which states peak intensity (PI) is proportional to the concentration of analytes, a spectroscopic non-calibration method was developed to estimate the apparent ileal digestibility (AID) of FA and apparent total tract digestibility (ATTD) of crude fat. To validate, diets incorporating 4 samples of flaxseed and field pea mixtures plus a basal diet were fed to pigs (initial BW: 23.1 kg) in a 5 × 5 Latin square design. Ingredients, diets, digesta and feces were scanned on a Fourier transform mid-infrared (FTIR) instrument with a single-reflection attenuated total reflectance attachment. The PI of anti-symmetric stretch at 2,923 cm^{-1} (r = 0.95, $P < 0.01$) or symmetric stretch at 2,852 cm^{-1} (r = 0.94, $P < 0.01$) of methylene (main component of FA) were strongly correlated to total FA content of ingredients, diets, and digesta, indicating the PI of either of two peaks can be used as an index for total FA content; the functional group digestibility (FGD) of both peaks were highly correlated (r = 0.87, $P < 0.01$) to the AID of total FA. The mean and standard deviation of the difference in diet AID of FA values between FTIR and gas-liquid chromatography (GLC) was 0.54 ± 3.78%. Fecal crude fat content was highly correlated (r = 0.96, $P < 0.01$) to the sum of PI of 2nd derivative spectra at 1,735 and 1,710 cm^{-1}. The ATTD of crude fat of test diets was highly correlated (r = 0.95, $P < 0.01$) with the FGD in area at 1766–1695 cm^{-1} which is associated with ester carbonyl (C=O) in mono-, di-, or triglycerides and C=O in free fatty acids. In conclusion, a non-calibration method using FTIR spectra and marker concentration appears promising for the prediction of AID of FA and ATTD of crude fat.

Key Words: digestibility, fat, spectroscopy

O224 **Effects of amino acid supplementation of reduced crude protein (RCP) diets on performance and carcass composition of growing-finishing swine.** J. K. Apple[1,*], B. E. Bass[1], T. C. Tsai[1], C. V. Maxwell[1], J. W. S. Yancey[1], A. N. Young[1], M. D. Hanigan[2], R. Ulrich[3], J. S. Radcliffe[4], B. T. Richert[4], G. Thoma[3], J. S. Popp[5], [1]*Animal Science, University of Arkansas Division of Agriculture, Fayetteville,* [2]*Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg,* [3]*Chemical Engineering, University of Arkansas, Fayetteville,* [4]*Animal Science, Purdue University, West Lafayette,* [5]*Agricultural Economics & Agribusiness, University of Arkansas Division of Agriculture, Fayetteville.*

Barrows and gilts (n = 210/gender) were used to test the effects of crystalline AA supplementation of reduced CP diets on growth performance and carcass composition of growing-finishing swine. Pigs were blocked by BW, and pens (6 pigs/pen) within each block and gender were assigned randomly to either corn-SBM diets (**C**) devoid of crystalline LYS and formulated to 95% SID AA requirements or 1 of 4 RCP diets (CP and crystalline LYS levels for dietary treatments during each feeding phase are presented in the accompanying table). During the last 3-wk feeding phase, 10 ppm of Paylean was included in all diets. Individual BW and pen feed disappearance were recorded at the end of each feeding phase to calculate ADG, ADFI, and G:F. At slaughter, HCW and FOM data were recorded before carcass chilling and a subsample of fresh hams (3/pen) were knife-dissected into muscle, fat, bone, and skin. ADG increased 2.1% between C and RCP3 but declined 6.1% between RCP3 and RCP4 (quadratic, $P < 0.01$). G:F increased 4.6% in gilts between C and RCP2 before decreasing to values similar between C and RCP4; yet, G:F was relatively unchanged in barrows across the dietary treatments (quadratic gender × RCP diet, $P = 0.04$). Fat depth increased (linear, $P < 0.01$) and fat-free lean yield decreased (linear, $P < 0.01$) as CP was reduced in swine diets. Percent ham muscle decreased (linear, $P < 0.01$), and percent ham fat increased (linear, $P < 0.01$), with decreasing dietary CP. Results imply that dietary CP can be reduced 19.7 to 28.6% across the 5 feeding phases by using crystalline AA without affecting live pig performance; however, in general, performance and carcass composition declined at the highest synthetic AA inclusion to levels below or similar to C diets.

CP (added LYS) of experimental diets for each feeding phase (% as fed)

Phase	C	RCP1	RCP2	RCP3	RCP4
1	23.70	21.61 (0.19)	19.58 (0.37)	17.61 (0.56)	15.72 (0.75)
2	21.53	19.46 (0.18)	17.44 (0.36)	15.49 (0.54)	13.61 (0.71)
3	18.97	17.34 (0.15)	15.74 (0.29)	14.16 (0.44)	12.68 (0.59)
4	17.66	16.30 (0.13)	14.96 (0.24)	13.64 (0.36)	12.37 (0.48)
5	20.24	18.60 (0.15)	17.01 (0.30)	15.44 (0.45)	13.93 (0.60

Key Words: live performance, reduced CP, swine

O225 **The effects of SID Trp:Lys ratio and Trp source in diets containing DDGS on growth performance and carcass characteristics of finishing pigs.** S. Nitikanchana[1,*], M. Tokach[1], S. Dritz[1], J. Usry[2], R. Goodband[1], J. DeRouchey[1], J. Nelssen[1], [1]*Kansas State University, Manhattan,* [2]*Ajinomoto Heartland LLC, Chicago, IL.*

A total of 2,290 pigs (PIC 1050×337; initially 71 kg) were used to determine the effect of Trp level and source in diets containing 30% DDGS on finishing pig performance. Pens of pigs were allotted to 1 of 7 dietary treatments in a completely randomized design with 26 to 28 pigs per pen and 10 to 13 pens per treatment. Treatments were arranged as a 2×3 factorial with the main effects of Trp source (L-Trp or soybean meal; SBM) and standardized ileal digestible (SID) Trp:Lys ratio (18, 20, or 22%). The 7th treatment was a negative control diet formulated to 16% SID Trp:Lys. Overall, a Trp source×SID Trp:Lys ratio interaction (P=0.03) was observed for G:F. Increasing SID Trp:Lys to 20% improved (quadratic, P<0.01) G:F when SBM was the source of Trp, but the optimum ratio was 18% with L-Trp. There was a Trp source × SID Trp:Lys interaction (P=0.01) for yield. Differences in response at 22% SID Trp:Lys led to a linear increase (P=0.01) in yield for L-Trp, but a quadratic increase (P=0.03) for SBM. For the main effect of SID Trp:Lys ratio, ADG and G:F improved (quadratic, P<0.01) as SID Trp:Lys ratio increased to 20%. Loin depth was greatest in the control diet and lowest at 18% SID Trp:Lys (quadratic, P=0.02). For the main effect of Trp source, no differences were observed in ADFI or G:F between sources; however, a trend (P=0.07) for greater ADG when using SBM as the Trp source was observed. Backfat was greater (P=0.04) and percentage lean (P=0.02) was lower in pigs fed with L-Trp than those with SBM as the Trp source. This study indicates an optimum SID Trp:Lys ratio of 20% for 71 to 127-kg pigs when fed 30% DDGS. Because SBM or L-Trp provided a similar growth response, differences in feed cost will be a major factor in choosing the optimal source of Trp.

Effects of Trp sources and increasing SID Trp:Lys ratio on finishing pigs

	Control	L-Trp			SBM			
	16.0	18.0	20.0	22.0	18.0	20.0	22.0	SEM
ADG, g	897	915	948	908	926	968	928	11.72
G:F	0.317	0.337	0.328	0.322	0.326	0.336	0.327	0.003
Yield, %	74.3	75.4	74.7	75.8	75.8	74.6	74.6	0.608
Lean, %	58.5	58.2	58.4	58.5	58.6	58.8	58.6	0.630

Key Words: DDGS, SID Trp, Trp source