

4 kg. Since there were no differences between treatments with RAC, but there were differences with those that did not contain RAC, we conclude that it is possible to use RAC with diets containing less than 16% CP.

Key Words: Ractopamine, Lean Tissue Gain, Carcass Yield

627 Effects of ractopamine level and feeding duration on the performance and carcass characteristics of late finishing market pigs. C. W. Parks^{*1}, G. L. Allee², R. B. Hinson², and S. N. Carr¹, ¹Elanco Animal Health, Greenfield, IN, ²University of Missouri, Columbia.

A study was conducted to evaluate the effects of Ractopamine HCl (RAC; Elanco Animal Health, Greenfield, IN) on the performance and carcass characteristics of late-finishing pigs. A total of 1,680 pigs w/ an average BW of 101 kg were used in a 3x2x2 factorial design consisting of 3 RAC levels (0, 5, and 7.4 ppm RAC), 2 RAC feeding durations (21 or 28 d prior to slaughter), and 2 genders (barrows and gilts). Diets were corn-soybean meal based and were formulated to contain 0.94% TID lysine. There were no dose x duration, nor gender x dose interactions; therefore, main effects of dose are presented. Pigs fed 5 and 7.4 ppm RAC had greater ADG (P<0.0001) and G:F compared to controls (P<0.0001). In addition, pigs fed 7.4 ppm had improved ADG (P<0.0001) and G:F (P<0.0001) as compared to pigs fed 5 ppm RAC. Feed intake was unaffected by treatment (P<0.14). Carcass data indicated an increase in HCW (P<0.0001) and yield (P<0.03) in RAC-fed pigs compared to control pigs. There were no differences observed in back fat depth due to treatment (P<0.18). However, there was an increase in LM depth due to both RAC treatments compared to controls (P<0.0001), as well as a significant improvement in lean percentage when feeding 5 ppm RAC compared to controls (P<0.05). These results indicate that RAC at 5 and 7.4 ppm improve the growth performance and carcass characteristics of late-finishing pigs.

Effects of ractopamine dose on performance and carcass characteristics

Measurement	0 ppm RAC	5 ppm RAC	7.4 ppm RAC	SEM
ADG, kg	0.76 ^a	0.85 ^b	0.91 ^c	0.010
ADFI, kg	2.57	2.56	2.60	0.017
G:F	0.30 ^a	0.33 ^b	0.35 ^c	0.003
HCW, kg	89.7 ^a	92.2 ^b	93.6 ^c	0.405
Yield, %	74.8 ^a	75.6 ^b	75.7 ^b	0.260
LM depth, mm	56.1 ^a	57.6 ^b	58.8 ^b	0.340
Backfat depth, mm	17.6	17.0	17.5	0.260
Lean, %	52.9 ^a	53.3 ^b	53.2 ^{ab}	0.130

^{a,b,c} Means differ (P<0.05)

Key Words: Ractopamine, Growth, Pigs

628 The effect of dietary lysine or methionine and copper/manganese on osteochondrosis lesions and cartilage properties in pigs. N. F. Frantz^{*}, J. L. Nelssen, G. A. Andrews, M. D. Tokach,

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An 84-d growth study with 120 gilts (initially 40.5 kg BW, 10 replications with 2 gilts per pen) was conducted to determine the influence of dietary lysine level and added methionine, copper, and manganese on osteochondrosis (OCD) occurrence in swine. Gilts were fed below (0.71% phase I and 0.53% phase II), at (0.89% phase I and 0.71% phase II), or above (1.16% phase I and 0.98% phase II) their requirement for true ileal digestible lysine (Lys) with standard concentrations or high added methionine (1%), Cu (250 ppm) and Mn (220 ppm) in a 3 x 2 factorial. At the end of the experiment, the distal aspect of the left humerus and femur of 60 gilts (one per pen) was evaluated for incidence of OCD and cartilage samples tested for compression and shear properties. Each joint was sliced into 3 mm sections and given a severity score for abnormalities on the external joint, the underlying articular cartilage surfaces, and physeal growth plate. Increasing dietary Lys increased (P < 0.01) ADG, but feeding high Met/Cu/Mn decreased ADG (P < 0.02). In pigs fed standard Met/Cu/Mn, increasing dietary Lys decreased cartilage shear energy (quadratic, P < 0.01); however, no other instron measurements were affected by Lys (P > 0.24). The addition of high Met/Cu/Mn had no effect on any cartilage instron measurements (P > 0.23). All animals had OC lesions at either the humerus or femur. Overall severity score did not correlate with ADG (R² = 0.03) or weight (R² = 0.02). Increasing dietary Lys concentration (P > 0.64) did not effect the overall severity score (abnormalities x severity); however, the addition of high Met/Cu/Mn tended (P < 0.09) to reduce the overall severity score of OC compared to pigs fed diets with normal Met/Cu/Mn. Feeding growing gilts to maximize growth performance with high dietary Lys may increase the severity of OC lesions, while a diet with additional Met/Cu/Mn above requirements may aid in the reduction of OC abnormalities and severity.

Key Words: Finishing Pigs, Osteochondrosis, Cartilage

629 Effects of different Ractopamine withdrawal times on growth performance and fat free lean growth rate in finishing pigs. G. E. Lanz A^{*3,1}, M. Lucero P^{3,1}, and J. A. Cuaron I², ¹Paiepeme A.C., Queretaro, Mexico, ²CNI-Fisiología Animal, INIFAP, Queretaro, Mexico, ³FESC UNAM, Ajuchitlan, Queretaro, Mexico.

Some programs for the use of Ractopamine-HCl (RAC) include resting periods to avoid receptors saturation. To identify the effects of RAC withdrawal on growth performance and fat free lean growth rate in finishing pigs, 159 pigs (BW = 82 kg) half gilts and barrows, were allotted to 3 diets: 1) Control: 3.35 Mcal ME and 17%CP; 2) RACHP: 3.35 Mcal, 19%PC, 10ppm RAC; 3)RACNP: as control plus 10 ppm RAC. After 21d on trial, all the animals changed to a finisher diet (3.35 Mcal ME/kg, 15%CP, 0.67% digestible Lys) consumed by 0, 7, 14, 21 or 28 d. After each withdrawal time animals were removed from the experiment (5 animals per withdrawal time per diet). Growth performance (ADFI, ADG, and Feed:Gain), and real time ultrasound (Aloka 500) measurements (back fat and loin depth) were taken weekly to estimate lean growth rate. After 21d on Study, RAC pigs were heavier (P≤0.001) than CON pigs; animals on RACNP consumed more feed than RACHP (3.23 vs 3.07 kg/day, respectively, P≤0.05). There was no difference in ADG or Feed:Gain by CP level, but between RAC and CON pigs (P≤0.001). The RAC diets improved FFLG (0.352 vs 0.430 kg/day P≤0.001) compared to CON pigs, but no differences