

# GUIDE

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## Growth Stimulants (implants)

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Growth stimulants increase the weaning weight of suckling calves and increase rate and efficiency of gain of cattle fed growing and finishing rations.

Growth stimulants that are implanted beneath the skin on the back side of the ear of cattle include Ralgro® and Synovex®. MGA® is added to the feed. MGA® is a hormone substance that is added to commercial protein supplements to stimulate the gain and feed efficiency of sexually mature, non-pregnant heifers. Synovex and Ralgro are effective for both steers and heifers.

Research indicates the use of these materials with feedlot cattle will increase rate of gain by 8 to 15 percent and improve feed efficiency by 6 to 10 percent (Table 1). High feed prices make growth stimulants return a larger profit. An eight percent improvement in feed efficiency saves \$16 of feed per animal if 500 pounds of gain are put on at a feed cost of 40 cents per pound of gain ( $500 \times \$0.40 \times .08 = \$16$ ). Faster gains also reduce yardage and other non-feed costs required for a unit of gain.

Table 1. Effect of Growth Stimulants on Average Daily Gain and Feed Efficiency in Steers\*

Growth Stimulants	No. Steers	No. Trials	% Increase in ADG	% Increase in Feed Efficiency
Ralgro	9,330	59	12.59	7.18
Synovex	1,002	14	14.53	8.97

\*Taken from summary by J. B. Overfield, Jr. and E. E. Hatfield. "Anabolic Agents for Beef Cattle," Illinois Beef Cattle Day Report, 1975.

Ralgro, Synovex, and MGA give similar increases in pre- and post-weaning performances of the beef cattle for which they are effective (Table 1). Be certain to follow label instructions for implanting technique, level of application and withdrawal times before slaughter when using these and other materials in livestock production. See Table 2 for the number of days the substance must be withdrawn before the animal is slaughtered.

### DES

Diethyl stilbestrol, a synthetic estrogen compound, has been a very effective growth stimulant for beef cattle, giving similar results to Ralgro or Synovex. It can be used in the feed or as an implant in the ear.

Traces of DES residues have been found in the internal organs but not the muscle tissues of some cattle given DES within 14 days of slaughter. The Food and Drug Adminis-

tration (FDA) banned the use of DES as an implant or feed additive for meat animals. Later the ban was revoked by U.S. courts.

At this time (January, 1979), a judicial decision appears to have cleared the way for reinstating the ban on the use of DES for meat animals. Watch for developments on the legality of its use.

### Synovex®

Synovex is a sex specific implant marketed by the Syntex Corporation, Box 653, Des Moines, Iowa. It is approved for cattle with minimum weights of 400 pounds and cannot be administered less than 60 days before slaughter. Synovex is a combination of two hormones. A dosage of Synovex-S, an implant for steers, contains 200 milligrams (mg) of progesterone and 20 mg of estradiol benzoate. Synovex-H for use with heifers contains 200 mg of testosterone and 20 mg of estradiol benzoate in a dosage. Company literature gives a summary of 18 college experiments which showed Synovex implants to increase daily gain by 12 to 14 percent and feed efficiency by 8 to 10 percent for steers fed growing and finishing rations.

Table 2. Use Restrictions of Growth Stimulants and Feed Additives.

Trade Name	Levels	Method of Use	Withdrawal before Slaughter	Type Animal Approved
Ralgro	36 mg	Implant	65 days	Suckling calves, steers and heifers
Synovex-S	220 mg	Implant	60 days	Steers over 400 pounds
Synovex-H	220 mg	Implant	60 days	Heifers over 400 pounds
MGA	0.25 mg to 0.5 mg per head/day	In feed	48 hours	Mature intact heifers

## Ralgro®

Ralgro is an implant that is a derivative of a mold produced on corn by a certain strain of the organism, *Gibberella zeae*. It is marketed by the International Minerals Corporation Chemical Group, Terra Haute, Indiana. Ralgro stimulates the performance of cattle in the suckling, growing or finishing stage. The recommended dosage, 36 mg, is the same for all weights of animals. It can be implanted at birth or at any later time, up to 60 days before slaughter.

The manufacturer reports 25 trials showed that Ralgro increased the rate of gain of feedlot steers by 9.3 and 10.3 percent and improved their feed efficiency by 8.7 and 5.7 percent during cold and mild seasons, respectively. There was no difference in carcass traits between control and treated animals in these trials when fed the same number of days. The implanted animals were heavier at slaughter.

## MGA®

Melengestrol acetate (MGA) is approved by the Food and Drug Administration (FDA) for use in the supplement portion of rations for feedlot heifers. MGA is a synthetic hormone.

It is similar in structure and activity to progesterone, the naturally occurring hormone of pregnancy. It improves rate of gain and feed use and suppresses estrus in feedlot heifers. In some 40 feedlot trials with heifers, MGA showed an increase over controls of 10.3 percent for average daily gain and 6.5 percent for feed conversion. There was no significant decrease in carcass quality in heifers fed MGA in these trials.

MGA is approved for feeding at the level of 0.25 to 0.50 mg a head daily. Feeding MGA to feedlot heifers will cost about one penny per head daily. Side effects are not a problem. An occasional slight mammary enlargement has been observed in heifers receiving MGA. A 48-hour withdrawal before slaughter is required. If the withdrawal is longer than 72 hours, many of the heifers will come into estrus, and the excitement may cause a loss in weight. The withdrawal period should be carefully controlled.

## Carcass Grade

If cattle that are fed growth stimulants remain in the feedlot the same number of days as other cattle, there is no significant difference in carcass composition. However, the cattle fed the growth stimulant will weigh 35 to 45 pounds more at the end of 130 days. No consistent difference in shrink or dressing percent has been evident.

When cattle are fed to the same weight, those that receive growth stimulants will be shorter-fed and often grade slightly lower but have less carcass fat and better cutability scores than cattle without the implant or additive.

There have been rumors that MGA increases the incidence of dark-cutting carcasses. Research has shown no connection between feeding of MGA and the incidence of dark-cutting carcasses.

## Implants for Suckling Calves

Suckling calves implanted with Ralgro have had 10 to 25 pounds or more heavier weaning weights in many trials. Implants do not appear to give as consistent an increase in growth response with suckling calves as they do with feedlot cattle. Herds under good environment in which calves make above average daily gain tend to show a greater increase in weaning weight from implants than herds in which suckling calves make lower daily gains. Faulty implanting techniques

may also account for some variability in suckling and post-weaning gain response.

In field studies at the University of Missouri, a 36-mg Ralgro implant increased the gain of nursing steer calves by 9 and 12 pounds and heifer calves by 15 and 18 pounds (Table 3). In some of these herds the implanted calves gained from 24 to 33 pounds more than non-implanted calves. Experiments at other universities indicate no difference in the response of steer and heifer suckling calves to Ralgro implants. Thus, the greater response of heifers in these Missouri trials is probably not typical. Nursing steer calves will likely benefit fully as much as heifers from Ralgro implants.

Heifers or bull calves that are to be saved for herd replacements should not be implanted. Ralgro implants have retarded testicle development of bull calves in Missouri trials.

## Cattle on Pasture

Synovex and Ralgro implants increase the gain and feed efficiency of cattle fed high roughage rations. Implants will usually increase the gains of yearling steers or heifers by 20 to 30 pounds during a summer grazing season.

A field study at the University of Missouri which involved 3,000 head of yearling steers on 43 farms tested a 36-mg implant of Ralgro for cattle on pasture. The average increase in gain per steer was 22 pounds (Table 4). Synovex implants will give an increase similar to that obtained with Ralgro for cattle on pasture.

Pastures will need to be good enough to support one pound daily gain or more to see much response from the use of growth stimulants with grazing cattle.

Table 3. Ralgro Implants for Suckling Calves (University of Missouri).

Year	Sex	No. Herds	Increase in Suckling Gain	
			lbs.	%
1976	Steer	9	12	6.3
1977	Steer	4	9	5.9
1977	Heifer & Steer	3	14	10.0
1976	Heifer	11	18	9.9
1977	Heifer	6	15	10.3

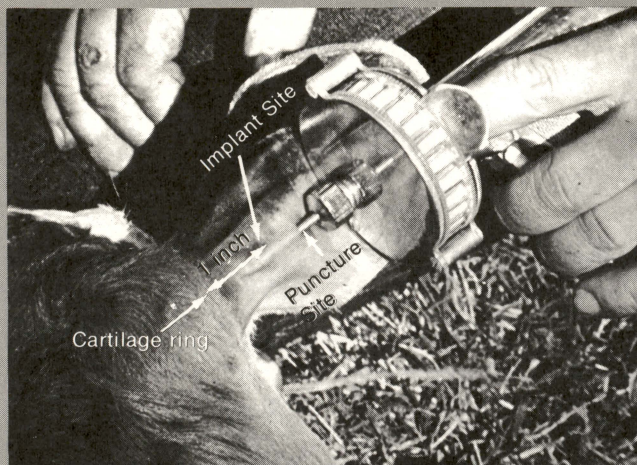
Table 4. Ralgro Implants, Yearling Steers on Pasture.

Year	Days	Average Gain/Herd, lbs.		
		0 mg	Ralgro 36 mg	Diff.
1971	120	156	176	20
1972	131	147	170	23
Avg. Increase	125	151	173	22
% Increase				15

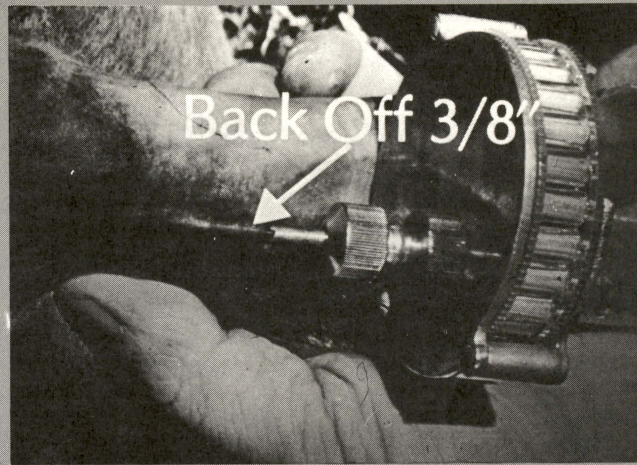
\*University of Missouri trials on 26 herds with 2,077 head in 1971 and 17 herds with 991 head in 1972.

## How Often to Reimplant?

Implants appear to be effective for about 100 days. Thus for a continuous response from implants, cattle need to be



Proper implanting technique for RALGRO is shown. Implant pellets should be deposited 1 inch from the cartilage ring.



Back the needle off  $\frac{3}{8}$  inch to provide a pocket for the implant pellets.

## Correct Implanting Techniques

Improper implanting techniques can result in unfavorable responses to growth stimulants. Faulty implanting can cause poor absorption of the pellet. There are reports of intact pellets being recovered from the ears of cattle 150 days after implanting. Some of the common implanting errors are:

1. Gouging the cartilage of the ear.
2. Putting the implant between the layers of the skin rather than underneath the skin.
3. Severing one of the veins of the ear causing hemorrhage.

Implants deposited in gouged cartilage may be covered with scar tissue which prevents their absorption. Also, pellets may be crushed and absorbed too rapidly when a cartilage is gouged. Hemorrhages may soften the pellet and cause rapid absorption. Poor absorption will result and no response will be observed if the implant is inserted between the layers of the skin.

The implant is made on the backside of the ear. The implant site may be above or below the midline of the ear, whichever is easier.

### Basic Points for Implanting:

1. Use a sharp needle.
2. Select the proper implant site, following the instructions of the manufacturer.
3. The proper angle of needle insertion is under the skin and above the cartilage.
4. Back the needle off slightly before pulling the trigger to prevent crushing pellets.
5. Keep the trigger depressed as you remove the



Implant pellets 1 inch from the cartilage ring beneath the skin.

6. Implanting near the tip of the ear, in the cartilage or in the blood vessels will alter absorption and reduce potential gains.

### Implanting site for Ralgro:

1. The point of the needle should be inserted approximately  $1\frac{1}{2}$  to 2 inches from the base of the ear, either above or below the midline.
2. After insertion of the needle, the point should be one inch from the base of the ear.

The implanting site for Synovex is the middle one-third of the ear toward the center. Be careful to avoid severing the major arteries of the ear.

Photos courtesy of IMC, RALGRO, International Minerals and Chemicals Corporation.

reimplanted approximately every 100 days, except that the withdrawal time before slaughter must be observed.

Whether reimplanting cattle this often pays has not been well defined by research results. The data in Table 5 show that in most of the trials a second implant increased performance of cattle fed finishing rations for more than 100 days. A second implant of Ralgro showed an advantage in four of six experiments. A second implant of Synovex increased daily gain by 2.75 percent in an average of three trials.

Stocker cattle to be wintered, grazed and then finished on high energy rations for 110 to 140 days should be implanted at the start of the wintering, grazing and finishing stages as a minimum for greatest benefit from growth stimulants.

## Implants Used with Rumensin

Rumensin® is a feed additive manufactured by Elanco Products of Eli Lilly and Company, Indianapolis, Indiana. It is purchased in commercial supplements and improves the feed conversion of cattle fed growing and finishing rations by about 10 percent.

Rumensin has no effect on rate of gain when cattle are fed high energy rations but improves both daily gain and feed conversion of cattle fed low energy rations. Research data indicate that improvement in rate of gain from implants will be about the same when used alone or in combination with Rumensin. Improvement in feed efficiency from the com-

Table 5. One vs. Two Implants.

Station	Year	Days fed	Implant	Day of Second Implant	Average Daily Gain		ADG % Increase from Second
					First	Second	
Ft. Hays, KS	1972	110	Ralgro	60	1.50	1.55	3.3
	1973	104	Ralgro	75	2.60	2.67	2.7
	1974	186	Ralgro	75	2.65	2.79	5.3
	1974	249	Ralgro	?	2.22	2.39	7.7
	1974	146	Ralgro	88	2.38	2.13	-10.5
Calif. Avg.	1974	142	Ralgro	63	2.29	2.17	- 5.2
					2.27	2.28	0.0
Colo.	1974	160	Synovex	48	2.75	2.83	2.9
Calif.	1974	142	Synovex	63	2.40	2.69	12.1
Ft. Hays, KS	1974	146	Synovex	88	2.47	2.32	- 6.0
Avg.					2.54	2.61	2.85

combined use of the two products is greater than when either is used alone. In some trials, the effect of the two has appeared to be nearly equal to the sum of their separate responses. In other trials, the improvement in feed efficiency from their combined use has been some less than the total of their separate responses.

