229 Effects of pelleting and fat supplementation on growth performance of growing-finishing pigs. E. van Heugten*, T. C. Schell, C. R. Risley, and J. A. Valancius, *Wayne Feed Division, Continental Grain Company, Chicago, IL.*

Two separate studies were conducted to determine the effect of pelleting and fat supplementation on performance of grower pigs (n=346) and finisher pigs (n=327). In each study, pigs were allotted by BW to one of four treatments (5 replicates/treatment) arranged in a 2 × 2 factorial randomized complete block design. Factors were: 1) diet form (meal or pellet), and 2) fat supplementation (0 or 5% added choice white grease). Corn-soybean meal based diets contained the following levels of ME for the 0 and 5% fat diets, respectively: 3260 and 3475 kcal/kg (grower); 3320 and 3535 kcal/kg (finisher). The lysine to ME ratio was kept constant (3.3 and 2.6 g/Mcal for grower and finisher diets, respectively). Methionine, threonine, and tryptophan levels were kept at a minimum constant ratio to lysine. In the grower study, pelleting improved ADG (746 vs 722 g/d, $P < .02$), reduced ADFI (1508 vs 1556 g/d, $P < .03$), improved G/F (.496 vs .467, $P < .03$), and efficiency of energy utilization (ADG/ME, 147 vs 138 g/Mcal, $P < .001$) in pigs. The improvement in G/F and ADG/ME due to pelleting tended ($P < .07$) to be greater in pigs fed diets without fat (8.5%) compared to pigs fed fat-added diets (4.5%). Addition of fat reduced intake (1467 vs 1597, $P < .001$) and improved G/F (.499 vs .463, $P < .001$). In the finisher study, pelleting reduced ADG (938 vs 984, $P < .02$) and ADFI (2537 vs 2848, $P < .001$), but improved G/F (.371 vs .346, $P < .001$) and ADG/ME (108 vs 101, $P < .001$), regardless of dietary fat level. Addition of fat improved ADG (982 vs 940, $P < .02$), reduced ADFI (2637 vs 2748, $P < .04$) and improved G/F (.374 vs .343, $P < .001$) and ADG/ME (106 vs 103, $P < .01$). Pelleting and fat addition had similar effects on feed intake and therefore nutrient levels in pelleted diets may need to be adjusted to maintain total daily nutrient intake and pig growth performance.

Key Words: Pigs, Pellets, Energy

230 Effects of added L-Carnitine during lactation on performance of first parity sows. R. E. Musser[1], R. D. Goodband[1]*, M. D. Tokach[1], J. L. Nelssen[1], K. Q. Owen[2], and S. A. Blum[2], [1]*Kansas State University, Manhattan and* [2]*Lonza Inc., Fair Lawn, NJ.*

A total of 107 first parity sows was used to determine the effects of added L-Carnitine in the lactation diet on sow and litter performance. Sows were fed a lactation diet that contained 1.0% lysine, .95% Ca, .85% P, with or without 50 ppm added L-Carnitine. No differences ($P > .10$) were observed for total number of pigs born, born live, stillborn, and mummies per litter. No differences ($P > .10$) were observed in number of pigs per litter on d 2, pigs weaned per litter, or pig survival. For the analysis of litter weight gain, litter weight at birth was used as a covariate. No differences ($P > .10$)were observed in litter weaning weights (41.65 vs 42.73 kg, control and added L-Carnitine, respectively). No differences ($P > .10$)in sow weight change or last rib fat depth change were observed. During the first week of lactation, ADFI was lower for gilts fed added L-Carnitine compared with control sows(4.32 vs 4.65 kg/d respectively; $P = .05$). No differences were observed in ADFI during week 2, or overall. Feeding added L-Carnitine at 50 ppm in lactation numerically tended ($P = .15$) to decrease the days to estrus(8.70 vs 6.85 days). The addition of L-Carnitine to the lactation diet had little effect on the performance of the first parity sow. However, a decrease in feed intake during the first week of lactation, and a tendency for fewer days to estrus were observed.

Key Words: L-Carnitine, Sows

231 Effect of dietary tea polyphenols on putrefactive metabolites in swine waste and pig performance. T. L. Veum, D. W. Bollinger, J. H. Porter, and D. M. Sievers, *University of Missouri, Columbia.*

Thirty two crossbred barrows averaging 37 kg BW were used in a 27 day experiment to determine the effect of tea polyphenols on pig performance and putrefactive metabolites in swine waste. Pigs were allotted to treatment by litter and weight and placed in individual pens. A 14% CP corn-soybean meal basal diet was supplemented with 0, .1, .2 and .3% of a commercial tea polyphenol product (Polyphenol G®, Mitsui Norin Co., Fujieda City, Japan). Diets were fed to appetite three times daily. Chromic oxide was added to the diet at .05% as a nondigestible indicator. Fresh fecal grab samples and total urine collections were made twice daily from days 22 to 26 of the experiment. There were no tea polyphenol treatment effects ($P > .9$) and no linear, quadratic or cubic responses ($P > .5$ to .9) to tea polyphenol concentrations for daily feed intake, daily gain or gain:feed ratio. There were no tea polyphenol treatment effects ($P > .1$ to .9) for any of the fecal and urinary metabolites measured (Phenol, p-cresol, 4-ethylphenol, indole, skatole and ammonia). There were linear declines in the mg of 4-ethylphenol excreted per day in feces ($P < .04$) and urine ($P < .08$) from 0 to .2% tea polyphenols, with no further decline at .3%. There were no tea polyphenol linear or quadratic responses ($P > .1$ to .9) for the other metabolites measured (mg/d) in feces and urine. In conclusion, tea polyphenols did not significantly reduce the fecal and urinary metabolites measured and did not improve pig performance. (Partially funded by the National Pork Producers Council, Des Moines, IA).

Key Words: Tea polyphenols, Swine, Odor, Performance

232 Dietary vitamin A, E, C needs of pigs experiencing a low or high level of antigen exposure. T. S. Stahly*, D. R. Cook, and R. C. Ewan, *Iowa State University, Ames.*

Fourteen sets of five littermate pigs were utilized to evaluate the impact of dietary concentration of vitamins A, E, and C on growth from 9.5 to 25.2 kg BW in pigs experiencing a low or high level of chronic antigen exposure (AE) thus immune system activation. Pigs from a single genetic strain and source were either administered ceftiofur and ampicillin on d 1, 3, 5, 8, 11 d of age, weaned (12-14 d) and placed in a sanitized facility isolated from other pigs (low AE) or not administered antimicrobials, weaned and placed in a nonsanitized facility occupied with older pigs (high AE). Dams of the pigs received a corn-soybean meal diet devoid of supplemental vitamins A, E, C from d 60 of pregnancy through lactation. Post-weaning, pigs were individually penned and self-fed a basal diet containing 25% of the estimated requirement (NRC, 1988) for 5-10 kg pigs for vitamins A and E and 8 mg/kg of vitamin C. All other vitamins were supplied at a minimum of 600% of NRC. At 9.5 ± 1.2 kg, pigs within a litter were randomly allotted to the basal diet supplemented with vitamins A, E, C equivalent to 0, 100, 200, 300, and 400% of NRC (2 mg of C added per 1 IU of E). Low AE pigs had lower serum alpha-1 glycoprotein concentrations (466 vs 726 μg/ml) and gained BW faster and more efficiently than high AE pigs. As dietary concentrations of A, E, C (V) increased, daily gains increased quadratically but the magnitude of the response differed between AE groups. Gain:feed ratios were not altered by diet.

		Dietary A, E, C, % NRC					Probability		
Criteria	Antigen exposure	25	125	225	325	425	AE	V	AE × V
Daily gain, g	Low	613	635	633	622	648	.01	.03	.05
	High	548	560	636	578	554			
Gain/feed, g/kg	Low	744	729	700	708	718	.03	.23	.40
	High	694	683	701	667	684			

Key Words: Pigs, Antigen exposure, Vitamins