10 Effect of genotype on feed intake pattern and ·wth performance in group housed growing pigs. Y. Hyun* M. Ellis, *University of Illinois, Urbana.*

: objective of this study was to investigate feed intake patterns :wo genotypes; Meishan [M] and Yorkshire [Y]. Forty-eight rows comprising equal numbers of M and Y were allocated on basis of weight to 4 feed intake recording stations (FIRE, nday, Newcastle upon Tyne, UK) to give mixed-genotype ups of 12 pigs. Animals were given ad libitum access to a wer diet (17 % CP and 3,365 kcal/kg ME). The study was ried out over a 6 week period from a starting weight of 36.4 ± kg for M and 42.1 ± 1.41 kg for Y. Each pig carried a nsponder with a unique identification which allowed the time, ·ation, and size of individual meals to be recorded. Pigs were ghed once per week. Y had higher ADG and daily feed intake FI) than M (721 vs 369 g P<.01; 1.37 vs 2.34 kg P<.01). Y made re frequent visit to the feeder (NFV; 18.5 vs 7.7 P<.01), had rter feeder occupation time per visit (FOV; 7.4 vs 12.9 min .01) and ate less feed per visit (FIV; 130 vs 177g P<.01). nsumption rates (CR) were greater for Y than M (19.3 vs 14.8 in P<.01). Feeder occupation time per day (FOD) of Y was ger than M (114.3 vs 82.8 min/pig P<.01). Feeder visits for Y re as high between 08:00 and 11:00. Feeding activity of M was h between 6:00 and 8:00, and between 16:00 and 21:00 when ding competition with Y was less. Both genotypes showed ong correlations between DFI and ADG (.79 vs .70 for M and , and between ADG and gain:feed (.75 vs .84 for M and Y). The relation between body weight (BW) and NFV (.44 vs .25 for M d Y) and CR (.46 vs .45 for M and Y) suggest that bigger pigs thin each genotype visited the feeder more often and ate more ickly. There were negative correlations between FIV and NFV 33 vs -.64 for M and Y), CR and FOV (-.29 vs -.56 for M and Y), d FOV and NFV (-.39 vs -.55 for M and Y). Regressions of BW feed intake patterns showed increases of DFI, NFV, FOD and t with BW, however FIV and FOV decreased as BW increased. is study suggests there are differences in feed intake patterns well as in growth performance between M and Y.

y Words: Swine, Growth, Feed Intake Pattern, Meishan, rkshire

111 Variability of apparent ileal digestibility of amino ids in different samples of peas for growing-finishing gs. M. Z. Fan, W. C. Sauer*, and V. M. Gabert, *University of berta, Edmonton, Canada.*

is study was to investigate factors responsible for the variability apparent ileal digestibility of amino acids (AA) among six pea mples. Six barrows, average initial BW 32.5 kg, fitted with a mple T-cannula at the distal ileum, were fed six diets according a 6x6 Latin square design. The diets were formulated to contain 5% CP from six pea cultivars: century, express, progreta, dley, tara, and trapper. The pigs were fed twice daily, at 0800 d 2000 h, 800 g each meal. Each experimental period lasted 7 d. eal digesta were collected, at 2-h intervals, for a total of 24 h. ith the exception of arginine, cysteine, histidine, and methio- ne, there were differences (P<.05) in the ileal digestibility of the dispensable AA (+semi) among these samples. Of the indispens- ble AA (+semi) within each sample, the digestibility of arginine d lysine were relatively high, ranging from 88.3 to 91.3 and 78.7 85.2% while the digestibility of methionine and tryptophan were latively low, ranging from 69.4 to 75.4, and 53.1 to 70.4%. The ypsin inhibitor activity (TIA) in the pea samples ranged from 61 to 7.35 trypsin inhibited unit/mg DM. Only the digestibility of yptophan was negatively correlated (P< .05) with the TIA in the mples. With the exception of arginine, cysteine, and tryptophan, e ileal digestibility of the indispensable AA (+semi) were egatively correlated (P < .05) with the NDF content in these mples. In summary, differences in the NDF content were partly sponsible for the variation in the ileal digestibility of the jority AA among the pea samples. The low digestibility of the ulfur-containing AA and tryptophan further accentuate the mitation of these AA in peas.

ey Words: Amino Acid Digestibility, Peas, Pigs

112 The effects of increasing dietary energy density on growing-finishing pig growth performance and carcass characteristics. J. W. Smith, II*, J. L. Nelssen, R. D. Goodband, M. D. Tokach, R. E. Musser, W. B. Nessmith, Jr., J. R. Bergstrom, and J. A. Loughmiller, *Kansas State University, Manhattan.*

Eighty crossbred gilts (PIC L326 x C-15; initially 45 kg BW) were used in a growth assay to evaluate the effects of dietary energy on growth performance and carcass characteristics. Choice white grease was added at 0, 1.5, 3.0, 4.5, and 6% to a corn-soybean meal-based diet to achieve energy levels ranging from 3.30 to 3.57 Mcal ME/kg. Pigs were blocked by BW and allotted to the five dietary treatments. Experimental diets were fed in two phases: growing (45 to 73 kg) and finishing (73 to 106 kg) with constant lysine:calorie ratios of 3.2 and 2.47 g lysine/Mcal ME in each period (1.06 to 1.14% and .82 to .88% lysine), respectively. During the growing phase, increasing energy density in the diet decreased ADFI and improved G:F (linear, P < .01) without affecting ADG. In the finishing period, the response was less consistent with decrease then increase in ADG and G:F (quadratic, P < .05). Total energy and lysine intakes were not affected by energy content of the diet during either phase. Optical probe analysis of the skinned carcass indicated a increase then decrease in backfat depth (quadratic, P < .05); however, ultrasonic measurements found no effects of dietary energy on backfat or loin muscle area. The results of this experiment indicate that energy density of the growing phase diet can be increased to improve G:F; however, during the finishing phase increasing energy density decreased ADG. Overall, increasing the energy density of the grower diet may be justified to improve feed efficiency without affecting subsequent carcass characteristics. With the gilts used in this trial, increasing energy density improved G:F during the growing phase but was less consistent in the finishing phase. Both ADG and carcass characteristics were not affected by energy density of the diet.

		Choice White Grease, %					
		0	1.5	3	4.5	6	CV
45 to 73 kg	ADG, kg	.89	.91	.89	.88	.93	7.5
	G:F	.45	.47	.48	.50	.50	7.9
73 to 106 kg	ADG, kg	.96	.87	.88	.88	.89	7.9
	G:F	.27	.25	.26	.26	.28	6.0

Key Words: Pigs, Fat, Energy density

113 PIGLET and BARROWS: Companion spreadsheets for synchronizing feeding to genetics. Dewey L. Harms*, and T. J. Safranski, *USDA-ARS, RLHUSMARC, Clay Center, NE.*

The practical need to customize feeding programs to nutritional requirements of different genders, ages and genetic populations has been recognized, with simulation modeling being a pertinent approach to accomplish this objective. To this end, two spreadsheet programs, both utilizing nonlinear optimization capability, have been developed to jointly accomplish this task for the grow-finish phase of pork production. The procedure is organized around the concept of ideal protein with the potential of diets to support lean growth highly related to the ratio of ideal protein to digestible energy (IPDER). The two software packages are PIGLET, for *P*reliminary *I*nvestigation of *G*enetic, *L*ogistic and *E*nvironmental *T*argets, and BARROWS, for *B*uild *A*ppropriate *R*ation *R*equired for *W*inning *S*imulation. Three broad steps include 1) nonlinear optimization on PIGLET of genetic potential growth and intake parameters to give best fit between model predictions and observed values for a flexible set of traits from a growth test, 2) determining phase feeding diet and ration specification on PIGLET using, either, a) formula solving for IPDER with *ad-lib* intake to maximize ideal protein retained and minimize deamination, or b) nonlinear optimization for IPDER and the restricted level of feeding as a fraction of *ad-lib* with additional constraints on lipid accretion, and 3) nonlinear diet optimization on BARROWS for an objective function for least cost per daily intake with constraints on IPDER for each feeding period of 2) and appropriate constraints on ingredients. It is presumed that premixes are included in prescribed amounts to satisfy vitamin, mineral and micronutrient requirements. This software is available to technical advisors to the swine industry who will collaborate to evaluate the software and, possibly, field test the procedure experimentally. Abundant use of color graphics is made in both software packages to aid visualization.

Key Words: Swine, Simulation, Nutrition