Lysine, Pigs, Economics

191 Determining an optimum lysine:calorie ratio for 35 to 120 kg gilts in a commercial finishing environment. R. G. Main, S. S. Dritz, M. D. Tokach, R. D. Goodband, and J. L. Nelssen, Kansas State University, Manhattan.

Our objective was to determine the optimum lysine:calorie ratio (g total dietary lysine/Mcal ME) for 35 to 120 kg gilts (PIC L337 x C22) in a commercial finishing environment. Four trials were used to manipulate the lysine:calorie ratio that optimized performance and IOMFC from 40 to 120 kg.

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Two experiments were conducted to evaluate the lysine requirement of barrows fed ractopamine HCl (Paylean, RAC) under heat-stress conditions. Exp. 1 was conducted in the Brody environmental chambers at the University of Missouri. Seventy-two barrows (TR-4 x PIC C-22) were subjected to a controlled cycling heat stress (cycling from 27 C at 21 C and 25 C) to produce high ambient temperatures. All pigs were weaned into an SEW nursery. Following the nursery period, they were sorted into two environments: an all-in-all-out grow/finish facility with high biosecurity measures in place (AIAO) or into a continuous flow system for the grow/finish phase (CF). At an average initial BW = 72.1 kg, pigs were allotted by weight, sex and ancestry to one of three ractopamine (RAC) treatments (ttr): 1) control, no RAC; 2) 5 ppm RAC wks 0-3; 10 ppm RAC wks 4-6; 3) 10 ppm RAC wks 0-3 and 1.10% Lys diet wks 3-6; 4) 1.50% Lys diet wks 0-3 and 1.00% Lys diet wks 4-6. Barrows were fed a 1.05% Lys diet wks 0-3, and a 1.00% Lys diet wks 4-6; gilts were fed a 1.15% Lys diet wks 0-3 and a 1.10% Lys diet wks 4-6. Pigs fed RAC had increased ADG (1022 vs 887 g/d; P < 0.05) and increased G:F (0.416 vs 0.439; P < 0.05) compared to the control trt during wk 0-3. Overall, pigs fed RAC had increased ADG (1022 vs 887 g/d; P < 0.05) and increased G:F (0.416 vs 0.439; P < 0.05) compared to the control trt. Additionally, pigs fed trt 3 had increased ADG (990 vs 926 g/d; P < 0.05) than trt 3 during wk 0-6. Pigs fed trt 2 also had increased final BW (109.0, 114.0, 110.8 kg; trt 1-3 respectively, P < 0.05) than the control trt. Real-time ultrasound data indicate that pigs fed RAC had increased loin eye area (LEA) (42.8, 45.8, 46.0 cm²; trt 1-3 respectively, P < 0.05). No significant differences between housing systems or interactions with increasing Lys level. Therefore, feed efficiency linearly (P < 0.01) and quadratically (P < 0.05) improved with increasing Lys level (0.399, 0.414, 0.441, and 0.421, respectively). Pigs fed diets with 10 ppm RAC and 0.90% total Lys had greater ADG (P < 0.02), feed efficiency (P < 0.001), and loin eye area accretion (P < 0.03) than non-RAC fed pigs. These experiments demonstrate that feeding Paylean® improves the growth performance of heat-stressed pigs and that the lysine requirement of barrows fed Paylean® may be as high as 1.30% total lysine under heat-stress conditions.

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193 The effects of environmental housing conditions on two ractopamine use programs in finishing pigs. S. A. Trapp*, B. E. Hill, S. L. Hankins, A. P. Schinckel, and B. T. Richert, Purdue University, West Lafayette, IN.

Littermate barrows (93) and gilts (96) were used in a 6-wk study evaluating the effect of environmental housing conditions on two ractopamine use programs for late finishing pigs. All pigs were weaned into an SEW nursery. Following the nursery period, they were sorted into two environments: an all-in-all-out grow/finish facility with high biosecurity measures in place (AIAO) or into a continuous flow system for the grow/finish phase (CF). At an average initial BW = 72.1 kg, pigs were allotted by weight, sex and ancestry to one of three ractopamine (RAC) treatments (ttr): 1) control, no RAC; 2) 5 ppm RAC wks 0-3; 10 ppm RAC wks 4-6; 3) 10 ppm RAC wks 0-6. Barrows were fed a 1.05% Lys diet wks 0-3 and a 1.00% Lys diet wks 4-6; gilts were fed a 1.15% Lys diet wks 0-3 and a 1.10% Lys diet wks 4-6. Pigs fed RAC had increased ADG (1022 vs 887 g/d; P < 0.05) and increased G:F (0.416 vs 0.439; P < 0.05) compared to the control trt during wk 0-3. Overall, pigs fed RAC had increased ADG (1022 vs 887 g/d; P < 0.05) and increased G:F (0.416 vs 0.439; P < 0.05) compared to the control trt. Additionally, pigs fed trt 3 had greater ADG (990 vs 926 g/d; P < 0.05) than trt 3 during wk 0-6. Pigs fed trt 2 also had increased final BW (109.0, 114.0, 110.8 kg; trt 1-3 respectively, P < 0.05) than the control trt. Real-time ultrasound data indicate that pigs fed RAC had increased loin eye area (LEA) (42.8, 45.8, 46.0 cm²; trt 1-3 respectively, P < 0.05). No significant differences between housing systems or interactions with increasing Lys level. Therefore, feed efficiency linearly (P < 0.01) and quadratically (P < 0.05) improved with increasing Lys level (0.399, 0.414, 0.441, and 0.421, respectively). Pigs fed diets with 10 ppm RAC and 0.90% total Lys had greater ADG (P < 0.02), feed efficiency (P < 0.001), and loin eye area accretion (P < 0.03) than non-RAC fed pigs. These experiments demonstrate that feeding Paylean® improves the growth performance of heat-stressed pigs and that the lysine requirement of barrows fed Paylean® may be as high as 1.30% total lysine under heat-stress conditions.

Key Words: Pigs, Ractopamine, Lysine


A total of 2,152 pigs were used in four experiments to determine the interactive effects of dietary carnitine and ractopamine HCl (Paylean, RAC). All trials were arranged as factorials with main effects of carnitine (0, 25, or 50 ppm in Exp. 1 and 2 and 0 or 50 ppm in Exp. 3 and 4) and RAC (0, 5, or 10 ppm in Exp. 1 and 0 or 10 ppm in Exp. 2, 3, and 4). Dietary carnitine was fed from 38 kg to market (Exp. 1 and 3) or for the last 3 or 4 wk before market (Exp. 4 and 2, respectively). Ractopamine was fed prior to market for 4 wk in Exp. 1, 2, and 3, and 3 wk in Exp. 4. Experiments 1 and 2 were conducted in university research facilities and Exp. 3 and 4 in commercial research barns. All diets were formulated to 1.0% Lys during the last phase of each experiment. In all experiments, pigs fed RAC (mtr vs CTR) had increased ADG (P < 0.05) and feed efficiency (G:F) compared to pigs not fed RAC. Feeding carnitine prior to the RAC feeding period did not affect (P > 0.25) pig performance. In Exp. 1 and 2, carnitine did not affect (P > 0.46) ADG during the 4 wk prior to market; however, G:F tended (quadratic; P < 0.07) to improve with increasing carnitine in Exp. 2. In Exp. 3, a carnitine × RAC interaction was observed (P < 0.04) for ADG and (P < 0.05) for carcass and RAC improved performance, but not additively. In Exp. 4, pigs fed carnitine had increased (P < 0.04) ADG (0.88 vs 0.84 kg) and G:F...