

Effect of Ractopamine in Finishing Diets: Meat Quality

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SUMMARY

Ractopamine at 5 ppm/kg feed improved growth and feed efficiency by 13% when fed for an average of 26 to 27 days. Ractopamine decreased backfat and improved loin thickness. Transit losses were higher in the ractopamine fed group.

INTRODUCTION

Paylean® is a feed additive that was recently registered in Canada. The active ingredient of Paylean® is ractopamine, a beta-adrenergic agonist known to stimulate muscle growth and inhibit lipid deposition. There is limited information available on the impact of RAC on the eating quality of pork and the results available are inconclusive. Moreover, few studies used taste panel evaluation. Those studies that did evaluate meat quality suggested that RAC had no effect on visual colour, firmness, marbling or sensory juiciness and flavour properties. However, the effect of RAC was inconsistent for some quality traits, specifically, meat tenderness or Warner-Bratzler shear force. The

Table 1. The effect of 5 ppm ractopamine on loin quality and cooking characteristics.

	Control	RAC	SEM	P value
pH	5.74	5.74	0.09	0.93
Drip loss				
24 hrs	4.77	4.28	0.78	0.35
48 hrs	6.73	6.21	0.80	0.38
CIE colour				
L*	54.47	43.13	0.65	0.62
a*	8.19	7.43	0.23	<0.001
b*	13.93	13.10	0.13	<0.001
Visual colour score				
Candian ^a	2.7	2.7	0.17	0.74
USA ^b	2.9	3.0	0.08	0.64
Japanese ^c	2.8	2.8	0.09	0.64
Marbling ^d	1.8	1.8	0.13	0.84
Back fat, mm	15.7	12.6	0.75	< 0.001
Loin-eye area, cm ²	52.2	56.0	1.62	< 0.001
Cook loss, %	20.3	20.5	0.63	0.73
Cook time, min	15.2	15.8	0.2	0.03
Shear force	64.9	72.8	2.7	< 0.001

^aScale of 1 to 5; 1=extremely pale, 5=extremely dark

^bScale of 1 to 6; 1=pale pinkish gray to white, 6=dark purplish red

^cScale of 1 to 6; 1=light, 6=dark

^dMarbling scores correspond to estimated intramuscular lipid content



acceptance of pork by the consumer is critical to the industry's success, therefore it is important to determine if RAC has an impact on eating quality. The data reported here was from a larger trial (see page 28). The specific objective of part 2 was to evaluate the impact of feeding 5 ppm RAC on meat quality and the sensory characteristics of pork.

MATERIALS AND METHODS

The experiment was designed so that the average starting weight within a treatment would be 87 kg. This was to provide an average of 28 days on Paylean prior to slaughter.

All animals were fed a diet comparable to the barn's normal gilt finisher. The experiment consisted of two treatments: control or 0.25% Paylean®, equivalent to 5 ppm ractopamine (RAC).

In each of two weeks, a total of 8 animals from each gender and treatment (32 animals per week) selected for shipping, were randomly selected for detailed meat quality analysis. Loin eye area and backfat measurements were determined following chilling. Loins were harvested one day post-slaughter, and cut into one inch chops for measurement of drip loss, subjective colour scores, chemical composition, sensory evaluation and shear force. Sensory analysis was conducted using 11 trained panelists. They were provided individual cubes of meat cooked to an internal temperature of 70°C.

'Including ractopamine in the diet at 5 ppm did not markedly affect meat quality parameters.'

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Table 2. The effect of 5 ppm ractopamine on loin quality and cooking characteristics.

	Control	RAC	SEM	P-Value
Initial tenderness ^a	5.6	5.2	0.16	0.04
Overall tenderness ^a	5.7	5.3	0.16	0.05
Connective tissue ^b	5.8	5.7	0.23	0.79
Juiciness ^a	5.2	5.2	0.17	0.85
Pork flavour intensity ^a	5.2	4.9	0.13	0.09
Flavour desirability	5.6	5.5	0.17	0.67
Overall acceptability	5.6	5.3	0.16	0.22

^aIntensity of sensory attributes was evaluated based on an 8-point scale (8=extremely tender, juicy, desirable flavour to 1 = extremely tough, dry and bland)

^bAmount of perceptible connective tissue.

RESULTS AND DISCUSSION

Similar to the results shown by those feeding ractopamine at 10 ppm or 20 ppm, including ractopamine in the diet at 5 ppm did not markedly affect meat quality parameters (Table 1). pH, drip loss, and visual colour scores were unaffected (P > 0.05). Changes in some of the colour scores were statistically significant, however, the absolute differences are of uncertain significance from a consumer perspective.

Our observation that RAC had no effect on marbling is consistent with some published reports, but not others. The lack of an effect in our study may be due to our low inclusion rate. The decrease in back fat, and improvement in loin-eye area are consistent with the known mechanism of action of ractopamine.

The increase in shear force, and decreases in observed tenderness supports previous reports that RAC may produce less tender pork. The effect of RAC on shear force was more pronounced in gilts, than barrows. Overall acceptability however, was not affected by the inclusion of RAC in the diet at 5 ppm (Table 2).

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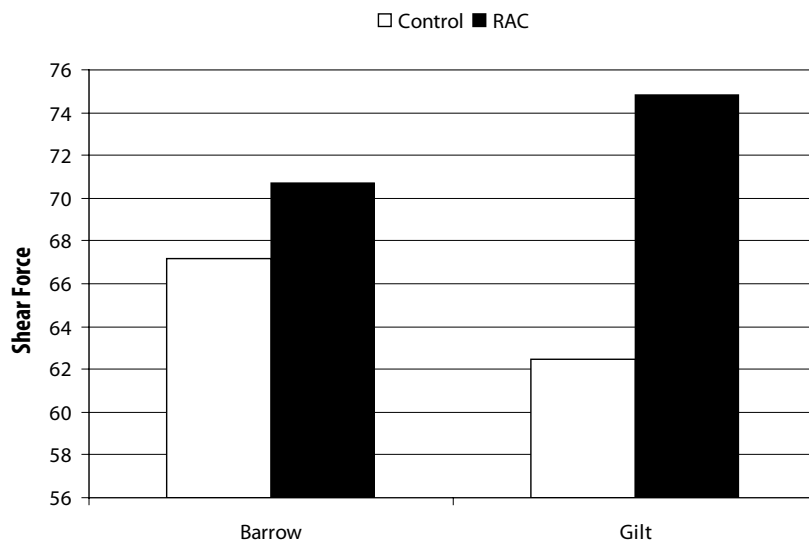


Figure 1. The effect of RAC and tenderness on Warner-Bratzler shear force (treatment, P < 0.01; gender P = 0.83; gender by treatment interaction, P < 0.01). A lower number indicates improved tenderness.