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Evaluation of Two Implants for Steers on Early-Intensively Grazed Tallgrass Native Range

J.K. Farney and M.E. Corrigan¹

Abstract

Commercial implants can have different coating technologies, carriers, and hormone amounts resulting in different payout characteristics and impacts on cattle growth. Revalor-G (Merck Animal Health, Madison, NJ) and Synovex One Grass (Zoetis Inc., Kalamazoo, MI) implants were used in stocker steers to evaluate calf gains during a 90-day summer grazing season. Revalor-G contains 40 mg of trenbolone acetate and 8 mg of estradiol, is uncoated, and has a cholesterol carrier. Synovex One Grass contains 150 mg of trenbolone acetate and 21 mg of estradiol benzoate, and has a porous polymer coating that extends payout window. Steers ($n = 242$) were assigned to one of seven pastures, implanted on day 0, and then weighed with an overnight shrink on days 0, 44, and 91 of grazing. Total gains and average daily gains during each half of the grazing season were determined. Average daily gain and total body weight gain were not different based on implant type. Cattle with the Revalor-G implant had an average daily gain of 2.6 lb/day, while cattle with the Synovex One Grass implant gained 2.5 lb/day. Cattle with the Revalor-G implant had a total body weight gain of 222 lb, while cattle with the Synovex One Grass implant gained 220 lb. Body weight gain and average daily gain were not different between implants in either section of the grazing period. Cattle performance was similar regardless of hormone amount and coating technology for these implants when used during a short-duration grazing period with stocker steers.

Introduction

Growth-promoting steroids in the form of an implant can increase average daily gain by 5% in suckling calves and 14% in stocker cattle (Reinhardt and Thompson, 2016). Implants have been approved for usage since the 1950s. Most approved implants utilize a carrier that results in a biphasic payout pattern of hormone, where there is a rapid spike in blood hormone concentrations in a few days after administration of the implant that slowly dissipates over a period of several months. This pattern is seen when using implants such as Revalor-G that utilize cholesterol as their carrier. In the case of Synovex One Grass, a porous polymer coating is used in the implant which extends the payout period of the implant up to 200 days.

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Given the short duration of the grazing period associated with a 90-day intensive early season grazing system and the declining grass quality at the end of the grazing period, implant payout pattern may impact performance response. The objective of the study was to evaluate stocker cattle gains on intensive early double-stocked native tallgrass prairie between two implants that have different lengths of effective use. The test hypothesis is that a quicker release of hormone from Revalor-G will result in greater gains early in the season, with no difference in gains between implants overall.

Experimental Procedures

Stocker steers that were 71% black hided ($n = 281$) were purchased from auctions, vaccinated for respiratory pathogens (Bovi-Shield Gold One Shot, Zoetis Inc., Kalamazoo, MI), and wormed with an oral (Valbazen, Zoetis Inc.) and an injectable dewormer (Dectomax, Zoetis Inc.). Steers were weighed individually using electronic scales at the start, midpoint, and end of the 2017 summer grazing period after an overnight shrink on April 24, June 7, and July 24. Steers were randomly assigned to be implanted with Revalor-G or Synovex One Grass and assigned to a pasture with an equal number of calves receiving each of the implants within the pasture. The number of head in each pasture was different so as to stock appropriately for available biomass. The steers were pastured at the Bressner Research Range Unit near Yates Center, KS. The Bressner Unit was divided into eight individual pastures (approximately 79 acres each), with four pastures on the north side and four pastures on the south side. Pastures were burned April 5, 2017.

One pasture of calves was removed from the analysis ($n = 38$) due to inaccurate final weights as a result of excessive shrink associated with a water tank malfunction within 2 days of weighing. Within the Revalor-G treatment, one calf died while on pasture and one calf was not weighed on the final date because he escaped into a neighboring pasture. Therefore, 242 weights were analyzed for the intermediate time point and 241 weights recorded at the end of the study were used in analysis.

Data were analyzed as a randomized complete block design with pasture as the blocking factor and individual animal as the experimental unit. The MIXED procedure of SAS (Version 9.3, SAS Institute Inc., Cary, NC) was used to evaluate treatment effects on average daily gain and body weight gain for the first half of grazing season, second half of grazing season, and total season grazing. Treatment was used as a fixed effect and pasture was used as a random effect in the model. Initial weight was included as a covariate when analyzing midpoint and final body weight as initial weights tended to be different by treatment ($P = 0.10$; Table 1). Initial weight was not significant in the models for average daily gain and body weight gains and thus was not included as a covariate. A Kenward-Rogers denominator degree of freedom was applied to all analyses. Means were considered different when the P -value was ≤ 0.05 with a tendency reported when $0.05 < P \leq 0.10$.

Results and Discussion

No differences ($P > 0.05$) were observed between Revalor-G and Synovex One Grass for season-long average daily gain and total body weight gain (Table 1). Average daily gain and body weight gains were not different ($P > 0.05$) between implants from

the beginning of the trial through the midpoint or from the midpoint until the end of grazing. In addition, steer weights were not different ($P > 0.05$) at weigh dates (Table 1).

The Revalor-G treatment produced gain more cost-effectively during a 90 day grazing season. Based on 2017 pricing, the actual purchase price was \$1.39 per dose for Revalor-G while Synovex One Grass was \$4.95 per dose. Since body weight gains were similar for each implant treatment, the cost of gain was less with the Revalor-G implant. Some payout likely remained on the Synovex One Grass implant and could be utilized prior to marketing cattle, but is a loss to the stocker cattle enterprise.

Forage quality affects implant weight gain responses, with higher quality forages providing a greater response. As summarized in a stocker calf implant review, other studies in Kansas tallgrass prairie rarely find differences in steer performance between implants, but do result in increased gains above non-implanted steers (Kuhl, 1997). Nutritional quality of cool season C3 grasses is generally assumed to be greater than warm season C4 grasses, as C3 grasses have greater nonstructural carbohydrates and protein with less fiber. In a review of the literature, differences in cattle gain based on type of implant occurred more frequently in longer duration grazing studies and in cool season grasses.

Implications

Steers implanted with Revalor-G or Synovex One Grass performed the same for average daily gain and total body weight gain in an early intensive double-stocked grazing system utilized on native Flint Hills pastures.

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Table 1. Stocker steer (n = 281) weights and gains at the start, midpoint, and end of study while grazing intensive early double-stocked native tallgrass prairie after being implanted with either Revalor-G or Synovex One Grass

Item	Revalor-G ¹	Synovex One Grass ²	Standard error of the mean	P - value
Season long grazing				
Initial weight (day 0), lb	554	567	6.0	0.10
Midpoint weight (day 44), lb	666	666	3.7	0.42
Final weight (day 91), lb	781	782	7.7	0.77
Average daily gain, lb	2.6	2.5	0.04	0.35
Body weight gain, lb	223	221	5.1	0.65
Gain from beginning of grazing through midpoint (day 0–44)				
Average daily gain, lb	2.5	2.6	0.10	0.45
Body weight gain, lb	106	108	3.7	0.58
Gain from midpoint through end of grazing period (day 45–91)				
Average daily gain, lb	2.6	2.5	0.10	0.47
Body weight gain, lb	119	115	3.1	0.48

¹Merck Animal Health (Madison, NJ) implant treatment.²Zoetis, Inc. (Kalamazoo, MI) implant treatment.