

and N determined by Ti were greater ($P < 0.05$) than Cr regardless of the levels of DMr and OB. The AID of GE or N was not affected by DMr level or OB level. In Exp. 2, the DMr level and duration of feces collection had no effect on ATTD of GE and DMr recovery. The total collection method determined greater ($P < 0.05$) ATTD of GE than Ti, which was greater ($P < 0.05$) than Cr. The recovery of Ti was greater ($P < 0.01$) than Cr. Inclusion of OB decreased ATTD of GE. In conclusion, the AID of GE and N, ATTD of GE, and DMr recovery were affected by DMr type but not DMr level; the inclusion of OB did not affect AID of GE and N and DMr recovery; and the duration of feces collection had no effect on ATTD of GE and DMr recovery.

Key Words: swine, digestibility, maker

356 Assessment of Sampling Technique of Swine

Diets on Analytical Variation. A. M. Jones*, J. C. Woodworth, C. I. Vahl, M. D. Tokach, S. S. Dritz, J. M. DeRouchey, B. D. Goodband, *Kansas State University, Manhattan, KS*

This study was designed to evaluate different sampling procedures and number of samples to collect from feeders within a swine facility to achieve an accurate assessment of nutrient fortification in swine diets. Treatments were arranged in a split-plot design with whole-plots receiving 1 of 6 concentrations of dietary Cu (27 to 147 mg/kg total Cu included in the diet) and subplots sampled with 1 of 2 techniques (probe vs. hand grab). A total of 6 feeders per dietary treatment were sampled using a 1.6 m brass open handle probe (Seedburo Equipment Company, Des Plaines, IL), which contained 10 openings spaced approximately 5 cm apart. The probe was inserted into the feeder on average 4 times to obtain ~900 g of sample. Alternatively, samples were simply collected by inserting a bare hand into the feeder approximately 8 times to obtain the ~900 g sample. Within a feeder and sampling technique, subsamples (~200 g) were created by using a sample splitter. In addition to the 6 individual feeder samples, a subsample (~33 g) from each individual feeder was pooled within dietary treatment and sampling technique to form a single composite sample. This process was repeated until 4 individual composite samples were created for each diet and sampling technique. All samples were ground through a centrifugal mill and submitted for mineral analysis in duplicate. Results indicated that the variability when sampling feeders with an open handle probe was reduced ($P=0.013$) for Cu and marginally reduced ($P=0.058$) for Ca when compared with

hand-sampling. There was no evidence for differences detected among sampling techniques when samples were pooled from 6 feeders to form a single composite sample. From these results, sampling frequency calculations were determined to assess sampling accuracy within a 95% confidence interval. Results indicated that the number of feeders or composite samples required to analyze was less when using a probe compared to hand collection. In summary, these results suggest that sampling with a probe is associated with less variability when analyzing individual feeder samples; however, this difference was not evident when pooling individual samples to form a composite sample. In addition, using a probe to obtain complete feed from swine feeders and pooling of individually collected samples reduces variability in analyzed nutrient results leading to a need for fewer replicate samples analyzed, which will help reduce analytical costs.

Key Words: calcium, copper, diet sampling

357 Prediction of the concentration of standardized ileal digestible amino acids in distillers dried grains with solubles for poultry: A meta-analysis

Poultry: A Meta-Analysis. J. Zhu*, Z. K. Zeng, G. C. Shurson, P. E. Urriola, *Department of Animal Science, University of Minnesota, St. Paul, MN*

High variability in amino acid (AA) content and digestibility among sources of corn and wheat distillers dried grains with solubles (DDGS) creates challenges for nutritionists when using it in precision nutrition feeding programs. A meta-analysis based on 86 observations from 19 publications was conducted to develop equations for predicting standardized ileal digestible content (SIDC) of AA based on variable chemical composition among DDGS sources (75 corn DDGS, 9 wheat DDGS, 1 wheat-corn DDGS blend, and 1 undefined DDGS source). A mixed model was used to develop prediction equations for SIDC of AA, and a backward selection of variables was conducted based on chemical composition of DDGS sources. Crude protein, NDF, and ADF content were greater ($P < 0.05$) in wheat-DDGS than in corn-DDGS. Wheat DDGS had greater ($P < 0.05$) concentrations of Arg, His, Ile, Phe, Thr, Trp, and Val, but less ($P < 0.05$) Leu content than corn-DDGS. The standardized ileal digestibility (SID) of AA in DDGS from all sources ranged from 61.9% (Lys) to 84.5% (Trp). Except for Phe, all indispensable AA had different SID between corn- and wheat-DDGS ($P < 0.01$). The AA content in DDGS source was the best predictor of SIDC for all AA. The prediction equations for SIDC of