186 Effects of dietary tryptophan:lysine ratio on the reproductive performance of primiparous and multiparous lactating sows. Z. Fan1,2,3, X. Yang1, J. Kim1, D. Menon1, S. K. Baidoo1, 1Southern Research and Outreach Center, University of Minnesota, Waseca, 2Institute of Animal Nutrition, Hunan Agricultural University, Changsha, China, 3State Key Laboratory of Animal Nutrition, Beijing, China.

The objective of this study was to determine the effects of dietary tryptophan (Trp) to lysine (Lys) ratio on the performance of lactating sows. Thirty primiparous and 195 multiparous lactating sows (Landrace × Yorkshire) were allocated on the basis of parity, body weight, and backfat to 5 dietary treatments according to a randomized complete block design with 5 blocks of farrowing date. The 5 experimental diets contained 0.16%, 0.19%, 0.23%, 0.26%, or 0.29% standardized ileal digestible (SID) Trp and SID Lys level was identical (0.87%) for all the diets, with the SID Trp:Lys ratio being 0.18, 0.22, 0.26, 0.30, and 0.33, respectively. Sows received their assigned lactation diets from Day 109 of gestation to weaning. Litter size was standardized to 10 to 12 piglets within treatment within 2 d after farrowing. The average lactation length was 18 d and no creep feed was provided. Changes of sow body weight and backfat during lactation, weaning-to-estrus interval, litter size and weight, litter weight gain, preweaning piglet mortality, and performance of subsequent parity (total interval, litter size and weight, litter weight gain, preweaning body weight and backfat during lactation, weaning-to-estrus was 18 d and no creep feed was provided. Changes of sow body weight and backfat during lactation, weaning-to-estrus interval, litter size and weight, litter weight gain, preweaning piglet mortality, and performance of subsequent parity (total interval, litter size and weight, litter weight gain, preweaning body weight and backfat during lactation, weaning-to-estrus interval) were recorded. Average daily feed intake of the primiparous sows showed a tendency (4.53, 5.63, 5.52, 4.92, and 4.81 kg/d; P < 0.10) to a quadratic dependency on the SID Trp:Lys ratio with the ratio of 0.22 being associated with the highest feed consumption. A quadratic pattern of body weight loss (−15.75, −8.28, −5.48, −16.41, and −15.67 kg; P < 0.05) and backfat loss (−5.6, −4.4, −4.2, −3.9, and −5.1 mm; P < 0.10) with increasing Trp level was observed for the primiparous sows during lactation and the losses were minimized with the SID Trp:Lys ratio of 0.25 according to the broken-line model. Nevertheless, preweaning piglet mortality of the primiparous sows increased linearly and quadratically (P < 0.05) as Trp level increased. On the contrary, piglet mortality of the multiparous sows decreased linearly (11.1, 11.8, 6.8, 10.2, and 7.2%; P < 0.05) with increasing dietary Trp and the mortality was noticeably reduced when the SID Trp:Lys ratio reached 0.26. No differences (P < 0.05) were observed for the remaining parameters. In conclusion, our results indicate that the optimal SID Trp:Lys ratio could be 0.22 to 0.26 for lactating sows.

Key Words: lactation, tryptophan, lysine, sow, reproductive performance
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187 Effects of dietary inclusion level of distillers dried grains with solubles (DDGS) and high-protein distillers dried grains (HP-DDG) on the growth performance and carcass characteristics of wean-to-finish pigs. A. Rojo1, M. Ellis2, E. B. Gaspar1, A. M. Gaines3, B. A. Peterson1, F. K. McKeith1, J. Killefer1, 1University of Illinois, Urbana-Champaign, 2University of Illinois, Champaign-Urbana, 3The Maschhoffs, LLC, Carlyle, IL.

The objective was to evaluate the effect of dietary levels of DDGS (10% crude fat level) and HP-DDG (5% crude fat level) on the wean-to-finish growth performance and carcass and pork quality characteristics of finished pigs. A RCBD was used with a 3 × 4 factorial arrangement of dietary treatments: 1) HP-DDG inclusion level (0, 10, 20, and 30%) and 2) DDGS inclusion level (0, 15, and 30%). Six replicates with a total of 2448 pigs, housed in mixed-gender pens (50% barrows and 50% gilts) of 34 were used. Growth performance was evaluated from weaning (5.9 ± 0.10 kg) to wk 20 postweaning (107.6 ± 6.86 kg); pigs were sent for harvest to a commercial facility at a mean pen BW of 123.8 ± 1.48 kg. No carcass or pork quality data were collected for pigs on the 30% HP-DDG inclusion level because low weight at the end of the study period. There were HP-DDG by DDGS level treatment interactions (P < 0.05) for ADG and ADFI. For the 0% HP-DDG diet, there was no effect (P > 0.05) of DDGS inclusion level on ADG (0.775, 0.767 and 0.763 kg/d for the 0, 15, and 30% DDGS inclusion levels) or ADFI (1.87, 1.89 and 1.88 kg/d for the 0, 15, and 30% DDGS inclusion levels respectively); however, for the other HP-DDG inclusion levels, ADG and ADFI were linearly reduced with increasing DDGS level with the magnitude of the reduction increasing with HP-DDG inclusion levels to the 30% DDGS and 30% HP-DDG inclusion levels respectively; P < 0.05). There was no effect (P > 0.05) of either HP-DDG or DDGS inclusion level on G:F. Increasing the dietary level of both HP-DDG and DDGS was associated with linear reductions (P < 0.05) in carcass yield (from 75.1 to 73.5% for the 0% and 20% HP-DDG levels, and 74.9 to 73.2% for the 0% and 30% DDGS levels). Longissimus muscle depth (from 6.46 to 5.98 and 6.29 to 6.14 cm for HP-DDG and DDGS, respectively), and belly flop distance (from 23.9 to 17.6 and 22.6 to 19.0 cm for HP-DDG and DDGS, respectively). These results suggest that DDGS can be included at up to 30% in diets without compromising growth performance of wean-to-finish pigs. However, growth performance was increasingly compromised at higher inclusion levels of both co-products and belly firmness was negatively affected by increasing levels of both DDGS and HP-DDG.

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