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## Growth Stimulants and Feed Additives

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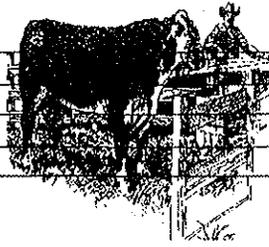
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# GROWTH STIMULANTS & FEED ADDITIVES

In recent years, the most revolutionary increases in beef cattle weights and feeding efficiencies have resulted from the development and use of growth stimulants, feed additives, and antibiotics. These nonnutritive products not only improve the rate and efficiency of gain but prevent certain diseases as well. Their use has significantly improved beef cattle production efficiency and provided a greater return per dollar invested than any other factor in the livestock industry. Growth stimulants deposit increased protein in the animal without changing protein or energy intake. They are designed to provide a constant slow release of active ingredients into the animal's bloodstream. In animals implanted with growth stimulants, the blood levels of hormone will fluctuate according to physiological factors associated with digestion and absorption of nutrients in the feed. The nutritional state of the animal and the quality and quantity of feed consumed will also determine the effectiveness of the growth stimulants.

## COMPUDOSE

Compudose is a relatively new implant recently cleared for use in steers of any age or weight—suckling, growing, or finishing. This implant, just over an inch long, is made of silicone rubber impregnated with estradiol-17B (a natural hormone) as the active ingredient. When inserted in the ear, the implant comes in contact with the extracellular fluid that carries the estradiol-17B into the animal's system. One Compudose implant will last about 200 days. The implant cannot be crushed or broken, and the active ingredient diffuses through the silicone rubber at a relatively constant rate.

Compudose increases gain by 5 percent in suckling calves, 9-16 percent in growing steers on pasture, and 12-15 percent in feedlot calves. Compudose implanted in finishing cattle increases feed efficiency 6-9 percent. No withdrawal time is required before slaughter. The implant is not cleared for use in replacement heifers.

## RALGRO

Ralgro (zeranol) is a nonhormonal anabolic agent approved by the Food and Drug Administration in 1969. Research data show an improved rate of gain of 10-15 percent in finishing steers and heifers implanted with Ralgro. For growing cattle, the increase in rate of gain is 10-12 percent.

Implanting suckling calves with Ralgro has increased gain in both steers and heifers by 5-10 percent, which would result in an increased weaning weight of about 25 pounds. Ralgro is not cleared for use in replacement heifers.

## SYNOVEX

Synovex-S is recommended only for steers. It contains 200 mg of progesterone and 20 mg of estradiol benzoate.

Synovex-H is recommended only for heifers. It contains 200 mg of testosterone and 20 mg of estradiol benzoate.

The active components of these two implants naturally occur in hormones that are chemically identical to those produced by the animal's endocrine glands.

Research has shown a 10-14 percent improvement in growth rates in steers and heifers grazing pastures. A 10-14 percent increase in growth rate and an 8-10 percent improvement in feed efficiency has been noted when Synovex is used in feed lots. Synovex implants (S and H) are not recommended for use in suckling calves, and Synovex-H is not cleared for use in replacement heifers.

Synovex-C is a growth-promoting implant that improves rate of gain in steer and heifer calves weighing less than 400 pounds. It contains 10 mg of estradiol benzoate and 100 mg of progesterone. Synovex-C is implanted subcutaneously in the middle third of the dorsal surface of the ear. No withdrawal time is required before slaughter of calves. However, Synovex-C should not be used in veal calves or calves less than 45 days old.

## FINAPLIX

Finaplix S is recommended only for steers. It contains 140 mg of trenbolone acetate. Finaplix S is an androgen with anabolic properties. It requires no withdrawal time and is most effective when used with other growth stimulants.

## IMPLANTING

For implants to be effective they must be properly deposited. The animal should be restrained to reduce head movement during implanting. All implants should be placed in the mid ear between the skin and the ear cartilage.

Procedures for implanting are:

- (1) Clean and disinfect the ear.
- (2) Determine implant placement.
- (3) Insert the needle the proper distance from that point.
- (4) Push the needle through the skin so it lies between the skin and cartilage of the ear.
- (5) Back the needle off slightly when implanting Ralgro, Synovex-S, and Synovex-H. When implanting Compudose, the implant should be allowed to develop its own channel as it is pushed forward from the needle.
- (6) Squeeze the trigger or push the plunger to deposit the implant.
- (7) Withdraw the needle.
- (8) Press the injection with thumb and finger to seal the opening.
- (9) Keep the needle sharp and clean and disinfect it after each use.

## FEED ADDITIVES

Feed additives can be divided into five categories: 1) ionophores, 2) antibiotics, 3) estrus suppressants, 4) buffers, and 5) others. Each has its own characteristics and feeding limitations, and some are approved to be fed in combination with others. Using the recommended level of feed additive is important since over or underfeeding will reduce animal performance.

### IONOPHORES

Ionophores are antibiotics that alter specific rumen microorganisms. This alteration changes fermentation in three ways.

(1) Ionophores improve the efficiency of energy metabolism by changing the type of volatile fatty acids produced in the rumen. They also reduce energy loss during feed fermentation. Increased energy retention improves performance.

(2) Ionophores decrease the breakdown of feed protein and may reduce microbial protein synthesis. This has little effect on the performance of cattle on high-grain diets but may be important for growing cattle fed high-roughage diets.

(3) Ionophores may reduce the incidence of acidosis, bloat, and coccidiosis. Ionophores include Monensin (Rumensin) and Lasalocid (Bovatec).

### BOVATEC

Bovatec (lasalocid) was recently cleared for use in cattle intended for slaughter. It alters rumen fermentation by increasing the proportion of propionic acid produced. Bovatec will improve rate of gain by about 5 percent when fed at the rate of 30 grams per ton and 3 percent when fed at the 20-gram level. It will also reduce average feed intake by 3 percent. The recommended feeding level is 25-30 grams per ton, or 100-300 mg per head per day.

### RUMENSIN

Rumensin (monensin sodium) is a feed additive that alters rumen fermentation by increasing the proportion of propionic acid produced and reducing acetic and butyric acid production, making rumen fermentation more efficient.

Rumensin is currently cleared for use in cattle-growing and finishing programs and cattle grazing pasture. It is not cleared for use in breeding cattle. Rumensin should be fed at 20-30 grams per ton, or 100-300 mg per head per day. Feeding Rumensin can reduce feed intake 9 percent and increase feed efficiency 5-12 percent. No withdrawal period is required before slaughter, and Rumensin is compatible with other feed additives and implants currently on the market.

### MELENGESTROL ACETATE (MGA)

This drug is approved for feedlot heifer rations to control estrus. Frequent riding of heifers in the feedlot will reduce gains, but feeding MGA will minimize the problem. Also, MGA will increase gain by about 11 percent and increase feed efficiency 7-8 percent. MGA is administered in the feed. The recommended dosage is 0.35 mg per day. The withdrawal time before slaughter is 48 hours.

### ANTIBIOTICS

Antibiotics, developed in the late 1940s and early 1950s, were the first feed additives. The antibiotics chlortetracycline, oxytetracycline, and tylosin have received considerable attention. Evidence shows that antibiotics improve the rate and efficiency of gain by 1) reducing the incidence of subclinical bacterial infections in the digestive and respiratory tracts, 2) stimulating appetite and creating a nutrient-sparing effect, and 3) stimulating certain enzyme systems. Antibiotics also usually reduce the incidence of diarrhea in young animals, lessen the likelihood of animals going off feed, and reduce the incidence of liver abscesses in cattle on high-grain diets. Producers are encouraged to read and carefully follow label directions for specific products.

### BUFFERS

Buffers resist change in rumen pH when acids are present. They are used to reduce the incidence of acidosis in high-grain diets or improve fiber digestion in corn silage diets. Feed additives used as buffers include sodium bicarbonate, sodium sesquicarbonate, limestone, sodium bentonite, and magnesium oxide. Buffers may increase gain and feed efficiency by 0-5 percent, although animal performance is extremely variable when buffers are used. Recommended levels of sodium bicarbonate and sodium sesquicarbonate are from 0.75 to 1.5 percent of ration dry matter; limestone, about 1 percent of ration dry matter; sodium bentonite, 1-2 percent of ration dry matter; and magnesium oxide, 0.5-0.75 percent of ration dry matter. No withdrawal time is required before slaughter.

### COMBINING FEED ADDITIVES AND GROWTH PROMOTING IMPLANTS

As previously mentioned, some feed additives can be fed in combination with other feed additives. All the feed additives discussed can be fed along with the use of growth-promoting implants. The effects of implants and feed additives are additive but not totally so.

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