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“Stocker Cents” article

Feed Additives for Stocker Cattle

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Feed Additive Basics

Feed additive use can be very effective in improving production levels, efficiency, and animal health. Feed additives are appropriate not only in cattle finishing operations, but also in stocker grazing operations. The primary effects of feed additives are to increase feed efficiency and/ or improve average daily gain. Some feed additives have additional benefits such as reducing incidence of bloat, acidosis, and coccidiosis. Other feed additives are used to suppress estrus, reduce liver abscesses, control foot rot problems, and control parasites. Feed additives can be classified into five general categories: antibiotics, ionophores, estrus suppressants, buffers, and others.

Ionophores

Antibiotics are typically viewed as tools to improve the health status of a beef animal. Antibiotics delivered through cattle feed can also provide benefits in cattle productivity and efficiency. Ionophores are antimicrobial compounds that do just this. The benefits of ionophores in beef cattle are well documented. Ionophores generally improve feed efficiency from 5 to 10% and improve gain 2 to 7%. Yet ionophores do not appear to impact carcass characteristics. In addition to impacts on cattle on high grain diets, ionophores significantly improve daily gain and feed efficiency when fed to cattle on high roughage diets in confinement. Referring to the impact of ionophore use on the U.S. beef industry, Dr. Harlan Ritchie of Michigan State University, in a 1996 report to the NCA Research and Education Committee, stated that ionophore use resulted in “an estimated overall savings of \$250 million annually in feed costs.”

Ionophores work by inhibiting or depressing the growth of certain rumen microorganisms. The inhibition of these organisms alters the rumen fermentation process in several ways:

- 1) Ionophores improve feed efficiency by changing the types of fatty acids produced in the rumen and increasing the capture of feed energy during rumen fermentation with less methane produced. Animal performance is improves due to increased energy retention during rumen fermentation.
- 2) Ionophores decease the breakdown of protein in the rumen. Monensin, for example, has been shown to have a “protein sparing” effect by decreasing ammonia formation from protein. The decreased breakdown of protein in the rumen increases the bypass of protein to the small intestines where it can be better utilized by the animal. This has little effect on performance of feedlot cattle

- on high grain diets, but it is important in growing cattle on high roughage diets. Research with monensin suggests that it works better on low protein diets.
- 3) Ionophores reduce the incidence of coccidiosis, acidosis, and bloat. Animal performance improves by reducing these stressors.
 - 4) While ionophores inhibit fiber-digesting bacteria, this is typically not a major concern because cattle on ionophores are usually on high grain diets. Some studies have even shown that fiber digestibility was not affected on high concentrate finishing diets. Nevertheless, using the proper feeding level of ionophores is particularly important on the forage-based diets common in Mississippi stocker operations. Feeding excessive levels of ionophores can reduce fiber digestion on high forage diets.
 - 5) In general, ionophores enhance the absorption of nitrogen, magnesium, phosphorus, zinc, and selenium.

Currently there are only two ionophores, monensin (Rumensin®) and lasalocid (Bovatec®) approved in the U.S. to be fed to beef cattle on pasture. Laidlomycin propionate (Cattlyst®) is another ionophore approved in the U.S. for use in beef cattle. However, it is only labeled for use in cattle fed in confinement for slaughter. With Rumensin® use, average daily gain should improve 5 to 15% and feed efficiency should improve 8 to 12%. In general, Rumensin® can be expected to decrease dry matter intake by 4%. Bovatec® and Cattlyst®, on the other hand, have limited effects on feed intake. Daily gain with Bovatec® use should improve 5 to 15%, and feed efficiency should improve 8 to 12%. Both Rumensin® and Bovatec® can be fed in dry or liquid supplements, and feeding rates for various classes of beef cattle are listed on the labels. Ionophores are very toxic to horses and are not approved for use in several other species of livestock. While Rumensin® is considered more toxic to horses than Bovatec®, it is not safe to allow horses to consume any feed containing ionophores.

MGA

Melengestrol acetate, better known as MGA, is a feed additive that suppresses estrus (heat or cyclic sexual activity) and improves gain and feed efficiency in beef females. It has practical application in heifer estrus synchronization programs. Feedlots also use MGA in finishing diets to reduce heifer riding behavior and associated production losses. Melengestrol acetate is a synthetic progestin that elevates progesterone levels and inhibits heat and ovulation, similar to EAZI-BREED™ CIDR®'s. These progestins have been shown to jump start estrus in some non-cycling cattle as well. While CIDR®'s are vaginal inserts, MGA is administered through feed. Making sure that heifers consume adequate quantities of MGA and that the length of the feeding period and timing of breeding are appropriate is crucial for MGA to be effective. Thus, proper bunk space is needed. Reduced conception rates have been reported in heifers bred within 1 to 12 days after withdrawal of MGA.

Buffers and Other Feed Additives

Buffers can be added to beef cattle diets to reduce fluctuations in rumen pH. Sodium bicarbonate is an example of a feed additive that buffers rumen pH in an attempt to reduce the incidence of acidosis on a high grain diet. Poloxalene (Bloatguard®) can be fed to beef cattle to aid in the prevention of bloat on legume and other lush pasture. Poloxalene can be mixed with feed or offered in block form. To be effective though, cattle must consume adequate quantities of poloxalene. It is still important to use other bloat preventative measures, such as filling cattle up on hay before turning them out onto lush pasture, to be safe when dealing with high bloat risk.

Mississippi BQA Feed Guidelines

The Mississippi Cattlemen Beef Quality Assurance (MS-BQA) Program addresses the use of feed additives. With regard to feedstuffs and sources, it recommends that:

- 1) Producers need to maintain a record of pesticide (herbicides, insecticides) use that could cause a violative residue in grazing cattle or feedlot cattle, as required by the EPA.
- 2) Producers should implement a quality-control program for incoming feed ingredients that attempts to eliminate contamination resulting from molds, mycotoxins, and chemical contamination such as pesticides.
- 3) Producers should submit for analysis by a qualified laboratory any feed ingredient suspected of contamination before use.
- 4) No ruminant-derived protein sources may be fed. To help prevent the establishment and amplification of BSE through feed in the U.S., FDA implemented a final rule that prohibits the use of most mammalian protein in feeds for ruminant animals. This rule, commonly referred to as the Ruminant Feed Ban, became effective on August 4, 1997.

With respect to feed additives and medications, MS-BQA guidelines specify that:

- 1) Only FDA-approved medicated feed additives may be used in rations.
- 2) All medicated feed additives shall be used in accordance with the FDA-approved label. Extra label drug use of feed additives is strictly prohibited. No one has the authority to adjust the dosage as labeled, including veterinarians.
- 3) Producers need to ensure that all additives are withdrawn at the proper time to avoid violative residues.
- 4) Medicated feed additives shall be used in accordance with the FDA Current Good Manufacturing Practices (CGMPs) regulations. These CGMPs include a formula record of all medicated feed rations produced and production records of all batches of feed produced that contain medicated feed additives. Production records must include additives used, dates run, ration names or numbers, and amounts produced. Anyone producing an animal feed containing an animal drug must follow CGMPs. This includes large multi-plant manufacturers and single-plant manufacturers, as well as on-farm mixing operations. The term "medicated feed" includes all medicated feed products intended to be a substantial source of nutrients in the diet of an animal. It includes products commonly referred to as

supplements, concentrates, premix feeds, and base mixes, and it is not limited to complete feeds intended to be the sole ration of the animal.

- 5) Producers must keep all records for at least 2 years from the date of transfer or sale of the cattle and shall have trace-back capability.

Responsible feed additive use is important. Feed additives are typically used in very small quantities. Toxicity and end-product residue concerns make appropriate mixing, delivery, and consumption vital. Therefore, most feed additive use is regulated, and not even veterinarians can approve the use of a feed additive in a manner inconsistent with label specifications. Feed additives must be used at the dosage, for the class of cattle, and only with the approved combinations according to the label. Time of administration and withdrawal periods, if required, must be followed as well. Some feed additives that are approved for use in confined cattle intended for slaughter are not approved for use in grazing cattle. In addition, many feed additives that may be used in stocker cattle are not approved for use in breeding cattle, so reading and following feed additive labels is critical. Fortunately, the feed industry has developed a variety of premix products and vitamin/ mineral packages, for example, which make it possible and convenient for cattle producers to use feed additives safely and effectively.

Next month Stocker Cents will look at feed additives such as antibiotics that are used for herd health purposes. For more information on feed additives or stocker production, contact your local Extension office or veterinarian. If you missed the recent Stocker Cattle Short Course in Brookhaven, Mississippi, the proceedings from the short course are available online at <http://msucares.com/livestock/beef/>.