Impact of Implanting Nursing Calves on Cow and Calf Performance

John Benner

Animal Science Extension Agent, Augusta County, Virginia Cooperative Extension

Introduction

Implanting beef cattle is a prudent practice that can improve calf growth and performance and producer return on investment. Growth promoting implants are approved for all phases of beef cattle production (cow-calf, stocker, feedlot). Reviews of published literature find that the impact of implanting nursing calves improves calf average daily gain by +0.097 to +0.12 lbs a day over control calves (Selk, G., 1997) with commercially available implants. However, surveys of cow-calf producers indicate only 37% of farms with 100+ cows implant their steer calves, while only 9% of producers with less than 100 cows implant their steer calves, (Vestal, et al., 2007). Another study found only 33% of cow-calf producers use growth promoting implants nationwide (Stewart, 2013). Though an expansive library of literature documents the benefit of implanting nursing calves on the average daily gain of the calf, there is limited data on the potential impacts on the dam of the implanted calf. The purpose of this study is to demonstrate the benefit of implanting nursing calves on average daily gain and weaning weight; and explore any impacts of implanting the calf on the calf's dam including body condition score, body weight and pregnancy status.

Methods

There are several brands of FDA approved implants for nursing calves. For this study, Synovex C® (100 mg progesterone/10 mg estradiol benzoate) was used (Zoetis, Kalamazoo, MI). Cattle used for the study included the 1st calf heifer and spare cow herd and their calves at SVAREC. All implanting procedures were approved by the Virginia Tech Institutional Animal Care and Use Committee. All calves in the project were born between September 2 and Nov. 29, 2021.

A total of 32 cow-calf pairs were included in the study, approximately half of the 1st calf heifer and spare cow herd (59). Initially, only steer calves and their dams were planned to be included. However, at the conclusion of the calving season, it was determined that later born heifers should be included in the study due to the greater number of heifers born in the calving season. Mature cows and 1st calf heifers were stratified by age and assigned randomly with their calves to either the control (n=17) or implant treatment. (n=15). Calves were implanted at pre-breeding CIDR insert for the cow herd (12/7/21, day 0). Calf weights were recorded at implantation (day 0), preg check (day 106) and weaning (day 133). Average calf age at implantation was 45 days and average age at weaning was 178 days. Cow body weight and body condition score was recorded at CIDR insert (day 0), and at preg check (day 106). Calf ears were palpated at preg check to insure proper implant placement.

Table 1 – Average Cow WT, BCS Calf Weight on Day 0.

12/7/2021

COW	Control	Synovex C	p Value	CALF	Control	Synovex C	p Value
Avg Cow WT	1242	1246	0.95	Avg Calf WT	154	165	0.52
BCS	5.82	6.13	0.46				

First calf heifers and the mature spare cow herd were managed on different pasture allotments from 12/7 (day 0) to 3/22/22 (day 105), when they were combined until weaning (day 178, 4/19/2022). Forage samples of stockpiled grass and hay were collected from 12/17 to 4/18 at regular two-week intervals Table 2. A summary table of average nutrient density of tested forage is shown in Table 2. Yields of stockpiled grass were also measured. Both herds were on hay for most of the period 1/17/2022 to 2/3/2022 (with an exception of 1/26-1/28) during an extended period of cold temperatures and snow remaining on the ground. The spare herd was on baleage beginning March 4. Both groups were fed baleage in addition to any remaining stockpile from 3/22 to 4/19.

Table 2. Nutrient Density and Yield for Forages Collected 12/17/21-3/22/22

1st Calf Heifers	**TDN%**	**CP%**	**Yield**	**lbs/acre**
8 sample average (includes both stockpile and hay)	59.21	11.17	6 sample avg	2381
Spares	**TDN%**	**CP%**	**Yield**	**lbs/acre**
8 Sample average (includes both stockpile and hay)	54.39	9.98	5 Sample average	1956

Results and Discussion

Weaning weights of calves, average daily gain of calves is included in Table 3. Cow body weight, BCS at preg check and ADG (loss) from implant (day 0) to preg check (day 133) for cows is also included in Table 3. Data was analyzed using Microsoft Excel single factor Analysis of Variance (ANOVA).

Table 3. Cow Preg Check and Calf Weaning Weight Data

Preg Check	3/23/2022			Weaning 4/19/2022			
	Control	Synovex C	p Value		Control	Synovex C	p Value
Avg Cow WT	1137	1157	0.73	Avg Calf WT	342	377	0.09
BCS	4.29	4.13	0.68	WDA	1.06	1.21	0.07
ADG	-1.00	-0.79	0.43	ADG	1.41	1.59	0.02
Avg Days Preg	73.53	77.67	0.73				

Implanted calf weaning weights averaged 35 lbs greater than non-implanted control calves. Though the study lacked a sample size sufficient achieve statistical power, the difference between implant and control tended towards significance $p<0.10$. Additionally, weight per day of age, WDA= $P<0.10$ tended toward significance and average daily gain, ADG=$P<.05$, indicated significance. Though numbers did not warrant analyzing weights by gender, it did appear that results were consistent whether calves were steers or heifers (Figure 1). The end result for both steers and heifers was a +0.18 improvement in ADG.

No significant differences were seen thus far in cow weights, body condition score or days pregnant at preg check. We hope to repeat the study next year and continue to evaluate any possible differences.

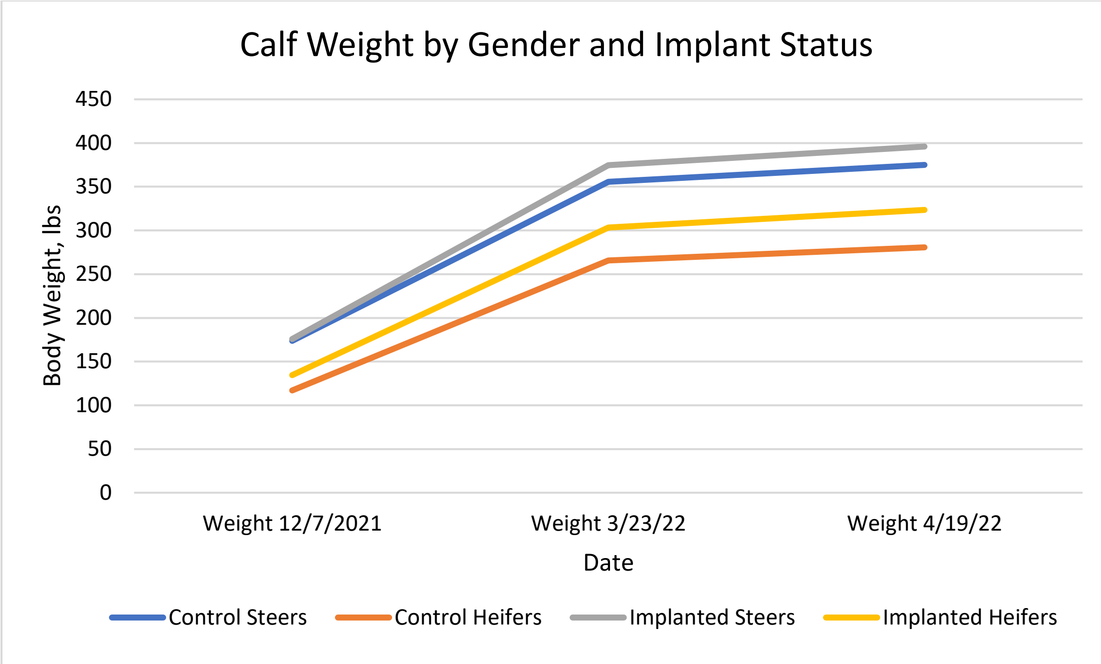

Figure 1. Calf Weight by Gender and Implant Status

Economics

Assuming implant costs at $1.35/head, labor at $0.80/head to implant plus $0.10/head for disinfectant and supplies, total implant cost is calculated at $2.25/head. Average prices for the weight range (377) and (342) for steers (377 lbs = $1.71/lb; 342 lbs = $1.83/lb) and heifers (377 lbs = $1.48/lb; 342 lbs = $1.44/lb) were pulled from the Virginia Weekly Cattle Auction Summary for the week of 4/17/2022-4/23/2022 (USDA-AMS/VDACS Market News Service). Using these assumptions, a return on investment was estimated for both steers and heifers using the following calculations.

$$Steers: Implanted\ WT = 377\ lbs\ x \frac{\$1.71}{lb} = \$644.67\ gross\ per\ calf$$

$$Steers: No\ Implant\ WT = 342 = 342\ lbs\ x \frac{\$1.83}{lb} = \$625.55\ gross\ per\ calf$$

$$\$644.67 - \$625.55 = \$19.12 - \frac{\$2.25}{calf} implant\ cost = \$16.87/steer\ calf$$

$$Heifers: Implanted\ WT = 377\ x \frac{\$1.48}{lb} = \$557.96\ gross\ per\ calf$$

$$Heifers: Implanted\ WT = 342\ x \frac{\$1.44}{lb} = \$492.07\ gross\ per\ calf$$

$$\$557.96 - \$492.07 = \$65.89 - \frac{\$2.25}{calf} implant\ cost = \$63.64/\ heifer\ calf$$

Naturally, these assumptions change with prices and weights, however, for calves designated to be sold at weaning in a non-natural market, implanting provides producers an increase in net return on investment by $16.87 and greater for steer and heifer calves.

Conclusions and Continuing Work

Though an extensive list of literature exists on implanting nursing calves, we do feel it prudent to demonstrate local results for Virginia producers in a fall calving scenario. With adequate nutrition supplied by stockpiled forage, hay and baleage, calf gains when implanted can be realized over non-implanted controls. A production system where cows are gathered for estrus synchronization and AI protocols offers an opportunity to implant calves at an average age of 45 days, and receive optimum time prior to weaning for implant payout of 133 days. We plan to repeat this study again this fall to verify results, increase cow and calf numbers involved in the study and account for any year over year variability in results.

References

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