

sion efficiency due to greater ADG ($P = 0.02$) at similar DMI ($P = 0.93$). This resulted in greater ($P < 0.04$) observed dietary ME concentration for cattle fed CDS. No differences ($P > 0.24$) were detected in ADG or GTF for cattle fed DGS or control diets. Therefore, observed ME concentration derived from iterating ADG and DMI for cattle fed DGS or a Control diet did not differ ($P = 0.50$). With the exception of impact on DMI, ether extract content, or a measure thereof, proved to be a significant effect on performance with P-values ranging from 0.005 (observed ME) to 0.12 (ADG). In all instances, modeled effects of ether extract on ADG, GTF or observed ME were positive indicating that as ether extract concentration of co-product increases, performance response improved. Effect of co-product ether extract was significant ($P = 0.05$) and reflected an impact of 0.06 Mcal observed ME/1% change in co-product ether extract content. At an average 7.25% ether extract concentration for DGS modeled in this analysis (3.12 Mcal ME/kg DM), the expected ME concentration of full-fat DGS (12% ether extract) would be 3.42 Mcal ME/kg DM. Equivalent NE_g concentrations for DGS containing 12%, 7.25% or 3.5% ether extract, corresponding to average concentrations for full-, reduced- and low-fat DGS, would be 1.66, 1.46 or 1.30 Mcal NE_g /kg DM, respectively. Results of this meta-analysis demonstrated that reducing oil content of corn co-products reduced energy value of co-products.

Key Words: distillers grains, energy value, growing cattle

GRADUATE STUDENT COMPETITION—PhD POSTER

- 424 **Effects of standardized ileal digestible lysine and added tribasic copper chloride on growth performance and carcass characteristics of finishing pigs.** K. F. Coble^{*1}, S. S. Dritz¹, J. L. Usry², M. D. Tokach¹, J. M. DeRouchey¹, R. D. Goodband¹, J. C. Woodworth¹, ¹Kansas State University, Manhattan, ²Micronutrients, Social Circle, GA.

A total of 1,267 pigs (PIC 337 × 1,050; initially 26.4 kg) were used in a 120-d experiment to determine the effects of standardized ileal digestible (SID) Lys and added tribasic copper chloride (TBCC; Intellibond C, Micronutrients, Indianapolis, IN) on growth performance and carcass characteristics of finishing pigs. Pens of pigs were allotted to 1 of 8 dietary treatments in a randomized complete-block design with 26 to 27 pigs per pen and 6 pens per treatment. Treatments were arranged in a split-plot design. Whole-plot treatments included 2SID Lys levels at 92.5 or 100% of the estimated requirement. Within each Lys level, there was a 2 × 2 factorial arrangement of treatments with either 0 or 150 ppm Cu from TBCC with 2 feeding durations (60 or 120 d). All diets were corn-soybean

Table 424.

| SID Lys,% | Early TBCC | Late TBCC | ADG,kg | G:F | Yield,% | HCW,kg | Carcass ADG,kg |
|-----------|------------|-----------|--------|-------|---------|--------|----------------|
| 92.5 | - | - | 0.88 | 0.365 | 75.06 | 97.8 | 0.65 |
| | + | - | 0.89 | 0.365 | 76.11 | 99.1 | 0.66 |
| | - | + | 0.89 | 0.369 | 75.74 | 99.9 | 0.67 |
| | + | + | 0.88 | 0.366 | 76.74 | 100.3 | 0.67 |
| 100 | - | - | 0.90 | 0.373 | 75.89 | 100.5 | 0.67 |
| | + | - | 0.91 | 0.378 | 75.35 | 100.8 | 0.68 |
| | - | + | 0.90 | 0.371 | 75.60 | 100.2 | 0.67 |
| | + | + | 0.91 | 0.373 | 75.76 | 101.1 | 0.68 |

meal-based with 30% dried distillers grains with solubles (DDGS) and contained 17 ppm of Cu from copper sulfate ($CuSO_4$) provided by the trace mineral premix. There were no 3-way interactions or 2-way interactions for early TBCC × SID Lys, late TBCC × SID Lys, or early TBCC × late TBCC. Overall (d 0 to 120), TBCC did not affect growth performance; however, pigs fed 100% of the SID Lys requirement had increased ($P < 0.05$) ADG, G:F, and final BW compared with those fed 92.5% of the estimated requirement. A significant TBCC × SID Lys interaction ($P < 0.05$) was observed for carcass yield and backfat depth. Hot carcass weight and carcass ADG were improved ($P < 0.05$) when pigs were fed 100% SID Lys compared with those fed 92.5%, and tended ($P < 0.10$) to improve in pigs fed TBCC compared with those not fed TBCC. In conclusion, feeding TBCC did not affect whole body growth performance, but increased HCW and carcass ADG. Also, there was a TBCC × Lys interaction for carcass yield and backfat. Increasing SID Lys from 92.5 to 100% of the estimated requirement resulted in increased ADG, HCW, carcass ADG, and improved G:F.

Key Words: copper, finishing pigs, lysine

- 425 **Effect of dietary lysine on carcass dressing percentage and lean cut yield in late finishing pigs.** T. Wang^{*}, N. Regmi, M. A. Crenshaw, J. R. Blanton, S. F. Liao, *Mississippi State University, Mississippi State.*

Although the lysine requirement of pigs at late finishing stage is lower than that of younger pigs, it is the last production stage for producers to provide optimal levels of dietary lysine to maximize carcass yield and quality. The objective of this study was to evaluate the effect of dietary lysine on growth performance and carcass characteristics of late finishing pigs. A total of 9 crossbred barrows (Yorkshire × Landrace; initial BW 94.4 ± 6.7 kg) were randomly allotted to 3 treatments, and each treatment consisted of three pen replicates with one pig per pen. Three corn and soybean-meal based diets were formulated according to the NRC (2012) requirements for nutrients except for lysine. The total lysine concentrations were 0.43, 0.71, and 0.98% (as-fed basis) for Diets 1 (D1, lysine-deficient), 2 (D2, lysine-adequate), and 3 (D3, lysine-excess), respectively. The feeding trial lasted 5 weeks, during which time the pigs were allowed ad libitum access to the respective