

172 The effects of conditioners (standard, long-term, and expander) affect on pellet quality and growth performance in nursery pigs. S. L. Johnston*, S. L. Traylor, R. H. Hines, J. D. Hancock, K. C. Behnke, and S. P. Sorrell, Kansas State University, Manhattan.

Two experiments were conducted to determine the effects of standard (ST), long-term (LT), and expander (EX) conditioners on nutritional value of phase-three nursery diets. In Exp. 1, 180 pigs (average initial BW of 11.7 kg) were fed corn-soybean meal-based diets (1.3% lysine) during a 28-d growth assay. Gain/feed was improved ($P < .004$) with pelleting and pellet durability index (PDI) increased with degree of conditioning (LT > ST). However, there was no advantage for LT vs ST conditioning in rate or efficiency of gain ($P > .5$). In Exp. 2 (initial BW of 10.4 kg), the pelleted diets tended to support greater ADG ($P < .08$) and gain/feed ($P < .002$) with no marked advantage from EX vs ST conditioning. In conclusion, pelleting improved efficiency of growth with no marked advantage for LT or EX compared to ST conditioning.

Item	Meal	ST-M	ST-P	LT-M	LT-P	EX-M	EX-P	SE
Exp 1 PDI	N/A	N/A	69	N/A	92	N/A	N/A	N/A
ADG, g	563	562	595	589	571	N/A	N/A	10
G/F, g/kg	562	565	608	534	652	N/A	N/A	24
Exp 2 PDI	N/A	N/A	82	N/A	N/A	N/A	89	N/A
ADG, g	563	562	560	N/A	N/A	521	540	13
G/F, g/kg	622	586	660	N/A	N/A	628	687	16

Key Words: Expander, Pig, Nursery

173 Effect of lysine to metabolizable energy ratio (LYS/ME) on growth and protein deposition in boars (M), barrows (C), and gilts (G) from 59 to 86 kg live weight. E. L. Hansen*, G. W. Libal, C. R. Hampton, and D. N. Peters, South Dakota State University, Brookings.

Two M, two C, and two G from each of four litters were used in a randomized complete block design with treatments (LYS/ME and sex) in a 2 x 3 factorial arrangement. Also, 1 M, 1 C, and 1 G from each of two litters were slaughtered at 59 kg to determine initial body composition. Two diets were formulated for each sex, LO containing 2.9, 2.0, and 2.5 and HI containing 3.4, 2.5, and 3.0 g lys/Mcal ME (LYS/ME) for M, C, and G, respectively. Pigs were individually penned with ad libitum feed and water. At slaughter, blood, head/feet/empty viscera, and carcass were taken from each pig. The three fractions were ground to obtain homogenous samples for separate proximate analyses. An interaction occurred between sex and LYS/ME for G/F. Barrows fed LO had higher ($P \leq .01$) G/F than when fed HI (303 vs 252), whereas G/F was not affected by LYS/ME in M and G ($P > .10$). There were no differences ($P > .10$) due to LYS/ME in ADG, ADFI, and carcass and whole body H₂O, CP, or fat deposition rates from 59 to 86 kg. However, there were differences among the sexes for these criteria. Main effect means are shown in the table.

	Sex			P	LYS/ME			SD
	M	C	G		HI	LO	P	
ADG, kg	1.08 ^b	1.17 ^c	94 ^a	$\leq .01$	1.08	1.05	NS	0.51
ADFI, kg	3.14 ^a	3.96 ^b	3.22 ^a	$\leq .05$	3.50	3.38	NS	3.39
Initial BF, cm	1.79 ^a	2.50 ^b	1.89 ^a	$\leq .05$	2.08	2.04	NS	2.60
IMA, cm ²	311	291	30.5	NS	30.8	29.7	NS	2.64
Lean, NPPC 1991	53.2 ^a	48.4 ^b	52.3 ^a	$\leq .05$	51.4	51.2	NS	1.99
Water, g/g	304 ^b	216 ^a	273 ^b	$\leq .05$	266	263	NS	43
Water, g/g	590 ^b	373 ^a	394 ^a	$\leq .01$	454	450	NS	53.6
CP, g/g	170 ^b	112 ^a	121 ^a	$\leq .05$	129	139	NS	24.24
Fat, g/g	291 ^a	602 ^c	384 ^b	$\leq .01$	447	404	NS	68.33

Key Words: Finishing pig, Lysine/ME, Protein deposition

174 Crystalline lysine and threonine supplementation of grain sorghum-based, low protein diets for growing-finishing swine. R. O. Myer*, J. H. Brendemuhl, and D. W. Gorbet, University of Florida, NFREC, Marianna.

Two trials were conducted to evaluate the effectiveness of crystalline lysine and threonine supplementation of grain sorghum-based, low protein diets for G-F swine. Each trial involved a comparison of grain sorghum-based diets formulated with 1) soybean meal (48%) as the supplemental source of amino acids, or 2) L-lysine-HCl and L-threonine with enough soybean meal to meet the requirements of the other amino acids. Both trials were similar and each involved 60 crossbred pigs (5 reps). For both trials, grower diets (.75% estimated digestible lysine) were fed from 29 or 32 kg to 54 or 51 kg avg BW for trials 1 and 2, respectively, finisher 1 (.64% dig lys) to 78 or 78 kg, and finisher 2 (.52% dig lys) to 115 or 105 kg. The grain sorghum utilized was a blend of commercial, low tannin hybrids; a different crop of grain was used in each trial. The grain contained (89% DM basis) 9.4 and 11.1% CP, .23 and .25% Lys, .33 and .40% Thr, .31 and .36% M+C, and .34 and 0.40% Ilu for trials 1 and 2, respectively. At the end of both trials, all pigs were slaughtered. Overall results over both trials for the control (1) and Lys-Thr (2) treatments, respectively, were: 1.03 and .98 kg ADG ($P < .01$), 3.08 and 2.99 kg ADF ($P = .11$), 2.99 and 3.06 F/G ($P = .09$), 48.4 and 47.4% carcass lean ($P > .10$), .365 and .340 kg avg lean gain/d ($P < .01$), and 1.15 and 1.37% of BW leaf (internal) fat ($P < .001$). There were no grain crop (trial) x diet effects ($P > .10$). Crystalline lysine and threonine supplementation of grain sorghum-based diets, in which the protein content was lowered by 3.5 percentage units, resulted in a small (5%) reduction in growth performance. There also was evidence that feed utilization was slightly reduced and carcass fat deposition, especially internal fat, was increased.

Key Words: Pigs, Amino acids, Grain sorghum

175 Dietary lysine requirement for optimal growth performance and carcass characteristics of 90 to 115 kg gilts. J. A. Loughmiller*, J. L. Nelssen, R. D. Goodband, M. D. Tokach, E. C. Titgemeyer, I. H. Kim, J. C. Woodworth, J. W. Smith II, J. R. Bergstrom, K. Hongtrakul, W. B. Nessmith Jr., and R. E. Musser, Kansas State University, Manhattan.

Two experiments using 230 gilts (PIC 326 x C-22) were conducted to determine the lysine requirement of finishing gilts from 90 to 115 kg. Treatments were arranged in a randomized complete block design with 7 or 8 gilts per pen and 5 or 4 replications per treatment (Exp. 1 and Exp. 2, respectively). Pigs were blocked by weight at an average weight of 42 (Exp. 1) or 39 kg (Exp. 2). All gilts were fed by weight in 3 phases from 40 to 115 kg. All diets were corn-soybean meal based with no synthetic amino acids. All gilts were fed a diet containing 1.0% lysine from 40 to 68 kg and .8% lysine from 68 to 90 kg. When the average block weight of 90 kg was reached, all gilts within the block were switched to treatments containing .40, .55, and .70% (Exp. 1) or .60%, .70%, .80% and .90% (Exp. 2) total lysine. In Exp. 1, increasing dietary lysine from .40% to .70% (11 to 20 g/d) improved ADG (739, 839, 894 g/d; linear, $P < .04$), gain/feed (265, 306, 316 g/kg; linear $P < .02$), plasma urea nitrogen (PUN) (12.39, 12.78, 15.51 mg/dL; linear, $P < .03$), backfat (23.9, 22.4, 20.6 mm; linear $P < .05$), and carcass lean percentage (49.8%, 51.0%, 51.6%; linear $P < .01$). In Exp. 2, increasing dietary lysine from .60% to .90% (18 to 26 g/d) had no effect on ADG (780, 781, 797, 790 g/d; linear, $P = .75$), gain/feed (258, 259, 267, 269 g/kg; linear, $P = .21$), backfat (22.5, 22.0, 23.2, 21.3 mm; linear $P = .63$) or carcass lean percentage (52.7%, 52.7%, 52.4%, 52.7%; linear $P = .89$). In summary, growth performance and carcass characteristics improved linearly with lysine levels up to .70% (19.8 g/d) in Exp 1 with PUN values indicating a lysine requirement between .55% and .70% total lysine. In Exp. 2, growth performance and carcass characteristics did not improve above .60% lysine (18 g/d). Based on the results of these experiments, the total dietary lysine requirement in gilts from 90 to 115 kg is between .60% and .70% (18 to 20 g/d) total lysine.

Key Words: finishing pigs, lysine, lean growth;