

Amino Acid Profiles and *In Vitro* Intestinal Digestibility of Corn Distiller Grain

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The modified dry corn fractionation process that separates germ and pericarp fibre before fermentation of the endosperm fraction has been implemented in some ethanol plants. This modified dry grind process increases fermentation efficiency and market opportunities for by-products. Protein content of corn distiller grains (DG) produced using fractional process (HPDG) is usually higher than that using the traditional dry grind process (TRDG). The objective of this study was to investigate whether the amino acid (AA) profiles of ruminal undegraded protein (RUP) and the intestinal digestibilities of AA vary with grain process prior to fermentation in ethanol plant.

Ten DG samples with 7 TRDG and 3 HPDG from different plants were evaluated. Ruminal degradation was measured by incubating nylon bags in the rumen of three lactating dairy cows during 18 h. The bag residues after the rumen incubation were exposed to a pepsin-pancreatin enzymatic solution to mimic digestion in the small intestine. Protein content (% of DM) was higher for HPDG (50%) than for TRDG (32%), whereas, AA profiles were not different between the two DG. The RUP (% of CP) of DG was not different between TRDG (62%) and HPDG (64%). However, the supply to the small intestine (g/kg DG) of RUP (346 vs. 214), and essential AA (EAA; 139 vs. 86), total AA (323 vs. 202), lysine (8.4 vs. 5.0), and methionine (5.8 vs. 3.4) from RUP were greater for HPDG than for TRDG. Similarly, the *in vitro* intestinal digestibility (% of "flow to duodenum") of RUP (86 vs. 82), EAA (95 vs. 92), total AA (96 vs. 94), and lysine (92 vs. 88) except for methionine (98 vs. 97) were higher for HPDG than for TRDG.

Implications: The RUP proportion of DG and AA profiles of feed DG or RUP residues were not different; whereas, the availability of RUP and EAA per kilogram of DG to the small intestine was greater with HPDG than with TRDG as a result of higher protein content and higher intestinal digestibility of RUP. The lysine needs to be particularly considered in ration formulation for using corn DG as main protein source since lysine is low but protein is high.