1987

For Beef and Sheep: Implants and Feed Additives

Cooperative Extension South Dakota State University

Follow this and additional works at: https://openprairie.sdstate.edu/extension_fact

Recommended Citation
https://openprairie.sdstate.edu/extension_fact/1022

This Fact Sheet is brought to you for free and open access by the SDSU Extension at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in SDSU Extension Fact Sheets by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.
For Beef and Sheep:
Implants
and
Feed Additives

Cooperative Extension Service
South Dakota State University
U.S. Department of Agriculture
For Beef and Sheep:

Implants and Feed Additives

John J. Wagner
Extension ruminant nutrition specialist

New products have complicated cattle and sheep feeding and management dramatically. A multitude of non-nutritive feed additives and several growth promoting implants are now available.

These products are designed to increase growth rate and/or improve the efficiency of growth. But you need to know how to use them if you are to achieve maximum benefit and minimize residue or carryover problems.

Growth and development

Growth and development of cattle and sheep are complex, dynamic processes. Livestock continually synthesize and degrade their body tissues. Net growth occurs when the synthesis rate of body tissue exceeds tissue degradation.

Growth promoting compounds enhance growth in several ways. They may reduce the degradation and/or increase the synthesis of body tissue, thereby increasing net growth rate. Another possible mechanism is tied to the efficiency with which nutrients are used for growth, at either the tissue or digestive system level.

In general, implants function at the tissue level by promoting increased protein synthesis. Feed additives usually function at the digestive tract level by promoting a more favorable environment for the efficient digestion and absorption of nutrients.

Implants

Implants are small, compressed pellets or small, silicone rubber devices that contain a growth stimulant which is slowly released into the circulatory system. Implants are placed under the skin in the middle third of the ear.

Table 1 lists the implants currently available on the market, their active ingredients, and use clearances.

Benefits

No single management tool has consistently shown as great an economic benefit in relation to cost as implanting.

Specific claims for each type of implant vary slightly. In general, cattle producers should expect 5-10% improvement in the weaning weight of calves, 8-10% increase in weight gain of backgrounding calves, 8-12% increase in feedlot gain, and a 5-8% improvement in the feed efficiency of feedlot cattle.

Implanting technique

Proper implanting technique is essential for effective response and to reduce the risk of raised tailheads and udder development in heifers, bulling activity in steers, or other side effects. The following is critical.

Restraint. Use restraints to prevent injury to the animal and yourself. Confine the animal in a squeeze chute or head gate. Nose tongs may, in some instances, provide greater safety, especially when implanting horned cattle.

Sanitation. Good sanitation prevents infection, which often results in the expulsion of the implant. Or infection may make the implant ineffective as the infection clears and the wound heals, scar tissue may form and seal the implant off from blood circulation.

The implant site on the back of the ear should be dry and free from mud, manure, and other debris. The manufacturers of implants recommend scrubbing the ear with a piece of cloth soaked in a germicidal solution.

Implanting devices should also be wiped clean between implantations. Excess water may damage the implant.

Implant site. Implants should be placed under the skin in the middle third of the ear.

Needle insertion. Hold the ear with one hand. Hold the implanting device firmly with the other hand. Insert the needle under the skin but do not penetrate the cartilage. Ease the needle forward toward the base of the ear until the full needle length is beneath the skin.

Pellet implantation. When the needle is completely inserted, withdraw it approximately one-half inch. Apply gentle, continuous pressure on the plunger, expelling the pellets while slowly withdrawing the needle. This procedure deposits the pellets in a straight line in the path of the needle.

If the pellets are forced through the fibrous tissue under
the skin, they may be crushed, resulting in side effects.

**Common errors.** The most common implanting errors include crushing or damaging the implant, depositing the implant into the cartilage or skin, pushing the needle through the ear and depositing the implant onto the ground, severing a blood vessel, and causing infection by poor sanitation.

**Feed additives**

Feed additives are non-nutritive compounds added to rations and generally do not supply essential nutrients. Instead, they exert their effect through manipulating rumen fermentation or through controlling liver abscesses, digestive disorders, bloat, coccidiosis, and other conditions.

Feed additives can be generally divided into six broad categories: 1) ionophores, 2) antibiotics, 3) coccidiostats, 4) estrus suppressants, 5) buffers, and 6) others. Each feed additive has its own properties, recommended level of feeding, and label clearances. You must understand these characteristics to achieve optimum response and maximum cost effectiveness.

**Ionophores**

Ionophores are a type of antibiotic that inhibit or depress the growth of specific rumen microorganisms. Rumen fermentation is altered in three ways:

1. The ratio of volatile fatty acids produced is altered, reducing energy losses and improving efficiency of energy utilization during ruminal fermentation of feed.

2. The breakdown of feed protein may be reduced, thus improving protein utilization by growing cattle fed high-roughage diets.

3. The incidence of acidosis, grain bloat, and coccidiosis is reduced, resulting in less stress and improving the general well-being and performance of cattle.

**Monensin, lasalocid, salinomycin, and narasin** are four of more than 75 known ionophores. Only monensin (Rumensin®) and lasalocid (Bovatec®) are approved for beef cattle. Lasalocid is approved for sheep as a coccidiostat (see coccidiostat discussion). The effect of ionophores and implants is additive, and they should routinely be used together.

**Monensin.** Monensin is marketed by Elanco Products Company, a division of Eli Lilly and Company under the tradename Rumensin®. Its label claim includes improved feed efficiency for beef cattle fed in confinement for slaughter, improved daily gain by cattle on pasture, and improved daily gain by replacement heifers. Rumensin® is not cleared for use in cow rations and is very toxic to swine and horses. Rumensin® can be fed with either tylosin (Tylan®) or melengestrol acetate (MGA®) and may be included in both liquid or dry supplements.

**Lasalocid.** Lasalocid is marketed by Hoffman-LaRoche, Inc. under the tradename Bovatec® for improved feed efficiency and rate of gain by beef cattle fed in confinement for slaughter and for improved rate of gain for cattle on pasture. It is not cleared for use in cows and is not safe for horses and swine. Bovatec® may be included in both liquid and dry supplements.

**Table 1. Implants.**

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Active ingredient</th>
<th>Dose</th>
<th>Withdrawal before slaughter</th>
<th>Re-implant interval</th>
<th>Type of animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ralgro1</td>
<td>Zeranol</td>
<td>36 mg</td>
<td>65 days</td>
<td>120 days</td>
<td>suckling calves, steers, heifers, lambs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 mg</td>
<td>40 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synovex-S2</td>
<td>progesterone estradiol benzoate</td>
<td>200 mg</td>
<td>No withdrawal</td>
<td>120 days</td>
<td>steers over 400 lb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synovex-H2</td>
<td>testosterone estradiol benzoate</td>
<td>200 mg</td>
<td>No withdrawal</td>
<td>120 days</td>
<td>heifers over 400 lb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synovex-C2</td>
<td>progesterone estradiol benzoate</td>
<td>100 mg</td>
<td>No withdrawal</td>
<td>120 days</td>
<td>suckling calves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compudose2</td>
<td>estradiol-17B</td>
<td>24 mg</td>
<td>No withdrawal</td>
<td>200 days</td>
<td>suckling calves, steers, heifers</td>
</tr>
<tr>
<td>STEER-oid4</td>
<td>progesterone estradiol benzoate</td>
<td>200 mg</td>
<td>No withdrawal</td>
<td>120 days</td>
<td>steers over 400 lb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEIFER-oid4</td>
<td>testosterone estradiol benzoate</td>
<td>200 mg</td>
<td>No withdrawal</td>
<td>120 days</td>
<td>heifers over 400 lb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Product of International Minerals and Chemical Company.
2 Product of Syntex Animal Health Products.
3 Product of Elanco Products Company.
4 Product of Anchor.

Table 2 lists approved
ionophores for cattle and their level of use, expected response, and withdrawal time.

**Antibiotics**

Antibiotics are fed to finishing cattle to control liver abscesses. They may also reduce the incidence of grain bloat. In lamb diets they have been found to reduce the incidence of enterotoxemia.

Antibiotics have also improved gain and feed conversion in cattle and lambs. In cattle, this response is probably the result of a reduction in liver abscesses.

Antibiotics approved by FDA to add to cattle rations include chlortetracycline, oxytetracycline, bacitracin, and tylosin. Chlortetracycline and oxytetracycline are approved for lamb diets. Only tylosin is approved for use in combination with another feed additive (Rumensin®).

Intermittent feeding of antibiotics for a short time while other feed additives are removed from the ration avoids label restrictions associated with combined use of additives. Cattle fed 1 g/head daily for 3 out of 28 days or 400 mg/head daily for 7 out of 28 days perform the same as cattle fed antibiotics on a continuous basis.

**Chlortetracycline.** Several companies market chlortetracycline under various trade names including Aureomycin®, Chlorachel®, Chlorate!®, CL TC®, and CTC®.

Chlortetracycline is approved for use in beef cattle at 70 to 100 mg/head daily to improve (3-5%) gain and feed efficiency and to aid in preventing bacterial pneumonia and shipping fever, reducing respiratory infection, and preventing anaplasmosis.

In lamb rations chlortetracycline is approved at 20 g/T of complete air dry feed to prevent enterotoxemia and at 20-50 g/T to improve gain and feed efficiency. Chlortetracycline may not be used in liquid supplements. A 2-7 day withdrawal time prior to slaughter is required if dosages higher than 100 mg/head daily are fed to cattle.

**Oxytetracycline.** Several companies market oxytetracycline under various trade names including Terramycin® and Oxtc®.

Oxytetracycline is approved at .5 to 5 mg/lb of body weight daily to aid in preventing bacterial diarrhea and at .5 to 2 g/head daily for the prevention and treatment of shipping fever.

For finishing cattle, 75 mg/head daily is fed to improve (3-5%) gain and feed efficiency and to reduce the incidence and severity of grain bloat and liver abscesses. For lambs 10-20 g/T of air dry complete feed is approved for improving gain and feed efficiency and 25 mg/head daily is approved as an aid in preventing enterotoxemia.

Oxytetracycline may not be used in liquid supplements. A 5-7 day withdrawal prior to slaughter is required if dosages higher than 75 mg/head daily are fed.

**Bacitracin.** Several companies market Bacitracin under the trade names of A.L. Zinc Bacitracin®, Bacifer® , Zinc Bacitracin Premix® and Zinc-Basitracin®.

Bacitracin is approved for use in beef cattle diets at 35-70 mg/head daily to increase rate of gain and improve feed efficiency (1-5%). It is not approved for use in liquid supplements or in lamb diets. No withdrawal is required prior to slaughter.

**Tylosin.** Tylosin (Tylan®) is marketed by Elanco Products Company for use in beef cattle rations at 8-10 g/T of air dry feed to reduce the incidence of liver abscesses. Feed efficiency and gain are usually improved 3-5%.

Tylosin can be used in both dry and liquid supplements and fed in combination with monensin. No withdrawal prior to slaughter is required.

**Coccidiostats**

Amprollium and decoquinate (Decoxx®) are marketed for the control of coccidiosis in cattle. Lasalocid (20-30 g/T of ration) is approved for use as a coccidiostat in lamb rations. No
withdrawal period is required for any of these products.

**Estrus suppressants**

Melengestrol acetate (MGA®) is a synthetic hormone with structure and activity similar to that of progesterone. It is marketed by TU/CO, a division of The Upjohn Company.

MGA® is fed at .25 to .5 mg/head daily and improves gain and feed efficiency (3-7%) of intact open heifers and suppresses estrus. Suppression of estrus reduces wasteful energy expenditures due to riding and chasing. Injuries due to riding are also reduced.

MGA® is approved for use in liquid and dry supplements and can be fed in combination with monensin. A 48-hr withdrawal prior to slaughter is required.

**Buffers**

Buffers are compounds with both acid and base properties. They resist changes in rumen or intestinal pH when acids are present.

Sodium bicarbonate (.75-1.5% of dry matter), limestone (1% of dry matter), sodium bentonite (1-2% of dry matter), and magnesium oxide (.5-.75% of dry matter) have all been fed to cattle and lambs to reduce acidosis on high grain diets or to improve fiber digestion on corn silage based diets. Response to dietary buffers has been variable.

**Others**

Sarsaparilla (Sevarin®) is classified as a natural product of plant origin and is free of FDA regulations.

It is recommended for feeding at a level of .5 to .6 g/head daily in conjunction with monensin or lasalocid. Results vary, with a range of 0-4% improvement in gain and feed efficiency.

Poloxalene (Bloat Guard®) is marketed by Smith Kline Animal Health Products, a division of Smith Kline Corporation. It is approved for the prevention of legume bloat in cattle. It is available in liquid and dry supplement, and no withdrawal period is required.

Probiotics are microbial products that may be fed to cattle or administered directly to the rumen through the use of a bolus, drench, paste, or ruminal injection.

These products are intended to aid the rumen's naturally occurring population of organisms to ferment feed. This is believed to result in increased feed intake. Severely stressed cattle may benefit from probiotic administration. Cattle that are not stressed probably will not benefit from them.

Trade names are used for reader convenience and do not imply endorsement or guarantee or responsibility for results. The label should be considered the final guide. Users are responsible for following all label directions and precautions.