

Vet Call

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Beef producers should consider feeding ionophores

Ionophores are compounds included in cattle diets to improve average daily gain (ADG), feed efficiency (FE) and animal health. They act by inhibiting certain microbial cells in the rumen, which results in a shift in volatile-fatty-acid (VFA) production toward more propionate production with corresponding reductions in acetate and butyrate.

There also is a reduction in protein breakdown due to the inhibitory effects of ionophores on certain rumen bacteria, resulting in an increased post-ruminal flow of dietary amino acids.

Monensin (Rumensin®) and lasalocid (Bovatec®) are ionophores available for use in cattle in the United States. They perform similarly in many situations; but they differ slightly in mode of action, label clearances and effects on certain health concerns.

In addition, bambarmycins (Gainpro®) is a relatively new antibiotic that is classified as a nonionophore antibiotic. It has some ruminal effects similar to those of ionophores and exerts similar effects on animal performance.

■ The benefits of ionophores

Metabolizable-energy (ME) and net-energy (NE) values of feeds should increase when ionophores are consumed. It is recommended that, when balancing a ration, the NE provided by the diet be increased by 12% if ionophores are included.

Ionophore use in conjunction with high-roughage diets (pasture, hay or silage) results in the same consumption but increased rate of gain because of improved efficiency of feed utilization.

Monensin is approved for use in supplements fed to mature, reproducing cattle on pasture or in confinement to improve FE. Monensin, lasalocid and bambarmycins are labeled for use in supplements fed to growing cattle (slaughter, stocker and feeder cattle and replacement heifers) on pasture to improve FE and to increase rate of gain.

Monensin, lasalocid and bambarmycins are labeled to improve FE and rate of gain for cattle fed in confinement for slaughter. Ionophores fed in conjunction with high-

energy feedlot-type diets result in decreased feed consumption but increased rate of gain — again, due to improved efficiency of feed utilization.

Now cleared for use in replacement heifers, inclusion of ionophores in heifer diets has been shown to increase the number of heifers that reach puberty by the start of the breeding season, to decrease the age at puberty, to decrease the weight at puberty, to increase corpora-luteal weight and to increase the amount of progesterone produced. The decrease in age at puberty is independent of improved ADG and increased body weight.

In addition to its effects on gain and efficiency, ionophore supplementation is effective for the prevention of several cattle diseases. Ionophores help prevent acute bovine pulmonary emphysema and edema (ABPEE) when cattle graze lush pasture. In addition, some lush legume pastures (alfalfa, red clover and white clover) are likely to cause pasture bloat when the plants are immature and levels of soluble protein are high.

Monensin is beneficial for control of pasture bloat, but lasalocid is not as effective. Both have been demonstrated to decrease the risk of grain bloat.

Rumen microbial production of gas and polysaccharides is important in cases of grain bloat, which is common if rations are stepped up rapidly and the hay and grain are ground. Animals that eat rapidly are at higher risk, as are animals with poor rumen motility.

■ Acidosis and coccidiosis

Acidosis is a problem with cattle abruptly changed from a roughage diet to a concentrate diet or with cattle that ingest large quantities of feeds rich in readily fermentable carbohydrates. In these situations, an aberrant cycle of fermentation occurs, causing rapid production of ruminal organic acids (VFA and lactic acid). The rate of lactic-acid production exceeds its rate of use.

Fiber-digesting bacteria are sensitive to lower pH in the rumen. As the pH in the rumen declines (becomes acidic), these

bacteria are destroyed, releasing endotoxins into the ruminal fluid.

Lactic-acid-fermenting bacteria also decline in number as pH decreases, the end result of which is a profound ruminal and systemic lactic acidosis and diarrhea and a variety of secondary disease processes, any of which may be life-threatening. Inclusion of an ionophore in the ration helps to decrease the incidence and severity of acidosis or digestive upset by decreasing intake and stabilizing consumption.

Coccidiosis in cattle is caused by a protozoan parasite that invades the cells of the intestinal tract. The organism damages the intestinal lining, thereby reducing the animal's ability to gain weight and, in some cases, can cause severe bloody scours and dehydration.

If monensin and lasalocid were hand-fed (rather than fed free-choice), they would help prevent and control coccidiosis. The ionophores do not act to treat active cases of coccidiosis; but they do kill the parasite, thereby preventing clinical cases of coccidiosis.

■ Some words of caution

Despite their many benefits, ionophores have some negative effects that must be considered. Ionophores are toxic to cattle and horses if they are fed undiluted (Type A or Type B feeds). Monensin is toxic to horses even when diluted. Bambarmycins is not cleared for use in breeding animals, and no ionophore is approved for use in rations of lactating dairy cows in the United States.

The Food and Drug Administration (FDA) controls feed additives with strict rules for their use. Feed additives cannot be used extra-label. They must be used at the dosage for the class of cattle and only with the approved combinations specified on the label.

With these constraints in mind, because of their many beneficial attributes, ionophores should be used in many, if not most, rations and supplements fed on beef farms.

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