



## DEHULLED, DEGERMED CORN AS A PREFERRED FEED INGREDIENT FOR PIGS

Presented Previously.....

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Corn constitutes a major portion of swine (and poultry) feeds. As such, its impact on manure production by animals can be expected to be substantial. Indeed, sieving fresh feces obtained from grower pigs (Kasper et al., unpublished) demonstrated that approximately 40% of the fecal dry weight was corn hulls (pericarp). This suggests that removing pericarp (indigestible fiber) prior to feeding pigs may result in a substantial reduction in manure production.

To test this hypothesis, degermed, dehulled corn (DGDH) was obtained from a dry milling plant. The nutritional value of this DGDH was compared to that of conventional corn in a series of nutrition experiments. In Exp. 1, ileal digestibility was determined using a Latin square design with 8 cannulated barrows. Ileal digestibility of dry matter, crude protein, and lysine was improved from 78 to 83, 83 to 89, and 78 to 86%, respectively ( $P < 0.05$ ) by degerming and dehulling corn, indicative of a much improved nutritional value.

In Exp. 2, total tract digestibility was determined using a Latin square design with 12 barrows. Digestibility of dry matter and crude protein was improved from 89 to 96 and 78 to 94%, respectively. The impact of this improvement on fecal production was a reduction in fecal dry matter excretion of 67% and fecal crude protein excretion of 29%.

In Exp. 3, growth performance was evaluated with 96 nursery pigs after formulating feeds using the above obtained nutritional values for DGDH. Although daily gain was not affected, feeding diets containing DGDH resulted in an improved feed efficiency (1.48 versus 1.54,  $P < 0.05$ ).

The material tested thus far was DGDH manufactured using conventional dry milling techniques. This process was optimized for use in animal nutrition using a pilot scale mill process. The removal of pericarp and germ from endosperm was increased by using a larger amount of moisture during tempering and increasing the length of tempering. Results of these modifications were DGDH with only 4% NDF (neutral detergent fiber) and 0.09% P (phosphorus), germ with 17% NDF and 0.97% P, and pericarp with 33% NDF and 0.29% P. These products (DGDH, germ, and pericarp) and extruded corn were used as energy sources in a complete diet and they provided exactly 5.5% crude protein to this complete feed. The remainder of the protein (6.5%) was provided by soybean meal. These diets were evaluated for ileal digestibility. Compared to unprocessed corn, indigestible dry matter was decreased by 30% when DGDH was used and 19% when extruded corn was used ( $P < 0.05$ ). In contrast, use

of germ and pericarp in the diet increased indigestible dry matter with 18% and 61%, respectively ( $P < 0.05$ ). Indigestible phosphorus was reduced 15% with DGDH and increased 174% with germ ( $P < 0.05$ ).

These data suggest that the nutritional value of corn products can be improved substantially by removing fiber. The result is an animal food ingredient that results in reduced waste production by decreasing dry matter, crude protein, and phosphorus excretion.