

The use of ractopamine to enhance the environmental sustainability of pork production

K.A. Ross^{1,2}, A.D. Beaulieu¹, J. Merrill³, G. Vessie³ and J.F. Patience^{1,4}

¹Prairie Swine Centre Inc., P.O. Box 21057, 2105-8th Street East, Saskatoon, SK. S7H 5N9;

²University of Saskatchewan, Saskatoon, SK; ³Elanco Animal Health, Guelph, ON; ⁴Iowa State University, Ames, IA; *Email*: kathryn.ross@usask.ca

This experiment was conducted to determine if ractopamine HCl (RAC) can increase nutrient utilization and decrease water use in hog operations. This experiment combined growth (GEXP) and metabolism (MEXP) experiments using 9 dietary treatments (trt) arranged as a 3 x 3 factorial: 3 levels of RAC (0, 5 & 10 ppm) and 3 standardized ileal digestible LYS: DE ratios (1.75, 2.25 & 2.75 g/Mcal DE). GEXP utilized a comparative slaughter technique which consisted of 120 barrows (initial BW 95±3 kg) including 12 assigned to an initial slaughter group; the remaining pigs were slaughtered at 108 (n=6/trt) or 120 kg (n=6/trt). Growth performance and nutrient retention were determined. The 15d MEXP consisted of 54 pigs (initial BW 95±3 kg; n=6/trt). Growth performance, feed and water intake and urine and fecal outputs were measured. In GEXP, RAC had no effect on ADG, ADFI or G: F (P>0.10). Increasing LYS improved G: F (0.35, 0.35 and 0.39; P<0.05), but not ADG or ADFI (P>0.10). Crude protein deposition rates tended to increase (162, 185 & 189 g/d for 0, 5 & 10 ppm RAC; P<0.12) and water deposition (466, 609 & 573 g/d; P<0.05) rates increased, while lipid deposition (620, 462 & 542 g/d) tended to decrease with RAC inclusion (P<0.10). Nitrogen (N) retention tended to increase (29, 32 and 34 %; P<0.11). Pigs fed higher LYS concentrations had improved N retention (26, 29 & 32 g/d; P<0.05) but not when expressed as a % of intake (P>0.10). In MEXP, higher levels of RAC and LYS improved ADG (1.09, 1.27 & 1.25 for RAC; 1.13, 1.27 & 1.21 for LYS; P<0.05) and G: F (0.34, 0.39 & 0.41 for RAC; 0.35, 0.40 & 0.40 for LYS; P<0.0001). RAC decreased water intake (8.3, 7.9 & 7.3 l/d; P<0.05.) and urine output (3.5, 3.2 & 2.9 l/d; P<0.05). LYS had no effect on water balance (P>0.10).

Implications: RAC may reduce the environmental footprint of pork production through improved nutrient utilization and reduced water requirements.