

MU Guide

PUBLISHED BY UNIVERSITY EXTENSION, UNIVERSITY OF MISSOURI-COLUMBIA

Growth stimulants (implants)

Homer B. Sewell, Department of Animal Science, College of Agriculture

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

Growth stimulants implanted beneath the skin in the middle third of the backside of the ear include Compudose, Ralgro, Synovex, STEER-oid, HEIFER-oid and Finaplex-S.

Research indicates that implants improve the weaning weights of beef calves by 10 to 35 pounds. Implants have increased rate of gain by 8 to 15 percent and improved feed efficiency by 6 to 10 percent when cattle were fed growing and finishing rations.

Extensive research indicates that implants will give at least a 10 to 1 return on their cost. High feed prices make growth stimulants return a larger profit for feedlot cattle.

An 8 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.

These implants give similar increases in the performances of the beef cattle for which they are approved. Be certain to follow label instructions for implanting technique and level of application when using these and other materials in livestock production. Table 1 gives restrictions on the use of each implant and the approximate number of days the implant is effective.

Compudose

Compudose has been cleared by the Food and Drug Administration for use on steers of any age and weight and for heifers fed in confinement for slaughter. Compudose is supplied by Elanco Products Company, a Division of Eli Lilly and Company, Indianapolis, Ind.

The silicone rubber implant is 1 inch long, $\frac{3}{16}$ inch in diameter, and contains 24 milligrams of estradiol. The implant dosage is effective for at least 200 days. Estradiol is released into the circulatory system of the animal to stimulate the pituitary gland to produce more growth hormones.



Growth implants are implanted beneath the skin behind ear.

A single Compudose implant increased the weaning weight of suckling steer calves by an average of 15 pounds in a summary of six trials. Gains of yearling steers in grazing trials were increased from 9 to 16 percent. Compudose improved the rate of gain by 11.3 percent in an average of 10 feedlot trials and improved feed efficiency by 7.6 percent in a summary of eight trials.

Ralgro

Ralgro is an implant derived from a mold produced on corn by a certain strain of the organism,

Table 1. Restrictions on the use of implants

<u>Trade Name</u>	<u>Dosage</u>	<u>Effective Days</u>	<u>Withdrawal Days</u>	<u>Type Animal</u>
Compudose	24 mg	200	0	Approved Steers-birth through feedlot, confined heifers
Finaplex-S	140 mg	63	0	Steers in feedlot
Ralgro	36 mg	90-120	0	Steers & heifers birth through feedlot
STEER-oid	220 mg	90-120	0	Steers over 400 lbs
HEIFER-oid	220 mg	90-120	0	Heifers over 400 lbs
Synovex-S	220 mg	90-120	0	Steers over 400 lbs
Synovex-H	220 mg	90-120	0	Heifers over 400 lbs
Synovex-C	110 mg	90-120	0	Steers & heifer calves up to 400 lbs

Gibberella zeae. The active ingredient is zeranol. It is marketed by Pitman-Moore Inc., Terre Haute, Ind.

Ralgro stimulates the performance of cattle in the suckling, growing or finishing stage. The recommended dosage, 36 mg, is the same for all ages and weights of animals.

The manufacturer reports 25 trials showing 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.

Synovex-S or H

Synovex is a sex-specific implant marketed by the Syntex Corporation, Des Moines, Iowa.

Synovex is a combination of two hormones. A dosage of Synovex-S, an implant for steers, contains 200 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. Synovex-S and Synovex-H are approved for cattle with minimum weights of 400 pounds.

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.

Synovex-C

Synovex-C is an implant for suckling beef steer and heifer calves 45 days of age or older. In May 1986, this implant was approved for use in beef replacement heifers. It is not to be used in veal calves or bull calves intended for breeding.

A dosage contains 100 mg progesterone and 10 mg estradiol benzoate. Steers and heifers have similar responses to this implant.

STEER-oid

STEER-oid is approved for steers weighing 400 pounds or more. It is sold by Anchor Laboratories, Inc., St. Joseph, Mo.

A dosage contains 200 mg of progesterone plus 20 mg of estradiol benzoate. It gives similar response to other implants available for steers.

HEIFER-oid

HEIFER-oid is approved for heifers weighing 400 pounds or more. It is sold by Anchor Laboratories, Inc., St. Joseph, Mo. A dosage contains 200 mg of testosterone and 20 mg of estradiol benzoate.

Finaplex-S

Finaplex-S is approved for use in growing and finishing feedlot steers for improved feed efficiency. It is sold by Hoechst-Roussel Agri-Vet Company, Somerville, N.J. The implant contains 140 mg of the anabolic agent trenbolone acetate (TBA). For continued effectiveness, this product should be reimplanted once after 63 days. TBA is a synthetic androgen (male hormone). The effects of an androgenic compound and an estrogenic compound should be additive since they affect growth by independent mechanisms. Finaplex-S has not been approved by FDA for combined use with other implants. Watch for further developments. Studies do indicate an increase in the performance of feedlot steers when it is used in conjunction with estrogenic implants compared to using either type alone. The response from several studies show this additive response may slightly reduce the number of steers grading choice or above (0 to 15%), but this response may depend upon dosage and time of implant. There is no indication the implant causes an increase in dark cutting carcasses.

Carcass grade

If cattle given growth stimulants remain in the feedlot the same number of days as other cattle, there

Table 2. Ralgro implants for suckling calves (University of Missouri)

Year	Sex	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

is no significant difference in carcass composition. However, the cattle given the growth stimulant will weigh 35 to 40 pounds more at the end of 130 days. No consistent difference in shrink or dressing percentage has been evident.

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

Implants for suckling calves

Suckling calves implanted with Compudose, Ralgro or Synovex-C have had 10 to 30 pounds 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. In a good environment in which calves make above average daily gain, herds show a greater increase in weaning weight from implants than herds in which suckling calves make lower gains. Trials in Texas and Indiana show that responses to implants by suckling calves are influenced by the milk production of the dam, pasture conditions, creep feeding, age and the genetic potential of the dam.

In field studies at the University of Missouri-Columbia, 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 2). In some of these herds, the implanted calves gained from 24 to 33 pounds more than non-implanted calves.

Experiments at other universities indicate little difference in the response of steer and heifer suckling calves to Ralgro implants. Thus, the greater response of heifers in these Missouri trials is not typical.

A second implant of Ralgro given 60 to 100 days after first implant increased weaning weight of suckling calves in Kansas and Wisconsin trials (Table 3).

Breeding animals

Synovex-C is approved for heifer calves that are to be retained for breeding. None of the other implants is approved for breeding animals.

The administration of a single Synovex-C implant to suckling heifer calves has produced an increase in weaning weight without a decrease in fertility at puberty. Re-implanting with Synovex-H implants after the use of Synovex-C delayed the onset of puberty for 60 to 90 days but did not have a perma-

Table 3. Extra weaning weight with two vs. one Ralgro implant

State	Sex	Weaning wt. advantage, lbs.
Kansas	S & H	5.9
Kansas	S & H	31.0
Kansas	S & H	18.7
Wisconsin	S	7.0
Wisconsin	H	4.0

nent effect on fertility of the yearling heifer. Multiple use of Synovex-H implants gave improved average daily gain, larger pelvis inlets and a trend toward greater ease of calving at maturity.

Ralgro implants retarded testicle development of bull calves in Missouri and other states' trials. Note that Synovex-C is not to be used in bull calves intended for reproduction.

A single implant of Ralgro at birth reduced the reproductive performance of yearling heifers in Missouri and Kansas trials. However, a single implant of Ralgro at two to five months of age had no effect on the reproductive performance of heifers in either of these trials. Other studies show heifer calves receiving a single implant of Ralgro at weaning or multiple implants through suckling and growing phases often have reduced reproduction capability as yearlings. In a Louisiana trial, heifers implanted with Ralgro at weaning had fewer numbers cycling at 15 months of age, but the difference had disappeared at 22 months of age. There is evidence that Ralgro implants have a greater detrimental effect on reproduction when heifers are gaining less than one pound daily after weaning.

Cattle on pasture

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-Columbia, 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 give an increase similar to that obtained with Ralgro for cattle on pasture.

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

Reimplants. A second implant of Ralgro or Synovex in mid-summer may add another 10 to 15 pounds of gain per head for steers and heifers grazing Missouri pastures.

Missouri field trials used 19 herds with 900 head of steers to compare one initial implant of Ralgro or Synovex with a second application of the same implant 70 to 100 days later for summer grazing periods of 140 to 200 days.

Table 4. Ralgro implants in yearling steers on pasture

	Days	Average gain/head, lbs.		
		0 mg	Ralgro 36mg	Difference
1971	120	156	176	20
1972	131	147	170	23
Avg	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.

A reimplant of Ralgro increased the average gain per head by 9.5 pounds in 11 trials averaging 166 days. The second implant of Synovex increased average total gain per head by 6.3 pounds in eight trials averaging 181 days. In five trials, where average daily rate of gain ranged from 1.23 to 2.29 pounds after the second implant of Synovex, total gain per head was increased by 14.82 pounds.

These trials indicate that when average daily gain is kept above 1.25 pounds in late summer with good pastures or supplemental grain feeding, a second implant of Ralgro or Synovex can add 15 pounds or more total gain to steers grazing summer pastures.

In another Missouri field study, a single implant of the longer-lasting Compudose (200 days) increased the average total gain per head by 13 pounds compared to one implant of Ralgro in a summary of 13 trials that averaged 172 days. In five trials there was no significant difference between one implant of Compudose vs. two implants of Ralgro at a 98-day interval in grazing periods averaging 187 days. STEER-oid appeared to last longer than Ralgro in Missouri trials with yearling steers grazed from 165 to 180 days. An initial implant of STEER-oid gave similar response to a reimplant of Ralgro at mid-trial.

How often to reimplant cattle

Synovex, Ralgro and STEER-oid implants are effective for approximately 90 to 120 days. Thus, for a continuous response from these implants, cattle need to be reimplanted approximately every 100 days.

A summary of 12 trials shows a second implant of Ralgro or Synovex for steers fed finishing rations for an average of 156 days increased rate of gain by 5.9 percent and improved feed efficiency by 4.1 percent (Table 5). Therefore, cattle that are implanted with Synovex or Ralgro and fed for 120 days or more will profit from a second implant at 60 to 90 days.

Stocker cattle to be wintered, grazed, and then finished on high energy rations for 110 to 150 days

Table 5. Effect of reimplants of Ralgro or Synovex for steers on finishing rations (12 trials).

Source	Initial weight	Days on feed	Change	
			ADG (%)	Feed/gain (%)
Kansas	630	146	10.9	-6.0
North Dakota	620	154	6.5	-5.8
California	655	168	1.7	-1.5
Idaho	615	160	5.4	-4.5
Kansas	653	167	11.5	-7.7
South Dakota	647	169	9.4	-4.8
Ontario	777	168	6.8	-3.5
Indiana	490	160	5.5	-1.2
Indiana	490	160	2.6	-2.7
Nebraska	581	170	1.1	-2.1
California	732	124	1.8	-2.2
California	732	124	2.0	-4.6
Average (12 trials)	635	156	5.9	-4.1

should be implanted at the start of the wintering, grazing and finishing stages. That's a minimum for the greatest benefit from growth stimulants. A second implant in the grazing and/or finishing stages may be warranted. Keep in mind that implants are most effective when cattle are gaining over a pound a day.

Implants for cull cows/feedlot bulls

Thin, cull cows make deposits of both protein and fat when placed on a high plane of nutrition for 50 to 60 days. This compensatory gain of cull cows has varied in its response to growth stimulants. Cull cows implanted with Ralgro gained 0.22 pound faster (11.4 percent) in a 59-day fescue grazing trial in Kansas. There has been no response to implants by cull cows in some trials.

Feedlot bulls have less response than steers to implants. They have some increase in rate of gain but little improvement in feed efficiency in feedlot comparisons. Bulls implanted with Synovex or Ralgro had 4.53 percent faster gain but no improvement in feed efficiency over nonimplanted bulls in a summary of 10 Cornbelt trials.

Implants used with feed additives

Including feed additives such as Rumensin, Bovatec and MGA in the cattle ration increases performance. Research data indicate the response from implants and these ration inclusions are additive. The improvement in rates of gain and feed efficiency from implants is about the same when used alone or in combination with these feed additives. Combined use of the two products gives greater performance than when either is used alone.