

726 Effects of reducing the particle size of corn on energy, phosphorus, and amino acid by growing pigs. O. J. Rojas* and H. H. Stein, *University of Illinois at Urbana-Champaign, Urbana.*

Two experiments were conducted to determine the concentration of DE and ME, the standardized total tract digestibility (STTD) of P, and the standardized ileal digestibility (SID) of CP and AA in corn ground to 4 different particle sizes (i.e., 339, 485, 677, and 865 μm). In Exp. 1, 40 growing barrows (initial BW 22.8 ± 2.1 kg) were placed in metabolism cages and allotted to a randomized complete block design with 4 diets and 10 replicate pigs per diet. One lot of corn was divided into 4 batches that were ground to the specified particle sizes and each batch was used in one diet that contained 97.7% corn (as-fed basis). Vitamins and minerals were included in the diets to meet the requirements for growing pigs with the exception that no inorganic P was used and all the P in the diets originated from corn. The concentration of ME was 3,964, 3,895, 3,868, and 3,826 kcal/kg DM for corn ground to a mean particle size of 339, 485, 677, and 865 μm , respectively. The ME concentration decreased (linear and quadratic, $P < 0.01$) as the particle increased. The STTD of P was 37.8, 37.1, 37.3, and 37.4% for corn ground to a mean particle size of 339, 485, 677, and 865 μm , respectively, and these values were not different. In Exp. 2, 10 growing barrows (initial BW: 29.2 ± 1.35 kg) were surgically equipped with a T-cannula in the distal ileum and randomly allotted to a replicated 5×5 Latin square design with 5 diets and 5 periods in each square. Four of the diets contained each batch of corn ground to a different particle size (96.6%, as-fed basis) as the only source of AA. A N-free diet was used to determine endogenous losses of CP and AA. With the exception of Trp, there was no effect of corn particle size on the SID of CP or any indispensable AA. In conclusion, reduction of the particle size of corn from 865 to 339 μm linearly increased the concentration of ME in the corn, but the particle size of corn does not affect the STTD of P or the SID of indispensable AA and CP.

Key Words: corn, particle size, pig