

Increasing Ractopamine Levels in Finisher Pig Diets Improves Growth Performance in Light, Medium and Heavy Boars

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Ractopamine hydrochloride (RAC; Paylean[®], Elanco Animal Health, Macquarie Park, NSW) is an approved β -agonist used to improve the production efficiency of pigs. A recent dose-response study in gilts indicated that average daily gain (ADG), feed conversion ratio (FCR) and hot standard carcass weight (HSCW) increased in a linear manner to dietary RAC up to at least 20 ppm, and that responses were similar regardless of starting weight between 65 and 95 kg (Rikard-Bell *et al.*, 2007). There has been little research on the responses of intact males (boars) to dietary RAC or how the responses might be affected by starting weight. The objective of this study was to determine the dose response to RAC in light, medium and heavy-weight boars.

Ninety-six individually penned boars were assigned to a 3x4 factorial design with the respective factors being starting weight [light (L; 65kg), medium (M; 80 kg) and heavy (H; 95 kg)] and dietary RAC (0, 5, 10 or 20ppm for 28 d). All diets were formulated to contain 13.9 MJ digestible energy (DE)/kg and 0.62 g available lysine/MJ DE. Pigs were slaughtered at the end of the study and carcass weight was recorded. Data were analysed by analysis of variance.

Table 1. Effect of starting weight and ractopamine dose on voluntary feed intake (VFI), average daily gain (ADG), feed conversion ratio (FCR), carcass weight (HSCW) and dressing % in finisher boars.

Weight (W)...	Light				Medium				Heavy				Significance			
	0	5	10	20	0	5	10	20	0	5	10	20	SED ¹	W	D	W x D
ADG (kg)	1.09 ^a	1.30 ^c	1.23 ^b	1.24 ^{bc}	1.22	1.25	1.17	1.28	1.17 ^a	1.20 ^a	1.36 ^b	1.33 ^b	0.063	0.286	0.007	0.022
VFI (kg/d)	2.75	3.06	2.92	3.09	3.10	3.19	3.14	3.18	3.36	3.28	3.56	3.34	0.117	<0.001	0.148	0.075
FCR (kg/kg)	2.54	2.36	2.39	2.50	2.57	2.57	2.68	2.51	2.88	2.77	2.64	2.55	0.127	<0.001	0.289	0.202
HSCW (kg)	71.2 ^a	74.8 ^b	72.4 ^a	75.5 ^b	83.8	85.4	84.3	86.1	96.5 ^a	96.3 ^a	98.5 ^a	99.4 ^b	2.09	<0.001	0.082	0.790
Dressing %	74.4 ^a	73.6 ^{ab}	72.7 ^b	75.8 ^c	73.5 ^a	74.7 ^b	75.4 ^b	75.1 ^b	76.2 ^a	75.7 ^{ab}	74.9 ^b	76.1 ^a	0.84	<0.001	0.050	0.034

¹Standard error of the difference for Weight x Diet, ^{abc}Means within a row and starting weight category with different superscripts differ significantly (P<0.05).

RAC-treated pigs within each weight category grew faster than their respective control counterparts (p=0.007). Within the L starting weight group, pigs on the 5 ppm RAC treatment grew faster than those on the higher RAC doses (P<0.05; Table 1). There was a linear relationship for ADG (P=0.031), dressing % (P=0.045) and HSCW (P=0.018) such that incremental increases of RAC resulted in increases in these traits for all start weight categories. FCR was not altered by dietary RAC (P=0.289), however a recent study (Rikard-Bell *et al.*, 2009) indicated that dietary RAC reduced FCR in both sexes with starting weights at 65 kg and RAC treatment for 28 d. These data indicate that for boars of all start weight categories, ADG, HSCW and dressing % increase linearly with increasing dosage of dietary RAC up to at least 20 ppm. However, in light boars ADG was maximised when dietary RAC was included at 5 ppm.

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