



EXTENSION

BEEF CATTLE RESEARCH UPDATE

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Effects of Various Ractopamine Hydrochloride Withdrawal Periods on Performance and Carcass Characteristics in Feedlot Steers

Ractopamine hydrochloride (RAC) is a β -adrenergic agonist that is FDA approved for increased rate of weight gain, improved feed efficiency, and increased carcass leanness in cattle fed in confinement for slaughter during the last 28 to 42 days on feed. A 2016 survey of consulting feedlot nutritionists indicated that approximately 84.8% of the clients serviced by the nutritionists used some type of β -adrenergic agonist in their finishing cattle diet.¹ Numerous studies have demonstrated improvements in feedlot performance and carcass composition when feeding RAC to finishing beef steers. RAC has a zero-day pre-slaughter withdrawal period. However, it may be of interest to cattle producers to understand the effects of various extended withdrawal periods as they develop marketing and/or management decisions, in order to determine what level of flexibility exists while maintaining performance benefits of β -agonists. Therefore, recently published research examined the effects of extended withdrawal periods (up to 7 days prior to slaughter) of β -agonists on feedlot performance, health, and carcass characteristics.²

In this study, 3,000 crossbred yearling steers (1162 lb) were used in two periods to evaluate the effects of various RAC withdrawal times on feedlot performance, health, and carcass characteristics. In Period 1, 6 blocks of 30 pens totaling 1,500 steers were utilized, which was repeated for Period 2. Cattle were randomly assigned to 1 of 5 treatments consisting of 1) No RAC fed (Controls), 2) 12-hour RAC withdrawal, 3) 2-day RAC withdrawal, 4) 4-day RAC withdrawal, and 5) 7-day RAC withdrawal. Cattle were fed for a total of 62 days, and applicable treatments were supplemented with 30.0 ppm (dry matter basis) of RAC (average dose = 322 mg per steer per day) for 33 days at the end of the feeding period, corresponding to their respective withdrawal times.

These researchers reported that there were no significant treatment differences ($P \geq 0.641$) in final live weight, average daily gain (ADG), or feed efficiency (Gain:Feed ratio) on a live weight basis. However, ractopamine treatments did exhibit increased weights, ADG, and improved efficiency of gain on a carcass-adjusted basis compared to control animals, which was calculated using a common 64.27% dressing percentage (average of all treatments). On a carcass-adjusted basis, final live weight for RAC fed cattle was 16.8 lb greater ($P < 0.001$) compared to control cattle. Feeding RAC increased ADG and gain efficiency on a carcass adjusted basis ($P \leq 0.002$) by 6.6 (4.21 vs. 3.95 lb/day) and 7.9% (0.178 vs. 0.165), respectively, compared to control cattle. Neither live nor carcass-adjusted ADG and G:F differed ($P > 0.10$) between the RAC-containing treatments, despite their various withdrawal periods. These authors speculated that performance differences in this experiment between RAC and control cattle on a carcass-adjusted basis “suggest that gut fill and resulting variation in dressing percentage likely accounted for a greater portion of the live weight in the control treatment and may have also diluted possible differences in ADG and G:F on a live-weight basis”.

Hot carcass weight (HCW) was on average 10.8 lb greater ($P < 0.001$) for RAC treatments vs. controls. In addition, dressing percentage was greater for RAC cattle than control cattle

($P = 0.017$, 64.35 vs. 63.94%). Ractopamine withdrawal period did not affect HCW or dressing percentage ($P > 0.10$) with the withdrawal treatments producing similar results. No differences in carcass quality existed among treatments, with cattle on all treatments averaging 73.26% of carcasses grading Choice or better.

In conclusion, in this experiment feeding ractopamine improved dressing percentage, HCW, and carcass-adjusted final weight, ADG, and feed efficiency. These improvements in performance and carcass characteristics are consistent with numerous other studies. Furthermore, a withdrawal period of up to 7 days prior to slaughter, did not negatively affect performance, health, or carcass traits. These results suggest that producers are afforded flexibility with regard to RAC withdrawal times when making marketing and/or management decisions, without sacrificing the performance benefits of RAC.

¹ Samuelson, K. L., M. E. Hubbert, M. L. Galyean, and C. A. Löest. 2016. Nutritional recommendations of feedlot consulting nutritionists: The 2015 New Mexico State and Texas Tech University survey. *J. Anim. Sci.* 94: 2648-2663.

² Bryant, T. C., J. I. Szasz, L. F. G. Pringle, E. Crispe, K. Shawn Blood, B. C. Bernhard and H. D. Hughes. 2020. Effects of various ractopamine hydrochloride withdrawal periods on performance, health, and carcass characteristics in yearling steers. *Transl. Anim. Sci.* 4: 67-74.