A total of 2,124 barrows and gilts (PIC 1050 'DNA 600, initially 48.9 kg) were used in a 32-d study to determine the optimal dietary standardized ileal digestibility (SID) Lys level in a commercial setting. Pigs were randomly allotted to 1 of 5 dietary treatments with 24 to 27 pigs/pen and 16 replications/treatment. Similar number of barrows and gilts were placed in each pen. Diets were fed over 3 phases (48.9 to 58.6, 58.6 to 70.9, and 70.9 to 80.8 kg respectively). Dietary treatments were corn-soybean meal-based and contained 10 (phase 1 and 2) or 5% (phase 3) distillers dried grains with solubles. Diets were formulated to 85, 95, 103, 110, or 120% of the current Pig Improvement Company (PIC, Hendersonville, TN) SID Lys gilt recommendations with phase 1 SID Lys levels of 0.90, 1.01, 1.09, 1.17 and 1.27%, phase 2 levels of 0.79, 0.87, 0.94, 1.03, and 1.10%, and phase 3 levels of 0.71, 0.78, 0.85, 0.92, and 0.99%, respectively. Dose response curves were evaluated using linear (LM), quadratic polynomial (QP), broken-line linear (BLL), and broken-line quadratic (BLQ) models. For each response variable, the best-fitting model was selected using the Bayesian information criterion. Overall (d 0 to 32), increasing SID Lys increased (linear, P< 0.001) BW, ADG, G:F, Lys intake/d, and Lys intake/kg of gain. Modeling margin over feed cost (MOFC), BLL and QP estimated the requirement at 105.8% and 113.7% respectively. In summary, while growth increased linearly up to 120% of the PIC current feeding level, the optimal MOFC was 106% to 114% depending on the model used.
Effect of Supplemental DL-met Above Requirement on Performance and Serum Concentration of Amino Acids in Heat Stressed Pigs. Adriana Morales Trejo1, Verónica Sánchez1, Bayron Pérez1, Lucero R. Camacho1, J. Caroline González-Vega2, John K. Htoo1, Miguel Cervantes3,

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The intestinal morphology can be compromised in pigs when exposed to heat stress (HS), partly due to increased production of reactive-oxygen species. Because methionine (Met) functions as intracellular antioxidant, requirement of Met may be increased in HS-pigs. The effect of dietary supplementation with DL-Met above requirement on performance and serum concentration (SC) of free AA in HS-pigs was evaluated.

A basal wheat-soybean meal diet was formulated to meet 100% Met requirement with the other indispensable AA exceeding at least 20% their requirement. Sixty individually housed pigs (23.0 ± 2.4 kg BW, 12 pigs/treatment) were randomly assigned to 5 treatments: TN100, thermal-neutral (22.7 °C) housed pigs fed the basal diet; HS100, HS120, HS140, HS160; HS pigs (29.6 to 39.4°C) fed the basal diet supplemented with DL-Met to contain 0, 20, 40, and 60% DL-Met above the requirement, respectively. Pigs had free access to feed and water during the 21-d trial. Blood samples were collected on d18 to analyze the absorptive AA-SC.

The effect of ambient temperature (HS100 vs. TN100), as well as the linear and quadratic effects of increasing Met levels in the diets for HS-pigs were analyzed. The performance results for the TN100, HS100, HS120, HS140, HS160 pigs were: Average daily gain (ADG), 728, 612, 720, 716, 719 g/d; average daily feed intake, 1.40, 1.34, 1.30, 1.30, 1.29 kg/d; gain:feed, 0.522, 0.474, 0.563, 0.562, respectively. The ADG reduced (P < 0.01) in HS100 compared with TN100 pigs, but linearly increased in HS-pigs, besides gain:feed (P ≤ 0.05), in response to DL-Met supplementation. The SC of Ile, Leu, Lys, Phe, and Val were higher in HS100 pigs than in TN100 pigs (P < 0.05). Graded supplemental DL-Met in diets for HS-pigs linearly decreased SC of Ile, Leu, and Val (P < 0.05), tended to decrease His, Lys, and Thr (P < 0.10), and increased Met (P < 0.01).

In conclusion, HS had negative effect on weight gain; however, it was ameliorated by adding 20% Met above the requirement.

Keywords: pigs, heat stress, methionine, serum amino acids