of distiller's dried grains with solubles (DDGS) fed to growing pigs. Twelve barrows (Ausgene Intl., Gridley, IL) with initial BW of 36.9 ± 5.6 kg were fitted with a T-cannula in the distal ileum and randomly allotted to a replicated 6 x 4 Youden square design with six diets and four periods. Five diets were based on DDGS (67.5%) and one diet was a N-free diet. Each feeding period lasted 7 d with ileal digesta collection every 6 and 7 d. Values for AID and SID were calculated for all DDGS sources and compared using an analysis of variance. In vitro furosine contents were determined in DDGS samples and these values were correlated with the in vivo data. Results of the in vivo study showed that the AID and SID of CP did not vary among sources. However, the AID for Lys, Trp, Leu and Arg and the SID for Lys and Leu varied ($P < 0.05$) among samples. The remaining indispensable AA did not differ in AID and SID among the five DDGS sources. The SID for Lys was poorly correlated with total CP ($R^2 = 0.22$) and total Lys content ($R^2 = 0$) indicating that total CP and total AA content may be inadequate to estimate Lys digestibility of DDGS in pigs. We hypothesize that this may be partly due to the heat damage of DDGS during processing which can alter Lys digestibility without altering its analyzed total Lys content. Results of the in vitro study showed that the average blocked lysine of samples (% of total Lys) estimated by the furosine method was 16.6 ± 5.2%. This represents the proportion of the total Lys that is not available to the pig, possibly due to early Maillard reaction. Furosine and blocked lysine were correlated to SID Lys ($R^2 = 0.67$ and 0.70, respectively). In conclusion, furosine and blocked Lys can potentially be used to predict SID Lys in DDGS by growing pigs. However, additional data are needed to establish a reliable prediction equation using this procedure.

Keywords: Amino acids, DDGS, furosine.