Nonruminant Nutrition: Nursery and Growing-Finishing Nutrition and Management

273P The effects of high-sulfate water and dietary zeolite (clinoptilolite) on nursery pig performance. J. R. Flohr*, M. D. Tokach, J. L. Nelssen, S. S. Dritz, J. M. DeRouchey, R. D. Goodband, and N. W. Shelton, *Kansas State University, Manhattan.*

A total of 320 barrows (PIC 1050, 5.5 kg BW) were used in a 24-d study to determine the effects of high-sulfate water and dietary zeolite on growth performance and fecal consistency of nursery pigs. Eight treatments were arranged as a 2 × 4 factorial with 2 water treatments (control or water with 3,000 ppm sodium sulfate; $NaSO_4$), and 4 dietary zeolite levels (0, 0.25, 0.5, and 1.0%). Barrows were transported (623 km) from the sow farm and were weighed and allotted to pens. There were 8 replications/treatment with 5 barrows/pen. Water treatments remained the same from d 0 to 24, and all diets were fed in 2 phases, with the same zeolite inclusion rates in both phases. Phase 1 diets were fed in a pellet form (d 0 to 10), and phase 2 diets fed in meal form (d 10 to 24). Fecal samples were collected on d 5, 9, 16, and 23, visually scored for consistency (1 = firm, 5 = watery), and analyzed for DM. There were no water source × zeolite interactions for any response criteria. Overall (d 0 to 24), pigs drinking high-$NaSO_4$ water had decreased ($P < 0.01$) ADG, ADFI, and G:F compared with pigs drinking control water. Pigs drinking high-$NaSO_4$ water had increased ($P < 0.01$) fecal scores and lower ($P < 0.04$) DM on d 5, 9 and 16 compared with pigs drinking control water. Increasing dietary zeolite increased (linear, $P < 0.05$) ADG and ADFI, but had no effect on G:F. In conclusion, the 3,000 ppm $NaSO_4$ resulted in decreased pig growth performance that had indicators of less firm fecal consistency with lower DM and higher scores. Supplemental dietary zeolite increased ADG and ADFI but did not affect fecal score or DM.

Table 1. Effects of supplemental dietary zeolite and sodium sulfate water on nursery pig performance (d 0 to 24) and fecal consistency

	Zeolite				
Item	0%	0.5%	1%	2%	SEM
Control water					
ADG, g	277	284	283	291	12.53
G:F	0.77	0.76	0.78	0.79	0.02
d 9 fecal score	3.4	3.3	3.4	3.3	0.13
d 9 fecal DM, %	23.9	25.0	25.2	26.2	1.0
3,000 ppm $NaSO_4$					
ADG, g	229	259	268	265	12.53
G:F	.73	.76	.74	.73	.02
d 9 fecal score	4.0	4.0	4.4	4.0	.13
d 9 fecal DM, %	19.0	18.0	17.0	19.8	1.0

Key Words: nursery pig, sulfate, water, zeolite

274P Evaluation of feed budgeting, complete diet blending, and over and under feeding each phase on finishing pig growth performance and carcass characteristics. H. L. Frobose*[1], J. M. DeRouchey[1], D. Ryder[2], M. D. Tokach[1], S. S. Dritz[1], R. D. Goodband[1], and J. L. Nelssen[1], *[1]Kansas State University, Manhattan, [2]Feedlogic Corp., Willmar, MN.*

A total of 252 mixed sex pigs (PIC 327 × 1050; initial BW = 39.2 ± 0.4 kg) were used in a 103-d growth study to compare feed–budgeting strategies and complete diet blending for finishing pigs on growth performance, carcass characteristics and economics. Feed was delivered to all pens of pigs using a computerized feed delivery system (FEEDPro, Feedlogic Corp., Willmar, MN) which is capable of delivering and dispensing 2 separate diets concurrently. There were 9 pens/treatment and 7 pigs/pen in a randomized complete block design. There were 4 experimental treatments: 1) standard 4–phase (0.91, 0.77, 0.67, 0.61% SID, respectively) complete feed program (Standard); 2) Blending a high– and low–lysine complete diet to meet the estimated daily SID lysine requirement from d 0 to d 103 (Curve); 3) Treatment 1 diets with 20% greater feed budget per phase (Over), and 4) Treatment 1 diets with 20% lower feed budget per phase (Under). Diets were corn-soybean meal based with no added fat. The Standard diet was budgeted 53.1, 62.6, 71.7 and 79.4 kg for phases 1 to 4, respectively. Overall (d 0 to 103), there were no differences ($P \geq 0.12$) in ADG, ADFI or G:F or final BW. Pigs phase-fed a standard budget tended to have heavier ($P \leq 0.10$) carcasses (HCW) than pigs fed the curve and tended to have ($P \leq 0.10$) greater percentage yield than those fed the curve or the over-budget. However, there were no differences ($P \geq 0.14$) in percentage lean, fat depth, or loin depth. Because of heavier HCW, pigs fed the standard feed budget had greater ($P \leq 0.05$) revenue per pig and tended to have greater ($P \leq 0.10$) income over feed cost (IOFC) than pigs fed via the curve with pigs over- and under-budgeted being intermediate.

Table 1. Effects of feeding method using FEEDPRO on overall performance

Criteria	Standard	Curve	Over	Under	SEM
ADG, kg	0.94	0.91	0.92	0.93	0.011
ADFI, kg	2.51	2.48	2.46	2.50	0.03
G:F	0.37	0.37	0.37	0.37	0.004
HCW, kg	99.7^{y}	97.6^{x}	97.9^{xy}	98.5^{xy}	0.97
Yield, %	75.1^{y}	74.5^{x}	74.4^{x}	74.6^{xy}	0.24
Feed cost, $/pig	73.87	72.47	72.70	72.92	0.934
Revenue, $/pig	185.49^{b}	179.73^{a}	181.74^{ab}	183.75^{ab}	2.036
IOFC, $/pig	111.62^{y}	107.26^{x}	109.04^{xy}	110.83^{xy}	1.868

$^{a,b}P \leq 0.05$; $^{x,y}P \leq 0.10$.

Key Words: feed blending, feed budgeting, finishing pig, growth

275P Effects of increasing NDF from corn dried distillers grains with solubles (DDGS) or wheat middlings (Midds), individually or in combination, on growth performance, carcass characteristics, and fat quality in finishing pigs. M. D. Asmus*, J. M. DeRouchey, J. L. Nelssen, M. D. Tokach, S. S. Dritz, and R. D. Goodband, *Kansas State University, Manhattan.*

A total of 288 pigs (38.0 kg BW) were used in an 87-d study to determine the effects of increasing dietary NDF from middlings (14.1% CP, 42.1% NDF, and 9.6% CF) and DDGS (24.9% CP, 30.4% NDF, and 12.2% fat) on growth performance, carcass characteristics, and fat quality. Pigs were allotted to 1 of 6 dietary treatments (6 pens/treatment; 8 pigs/pen) with varying levels of DDGS and middlings added to corn-soybean meal-based diets to achieve NDF concentrations ranging from 9.2 to 18.8% (Table 1). Choice white grease (CWG) was added to maintain similar dietary SID lysine to ME within phase. The only DDGS × middlings interaction was a trend for carcass yield ($P = 0.09$). Adding middlings or DDGS to the diet reduced carcass yield, but the effect was not additive. Overall, adding middlings to