Feed Additives and Animal Health

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Most feed additives were developed for or have an effect on the health of the animal. Additives such as tetracyclines, sulfas, coccidiostats and anthelmintics, yeast and microbial cultures have as their main objective, the prevention of disease or other health related treatment. Other additives, most significantly, the ionophores, are not marketed primarily as animal health additives, but as performance enhancers. Even though this is their main purpose, these products have an indirect impact on the animal health program at the feedlot.

Feed grade medication requires control and cooperation between veterinarian and nutritionist to be most effectively utilitzed. Feed medications as usually used to address widespread problems in a large number of animals such as coccidiosis and respiratory disease complex. The additive chosen for a particular feedyard should be effective for the condition it is intended. It should also not depress consumption and not interfere with sick pen treatment programs. An example would be if oxytetracycline was the first chosen primary treatment drug in the sick pen, it would probably not be the feed medication of choice for inclusion in the receiving program. These programs should be discussed by the nutritionist and veterinarian. Both professionals should have common goals not the least of which is adherence to withdrawal times.

Feed medications and their use in the starting phase receive considerable attention, discussion and controversy. Questions such as: should we use a coccidiostat and to what weight of cattle? Should ionophores be incorporated in starting diets and at what levels? Should the diet be fortified with antibiotics and sulfa or reserved for treatment and again at what levels? Is a feed grade anthelmentic as effective as a drench or injectable? The answers to these questions are not the same in all cases. Each individual situation and pen and feedlot are different and require constant evaluation.

Feed medication and additives probably have their greatest impact on the starting phase, so my initial discussion will center on these uses.

One of the most recent and widely adapted and accepted practices is the use of a coccidiostat, specifically decoquinate, in receiving and starting diets of stressed, particularly light weight stressed calves. Since there is no perfect way to treat coccidiosis and reverse the intestinal damage that it causes, it is preferable to attempt to prevent the disease by using the coccidiostat. Decoquinate works by destroying the life cycle (about 21 days) of the organism early and thus preventing coccidia from penetrating the intestinal mucosa. By stopping the life cycle at this point, intestinal damage, which can interfere with nutrient digestion, is prevented or at least reduced. The coccidiostat only stops the life cycle. When it is removed from the diet the cycle will continue once again. It is hoped that stress has been removed by that time and the animal's own immune system can respond to any continued exposure. An ionophore is usually incorporated at this point which also has anti-coccidia activities.

Drs. Hutchinson and Cole at Texas A&M, Bushland Station in cooperation with the University of Tennessee have done considerable research with long-hauled, stressed calves and starting programs. Their observations on percentage of cattle beginning to eat feed on day 1, day 2, 3, 4, 5, 6, and 7 shows a definite positive impact due to the incorporation of decoquinate in the receiving program. Weight gain at 28 days is usually greater as well as more uniform and higher feed consumption.

Of course, performance, health and profitability are not improved on every group of cattle receiving decoquinate. Not all new cattle have coccidiosis. The decision for use should be based on evaluation of drug cost versus potential for sickness, treating costs, mortality and performance loss. Removal of this source of stress is beneficial in most cases.

Bacteriostatic drugs, those that inhibit the growth of susceptible bacteria, have long been cleared and used as feed medication. Tetracyclines (chlortetracycline and oxytetrecyclines), sulfa and neomycin have use in controlling low level respiratory infection but require the body's assistance to overcome the infection. Combinations such as sulfa and chlortetracyclines (AS700) and neomycin and oxytetracycline (NeoTerra) generally provide a better response in combination than when given alone, if given early in the face of bacterial challenge.

The decision to use or not use these products in receiving diets is not always clear-cut. Less treatment, better daily gains and feed efficiency are often associated with their use. However, if cattle are highly stressed and already carrying an advanced infection the use of the medications can "mask" the problem for a short period then an explosive problem exists. Some also believe the use of these

products as feed medication allows the animal's system to develop strains of pathogens that are resistant to the drug. This obviously reduces the effectiveness of the injectable form of the same medication.

I would like to stress again, when considering choice of antibiotics or any feed medication, consider withdrawal times and clearance levels. Two grams per head per day of oxytetracyclines are approved for feed medication in the receiving program whereas the clearance for chlortetracycline is 350 mg. per day for the same use. Withdrawal times for tetracyclines varies from 0 to 10 days and when used in combination with sulfa the withdrawal time is 7 days. Careful attention to these details becomes more evident and demanding as we move toward quality assurance programs now being used in some states and proposed in most others.

The public concern over the perceived negative impact of antibiotic use and feeding on human health has caused us all to scrutinize the use of the products. This has had a positive impact on sales of microbial and yeast additives. These products are perceived in a much more positive light as being "natural". Indeed these "probiotic" cultures have received much attention recently. This area of research is very exciting and it appears hopeful that some products will eventually develop as a replacement or at least supplement the more traditional antibiotic therapy.

Certain strains of these micro-organisms have been demonstrated to retard or prevent growth and infection from pathogenic organisms such as Salmonella. The feed additives currently available serve primarily to replenish bacterial loss in the GI tract of stressed or sick animals. The choice and use of these products should be based on individual situations. The culture used should be strains that grow and thrive on the substrate being fed to the animal. For example, a micro-organism that grows on a milk-based substrate probably has little place in a diet based on hay and corn.

Another choice that must be made when considering whether to use injectable, drench or feed-grade is the choice of anthelmintics. There doesn't appear to be much question that most incoming cattle should be de-wormed. The question seems to be, which product and in what form. Feed grade anthelmintics have undoubtedly been proven to be as effective as their injectable or drench counterparts IF the animal consumes the product. The dose tolerance of these products (Tramisol, Levasole, Safegard and TBZ) is relatively wide so an adequate job can be done. However, it is my feeling that the use of these products should be delayed until feed consumption appears to be consistent among all animals in a pen, probably not until they have been on feed at least 10 to 14 days. This recommendation has obvious impact on cattle that arrive at the feedlot with a heavy worm load. This load can definitely affect performance on the start and negatively effect the immune system.

Injectable Antibiotics	Minimum Days Withdrawal
Combiotic®	30
Gallimycin®	14
LA-200®	28
Neo 200 mg (Oral Use Only)	30
Oxyject® 100 mg	20
Penicillin G Procaine (Withdrawal times vary -check label directions)	
Penicillin G Procaine Dihydrostreptomycin	30
Pen BP-48®	30
Tylan®200	21
Terramycin® 100 mg.	15
Terramycin® 50 mg.	22

Implants	Minimum Days Withdrawal
Compudose®	0
Ralgro®	65
Synovex®(S,H,C)	0
HEIFER-oid®	0
STEER-oid®	0

Biologicals	Minimum Days Withdrawal
Killed Virus	21
Bacterins	21
Modified Live	21

Feed Additives	Minimum Days Withdrawal
Rumensin®	0
legal clearance with:	
MGA® (same supplement)	48 hours
Tylan®	0
Rabon®	0
Bovatec®	0
legal clearance with:	
OTC (Oxytetracycline)	0
MGA®(separate supplements)	48 hours
Deccox®	0
Zinpro®	0
Chlortetracycline 350 mg/head/day or less	0
AS-700®	7
Rabon®	0

Anthelmentics	Minimum Days Withdrawal
Levasole® Injectable	7
Levasole® Gel	6
Levasole® Bolus	2
Ivermectin Injectable	35
Ivermectin Paste	24
Safe-Guard® Suspension	8
Safe-Guard® Block	11
TBZ® Paste	3
TBZ® Bolus	3
TBZ® Drench	3

The class of feed additives that have had probably the greatest impact on the way we feed cattle today are the ionophores. The choice to use Bovatec or Rumensin can be justified by various biases of the feedlot manager and nutritionist. The two products exhibit differences in potency, type of ration fed and the management ability of the feedlot being considered. It is important that an ionophore be incorporated into the feeding program. The positive impact of these products on the competitiveness of the beef production business is not just in terms of significantly improved feed efficiency and slight increases in average daily gains.

The incorporation of ionophores has allowed for better control and predictability of feed intake. This becomes very important when we consider the economic importance of getting cattle started as soon as possible and being able to go to a higher energy, lower roughage diet. This is reflected in greater performance, more competitive costs and with less concern for health problems associated with high concentrate feeding.

The ionophores have been demonstrated to reduce the incidence of feedlot bloat associated with highly processed feedstuffs. The more predictable and consistent intakes accompanied by the resulting acetate:propionate ratios produced by the rumen micro-organisms has greatly reduced concerns for digestive disturbances. Therefore, although the association between ionophores and animal health is indirect, it is manifested in less pulls and prob-

lems associated with feeding high concentrate rations.

The feeding of low levels of antibiotics has generally been shown to result in improved animal performance. More recently, with higher concentrate feeding and more complete feed processing, these low levels have been incorporated to reduce the incidence of liver abscesses. Abscesses are less severe in certain geographic areas and the decision to feed antibiotics at low levels should be made on the basis of need under particular circumstances. Again, the negative perception by the public of the effect of continuous antibiotic use on human health is an issue that must be addressed by our industry. Many feedlots have discontinued their use in an effort to improve public acceptance of their product, BEEF.

Convention Speakers