

39 Implants and Their Use in Beef Cattle Production

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Objectives

- Discuss types of implants.
- Discuss the effects of implants.
- Present proper procedure for implanting.

The term “implant” is used to refer to a group of products used in the cattle industry that increase the rate and efficiency of growth, both metabolic and economic. Implants contain natural or synthetic anabolic compounds that produce physiological responses in the animal similar to natural hormones. Implants are typically made of a powder that is compressed into a small pellet. The pellet is placed, or implanted, under the skin on the backside of the animal’s ear. Each type or brand of implant has a specific applicator, referred to as an implant gun, which is used to properly administer the implant.

Safety of Implants

There is much concern expressed by consumer groups in the news and social media about using growth-promoting hormones in beef production systems. Table 39.1 shows the estrogenic activity of foods commonly consumed in the U.S.

Table 39.1. Estrogenic activity per 4 ounce serving of several common foods.^a

Food	Estrogen, ng
Soybean oil	226,757
Cabbage	2,721
Wheat germ	453
Peas	453
Eggs	3,968
Ice Cream	680
Milk	15
Beef from pregnant cow	159
Beef from implanted cattle	2.5
Beef from non-implanted cattle	1.8

^a adapted from Preston (1997)

Beef from steers and heifers fed for slaughter have a very low level of estrogenic activity, regardless of implant status. In fact, ice cream contains 272 times more estrogen than implanted beef (Preston, 1997). Common grain and vegetable sourced foods such as peas, wheat germ and cabbage have 180 to 1,000 times the estrogenic activity of implanted beef. Natural estrogen production in humans is much higher than many expect; a pregnant human female produces 90,000,000 nanograms of estrogen per day, a non-pregnant adult female 5,000,000 nanograms of estrogen per day, an adult male 100,000 nanograms of estrogen per day and a pre-pubertal child 40,000 nanograms of estrogen per day. So the safety of growth promoting implants is certain. The safety of implants is assured when FDA approved products are used according to their labels. History and several organizations including, but not limited to, the U.S. Food and Drug Administration, the World Health Organization and the Food and Agriculture Organization have concluded that the use of implants in beef production poses no safety risk to consumers.

Current Use of Implants

Implants have a long history of use in the beef cattle industry. The first commercial implant was introduced in 1957. Since then, the use of implants has been widely adopted by the cattle feeding and stocker sectors of the beef industry. According to a 1999 survey, 99% of all feedlot cattle are implanted at least one time during the finishing phase.

Two recent Oklahoma studies surveyed 729 producers who received the Beef Cattle Manual (Johnson, 2008 and Vestal et al., 2007). Thirty-seven percent of cow-calf producers with larger operations (more than 100 cows) indicated they implanted their steer calves, while only 9% of cow-calf producers with smaller operations (fewer than 100 cows) implanted their steer calves (Vestal et al., 2007). Approximately 60% of stocker producers implant their cattle (Johnson, 2008). In fact, 58.6% of cattle from designated stocker-only operations nearly always implanted their steers, while only 28.8% of steers from stocker operations that included a cow-calf component were implanted. Data from the 2008 National Stocker Survey shows that 78.6% of stocker operations with more

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than 1,000 head implant their cattle, dropping to 52.7% in operations with less than 200 stockers.

Types of Implants

There are three types of compounds used in implants: estrogens, androgens and progestins. Estrogens mimic the effects of the naturally occurring hormone estrogen. Estradiol benzoate, estradiol 17-beta and zeranol are the primary estrogenic compounds used in implants. Alternatively, androgenic compounds mimic the effects of the naturally occurring hormone testosterone. Testosterone propionate and trenbolone acetate (TBA) are the principal androgenic compounds used in implants. Synthetic progesterone also is used in implants; however, its effect on the animal is less pronounced than the other two hormone analogues. Tables 39.2 (suckling calves), 39.3 (stocker cattle) and 39.4 (feedlot) list compound combinations and dosages supplied in commercially available implant products. Some commercially available implants have singular hormone activity, such as Ralgro with only estrogenic analogue zeranol or Finaplex containing only the testosterone analogue TBA, but most have combinations of hormone activity.

All implants are designed to release the compounds into the bloodstream of the animal slowly through time. Different implants are formulated to provide different lengths of time for all of the compounds to be released. This effective period or lifespan of the implant is commonly referred to as the “payout” period. Label claims of payout range from 60 days to 400 days. Factors that affect payout include formulation of the implant, proper administration of the implant and blood flow to the ear. Reimplanting provides longer-term benefits but reimplanting before the end of the payout period of the previous implant has not provided any additional effectiveness. Research conducted at the USDA ARS Southern Plains Experimental Range near Fort Supply shows this relationship (Table 39.5). Steers given an implant supplying estradiol and progesterone before turnout onto native range in the early summer did not respond to additional implants given in mid-summer (day 61 of grazing) with control steers not receiving an additional implant gaining 1.7 pounds per day and steers receiving either Estradiol and Progesterone or a combination implant supplying Trenbolone Acetate/Estradiol gaining 1.8 pounds per day during the late summer (Grigsby, unpublished data). This research shows that reimplanting before the end of

Table 39.2. Beef cattle implants approved for use in suckling calves and calves less than 400 pounds.

Steer	Heifer	Implant	Company	Ingredient/dose	Relative potency	Payout	Reimplant
x	x	Ralgro	Merck	36 g zeranol	Low	70 to 100	45 to 70
x		Compudose	Elanco	25.7 mg estradiol	Moderate	200	200
x		Encore	Elanco	43.9 mg estradiol	Moderate	400	400
x	x	Synovex-C	Zoetis	100 mg progesterone 10 mg estradiol benzoate	Low	70 to 100	55 to 90
x	x	Component E-C	Elanco	100 mg progesterone 10 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Low	70 to 100	

Table 39.3. Beef cattle implants approved for use in stocker calves and growing calves in confinement more than 400 pounds.

Steer	Heifer	Implant	Company	Ingredient/dose	Relative potency	Payout	Reimplant
x	x	Ralgro	Merck	36 g zeranol	Low	70 to 100	45 to 70
x		Compudose	Elanco	25.7 mg estradiol	Low	200	200
x		Encore	Elanco	43.9 mg estradiol	Low	400	400
x		Synovex-S	Zoetis	200 mg progesterone 20 mg estradiol benzoate	Moderate	90 to 120	70 to 100
x		Component E-S	Elanco	200 mg progesterone 20 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Moderate	90 to 120	70 to 100
	x	Synovex-H	Zoetis	200 mg testosterone propionate 20 mg estradiol benzoate	Moderate	90 to 120	70 to 100
	x	Component E-H	Elanco	200 mg testosterone propionate 20 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Moderate	90 to 120	70 to 100
x	x	Revalor-G	Merck	40 mg trenbolone acetate 8 mg estradiol	Moderate	100 to 140	100 to 120
x	x	Component TE-G	Elanco	40 mg trenbolone acetate 8 mg estradiol 29 mg tylosin tartrate (local antibiotic)	Moderate	100 to 140	100 to 120
x	x	SynovexOne Grass	Zoetis	150 mg trenbolone acetate 21 mg estradiol benzoate	Moderate	180 to 200	180 to 200

Table 39.4. Beef cattle implants approved for use in finishing cattle in confinement > 400 pounds.

<i>Steer</i>	<i>Heifer</i>	<i>Implant</i>	<i>Company</i>	<i>Ingredient/dose</i>	<i>Relative potency</i>	<i>Payout</i>	<i>Reimplant</i>
x	x	Ralgro	Merck	36 g zeranol	Low	70 to 100	45 to 70
x	X	Compudose	Elanco	25.7 mg estradiol	Low	200	200
x	x	Encore	Elanco	43.9 mg estradiol	Low	400	400
x		Synovex-C	Zoetis	100 mg progesterone 10 mg estradiol benzoate	Low	70	55 to 70
x		Synovex-S	Zoetis	200 mg progesterone 20 mg estradiol benzoate	Low	90 to 120	70 to 100
x		Component E-S	Elanco	200 mg progesterone 20 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Low	90 to 120	70 to 100
	x	Synovex-H	Zoetis	200 mg testosterone propionate 20 mg estradiol benzoate	Low	90 to 120	70 to 100
	x	Component E-H	Elanco	200 mg testosterone propionate 20 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Low	90 to 120	70 to 100
x	x	Synovex Choice	Zoetis	100 mg trenbolone acetate 14 mg estradiol benzoate	Moderate	100 to 140	70 to 100
x		Revalor -IS	Merck	80 mg trenbolone acetate 16 mg estradiol benzoate	Moderate	100 to 140	90 to 100
x		Component TE-IS	Elanco	80 mg trenbolone acetate 16 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Moderate	100 to 140	90 to 100
	x	Revalor -IH	Merck	80 mg trenbolone acetate 8 mg estradiol benzoate	Moderate	100 to 140	90 to 100
	x	Component TE-IH	Elanco	80 mg trenbolone acetate 8 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	Moderate	100 to 140	90 to 100
x		Revalor-S	Merck	120 mg trenbolone acetate 24 mg estradiol benzoate	High	100 to 140	90 to 100
x		Component TE-S	Elanco	120 mg trenbolone acetate 24 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	High	100 to 140	90 to 100
	x	Revalor-H	Merck	140 mg trenbolone acetate 14 mg estradiol benzoate	High	100 to 140	90 to 100
	x	Component TE-H	Elanco	140 mg trenbolone acetate 14 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	High	100 to 140	90 to 100
x	x	Revalor 200	Merck	200 mg trenbolone acetate 20 mg estradiol	High	100 to 140	90 to 100
x	x	Component TE-200	Elanco	200 mg trenbolone acetate 20 mg estradiol benzoate 29 mg tylosin tartrate (local antibiotic)	High	100 to 140	90 to 100
x		Revalor -XS	Merck	200 mg trenbolone acetate 40 mg estradiol benzoate	High	200	200
	x	Revalor -XH	Merck	200 mg trenbolone acetate 20 mg estradiol	High	200	200
	x	Finaplix - H	Merck	200 mg trenbolone acetate	High	70 to 100	60 to 100
x	x	Synovex Plus	Zoetis	200 mg trenbolone acetate 28 mg estradiol	High	150 to 200	150 to 200
x	x	Synovex One Feedlot	Zoetis	200 mg trenbolone acetate 28 mg estradiol	High	200	200

Table 39.5. Effect of reimplanting grazing steers previously implanted with an estradiol/progesterone implant in mid-summer before implant payout on late summer performance.

	Control	Implant type		P-value
		Est/Prog ^a	TBA/E ^b	
Steer weight, lbs				
July 18	596	599	598	0.80
September 27	708	719	721	0.37
Weight gain, lbs/steer	113.3	119.7	121.6	0.12
Average Daily Gain, lbs/day	1.7	1.8	1.8	0.12

Adapted from Grigsby et al. unpublished data.

a Est/Prog – supplied 200 mg progesterone and 20 mg estradiol benzoate.

b TBA/E – supplied 40 mg trenbolone acetate and 8 mg estradiol

the payout period of the previous implant provides little to no benefit.

Effects of Implants on Beef Cattle Performance

Nursing Calves

Implant products are available for calves weighing less than 400 pounds (Table 39.2). Implants cleared for use in nursing calves generally contain a lower dose of the active ingredient compared to products cleared for use in older cattle (Tables 39.3 and 39.4). These implants are typically administered when the calves are between two months and four months of age. Research has shown implants given during the suckling phase will increase average daily gain (ADG) of steer calves by approximately 0.10 pound per day. Response in heifers is slightly lower. Zeranor and estradiol benzoate/progesterone implants appear to produce a slightly better response than estradiol 17-beta products.

Most calf implants are designed for payout in approximately 100 days to 120 days. In some circumstances, the suckling period is long enough that reimplanting would be appropriate. Steer calves implanted twice with zeranol or estradiol benzoate/progesterone implants gained approximately 0.12 pounds per day more than nonimplanted control animals. The additional implant did not appear to have as much effect as the initial implant. Calves should be 30 days to 45 days old before they are implanted. Bull calves intended for breeding should not be implanted. Bull calves not intended for breeding should be castrated at the time of implanting, as one effect of the implant is possible inhibited scrotal development, which makes later castration more difficult.

Nursing Bull Calves Versus Nursing Implanted Steer Calves

Many producers follow the practice of leaving bull calves intact until weaning rather than castrating them. The idea is that natural hormones produced in the testicles

increase ADG and weaning weight of the calves. Numerous research trials have shown implanted steer calves gain at a rate equal to, or greater than, bull calves. Castrating bulls as small calves, as opposed to when they are older, reduces overall stress on the calf. The stress and hormonal effects of castration at weaning can reduce post-weaning gain potential and the calf's ability to withstand diseases typically associated with weaning and marketing. This difference in post-weaning performance of bulls versus steers is recognized by cattle buyers, as indicated by the fact that steers will command a \$5 to \$10 per cwt. premium over intact bull calves. Producers wanting to maximize the value of male calves at weaning should consider early castration at birth or at two months to four months of age and use an implant approved for nursing calves.

Stocker Calves

Calves that are weaned and placed on grass or small grain pastures for a period of time before finishing in a feedlot are referred to as stocker calves. There are several implants available for stocker calves (Table 39.3). Implant research trials have shown an improvement in the ADG of stocker cattle from 8% to 20%. Numerous trials indicate that producers can expect a 10% to 15% (0.18 pounds per day to 0.27 pounds per day) improvement in ADG over nonimplanted controls. These studies were conducted through various lengths of time, but the average was approximately 150 days, which is a typical stocker grazing period. Research results are inconclusive concerning the value of one type of compound over the others.

Payout for stocker implants is generally in the range of 80 to 100 days, although several products are available with much longer payout periods. In June 2023 the FDA will no longer allow reimplanting of calves within a production phase unless it is specifically allowed on the label. Performance benefits will be lost after an implants effective payout period. Alternatively, implants designed for a longer payout time should be used as the initial and only implant to provide an active implant through a long grazing season.

The impact of keeping an active implant on performance is shown with steers grazing native range at the Klemme Range Research Station near Bessie, OK. These steers were implanted with combination implant supplying trenbolone acetate/estradiol (TBA/E) at receiving 60 days before grazing turnout on May 22, steers were either not reimplanted or were reimplanted with combination implant supplying TBA/E or estradiol and progesterone on July 23 (Day 62 of grazing) at the end of the expected payout period of the previous implant (Grigsby unpublished data). Table 39.6 shows the performance of the steers during the late summer grazing period from July 23 to September 30. Reimplanting with estradiol and progesterone following an initial combination TBAS/E implant provided no additional gain compared with controls that were not reimplanted, yet reimplanting with a combination implant supplying TBA/E combination increased average daily gain by 0.5 pounds per day compared with the non-reimplanted controls and by 0.9 pounds per day compared with the steers reimplanted with estradiol/progesterone. This shows the value of matching

Table 39.6. Effect of reimplanting grazing steers previously implanted with a trenbolone acetate/ estradiol combination (TBA/E) implant in mid-summer after implant payout on late summer performance.

	Implant Type			P-value
	Control	Est/Prog ^a	TBA/E ^b	
Steer weight, lbs				
July 23	667	667	666	0.99
September 30	806	788	834	< 0.01
Weight gain, lbs/steer	165.6	138.0	200.1	0.01
Average Daily Gain, lbs/day	2.4	2.0	2.9	0.01

Adapted from Grigsby et al. unpublished data.

a Est/Prog – supplied 200 mg progesterone and 20 mg estradiol benzoate.

b TBA/E – supplied 40 mg trenbolone acetate and 8 mg estradiol

the payout period of implants with the length of ownership (in contrast with reimplanting prior to end of payout period shown in Table 39.5) as well as the importance of following the standard recommendation to follow initial implants with implants of equal or higher potency to see continued performance responses. Factors affecting stocker response to implants are numerous and include sex, weight, genetic gain potential, forage availability, diet quality, supplementation and environmental conditions. Research has shown that as ADG of nonimplanted controls increases (due to pasture quality or other factors), the response to an implant also increases. No adverse effects have been documented from implanting cattle that gain at very low rates. Figure 39.1 shows the implant response of steers stocked on wheat pasture at either 0.75 acres per steer (1.5 steers per acre; Low Gain) or 1.5 acres per steer (High Gain) by Williamson et al., 2014. Steers stocked for a low rate of gain without implants gained only 1.4 pounds per day while implanting increased gains by 0.28 pounds per day, a 20% increase in gain with implants. Steers stocked on wheat pasture for a high rate of gain had average daily gains of 2.19

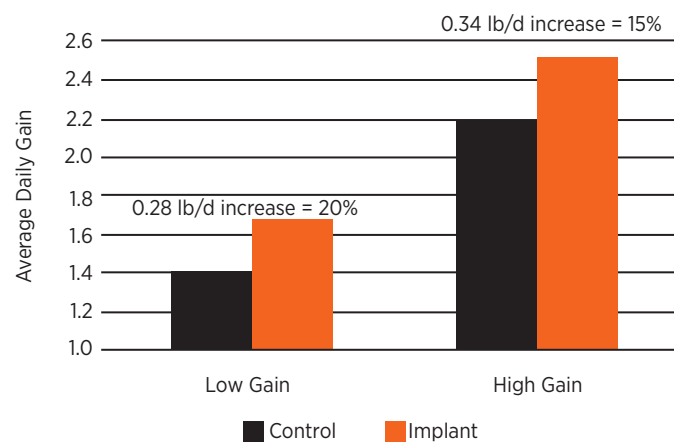


Figure 39.1. Implant response by steers grazing wheat pasture stocked to achieve either a low (1.5 steers per acre) or high (1.5 acres per steer) rate of gain during the winter and early spring. (Adapted from Williamson et al., 2014.)

pounds per day without implants, which was increased by 0.34 pounds per day to 2.53 with the implant, a 15% increase in gain. In this research, the increase in gains were similar even though the potential gains on pasture were quite different.

Research has indicated responses to implants, supplementation and ionophores are 100% additive in stocker cattle, and there may be a slight synergistic relationship. Full benefit should be expected from both the implant and the supplement program if both are used in stocker cattle. Figure 39.2 shows the gain response of steers grazing wheat pasture in the fall and winter to both growth-promoting implants and an ionophore (Beck et al., 2014). Steers in this experiment that were not supplied the ionophore nor given an implant gained 2.29 pounds per day, implanted steers not fed the ionophore gained 2.71 pounds per day—an increase of 0.42 pounds per day. Feeding an ionophore increased gains by 0.20 pounds per day whether they were implanted or not, so steers fed an ionophore and implanted gained 0.6 pounds per day than steers not implanted or fed an ionophore, which increased net returns by \$42 per steer.

Feedlot Cattle

Implants are used extensively by the feeding industry in the U.S. to improve ADG and feed efficiency. The finishing period can range from 120 days to 240 days. A single implant may improve ADG by 0.35 pound per day in steers and 0.25 pound per day in heifers. Feed conversion may be improved by 0.5 pound of feed per pound of gain. Aggressive feedlot implant programs can result in up to a 21% improvement in daily gain and an improvement in feed conversion up to 11%. This increased efficiency and weight gain produces a significant economic return. An implant program for finishing cattle must evaluate numerous factors, including decisions concerning timing of implant, ingredient of implant and number of implant times. There are many different options available for implanting finishing calves (Table 39.4) ranging from very conservative (low-potency hormone levels) to very aggressive (high-potency hormone

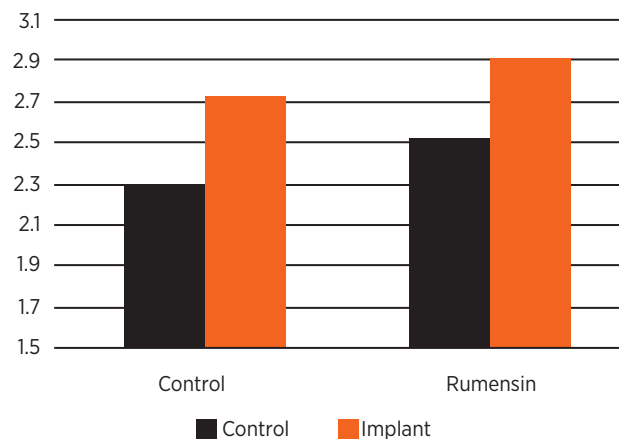


Figure 39.2. Gain response of steers grazing wheat pasture to growth promoting implants and an ionophore (monensin). (Adapted from Beck et al., 2014.)

levels). Selection of implant program depends on previous management history, genetics of the animal and production and marketing goals.

Implants can have pronounced effects upon carcass characteristics of cattle. In general, when cattle are fed the same number of days, implants improve carcass weight and ribeye area, while decreasing marbling scores. With these circumstances, implants may reduce the percentage of cattle grading at least USDA Choice by 2% to 24%. Implants also may slightly increase skeletal maturity, which also impacts USDA Quality Grade. Type of implant, gender and genotype of the animal all influence these responses. However, if cattle are harvested at constant back fat thickness, implants may have little to no impact on quality grade.

Barham et al. (2012) finished two sets of calves either directly after preconditioning 63 days (calf-fed) or as yearlings following an extensive 133-day low-growth stocker period that were managed with either aggressive implanting (implants administered at weaning, during grazing [yearlings only], at arrival to feedyard and reimplanted during finishing) or delayed implanting (implants administered only at reimplanting during finishing). Breeding selection for the herd of one set of calves had been for carcass quality and growth; while the herd for the second set were selected for maternal hybrid vigor and growth traits. The aggressive implant program increased growth and hot carcass weights of both calf-feds and yearlings from both herds. In the first herd (the one selected for carcass quality), aggressive implanting program reduced marbling scores of both the calf-feds and yearlings, and the impact was greatest in yearlings with the percentage of USDA Choice quality grade or greater: decreased from 95% in delayed implant to 45% in aggressively implanted cattle. While in the second herd (not selected for carcass quality), marbling score, USDA quality grade and the percentage USDA Choice was not affected by an implant program. This research indicates that aggressively implanting cattle prefinishing with high genetic propensity for marbling during a period of restricted nutrition can have a large impact on subsequent carcass quality, yet marbling and carcass quality of cattle with limited genetic selection for those traits are not affected by implant program prefinishing. For a complete review of feedlot implant effects, see Duckett and Owens, 1997.

Lifetime Implanting Strategies

In the modern beef industry, it is fairly common

for cattle to receive three or more implants during their lifetime. For producers who operate in only one segment of the industry, the implant decision is simple. However, for producers who retain ownership of an animal through two or more phases and market cattle on a carcass merit price grid, implant decisions become more complex. It is possible implants administered in one phase can have carryover effects in subsequent phases, however in many studies, this carryover effect has not materialized (Reuter and Beck, 2013). Implants approved for suckling calves are less potent than those approved for stockers, which are less potent than many feedlot implants. A strategy to maximize lifetime gain of the animal while minimizing deleterious effects on carcass quality and animal behavior is an implant program using increasingly potent implants. During the suckling phase, a low-potency implant will be used, followed by one or two moderate implants in the growing phase, followed by a moderate implant upon placement in the feed yard, then a high-potency implant 80 days to 100 days before slaughter. The effects of multiple implants on marbling scores may become more dramatic as three or more implants are used during the animal's lifetime. Producers who retain ownership of animals through more than one production phase should evaluate their overall implant program for the way their cattle are being marketed. Factors to consider are the feed cost, the base value of additional carcass weight, the Choice-Select spread and the potential value of marketing cattle into specialty, non-hormone treated cattle (NHTC) programs.

Implanting Replacement Heifers

Producers often raise the question, "Is it safe to implant replacement heifers?" Research has shown heifer calves intended for use as breeding animals can be implanted one time between 45 days of age and weaning with no significant effect on subsequent conception rates or calving difficulty. Heifers implanted immediately at birth, following weaning or multiple times prior to weaning had significantly lower conception rates compared to heifers receiving a single implant prior to weaning.

Most producers should be able to identify potential replacements heifers at weaning. The producer can then implant the stocker heifers to improve gain and not implant the heifers intended for breeding. See chapter 29 for a more thorough discussion of implanting replacement heifers.

Table 39.7 Effect of pre-finishing implants on carcass quality of calves shipped directly to the feedlot after preconditioning (CALF-FED) or shipped to the feedyard as yearlings following wheat pasture managed for low rate of gain (LOW GAIN) or high rate of gain (HIGH GAIN).

	CALF-FED		LOW GAIN		HIGH GAIN	
	No implant	Implant	No implant	Implant	No implant	Implant
Hot carcass weight, lbs	682	680	703	710	760	781
Rib eye area, inch ²	11.5	11.5	12.2	13.2	13.6	13.5
Marbling Score	559	508	492	427	471	468
Quality Grade	CH0	CH0	CH	CH	CH	CH
% Choice	100	95	100	74	89	85

Adapted from Williamson et al., 2014.

Economics

Implants are one of the most cost-effective technologies available to cattle producers. Stocker implants typically return more than \$15 for every \$1 invested. Implants effectively increase growth rate, increase protein deposition and improve feed efficiency resulting in approximately a 7% overall reduction in the cost to produce beef (Lawrence and Ibarburu.). Consider this example of the economic potential of implanting unweaned calves: A nursing calf, implanted at three months of age and 150 days before weaning may gain 0.10 pound per day for 150 days. The 15 pounds additional weaning weight could have a value of \$1.00 to \$2.00 per pound for a total of \$30. The implanting cost is approximately \$0.85. Here, the net return would be \$29.15 per calf sold.

Alternative production systems such as organic, NHTC or “natural,” generally do not allow cattle to be implanted. Producers who want to use these production systems should ensure the premiums they receive for these cattle will offset the reduced production and efficiency implants (and other technologies) offer. Historically, these premiums have not been adequate to offset the lost production (Maxwell et al., 2015).

Some regions (i.e. the European Union) and countries do not allow the use of implants at all.

Beef Quality Assurance

Implant Location

The only approved implantation site for all brands of implants is subcutaneously in the middle one-third of the back of the ear. The implant must not be closer to the head than the edge of the auricular cartilage ring farthest from the head. The procedure to insert the implant should be done under conditions as sanitary as possible. Cleaning the ear, keeping equipment clean and using a sharp needle are all recommended. Problems with ear abscesses are the most common cause of implant defects and are usually related to poor sanitation while implanting. Proper animal restraint makes the implanting placement more accurate and the procedure safer for the handlers. Follow all manufacturers' recommendations for implant administration.

Figure 39.3 shows the correct location. The Food and Drug Administration (FDA) no longer allows implants to be placed at the base of the ear.

Implanting Procedure

A qualified and trained individual should be assigned the task of implanting. Employing the following steps will greatly diminish the incidence of implanting errors, such as abscesses, crushed pellets or missing implants. Achieving an active, undamaged uncontaminated implant in each calf is the goal. Speed will come with practice; it is better to do it right the first time than to have to go back and fix mistakes. Similarly, it is much better to take time and do it right than to pay for an implant and not realize a \$20 to \$30 per head advantage because the job was done incorrectly.

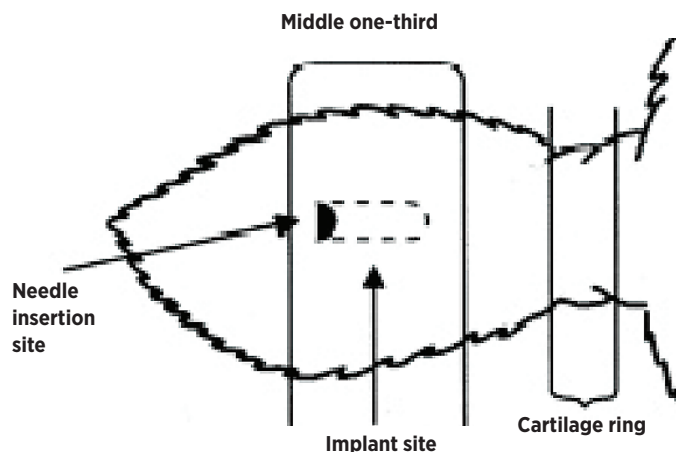


Figure 39.3. The correct location for implants.

1. Read the label for all animal health products. Ensure the correct dosage, location and procedures are followed. Ensure the product is labeled for use in the class of animal to which it is being administered. Any deviation from label directions carries the potential for stiff legal penalties and should be directed by a licensed veterinarian.
2. Obtain all of the necessary equipment to maintain sanitation. A tray and large sponge soaked in a disinfectant should be used to store the implant applicator between uses. An extra needle for the applicator should be available in case the needle becomes dull, burred, bent or broken. A clean table out of the way of flying debris should be used to store the applicator and implants between uses.
3. Become familiar with the operation of the implant applicator.
4. Properly restrain the animal to prevent movement. If necessary, further restrain the head by use of a halter.
5. Inspect the animal's ear. Check for previous implants or abscesses, presence of ear tags or ear tag holes, mud, manure or other debris. Clean and dry the implant area by wiping with a paper towel and disinfectant. Do not attempt to implant through mud or manure.
6. Wipe the needle through the sponge to disinfect it. Pull the tip of the needle across the sponge with the bevel facing down against the sponge to clean out any material inside the needle.
7. Pinch the tip of the animal's ear between the thumb and index finger of the left hand (for the left ear). Place the tip of the applicator needle against the ear at a slight angle, bevel side up or away from the ear, at the outer edge of the implant zone.
8. Slide the needle under the skin of the ear and insert it fully. Make sure it is under the skin and not in the cartilage or punctured all the way through the ear. If the needle skips off the back of the ear, return to step number 5.
9. Slide the needle back out of the ear slightly and pull the trigger to deposit the implant and withdraw the needle completely. (Figure 39.4)

10. Feel the implant site to ensure the pellets were correctly deposited, not bunched up or crushed (Figure 39.5).
11. Return the applicator to the tray and wipe across the sponge to disinfect it.

Other Issues

- Implants have no slaughter withdrawal, as the ear is always removed as offal during



Figure 39.4.



Figure 39.5.

the slaughter process.

- No implants are cleared for use in classes of cattle besides calves, stockers and feedlot animals. This includes breeding animals, cull cows, dairy cattle and veal calves.
- Implants should not be administered at birth due to hormonal development of the calf. Label instructions specify a minimum of 30 days or 45 days of age for administration of calf implants, depending on the implant.
- Implants should be stored properly to maintain effectiveness. Store in a clean, dry place in a plastic bag sealed to keep out moisture and debris. Consult the label for storage temperature.
- If possible, implant cattle on dry days when the cattle are dry and free of mud. This will reduce the incidence of abscesses.
- One implant manufacturer offers a line of implant products that include both the anabolic compound pellet and a pellet containing a dose of the antibiotic Tylan™. The purpose of the antibiotic pellet is to dissolve soon after administration and reduce the incidence of implant site abscesses.

Animal Health

Implants are suspected to directly cause, or be

associated with, several undesirable changes in animals. Responses normally associated with reproductive processes are observed in heifers, including signs of estrus, vaginal or rectal prolapses, development of the udder and other problems. Implants may increase the incidence of bullers in steers. Bullers are steers that will stand to be mounted similar to the behavior of a cow in estrus. However, it is thought that bulling is caused by a physiological defect in the animal and implants merely exacerbate this condition. Estimates of the frequency of the occurrence of bullers range from 1% to 4%.

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