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Influence of implanting grazing steers with Ralgro® or Synovex-S® followed by Synovex® Plus™ or a Ralgro®/Synovex® Plus™ reimplant program in the feedlot on pasture/finishing performance and carcass merit

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**INFLUENCE OF IMPLANTING GRAZING STEERS WITH RALGRO®
OR SYNOVEX-S® FOLLOWED BY SYNOVEX® PLUS™ OR A
RALGRO®/SYNOVEX® PLUS™ REIMPLANT PROGRAM
IN THE FEEDLOT ON PASTURE/FINISHING
PERFORMANCE AND CARCASS MERIT ¹**

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Summary

In an 84-day pasture/132-day finishing study using 480 crossbred steers (675 lb), Ralgro® increased ($P<.05$) pasture gains 9.3% compared to nonimplanted controls. Gains of Synovex-S®-implanted steers were intermediate. Pasture treatments were split into two finishing-phase implant treatments: Synovex® Plus™ or initial Ralgro with a Synovex Plus reimplant on day 56. No interactions occurred between pasture and finishing implants with respect to finishing performance or carcass traits. Steers on the Synovex Plus treatment gained 11.7% faster and 7.9% more efficiently ($P<.01$) during the first 56 days of the finishing phase than the Ralgro-implanted steers. However, when those steers were reimplanted with Synovex Plus, they gained 22.2% faster and 21.1% more efficiently ($P<.01$) during the last 76 days. Over the entire 132-day finishing phase, the feedlot reimplant program improved rate (4.0%; $P<.06$) and efficiency (7.5%; $P<.01$) of gain compared to Synovex Plus alone. Overall, gains and intakes during the finishing phase were similar for all pasture implant treatments. However, control pasture steers were 4.5% more efficient ($P<.08$) than Ralgro and Synovex steers during the finishing phase. Neither pasture or finishing implant treatment influenced carcass traits. This study indicates that implanting during grazing may reduce feed efficiency during the finishing phase, especially when a feedlot reimplant program is not used. However, this finding disagrees with several previous research studies where pasture implantation had no effect on feedlot performance.

(Key Words: Ralgro, Synovex, Synovex Plus, Pasture, Finishing, Carcass, Implants.)

Introduction

Estrogenic implants enhance performance and profitability of grazing cattle. However, many stocker producers still do not implant because of concerns about negative carryover effects on feedlot performance and/or carcass grade. These concerns have increased as a result of the recent, widespread use of androgenic implants containing trenbolone acetate (TBA) and estrogen. Although these androgenic products maximize feedlot performance, they have the potential to reduce USDA quality grades more than their estrogenic counterparts. This is especially evident in aggressive reimplant programs.

Synovex Plus (200 mg TBA and 28 mg estradiol benzoate) was approved recently by the FDA for feedlot cattle. This TBA/estrogen combination contains 67% more TBA than Revalor-S® (120 mg TBA and 24 mg estradiol), suggesting a greater potential for reducing carcass quality, especially when used in a reimplant program. In theory, that problem could be minimized by using a mild estrogenic product initially in the pasture and/or feedlot. Our objective was to test the effects of Ralgro vs. Synovex-S on stocker performance and effects of subsequent Synovex Plus or Ralgro with a Synovex Plus reimplant on finishing performance and carcass attributes.

Experimental Procedures

¹Appreciation is expressed to Mallinckrodt Veterinary, Inc. for financial support of this study.

²South Central Area Extension Office, Hutchinson.

Approximately 750 head of yearling steers (650 to 700 lb) were purchased from Oklahoma livestock auctions during late April and early May. Upon arrival at the KSU feedlot, all cattle were individually weighed, vaccinated against common viral and bacterial diseases, and treated for internal and external parasites. The ears of each steer were palpated and those with pre-existing implants were excluded from the study. The cattle were fed a nutritionally-balanced receiving ration containing Rumensin® during the short pre-trial stage. From this group, 480 head of more uniform, predominantly British and Continental crossbred steers with no more than one-fourth Brahman breeding were selected for the study.

At the beginning of the grazing trial (May 15), on-test weights were based on the average of two consecutive, early-morning, unshrunk weights. All 480 steers were stratified by weight and randomly allotted within strata to three grazing implant treatments: Control (no implant), Ralgro, and Synovex-S. In addition, cattle were pre-assigned to one of two finishing implant treatments: a single Synovex Plus (Syn+) or an initial Ralgro implant with a Syn+ reimplant, using the same stratification/randomization technique based on pregrass weights. Cattle then were shipped to a single intensive-early stocker native Flint Hills pasture in eastern Kansas. The cattle were monitored weekly on grass, and a medicated complete mineral supplement was provided. On August 5, the cattle were returned back to the KSU Beef Cattle Research Center. Upon arrival, steers were fed a standardized amount of a high-roughage receiving diet for 3 days to equalize gut fill, then two consecutive morning unshrunk weights were used to determine final 84-day grazing-phase weights.

The finishing phase began immediately, using the average of the two final grazing body weights as the starting point. All steers were dewormed and treated for lice and grubs and received a booster viral vaccination. Cattle from each of the three pasture implant treatments were placed into randomly pre-assigned pens (eight pens of 15 head, and four pens of 10 head). Half of the pens from each grazing treatment were implanted with Syn+, and the remaining half were implanted initially

with Ral, followed by Syn+ after 56 days on feed (Ral/Syn+). Cattle were located in 36 pens (24 dirt pens and 12 concrete pens) with six replications per treatment. Cattle were moved up on feed over 15 days using four step-up rations, with the final *ad-libitum* finishing ration (dry basis) consisting of 83% dry-rolled corn, 9% ground alfalfa hay, 4% Car-mil Glo® (a molasses-fats source), and 4% supplement. The final ration was formulated to contain 13.8% crude protein (1% urea), .75% calcium, .70% potassium, .35% phosphorus, .25% magnesium, and .30% salt, plus 30 g Rumensin® and 10 g Tylan® per ton on a dry matter basis. Trace minerals and vitamins A and E were supplemented to exceed 1996 NRC requirements.

Interim body weights (days 30, 56, 84, 112) and implant status (missing, abscess, etc.) were monitored during the finishing period. The 132-day finishing period ended on December 16, and an average of unshrunk weights on two consecutive mornings was determined. Eleven steers were removed because of health problems unrelated to the study. The remaining 469 were slaughtered at a commercial packing plant on the same day that the last weight was obtained, and complete carcass data were obtained.

Results and Discussion

No significant pasture × finishing phase treatment interactions occurred. Pasture gains were 9.3% higher ($P < .05$) for steers implanted with Ral vs. controls, and gains of steers implanted with Syn were intermediate (Table 1). Overall stocker gains (1.35 lb/day) were below normal as a result of the dry, late spring. Control pasture steers gained faster ($P < .06$) than Ral steers during the first 56 days in the finishing period, while gains of Syn steers were intermediate. Overall, 132-day finishing gains were similar for all pasture implant treatments. Intakes during the finishing phase were similar for all pasture implant treatments. However, control pasture steers tended to be more efficient ($P < .08$) than pasture implanted steers during the first 56 days and over the entire 132-day finishing phase.

In the finishing period, steers implanted with Syn+ at the start of the finishing period gained 11.7 % faster ($P<.01$) than the Ral/ Syn+ steers during the first 56 days; however, following reimplantation of the Ral steers with Syn+ at 56 days, the reimplanted group gained 22.2 % faster ($P<.01$), resulting in 4.0% better ($P<.06$) gain over the entire 132-day finishing period (Table 2). Correspondingly, steers on the Syn+ treatment

were 7.0% more efficient ($P<.01$) during the first 56 days, 21.1% less efficient ($P<.01$) during the last 76 days, and 7.5% less efficient ($P<.01$) over the entire 132-day finishing period than the Ral/Syn+ treatment. These results indicate that the payout from Syn+ may have declined after 56 days, resulting in reduced performance. Table 3 shows the finishing performance for each of the pasture/finishing implant combinations.

Table 4 shows the carcass characteristics for each of the pasture/finishing implant strategies. Treatment had no effects ($P>.10$) on dressing percentage, ribeye area, backfat, or yield grade. Additionally, carcass quality characteristics, such as marbling score, percentage Choice, and lean/bone maturity scores, were the same for all pasture/feedlot implant combinations.

Table 1. Effect of Pasture Implant on 84-Day Grazing Gains and Subsequent 132-Day Finishing Performance of Steers

Item	Pasture Treatment		
	Control	Ralgro	Synovex-S
Pasture phase:			
No. steers	160	160	160
Initial wt, lb	676	674	676
Final wt, lb	784	791	790
Daily gain, lb	1.29 ^a	1.41 ^b	1.35 ^{ab}
Finishing phase:			
No. steers (pens)	156 (12)	155 (12)	158 (12)
Final wt, lb	1264	1250	1254
Period, days	Daily gain, lb		
1-56	4.45 ^d	4.21 ^c	4.36 ^{cd}
57-132	3.04	2.93	2.89
1-132	3.64	3.47	3.51
	Daily DM intake, lb		
1-56	21.0	21.0	21.1
57-132	22.6	22.7	22.8
1-132	21.8	21.9	22.0
	Feed/gain		
1-56	4.72 ^e	5.00 ^f	4.83 ^{ef}
57-132	7.42	7.72	7.89
1-132	5.98 ^e	6.29 ^f	6.23 ^f

^{ab}Means in a row not bearing a common superscript differ ($P<.05$).

^{cd}Means in a row not bearing a common superscript differ ($P<.06$).

^{ef}Means in a row not bearing a common superscript differ ($P<.08$).

Table 2. Effect of Finishing Phase Implant Program on Steer Performance (Initial Implant, Day 0; Secondary Implant, Day 56)

Item	Syn +	Ral/Syn +
No. steers (pens)	232 (18)	237 (18)
Initial wt, lb	789	788
Final wt, lb	1247	1264
Period, days	-----Daily gain, lb-----	
1-56	4.58 ^c	4.10 ^d
57-132	2.66 ^c	3.25 ^d
1-132	3.47 ^a	3.61 ^b
	-----Daily DM intake, lb-----	
1-56	21.5	20.6
57-132	23.1	22.3
1-132	22.3	21.4
	-----Feed/gain-----	
1-56	4.68 ^c	5.03 ^d
57-132	8.69 ^c	6.86 ^d
1-132	6.41 ^c	5.93 ^d

^{ab}Means in a row not bearing a common superscript differ (P<.06).

^{cd}Means in a row not bearing a common superscript differ (P<.01).

Table 3. Effect of Pasture and Finishing Implant Combinations on Steer Feedlot Performance

Pasture Trt:	Control		Ralgro		Synovex-S	
Finishing Trt:	Syn+	Ral/Syn+	Syn+	Ral/Syn+	Syn+	Ral/Syn+
No. steers (pens)	78 (6)	78 (6)	76(6)	79(6)	78(6)	80(6)
Initial wt, lb	788	779	788	795	791	789
Final wt, lb	1276	1252	1234	1265	1241	1266
Period, days	-----Daily gain, lb-----					
1-56	4.77	4.13	4.44	3.97	4.60	4.13
57-132	2.90	3.19	2.60	3.26	2.53	3.24
1-132	3.69	3.59	3.38	3.56	3.41	3.62
	-----Daily DM intake, lb-----					
1-56	21.9	20.1	21.1	21.0	21.7	20.5
57-132	23.6	21.7	23.1	22.3	23.0	22.7
1-132	22.7	20.9	22.1	21.6	22.2	21.6
	-----Feed/gain-----					
1-56	4.58	4.87	4.74	5.29	4.69	4.98
57-132	8.14	6.81	8.85	6.83	9.05	6.99
1-132	6.14	5.82	6.54	6.07	6.52	5.97

Table 4. Effect of Pasture/Feedlot Implant Strategy on Carcass Traits

Pasture Trt:	Control		Ralgro		Synovex-S	
Finishing Trt:	Syn+	Ral/Syn+	Syn+	Ral/Syn+	Syn+	Ral/Syn+
HCW, lb	785	776	767	779	764	786
Dressing %	61.5	61.9	62.2	61.6	61.6	62.1
Ribeye area, sq. in.	13.8	13.9	13.5	13.5	13.0	13.8
Backfat, in.	.41	.38	.43	.40	.39	.39
KPH, %	2.5	2.3	2.5	2.4	2.4	2.3
Yield grade	2.6	2.4	2.7	2.6	2.7	2.5
Maturity score						
Lean	A ⁸⁰	A ⁷⁹	A ⁸¹	A ⁷⁷	A ⁷⁹	A ⁸⁰
Skeletal	A ⁸²	A ⁸¹	A ⁸³	A ⁸²	A ⁸⁴	A ⁸⁸
Marbling score	SI ⁶⁴	SI ⁸⁵	SI ⁸¹	SI ⁵⁷	SI ⁷¹	SI ⁶⁹
Choice, %						
Initial ^a	30.6	44.3	40.9	23.8	36.3	34.1
Final ^b	40.6	57.8	52.0	34.4	45.5	41.6
Abs. livers, n	3	3	7	5	3	2

^aInitial % Choice determined by USDA grader approximately 20 minutes after carcasses were ribbed.

^bFinal % Choice reflects percentage following additional chill time and regrading by USDA grader.