Table 1. Effects of branched-chain amino acid ratios on growth performance of pigs

						P =[1]	
Item[2]	Control	Low ratio	Medium ratio	High ratio	SEM	AA Linear	AA Quadratic
Initial BW, kg	39.3	39.3	39.3	39.3	0.56	0.911	0.614
Final BW, kg	132.3	130.8	131.3	131.8	1.08	0.107	0.857
Overall							
ADG, kg	0.89[a]	0.87[b]	0.88[ab]	0.88[ab]	0.013	0.011	0.564
ADFI, kg	2.52	2.47	2.49	2.52	0.030	0.032	0.959
G:F, g/kg	352	352	353	351	2.72	0.728	0.705
Carcass characteristics							
HCW, kg	97.4	96.7	97.1	97.5	0.95	0.272	0.953
Carcass yield, %	73.4	73.7	73.6	73.7	0.32	0.968	0.784
Lean, %	57.0	56.6	56.3	56.5	0.25	0.866	0.081
Back fat depth, mm	14.0[b]	14.6[ab]	15.0[a]	14.7[ab]	0.27	0.614	0.213
Loin depth, mm	68.6[a]	67.1[ab]	66.7[b]	67.9[ab]	0.49	0.166	0.147

[a-b]Means within a row with different superscript differ ($P < 0.05$).

[1]Linear and quadratic contrasts were evaluated based on total Leu, Ile, Val, and Trp:Lys ratios per diet and compares means of the low- medium- and high-ratios.

[2]The control diet contained high soybean meal and low feed grade amino acids with ratios to Lys ranging from 92 to 95% for Val, 79 to 83% for Ile, and 23% for Trp. The other 3 diets contained lower soybean meal levels and high feed grade amino acids with Val:Lys, Ile:Lys, and Trp:Lys increasing for the three treatments (Low, Medium, and High). For the low treatment, Val:Lys, Ile:Lys, and Trp:Lys were 67, 55, and 18, respectively. For the medium ratios, Val:Lys, Ile:Lys, and Trp:Lys were 72, 60, and 21, respectively. For the high ratios, Val:Lys, Ile:Lys, and Trp:Lys were 80, 65, and 23, respectively. The Leu:Lys levels ranged from 139 to 154% in the different diet phases for the three treatments with higher levels of feed grade L-Lys.

Keywords: branch chain amino acids, growth performance, pig

168 Evaluation of Increasing Dietary Threonine to Lysine Ratio in Corn-Soybean Meal Diets with and Without Dried Distillers Grains with Solubles (DDGS) on Growth Performance of Grow-Finish Pigs.

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Abstract: A total of 2,160 pigs (PIC 337×1050; initial BW 35.1 kg) were used in a 112-d growth trial to evaluate the effects of normal or high SID Thr:Lys ratio in diets with and without DDGS on growth performance. Pigs were assigned to pens (27 pigs per pen) in a randomized complete block design by BW with 20 replications per treatment. Pens of pigs were allotted to 1 of 4 dietary treatments arranged in a 2×2 factorial with main effects of dietary Thr level (Normal vs High) and DDGS (with or without). Treatment diets were formulated in 4 phases from 35 to 57, 57 to 82, 82 to 105, and 105 to 136 kg BW. Diets with high DDGS were formulated to include 40% DDGS in phase 1 and 2, 30% in phase 3, and 15% in phase 4. Normal Thr diets were formulated to contain 61, 62, 63, and 65% SID Thr:Lys ratios for the 4 dietary phases, respectively. High Thr diets had SID Thr:Lys ratios of 67, 68, 69 and 72%, respectively. There were no (P>0.10) DDGS×Thr interactions. For the overall period (d 0 to 112), pigs fed diets without DDGS had increased ($P < 0.001$) ADG and BW, and reduced ($P < 0.001$) ADFI leading to improved ($P < 0.001$) G:F. There was no evidence for difference ($P > 0.10$) between diets with normal or high SID Thr:Lys ratio regardless of DDGS inclusion. In summary, the addition of high levels of DDGS reduced ADG and increased ADFI, which resulted in poorer G:F and lighter final BW, regardless of the dietary SID Thr:Lys ratio. These results indicate that addition of an insoluble fiber source, such as corn DDGS, does not increase the Thr:Lys requirement of finishing pigs.

	No DDGS		DDGS			P =		
Item	Normal Thr	High Thr	Normal Thr	High Thr	SEM	Thr	DDGS	Thr × DDGS
Day 0 to 112 (Overall)								
ADG, kg	0.92	0.92	0.90	0.90	0.006	0.973	<0.001	0.989
ADFI, kg	2.59	2.64	2.72	2.70	0.027	0.556	<0.001	0.252
Gain:feed	0.36	0.35	0.33	0.33	0.003	0.408	<0.001	0.164
Final BW, kg	136.6	136.9	133.6	133.3	0.803	0.972	<0.001	0.655

Keywords: DDGS, grow-finish pig, SID Thr.