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January 2008

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Griffin, William A.; Adams, Don C.; and Funston, Richard N., "The Effect of Delaying Initial Feedlot Implant on Performance and Carcass Characteristics of Calf-fed Steers" (2008). *Nebraska Beef Cattle Reports*. 33.
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# The Effect of Delaying Initial Feedlot Implant on Performance and Carcass Characteristics of Calf-fed Steers

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## Summary

*Steers in two, 2-year experiments (n = 409) were either given an implant at feedlot arrival or implanted 30 days after feedlot entry. In Experiment 1, steer calves were not implanted at branding and in Experiment 2 calves were implanted at branding. There was no difference in feedlot performance for either experiment. However, in Experiment 1 there was a year by treatment interaction for marbling score suggesting that delaying implant in calves may affect quality grade.*

## Introduction

Common perception is that cattle have to be fed a certain number of days before they will grade choice, suggesting that marbling develops later in the life of cattle. However, hypertrophy of adipocytes begins at 100 to 200 days of age (Vernon, R.G., 1980 *Progress in Lipid Research* 19:23), suggesting management practices such as implanting schedule can alter marbling in the life of calves.

Implanting with low dose initial implants or delaying implanting has been shown to improve quality grade (Scaglia et al., *2004 Prof. Anim. Sci.* 20:170). Cattle in the majority of these studies receive only one implant in the feedlot phase of production. Most implants only pay out for 100 to 120 days, leaving calf-feds that are often fed more than 200 days with a substantial portion of the feeding period with no implant in a single implant system.

The objective of our study was to determine if delaying initial feedlot implant affects feedlot performance and carcass characteristics of steer calves that were implanted or not implanted at branding.

## Procedure

*Experiment 1*

One hundred steer calves (474 ± 44 lb) were received each year for two consecutive years from the Gudmundsen Sandhills Laboratory in the fall. Upon arrival, cattle were dewormed and vaccinated using standard feedlot procedures. Steers were not given an implant at branding. Therefore, the initial feedlot implant would have been the first implant in the life of the calf. Upon arrival, calves were weighed and allotted to one of two treatments: delay initial feedlot implant until 30 days on feed or receive initial feedlot implant at the beginning of the finishing period. Weights were taken on day 0, 30 (delay implant), 115 (reimplant), and 212. Calves in both treatments were reimplanted on the same day.

*Experiment 2*

One hundred twenty-seven and eighty-four steer calves (525 ± 52 lb) were received in year one and year two, respectively. Calves were received from the Gudmundsen Sandhills Laboratory in the fall. Upon arrival, cattle were dewormed and vaccinated using standard feedlot procedures. Steers received for this experiment were given a Synovex C implant at branding. Upon arrival calves were weighed and allotted to one of two treatments: delay initial feedlot implant until 30 days on feed or receive initial feedlot implant at the beginning of the finishing period. Weights were taken on day 0, 30 (delay implant), 104 (reimplant), and 218. Calves in both treatments were reimplanted on the same day.

In both experiments, weights were the average of two consecutive day weights taken in the morning prior to feeding. Final BW was calculated by adjusting hot carcass weight to a common 63% dressing percentage. Cattle were slaughtered at a commercial packing plant and hot carcass weight was collected on day of slaughter. Following a 24-hour chill USDA Marbling Score, KPH fat, fat thickness, and ribeye area data were collected. Yield grade was calculated for analysis. Additionally, cattle in both experiments were given Synovex S® as their initial feedlot implant and reimplanted with Synovex Choice®. All calves were fed a diet containing 48% dry-rolled corn, 40% wet corn gluten feed, 7% alfalfa hay, and 5% supplement. Statistical analysis was performed using the Mixed procedure of SAS, with pen as the experimental unit, and treatment, year, and year by treatment interaction in the model statement.

## Results

*Experiment 1*

The simple effects of treatment by year from Experiment 1 are presented in Table 1. For feedlot performance there was no treatment by year interaction ($P > 0.20$). When looking at implant treatment, initial BW ($P = 0.60$), BW at reimplant ($P = 0.16$), and final BW ($P = 0.52$) were not different. However, BW on day 30 was 24 lb greater for steers in the normal implant treatment ($P < 0.01$). Daily gain from day 0 to 115 ($P = 0.35$), day 30 to 115 ($P = 0.15$), day 30 to 212 ($P = 0.22$), and overall ADG ($P = 0.68$) were not different across treatments. However, ADG from day 0 to 30 was 0.66 lb/day greater ($P = 0.02$) for cattle implanted on day 0. Feed to gain and DMI can not be reported because cattle from both treatments were fed in the same pens.

Hot carcass weight ($P = 0.51$), fat thickness ($P = 0.59$), ribeye area ($P = 0.81$), KPH fat ($P = 0.93$), and yield grade ($P = 0.88$) were not different when comparing cattle that

(Continued on next page)

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**Table 1. Simple effects of delaying initial feedlot implant on feedlot performance and carcass characteristics from Experiment 1.**

| | Year 1 | | Year 2 | | | *P*-value | | |
|---|---|---|---|---|---|---|---|---|
| Item | Normal | Delay | Normal | Delay | SEM | Treatment | Year | Treatment*Year |
| Feedlot Performance | | | | | | | | |
| Initial BW, lb | 478 | 475 | 473 | 471 | 6 | 0.60 | 0.36 | 0.92 |
| Day 30 BW[a], lb | 618 | 591 | 594 | 574 | 4 | < 0.01 | < 0.01 | 0.41 |
| Day 115 BW[a], lb | 931 | 914 | 927 | 917 | 8 | 0.16 | 1.00 | 0.20 |
| Final BW, lb | 1273 | 1266 | 1276 | 1268 | 12 | 0.52 | 0.84 | 0.97 |
| Day 0-30 ADG, lb/day | 4.27 | 3.52 | 3.79 | 3.23 | 0.19 | 0.02 | 0.11 | 0.63 |
| Day 0-115 ADG, lb/day | 4.01 | 3.88 | 3.85 | 3.78 | 0.09 | 0.35 | 0.24 | 0.78 |
| Day 30-115 ADG, lb/day | 3.85 | 3.97 | 3.83 | 3.94 | 0.06 | 0.15 | 0.72 | 0.94 |
| Day 30-212 ADG, lb/day | 3.83 | 3.94 | 3.57 | 3.63 | 0.06 | 0.22 | < 0.01 | 0.69 |
| Day 0-212 ADG, lb/day | 3.92 | 3.89 | 3.64 | 3.61 | 0.07 | 0.68 | < 0.01 | 1.00 |
| Carcass Characteristics | | | | | | | | |
| Hot carcass weight, lb | 802 | 798 | 804 | 799 | 7 | 0.51 | 0.84 | 0.95 |
| Marbling score[b] | 527 | 570 | 558 | 536 | 12 | 0.44 | 0.92 | 0.05 |
| Fat thickness, in | 0.49 | 0.48 | 0.56 | 0.59 | 0.02 | 0.59 | < 0.01 | 0.30 |
| Ribeye area, $in^2$ | 12.73 | 12.85 | 12.86 | 12.80 | 0.14 | 0.81 | 0.79 | 0.55 |
| KPH fat, % | 2.84 | 2.85 | 2.03 | 2.02 | 0.05 | 0.93 | < 0.01 | 0.85 |
| Yield grade | 3.3 | 3.2 | 3.2 | 3.3 | 0.1 | 0.88 | 0.33 | 0.12 |
| Choice, % | 68 | 90 | 86 | 71 | 6 | 0.59 | 0.91 | 0.05 |

[a]Day 0 = Feedlot entry, Day 30 = delay cattle receive initial feedlot implant, Day 115 = Reimplant, Day 212 = Day of Harvest.
[b]Marbling score = $Slight^0$ = 400, $Small^0$ = 500, etc.

were implanted at feedlot entry and cattle delayed initial implant 30 days. However, there was a year by treatment interaction for marbling score ($P = 0.05$) and percentage of carcasses grading choice or higher ($P = 0.05$). With delayed cattle in year one grading 22 percentage units higher choice and in year two cattle that were implanted on day 0 grading 14.5 percentage units higher choice.

*Experiment 2*

The simple effects of treatment by year from Experiment 2 are presented in Table 2. For feedlot performance and carcass characteristics there were no treatment by year interactions ($P > 0.22$). When comparing across implant treatment, initial BW ($P = 0.89$), BW at delayed implant ($P = 0.92$), BW at reimplant ($P = 0.84$), and final BW were not different ($P = 0.80$). Daily gain from day 0 to 30 ($P = 0.40$), day 0 to 104 ($P = 0.40$), day 30 to 104 ($P = 0.79$), day 30 to 218 ($P = 0.70$), and overall ADG ($P = 0.58$) were not different across treatments. Feed to gain and DMI can not be reported because cattle from both treatments were fed in the same pens.

When comparing carcass characteristics for Experiment 2, hot carcass weight ($P = 0.80$), fat thickness ($P = 0.28$), ribeye area ($P = 0.43$), KPH fat ($P = 0.86$), yield grade ($P = 0.64$) marbling score ($P = 0.28$), and percentage choice ($P = 0.46$) were not different when comparing cattle that were implanted at feedlot entry and cattle delayed initial implant 30 days.

From this study, it is evident that calves that are implanted at branding and delayed initial feedlot implant 30 days after feedlot entry do not exhibit any performance response or improvement in carcass characteristics when compared to cattle that are implanted at feedlot entry. However, naive cattle that receive their first implant at feedlot entry have greater ADG the first 30 days of the feeding period compared to cattle that are delayed initial implant 30 days after arrival, however, carcass weights were not affected by implant regimen. Additionally, because of the year by treatment interaction exhibited in experiment one; it is unclear as to whether delaying implanting in cattle that were not implanted at branding creates any difference in quality.

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**Table 2. Simple effects of delaying initial feedlot implant on feedlot performance and carcass characteristics from Experiment 2.**

| | Year 1 | | Year 2 | | | *P*-value | | |
|---|---|---|---|---|---|---|---|---|
| Item | Normal | Delay | Normal | Delay | SEM | Treatment | Year | Treatment*Year |
| Feedlot Performance | | | | | | | | |
| Initial BW, lb | 509 | 513 | 538 | 538 | 18 | 0.89 | 0.16 | 0.92 |
| Day 30 BW[a], lb | 619 | 619 | 642 | 639 | 15 | 0.92 | 0.17 | 0.92 |
| Day 104 BW[a], lb | 976 | 975 | 982 | 975 | 8 | 0.84 | 0.89 | 0.89 |
| Final BW, lb | 1286 | 1280 | 1301 | 1290 | 34 | 0.80 | 0.70 | 0.94 |
| Day 0-30 ADG, lb/day | 3.41 | 3.29 | 3.48 | 3.37 | 0.14 | 0.40 | 0.59 | 0.95 |
| Day 0-104 ADG, lb/day | 3.73 | 3.68 | 3.93 | 3.86 | 0.07 | 0.40 | 0.02 | 0.86 |
| Day 30-104 ADG, lb/day | 3.79 | 3.78 | 4.04 | 3.99 | 0.13 | 0.79 | 0.10 | 0.89 |
| Day 30-218 ADG, lb/day | 3.54 | 3.50 | 3.58 | 3.54 | 0.11 | 0.70 | 0.71 | 0.97 |
| Day 0-218 ADG, lb/day | 3.51 | 3.47 | 3.58 | 3.53 | 0.09 | 0.58 | 0.46 | 0.98 |
| Carcass Characteristics | | | | | | | | |
| Hot carcass weight, lb | 810 | 806 | 820 | 813 | 21 | 0.80 | 0.69 | 0.95 |
| Marbling score[b] | 579 | 582 | 560 | 517 | 18 | 0.28 | 0.05 | 0.22 |
| Fat thickness, in | 0.51 | 0.53 | 0.52 | 0.52 | 0.02 | 0.56 | 0.74 | 0.56 |
| Ribeye area, $in^2$ | 13.54 | 13.31 | 14.34 | 14.23 | 0.22 | 0.43 | < 0.01 | 0.78 |
| KPH fat, % | 1.83 | 1.93 | 1.88 | 1.80 | 0.08 | 0.86 | 0.57 | 0.26 |
| Yield grade | 2.9 | 3.0 | 2.7 | 2.7 | 0.1 | 0.64 | 0.07 | 0.56 |
| Choice, % | 88 | 92 | 84 | 63 | 12 | 0.46 | 0.18 | 0.29 |

[a]Day 0 = Feedlot entry, Day 30 = delay cattle receive initial feedlot implant, Day 104 = Reimplant, Day 218 = Day of Harvest.
[b]Marbling score = $Slight^0$ = 400, $Small^0$ = 500, etc.

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