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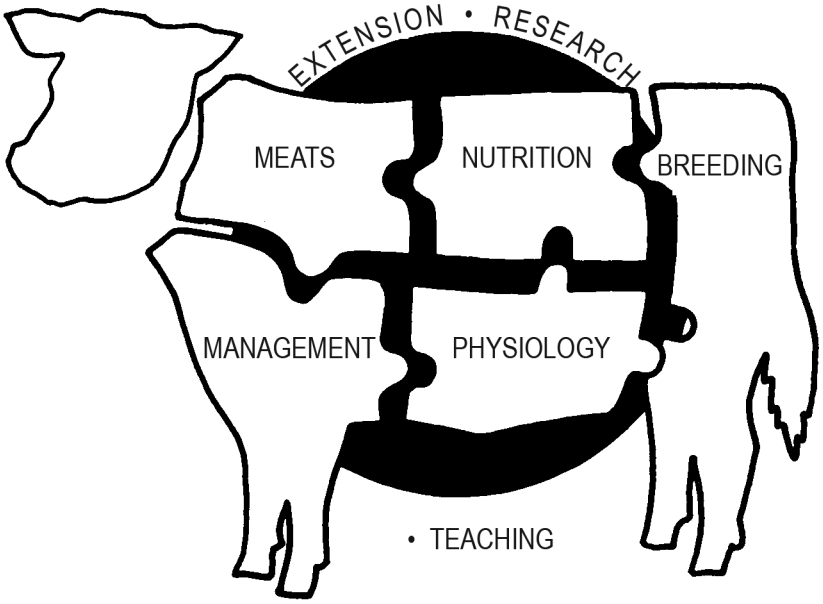

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Effects of Three Aggressive Implant Protocols on Feedlot Performance and Carcass Traits of Calf-Fed Steers

F. Henry Hilscher
Galen E. Erickson
Marshall N. Streeter
Robert J. Cooper
Bill D. Dicke
D. J. Jordon
Tony L. Scott[1]

Summary

A commercial feedlot study compared the effects of three initial implant strategies [Revalor® 200 (Rev200), Revalor® IS (RevIS), or Revalor® XS (RevXS)] followed by a Revalor 200 terminal implant on performance and carcass characteristics of feedlot cattle. No differences in final BW, DMI, ADG, or F:G were observed. The RevXS treatment resulted in larger LM area, lower calculated yield grades, less back fat, and a greater percentage of yield grade 1 carcasses. The Rev200 and the RevXS treatments had a higher percentage of carcasses that graded select compared to RevIS suggesting initial implant has little impact on feedlot performance but small effects on quality and fatness at equal days on feed.

Introduction

Steers have the ability to respond to higher dose single implant protocols compared to non-implanted steers, with increased growth performance and leaner body composition when cattle are harvested on an equal day basis. Results of increasing the amount trenbolone acetate (TBA) and estradiol (E) levels in reimplant protocols have resulted in mixed results. Regardless, industry use of steer protocols employing an initial Revalor 200 subsequently re-implanted with Revalor 200 in steers fed 180 to 200 days have become increasingly common. Aggressive protocols utilizing Revalor XS as an initial implant and reimplanted with Revalor 200 have been evaluated in only one study. A more intensive evaluation of aggressive implant protocols in calf-fed steers is needed. The objectives of this study were to determine the effect of three initial implants (Revalor IS, Revalor XS, and Revalor 200) followed by a terminal Revalor 200 on feedlot performance and carcass traits in calf-fed steers fed for approximately 180 to 200 days.

Procedure

A commercial feedlot experiment was conducted at Hi-Gain Feedlot near Farnam, Neb. Crossbred calves (n = 1,408; initial BW = 673 ± 23 lb) from ranches and auction barns in Nebraska, Nevada, and Utah were utilized for this trial. Steers were blocked (n = 3) by arrival date and projected harvest date. Steers were allocated to pens by sorting every two steers into one of three pens before processing. Pens were assigned randomly to one of three treatments (six pens/treatment). The treatments for this trial involved three different initial implants followed by a common terminal implant: Revalor IS (80 mg TBA and 16 mg E), Revalor 200 (200 mg TBA and 20 mg E), or Revalor XS (200 mg TBA and 40 mg E) given on day 1 with each treatment consisting of a subsequent Revalor 200 implant at day 115. Implants were placed in the upper middle one-third of the ear under the skin. At reimplant, all implants were placed in the opposite ear of the initial implant. Mean days on feed across all blocks was 195 days. A step-up period consisting of three adaptation diets was used to adapt cattle to the finishing ration. The finishing ration on average contained 49.9% dry-rolled corn (range 54.6-41.1%), 19.2% ADM-Synergy (range 28-0%), 19.6 % wet distillers grains with solubles (range 35-12%), 5 % liquid supplement (range 5.2-4.1%), 3.9% mixed hay (range 4.0-3.5%), and 2.4% corn silage (range 3.0-0%). All ration changes that occurred during the feeding period were the same for all cattle on trial. The supplement was formulated to provide 360 mg/steer daily of Rumensin® and 90 mg/steer daily of Tylan®. At the end of the feeding period, three replications of cattle were fed Zilmax at 7.56 g/ton DM for 20 days followed by a three-day withdrawal before harvest and, due to removal of Zilmax from the market, the remaining three replications were fed Optaflexx at 300 mg/head/day for the last 28 days of the feeding period. Feeding of beta-agonist was equal across treatments within a replication as all cattle were fed either Zilmax or Optaflexx. Pen weights were collected on day 1, and performance was calculated from pen BW. Final live body weight was determined at shipping using the average of the pen weight shrunk by 4% to adjust for gut fill. Carcass-adjusted performance was calculated using final BW, based on HCW divided by a common dressing percentage of 64.5%. Cattle were slaughtered at a commercial harvest facility on three dates. On day 1 of harvest, both liver scores and HCW were recorded and after a 48-hour chill, KPH fat, 12th rib fat thickness, color score, LM area, USDA marbling score, and USDA quality and yield grades were recorded. Both feedlot and carcass data were analyzed on a pen basis as a randomized block design using the Glimmix procedure of SAS (SAS Institute, Inc., Cary, N.C.). The model included the fixed effects of treatment with block as a random effect. Treatment means were separated using LSD test when the F-test statistic was significant

Table 1. Performance of steers implanted with either Revalor IS, 200, or XS on day 1 followed by Revalor 200 on day 115.

	Treatments				
Variable	RevIS	Rev200	RevXS	SEM	*P*-value
Pens	6	6	6	—	—
Steers	473	471	464	—	—
Initial BW, lb	676	672	674	10.1	0.81
Live performance[1]					
Final BW, lb[2]	1474	1475	1468	14.9	0.70
DMI, lb/day	24.3	24.1	24.0	0.4	0.58
ADG, lb	4.08	4.11	4.06	0.05	0.51
F:G	5.95	5.88	5.91	0.07	0.49
Carcass adjusted performance[3]					
Final BW, lb	1491	1488	1496	21.2	0.64
ADG, lb	4.16	4.16	4.19	0.05	0.68
F:G	5.83	5.80	5.71	0.12	0.36

[1]Finishing performance was calculated with dead and rejected animals removed from the analysis.
[2]Final BW is the average pen weight shrunk 4%. Subsequent ADG, and F:G are calculated from 4% shrunk final BW.
[3]Calculated as HCW divided by the average dressing % of 64.55. Subsequent ADG, and F:G are calculated from carcass adjusted final BW.

Table 2. Carcass characteristics of steers implanted with either Revalor IS, 200, or XS on day 1 followed by Revalor 200 on day 115.

	Treatments				
Carcass characteristics	RevIS	Rev200	RevXS	SEM	*P*-value
HCW, lb	962	959	965	13.7	0.64
Marbling[1]	466	448	452	17.2	0.15
LM area, in[2]	15.0[a]	15.2[a]	15.6[b]	0.1	<0.01
Fat thickness, in	0.70	0.70	0.66	0.04	0.05
Yield Grade[2]	3.53[a]	3.46[a]	3.22[b]	0.13	0.01
Yield Grade[3]					
1	3.91[a]	5.91[a,b]	8.95[b]	1.12	0.03
2	22.07	25.45	29.59	2.19	0.07
3	45.06	40.68	44.27	2.39	0.40
4	25.75[a]	23.41[a]	15.83[b]	2.10	0.01
5	3.22	4.55	1.38	0.99	0.06
Quality Grade[3,4]					
Prime	2.50	1.13	1.37	0.74	0.28
Premium Choice	27.73	23.13	25.06	2.13	0.32
Low Choice	50.45	48.30	47.38	2.38	0.65
Select	19.32[a]	27.44[b]	26.20[b]	2.13	0.03

[1]Marbling score 300 = Select, 400 = Small.
[2] Yield grade was calculated as 2.5 + (2.5 x fat thickness) – (0.32 x LM area) + (0.2 x %KPH fat) + (0.0038 x HCW).
[3]All numbers are expressed as percentages. The Yield Grade and Quality Grade values represent the proportion of carcasses within each group that received a yield and quality grade.
[4]Quality Grade proportions were based on marbling scores.
[a,b] Means within a row with different superscripts differ ($P < 0.05$).

(protected F-test). Frequency data (Yield, Quality, and Health data) were analyzed using binomial proportions with Glimmix and the ILINK option of SAS was used to determine least square means and SE of the proportions. Alpha values ≤ 0.05 were considered significant.

Results

There were no differences in DMI (P ≥ 0.58) between the three implant strategies over the entire feeding period (Table 1). Using carcass-adjusted performance, no differences in final BW or ADG were observed. Therefore, F:G also was unaffected by implant strategy. Likewise, similar results were observed when evaluating performance using final live BW.

There were no differences ($P \geq 0.15$) in HCW or USDA marbling score in carcasses when comparing the three strategies (Table 2). Steers within the RevXS treatment had a significant increase ($P \leq 0.05$) in LM area, and 12th rib backfat, which also led to a significant decrease ($P = 0.01$) in calculated yield grade when compared to the Rev200 and RevIS treatment groups. Steers that received Revalor XS as an initial implant followed by Revalor 200 at reimplant had an increase ($P = 0.03$) in the percentage of yield grade 1 carcasses when compared to cattle that received RevIS as initial implants. With this increase in percentage of yield grade 1 carcasses there was a similar decrease ($P = 0.01$) in the percentage of yield grade 4 carcasses in RevXS treated steers compared to Rev200 and RevIS. Overall, there were no differences in the percentage of cattle that graded choice or greater; however the cattle that received the Rev200 and RevXS treatment had an increase ($P = 0.03$) in the percentage of cattle that graded USDA Select compared with steers receiving the RevIS treatment.

In conclusion, the steers implanted with either Revalor 200, IS, or XS initially and commonly reimplanted with Revalor 200 had similar feedlot performance. Additionally, the use of more aggressive implants strategies could negatively impact quality grades in steer calves compared to a traditional low dose implant followed by a high dose terminal implant at equal days on feed.

[1]F. Henry Hilscher, graduate student; Galen E. Erickson, professor, University of Nebraska Lincoln Department of Animal Science, Lincoln Neb.; Marshall N. Streeter, Merck Animal Health, De Soto, Kan.; Robert J. Cooper, Bill D. Dicke, D.J. Jordon, Tony L. Scott, Cattlemen's Nutrition Services, Lincoln, Neb.