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Effect of Nursing Calf Implant Timing on Growth Performance and Carcass Characteristics

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Objectives

Compare pre- and post-weaning growth performance, carcass characteristics and meat quality attributes of calves that did not receive an implant or were implanted early or late in the suckling period.

Materials and Methods

Angus × Simmental crossbred steer calves (n = 135) of a single source were blocked by birth date, birth weight, and randomly assigned to treatments: Control (no pre-weaning implant); Early (36 mg zeranol; Ralgro, Merck Animal Health– average of 58 d of age); and Late (36 mg zeranol,– average 121 d of age). After weaning, steers were blocked by initial feedyard body weight to 5 pen replicates of each implant treatment (15 total pens, 9 steers per pen). All steers were implanted on d 21 after arrival at the feedyard, and d 108 of the finishing period. Steer weight and ultrasound measurements of ribeye area (REA), backfat (BF) and percent intramuscular fat (IMF) were collected when implants were administered, at weaning and on the day of harvest. Carcass measurements included hot carcass weight (HCW), LMA, 12th rib backfat (FT), kidney, pelvic and heart fat (KPH), marbling score, and maturity score. Objective color (L*, a*, b*) was recorded after a 45 min bloom period. A 3.8-cm section of strip loin was removed from both sides of each carcass posterior to the 12th rib separation and portioned into 2.54-cm steaks. Steaks were aged for 3 or 14 d for analysis of cook loss and Warner Bratzler Shear Force (WBSF). The remaining portion of each sample was used for analysis of crude fat percentage. Statistical analyses were conducted using mixed model procedures in a randomized complete block design. Least square means were computed and separated using least significant differences when treatment effects were significant at $\alpha \leq 0.05$.

Results

Steer body weights, ADG and feed conversion ratio did not differ among treatments ($P > 0.05$) for the duration of the project. Ultrasound REA and BF (averaged across all collection days) did not differ ($P > 0.05$), however, steers on the Control treatment had a greater ($P \leq 0.05$) percent IMF (averaged across all collection days) than Early implanted steers, while steers receiving the Late implant were intermediate and not different from the other treatments. Hot carcass weight, LMA, FT, yield grade, marbling score, overall maturity, and objective color (L*, a*, b*) did not differ ($P > 0.05$) due to timing of suckling implant. The proportion of steers in each yield and quality grade was similar among treatments, and the average carcass across all treatments was Low Choice, Yield Grade 3. There were no differences among treatments for total carcass value or price/cwt ($P > 0.05$) based on plant assigned premiums and

discounts. This illustrates that steers implanted successively (3 implants) can grade USDA Low Choice as well as steers implanted twice in the feedyard. Percent cook loss, percent crude fat, percent moisture and WBSF were not different among treatments ($P > 0.05$). However, as expected, tenderness of all steaks improved ($P \leq 0.05$) with aging (3.56 ± 0.131 kg at 3 d versus 2.89 ± 0.092 kg at 14 d).

Conclusion

Timing of suckling implant did not influence live performance, carcass characteristics or meat quality of steers fed in this study. Further, suckling implants did not provide any advantages in performance or carcass merit compared with steers not implanted during the suckling period.

Table 1. Least squares means for effect of suckling implant timing on carcass characteristics and meat quality

Variable	Control[1]	Early[1]	Late[1]	SEM	*P*-value
Hot carcass weight, kg	357	362	361	8.91	0.773
Ribeye area, sq cm	38.63	38.81	38.22	0.61	0.792
12th rib fat thickness, cm	2.04	2.03	2.06	0.10	0.937
Yield grade	3.01	3.02	3.11	0.12	0.442
Marbling score[2]	466	473	468	12.21	0.912
WBSF, kg	3.19	3.14	3.34	4.44	0.190
Cookloss, %	18.93	18.97	18.91	0.88	0.995
Lipid, %	5.00	5.29	4.99	0.01	0.327
Moisture, %	71.53	71.39	71.61	0.24	0.363

[1]Treatments: Control = no calf implant, Early = implanted at 58 d of age, and Late = implanted at 121 d of age.

[2]Marbling score: 200 = Traces0, 300 = Slight0, 400 = Small0, 500 = Modest-0.