



Implanting Beef Cattle

Donald R. Gill
Extension Animal Nutritionist

Twenty five years of research and industry experience has shown no management tool that returns more dollars per dollar invested than does implanting. Practically all feedlot cattle and the majority of stocker cattle are implanted. A significant number of nursing calves, however, are not implanted. A good understanding of how implants work, the right times to use them and the proper techniques for implanting may result in greater use of implants and more effective utilization of implants in herds already using them.

What are Implants?

Implants are small pellets or devices that are placed under the skin of the ear. Each implant contains a growth stimulant that is slowly released into the blood circulation. There are currently four approved implants for cattle. Synovex® is cleared for all ages of cattle. It comes in three forms. Synovex C® is for calves up to 400 lbs and contains 100 mg. of progesterone and 10 mg. of estradiol benzoate. Synovex S® is for steers and contains 200 mg. of progesterone and 20 mg. of estradiol benzoate while Synovex H® is for growing (over 400 lb) and finishing heifers and contains 200 mg. of testosterone and 20 mg. of estradiol.

STEER-aid® is similar to Synovex-S® in the stimulants used containing: progesterone USP (200 mg.) and estradiol benzoate (20 mg.).

Ralgro® is a compound isolated from a mold, *Gibberella Zea*, originally found on corn. While not a hormone, it appears to affect the release of certain hormones in the body and is classified as a protein anabolic (building) agent. Ralgro® is approved for all ages of cattle.

Compudose® is a new long lasting implant made of estradiol-17B mixed with silicone rubber to form an exterior coating on a solid silicone rubber core. The active hormone estradiol-17B is dissolved in the silicone rubber and when implanted in an animal the hormone migrates out of the implant at a constant rate. These implants can be manufactured to have hormone release patterns extending over extended periods of time. Compudose-200® is an implant designed to last at least 200 days.

Ralgro®, STEER-aid® and Synovex® are effective for about 100 days. No withdrawal is required for Compudose® and Synovex®. Ralgro® and STEER-aid® have a 65 day withdrawal before slaughter.

Oklahoma Cooperative Extension Fact Sheets
are also available on our website at:
<http://www.osuextra.com>

Why Do Implants Lose Their Effectiveness?

The beef animal when given a proper level of a growth stimulant will grow at a rate of six to 30 percent faster than a non-stimulated control. However, following stimulation, or if the stimulation is removed, this animal will for a period of time grow at a rate much less than the control animal. By using assay procedures, what is happening following implanting with Synovex® has been followed at Oklahoma State University. Figure 1 shows total blood estrogen in a cycling beef cow. The level of estrogen found in a normal steer is also shown on the figure. Whenever steers are subjected to a continuously circulating level of estrogen activity representing 1/2 to 2/3 the biological potency as that hormone naturally produced by the estrus cow, the estrogen growth responses is observed.

Figure 2 illustrates blood estrogen activity in a steer following a Synovex® implant. Note that after about 84 days the level of estrogen drops below the probable stimulatory level. Ralgro® implants are not the same as Synovex® and their mechanism of action is likely different. However, the principles of action are likely very similar. With a single recommended dose of either implant the animals will likely benefit from a reimplant after about 100 days.

In theory, at least the Compudose® implant should last at least as long as indicated by the label.

Won't I Get All Kinds of Side Effects?

Side effects (raised tailheads, udder development, etc) are rare if proper implanting technique is used.

What Are The Most Common Errors in Technique?

The proper location for Synovex® is under the skin in the center 1/3 of the ear. Ralgro® should be implanted in the muscle and fat tissue at the base of the ear. The most common errors are:

1. Crushing the implant. Crushed implants release their active agents too quickly. Side effects may appear quickly and the implant will not be effective for very long. To avoid crushing, insert the needle to its full length, then **withdraw** a distance equal to the space occupied by the

Figure 1. Total Blood Estrogen in a Cycling Beef Cow

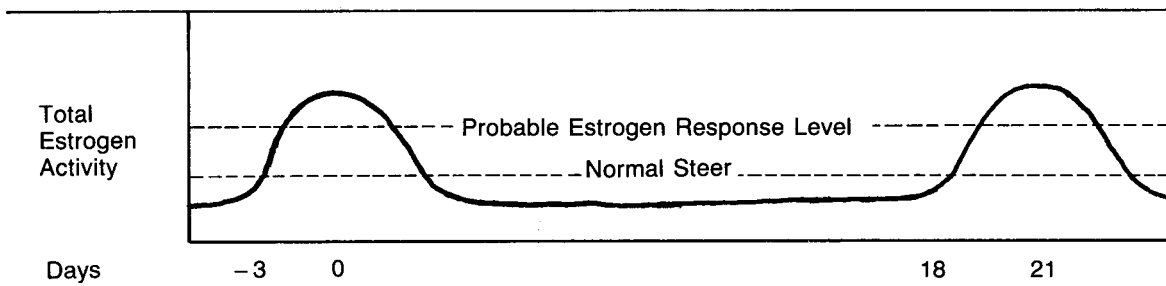
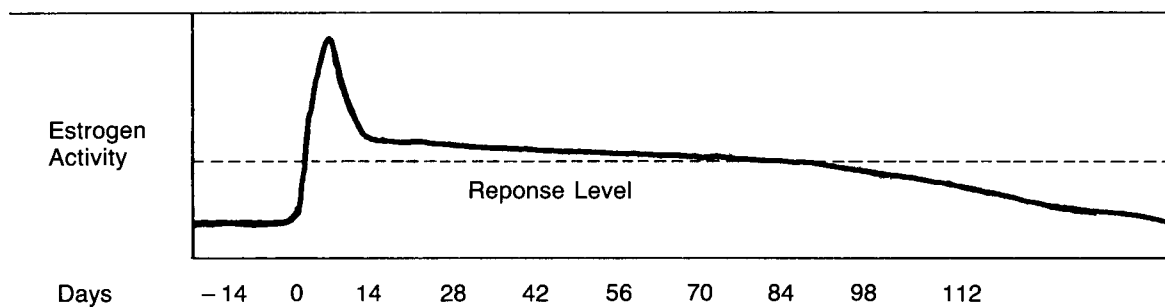


Figure 1. Total Blood Estrogen Activity in a Steer Following a Typical Implant



1. implant before inserting the implant. Failure to create space for the implant will cause crushing or result in a cluster or ball of pellets.
2. Depositing the implant into the cartilage. There is no blood flow and no absorption.
3. Depositing the implant into the skin. There is no absorption here either.
4. Pushing the needle through the skin and depositing the pellets on the ground.
5. Severing a blood vessel. Absorption will be too rapid.
6. Infections. Good sanitation should be observed, especially with the Compudose[®] implant since it is larger than Ralgro[®] or Synovex[®].

Implanting should not be hurried. The failure to get an extra 20-50 pounds of additional weight for \$1-\$2 invested certainly makes a little patience pay off.

How Much Benefit Will Implanting Give?

Nursing calves' best responses to implants are seen when cattle have sufficient nutrition to permit good gains. Increases of five-10 percent in weaning weights have generally been reported when suckling calves were implanted. Calves given two Ralgro[®] implants about 100 days apart have typically gained faster than calves given a single implant during the nursing period. Compudose[®], cleared for steer calves only, should be active for the entire nursing period. If a single Ralgro[®] implant is to be used, it would probably be better to give it at four months of age so it would be active during the last 100 days of the nursing period.

Growing Cattle

Growing calves grazing pastures adequate to permit one lb/day gains or better have increased daily gains from 10-20 percent. If the grazing period will exceed 100 days, reimplantation with Ralgro[®] or Synovex[®] must be considered. Compudose[®] would be active for 200 days and should not require reimplanting in most situations. The decision of which implant to use depends on the length of the grazing period, plans to rework the calves for other reasons (spraying, revaccination), cost of the implant, labor, and sex of calf since Ralgro[®] and Synovex[®] are approved for both steers and heifers.

Feedlot Performance

Implanting steers on finishing rations has increased gains by eight- 12 percent and improved feed efficiency by five-eight percent. Similarly, heifer gains were increased six-10 percent and feed conversion by four-seven percent. Withdrawal dates must be observed and need to be considered when reimplanting.

How Does Implanting at One Stage of Growth Affect Later Growth?

A Nebraska study by Dr. J.K. Ward showed that nursing phase implants (Ralgro[®]) did not decrease response to reimplantation during the growing phase. Calves implanted while nursing but not reimplanted during the growing phase, gained faster (1.71 vs. 1.59 lb/day) during the growing phase

than calves not implanted during the growing phase, suggesting some carry-over response. It should be noted that calves receiving both nursing and growing implants outgained (1.90 vs. 1.71 lb/day) calves implanted only during nursing. All cattle in this study responded to finishing phase implants although calves that had been implanted while nursing did not respond to the finishing implant as well as unimplanted calves.

A Colorado study showed similar results. Steers that had never been implanted responded better to a finishing phase implant than did steers previously implanted during nursing and growing phases. In this study, steers implanted during nursing, growing, and finishing (Ralgro®) weighed 66 lb more than steers that had not received implants.

Can I Implant Replacement Heifers?

Heifers intended for breeding should not be implanted. Although most data has been obtained with Ralgro®, the

following recommendations likely hold true for Synovex® also. An implant during nursing will probably not affect fertility. An implant at weaning may reduce fertility slightly. An implant at yearling age may have more serious consequences, and repeated implants from birth to puberty will severely reduce fertility in heifers. Compudose®, with its long effective period, probably should never be used on breeding heifers.

Can I Implant Bulls?

In a Kansas study, bull calves were implanted every 100 days (Ralgro®) from birth to 15 months of age. Compared to unimplanted bulls, the implanted bulls showed a 50 percent reduction in testicle size, impaired semen quality and a virtual absence of sex drive. In Oklahoma studies, young bulls fattened for slaughter responded to implants, but the response was not as large as might be expected with steers.

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, sex, age, religion, disability, or status as a veteran in any of its policies, practices or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Samuel E. Curl, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Dean of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0902