

producing pigs with different lysine requirements than sorting pigs in 80–20 or 90–10 percentile groups. The combined implementation of split-sex feeding and sorting based on BW resulted in the most precise feeding of pigs.

Key Words: pig growth, stochastic model, lysine requirements

193 Effects of increasing standardized ileal digestible lysine:calorie ratio on growth performance of growing-finishing pigs. J. R. Bergstrom*, N. W. Shelton, M. L. Potter, J. Y. Jacela, J. M. DeRouche, M. D. Tokach, S. S. Dritz, R. D. Goodband, and J. L. Nelssen, *Kansas State University, Manhattan.*

A total of 1,080 pigs (PIC TR4 × 1050) were used in four 28-d RCB experiments to determine the lysine requirements of growing-finishing pigs reared in a new research facility. Low- and high-lysine diets without added fat were formulated for each experiment by varying amounts of corn, soybean meal, and synthetic amino acids in order to meet or exceed an ideal amino acid pattern. The 2 diets were blended to form 6 lysine levels. There were 6 pens with 6 or 8 pigs per pen and an equal number of barrows and gilts in each pen. In Exp. 1, 252 pigs (initially 37 kg) were fed standardized ileal digestible (SID) lys:cal ratios ranging from 2.09 to 3.59 g/Mcal ME. Performance and margin over feed cost (MOF) were optimal at 2.69 g/Mcal. In Exp. 2, 288 pigs (initially 56 kg) were fed SID lys:cal ratios ranging from 2.12 to 3.27 g/Mcal. Optimal performance and MOF occurred at 2.35 g/Mcal. In Exp. 3, 252 pigs (initially 80 kg) were fed SID lys:cal ratios ranging from 1.49 to 2.98 g/Mcal. Optimal performance and MOF occurred at 2.09 g/Mcal. In Exp. 4, 288 pigs (initially 102 kg) were fed the same SID lys:cal ratios as in Exp. 3. Increasing SID lys:cal ratio decreased (linear; $P < 0.04$) ADFI, carcass yield, and MOF, and improved (linear; $P < 0.01$) G/F. Despite a linear improvement in G/F, ADG did not improve above 1.79 g/Mcal, which resulted in the best MOF. These experiments agree with previous recommendations for pigs of this genotype. For pigs weighing 37 to 65 kg, 56 to 86 kg, 80 to 107 kg, and 102 to 129 kg, performance and MOF were optimized with SID lys:cal ratios of 2.69, 2.35, 2.09, and 1.79 g/Mcal ME.

Table 1.

	SID lys:ME, g/Mcal						SEM	Linear, Quadratic, $P <$ $P <$	
	2.09	2.39	2.69	2.99	3.29	3.59		$P <$	$P <$
Exp. 1	2.09	2.39	2.69	2.99	3.29	3.59			
ADG, g	982	993	1035	1018	1027	1025	16	0.04	0.15
G/F	0.40	0.41	0.43	0.42	0.43	0.44	0.01	0.01	-
Exp. 2	2.12	2.35	2.58	2.81	3.04	3.27			
ADG, g	1070	1103	1101	1088	1092	1065	17	-	0.12
G/F	0.35	0.36	0.36	0.36	0.37	0.37	0.01	0.02	-
Exp. 3	1.49	1.79	2.09	2.39	2.69	2.98			
ADG, g	890	899	972	939	918	969	27	0.06	-
G/F	0.30	0.30	0.32	0.31	0.32	0.33	0.01	0.01	-
Exp. 4	1.49	1.79	2.09	2.39	2.69	2.98			
ADG, g	959	1009	1009	1017	1018	1006	22	0.13	0.15
G/F	0.28	0.29	0.30	0.30	0.31	0.31	0.01	0.01	-

Key Words: finishing, lysine, pigs

194 Efficacy of methionine hydroxy analogue-calcium salt and DL-methionine to support nitrogen retention in growing pigs. F. O. Opapeju*¹, J. K. Htoo², and C. M. Nyachoti¹, ¹*University of Manitoba, Winnipeg, MB, Canada,* ²*Evonik Degussa GmbH, Hanau, Germany.*

Methionine is one of the limiting AA in swine diets. In addition to DL-methionine (DLM, 99% purity) and liquid DL-methionine hydroxy analogue-free acid (88%), calcium salt of methionine hydroxy analogue (MHA-Ca; 84%), is also commercially available as a Met source. Data on the efficacy of MHA-Ca relative to DLM in pigs are scarce. This study assessed the efficacy of MHA-Ca relative to DLM in growing pigs fed wheat-barley based diets using N retention as a response criterion. Fourty-two barrows (Genesus; average initial BW 19 kg) were used in two consecutive N-balance experiments with 21 pigs each. Pigs were randomly allotted to 7 test diets giving a total of 6 replicates per treatment. Dietary treatments consisted of a Met-deficient wheat-barley-based basal diet or the basal diet with 3 added levels of DLM (0.02, 0.04, and 0.06%) or MHA-Ca (0.0238, 0.0476, and 0.0714%), supplemented on an equi-molar basis. The basal diet was adequate in all nutrients and energy except for Met. Pigs were housed individually in metabolism crates and fed at 3.5% of their BW and had free access to water. After a 7-d adaptation period, feces and urine were collected quantitatively for 5 d. Although fecal N excretion was not different, urinary and total N outputs linearly decreased ($P < 0.05$) with DLM or MHA-Ca supplementation. Nitrogen retention, expressed as g/d, % of intake and % of absorbed, linearly increased ($P < 0.05$) with supplementation of DLM and MHA-Ca, indicating that efficacy was tested within the sensitive phase. The slope of DLM was higher ($P = 0.044$) than that of MHA-Ca when expressed as N retention (% of absorbed), however, the slopes were not different for N retention when expressed as g/d or as % of intake. Using a slope-ratio procedure, the relative efficacy of MHA-Ca to DLM observed in this experiment was 73.9, 71.2 and 56.3% on a weight to weight basis for N retained expressed as g/d, % of intake, and % of absorbed, respectively.

Key Words: efficacy, DL-methionine, methionine hydroxy analogue calcium salt

195 Interaction of dietary energy and protein on growth performance, carcass characteristics and feed digestibility in individually penned finishing barrows when fed at a constant lysine to calorie ratio. P. M. Cline*, T. C. Tsai, C. R. Dove, and M. J. Azain, *University of Georgia, Athens.*

Increasing the lysine to calorie (Lys:ME) ratio (g lysine/Mcal) in diets that meet the energy requirement for grower-finishing pigs has been shown to increase ADG. However, there is a lack of research on the effects of varying protein and energy at a constant Lys:ME ratio on growth performance. The objective of this study was to determine the performance response to changes in dietary fat, protein, and fiber content in finishing barrows while maintaining a constant Lys:ME ratio. This experiment was conducted in 2 trials of 25 individually penned pigs each (1 pig/pen, total 50 pigs). There were no trial interactions for the parameters measured therefore; data from both trials were combined. Barrows (initial wt=85.3kg) were blocked by weight and assigned one of five experimental diets (0.50, 0.55, 0.60, 0.65, and 0.70 % total lysine) with a constant Lys:ME ratio (1.833g lysine/Mcal). The 0.50% total lysine diet did not meet NRC requirements however, all other diets met requirements (NRC, 1998). Pigs were fed experimental diets for 28 d, and body weights, feed intakes, and ultrasound measurements were recorded on d 14 and 28. Blood samples were taken on d 28 to determine