Feeding Ractopamine Improves Growth Performance and Carcass Characteristics of the Lard-type Mangalica Pig

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Introduction

Mangalica pigs are a popular niche breed given their reputation for superior quality pork. However, the slow growth rate, poor lean yield and excessive adiposity exhibited by this breed limits its widespread adoption. Understanding what regulates how much a pig eats could allow strategies to be developed that maintain optimal growth and health while requiring less feed. Interestingly, our preliminary data indicate that unlike modern production breeds, Mangalica pigs do not experience decreased feed intake during heat stress or in response to energy dense diets. This is interesting as pork represents a significant animal protein source in the American diet. Furthermore, pork production and its allied industries form a vital economic support for many communities. Thus, increasing the sustainability of pork production is important for both our nation's nutritional and economic security.

Methods

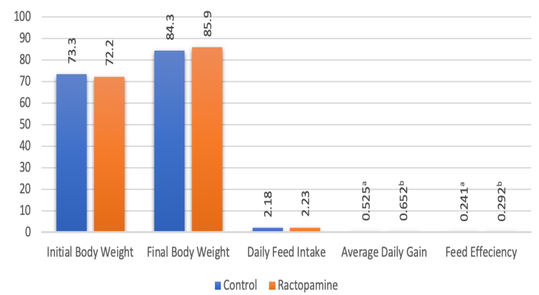
- Pigs (n=28) weighing 73 kg were fed a standard grower ration supplemented with either 0 or 22 ppm RAC fed for 21 days during finishing phase.
- Daily feed intakes and weekly body weights were recorded for all animals.
- Pigs were finished to a 105 kg harvest weight.
- At 24h postmortem, carcasses were split and ribbed to facilitate pork quality and carcass composition measurements.
- Primal cuts were fabricated and individually weighed.
- Longissimus dorsi chops were sliced into 2.54-cm-thick chops and vacuum packaged.
- All chops were frozen for storage then thawed at 1°C for 24h.
- Chops were cooked at 176°C until an internal temperature of 71.1°C was achieved then data analysis was conducted on cook yield.
- Cooked using a Vulcan (Model: #VC4EC) convection oven.
- Internal temperature monitored with digital thermometer in the geometric center of the chop or slice.
- Instrumental fresh cr olor (L*, a* and b*) was observed by utilizing (N=3) chops from each carcass.
- Instrumental tenderness (Warner-Bratzler Shear Force) was obtained from cooked samples with (N=10) from each carcass.

Objectives

Our objective was to determine if feeding Ractopamine (RAC), a metabolic modifier that improves feed efficiency and lean yield, would improve growth performance without impairing pork quality in the Mangalica.

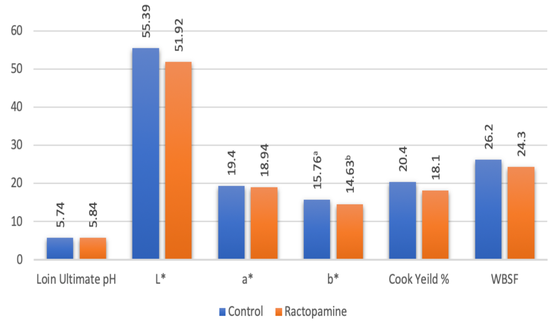
Figures

Figure 1. Growth Performance of Mangalica Pigs Fed 0 or 20 ppm Ractopamine for 21 days *ad libitum* [1]



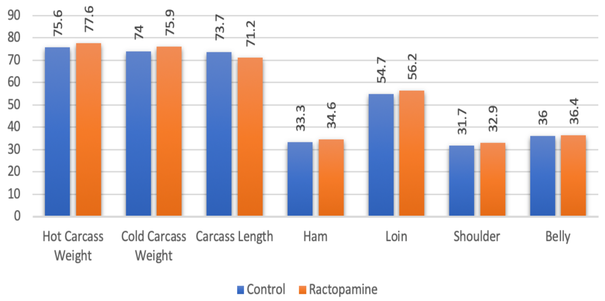
[1]Values are group mean +/- SEM, n=8, differing superscripts within a variable denote differences between weigh classes, *P < 0.05*
[a,b]Mean values and standard deviations in the same row with different superscripts are significantly different (p < 0.05).

Figure 2. Meat Quality Traits of Mangalica Pigs Fed 0 or 20 ppm Ractopamine for 21 days *ad libitum* [1]



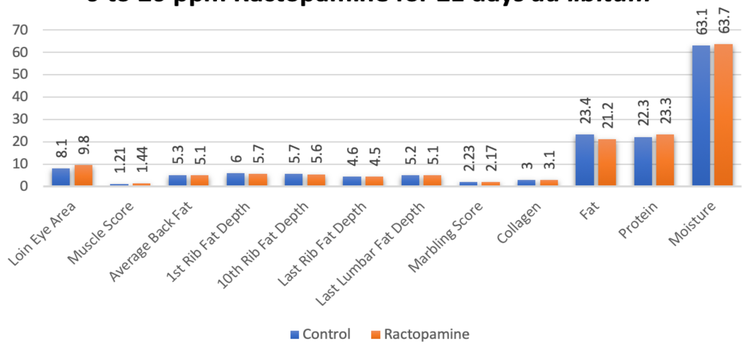
[1]Values are group mean +/- SEM, n=8, differing superscripts within a variable denote differences between weigh classes, *P < 0.05*
[a,b]Mean values and standard deviations in the same row with different superscripts are significantly different (p < 0.05).

Figure 3. Carcass Parameters and Primal Cuts of Mangalica Pigs Fed 0 to 20 ppm Ractopamine for 21 days *ad libitum* [1]



[1]Values are group mean +/- SEM, n=8, differing superscripts within a variable denote differences between weigh classes, *P < 0.05*
[a,b,c]Mean values and standard deviations in the same row with different superscripts are significantly different (p < 0.05).

Figure 4. Carcass Composition of Mangalica Pig Fed 0 to 20 ppm Ractopamine for 21 days *ad libitum* [1]



[1]Values are group mean +/- SEM, n=8, differing superscripts within a variable denote differences between weigh classes, *P < 0.05*
[a,b,c]Mean values and standard deviations in the same row with different superscripts are significantly different (p < 0.05).

Conclusions & Results

RAC failed to suppress voluntary feed intake ($P > 0.71$). Interestingly RAC increased LEA ($P < 0.0001$) by 21% but did not impact 10th rib fat depth ($P > 0.90$) or marbling score ($P > 0.77$). Likewise, RAC failed to alter any primal cut weights. Feeding RAC lowered b* values ($P < 0.04$) and tended to lower L* values ($P < 0.08$) while not affecting a* values ($P > 0.30$) suggesting RAC darkened loin color. Finally, RAC improved cook yield percentage ($P < 0.02$) 11% while not impacting WBSF ($P > 0.31$). Collectively, this data supports the hypothesis that feeding RAC to the lard type Mangalica pig improves growth performance without impairing pork quality in this breed. Feeding RAC may be a viable strategy to improve the economic feasibility of utilizing this breed to target niche markets. In similar studies utilizing Ractopamine in the swine finishing phase the literature reveals comparable results to this study. These resemblances are characterized through muscling, fat deposition, marbling score and color of fresh cuts (Stoller et. al.).

Reference/Acknowledgment

Stoller, G. M., et al. "The Effect of Feeding Ractopamine (Paylean) on Muscle Quality and Sensory Characteristics in Three Diverse Genetic Lines of swine1,2." *Journal of Animal Science*, vol. 81, no. 6, 2003, pp. 1508–1516., doi:10.2527/2003.8161508x.

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