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## Rumensin: A New Feed Additive for Feedlot Cattle

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9. Dr. J. H. Greve
10. Dr. George Beran

# Rumensin:<sup>®</sup> A New Feed Additive for Feedlot Cattle

by  
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Allen Trenkle†

Because feed comprises over 80% of the cost of producing fat cattle, considerable research has been directed towards improving utilization of the energy in feeds by ruminants. Attempts to get more energy from cattle feeds have included grinding, pelleting, steam flaking, feeding ensiled high moisture grains and feeding high concentrate rations. Several years ago studies were conducted in the Lilly Research Laboratories of Eli Lilly and Company to improve efficiency of energy utilization by ruminants by searching for a compound which would change the proportion of volatile fatty acids produced during microbial digestion in the rumen. One compound which was found to consistently increase propionic acid production and decrease the production of acetic and butyric acids was monensin, a polyether produced by *Streptomyces cinnamonensis*, has weak gram positive antimicrobial activity and also is an effective coccidiostat. The compound is currently marketed as a

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coccidiostat for poultry under the tradename Coban<sup>®</sup>. Monensin was tested in cattle and found to improve the utilization of feed energy for growth. The product has recently been cleared by the Food and Drug Administration for use in feed lot cattle feeds at the rate of 5 to 30 grams per ton of complete feed and will be marketed by Elanco Products Company, the agricultural division of Lilly, under the tradename Rumensin<sup>®</sup> (Monensin Sodium).<sup>7</sup>

Rumensin<sup>®</sup> is thought to act directly on the rumen flora to increase the production of propionic acid. The specific effects of the compound on the bacterial cells are not known. The microbes in the rumen break down starches and celluloses in feeds to sugars and then to volatile fatty acids which supply energy to the ruminant animal. Acetic, propionic and butyric are the principal fatty acids produced, but the efficiency with which sugars are converted to these acids varies considerably. When acetic and butyric acids are formed some of the carbon and hydrogen (energy) are lost as CO<sub>2</sub> and methane. No energy is lost, however, when sugars are converted to propionic acid. In a typical beef feeding

TABLE 1—Effect of Rumensin<sup>R</sup> and Diethylstilbestrol on feedlot performance of yearling steers, initial 98 days.<sup>1</sup>

DES implant, mg	0	0	30	30
Rumensin <sup>R</sup> , ppm	0	25	0	25
Dry Matter Consumed [lbs/day]	16.8	15.4	16.8	15.7
Gain[lbs/day]	2.32	2.42	2.46	2.65
Feed/100 lbs. gain	725	637	682	591

1) Burroughs, Trenkle, Vetter 1975

situation, the rumen bacteria produce about 60% of the fatty acids as acetic acid, 30% as propionic acid, and 10% as butyric acid. With Rumensin<sup>R</sup>, acetic acid decreases to about 52%, butyric acid to 8%, and propionic acid increases to 40% of the total acids produced.<sup>4</sup>

Numerous feedlot trials throughout the United States have substantiated the claim that Rumensin<sup>R</sup> increases feed efficiency in cattle. Results have been remarkably consistent with respect to feed efficiency. A representative example of the effects of Rumensin<sup>R</sup> on beef cattle performance was carried out at Iowa State University during 1975. The Results of these experiments are presented in Table 1.

Rumensin in this experiment increased feed efficiency approximately 12%. Results of other feeding trials with over 5,000 feedlot cattle are similar with a range of 10% to 20% improvement in feed efficiency. In the experiment shown in Table 1, average daily gains were also greater in the cattle receiving Rumensin<sup>R</sup> however, no claim is being made for increased gain. Increased daily gains due to feeding Rumensin<sup>R</sup> are often observed in cattle fed lower energy rations. Animals on pasture respond to Rumensin<sup>R</sup> with increased weight gains.<sup>5</sup> Feeding Rumensin<sup>R</sup> has not resulted in any significant changes in carcass composition, carcass cutability or carcass quality.<sup>4</sup>

An interesting observation is that diethylstilbestrol seems to act independently of Rumensin<sup>R</sup> in that the two compounds have an additive effect (Table 1). Ralgro<sup>R</sup> and Synovex<sup>R</sup> implants have also shown additive effects with Rumensin.<sup>R2</sup>

During the first few days after feeding Rumensin<sup>R</sup> feed intake may be up to 30%

below expected consumption. Some cattle feeders may be concerned about this marked drop in consumption, but after 30 days of feeding Rumensin<sup>R</sup> feed intake will be about 90% of expected consumption. The decreased feed intake is probably the result of a depression of the feeding center by increased levels of propionic acid in the blood. The cattle feeder should be made aware that Rumensin<sup>R</sup> acts by increasing the amount of energy obtained from each pound of feed and, therefore, less feed is needed for each pound of gain. It should also be emphasized that using greater than recommended levels of Rumensin<sup>R</sup> (30 grams per ton of complete feed), will result in more severe depression of feed intake. Rumensin<sup>R</sup> should not be used in cases where a decrease in feed intake is contraindicated. Newly purchased calves not accustomed to being fed grain and still under the stress of shipping would be an example. An intake depression in this case could be undesirable. Good judgment should prevail in such cases.

Some may question the value of Rumensin<sup>R</sup> if there is no increase in live weight gain. The data shown in Tables 2 and 3 compare the relative value of increased gain and improved feed efficiency in feedlot cattle. The economic impact of improvements in feed efficiency of feedlot cattle are clearly shown by these examples using current feed costs.

In Summary, Rumensin<sup>R</sup> a new feed additive for feedlot cattle, has been shown to increase feed efficiency an average of 10%. With high feed prices this product has tremendous potential in lowering the cost of beef production but proper use is essential for optimum returns. The purpose of this communication is to acquaint in-

**TABLE 2—Effect of increasing average daily gain of feedlot cattle from 500 to 1100 lbs.**

	<u>Control</u>	<u>Treatment</u>
Average Daily Gain [lbs]	2.50	2.88
Feed/100 lbs of Gain [lbs]	800	800
Feed Cost [5c/lb]	\$240.00	\$240.00
Over head [20c/head/day]	\$ 48.00	\$ 41.67
Total Cost	\$288.00	\$281.67 <sup>1</sup>
Saving		\$ 6.33

1) Cost of bringing about the improvement has not been included.

**TABLE 3—Effect of improving Feed Efficiency of feedlot cattle 15% from 500 to 1100 lbs.**

	<u>Control</u>	<u>Treatment</u>
Average Daily Gain [lbs]	2.50	2.50
Feed/100 lbs of Gain [lbs]	800	600
Feed Cost [5c/lb]	\$240.00	\$204.00
Overhead [20c/Head/Day]	\$ 48.00	\$ 48.00
Total Cost	\$288.00	\$252.00 <sup>1</sup>
Saving		\$ 36.00

1) Cost of bringing about the improvement has not been included.

dividuals associated with the beef cattle industry with this new product.

#### **GENERAL RECOMMENDATIONS FOR USE OF RUMENSIN<sup>R</sup>**

1. Rumensin<sup>R</sup>, a new feed additive for feedlot cattle, has been cleared by the Food and Drug Administration for incorporation into feeds at the rate of 5 to 30 grams per ton of total ration.
2. Feed 30 grams per ton if cattle are to be fed for over 60 days. The cattle will compensate for the initial decrease in feed intake observed after first feeding Rumensin<sup>R</sup>.
3. Feed 20 grams per ton if cattle are to be fed less than 60 days.
4. Rumensin<sup>R</sup> can be added to rations containing different grains (corn, milo or barley) or to rations containing different amounts of roughage with similar results. Rations containing silages or other wet feeds should be corrected to a 90% dry matter basis for determining the rate of adding Rumensin<sup>R</sup>.
5. Feed continuously, because there are no residues in cattle tissues when fed up to the time of slaughter. There is no

- required withdrawal period.
6. Once incorporated into the total ration, feed containing Rumensin<sup>R</sup> should be fed within 30 days to obtain maximum benefits of the product.
7. Rumensin<sup>R</sup> can be fed to cattle of different weights, steers or heifers, with similar results. Rumensin<sup>R</sup> probably should not be fed to newly acquired feeder cattle until they are accustomed to consuming grain.
8. Firms with properly approved federal forms (FD 1800) will be able to purchase Rumensin<sup>R</sup> 30 (premix) from Elanco for addition to cattle feeds. Cattle feeders can purchase feeds (in most cases a supplement) containing Rumensin<sup>R</sup> from these firms.
9. Rumensin<sup>R</sup> has not been cleared for use in feeds containing other drugs such as antibiotics or diethylstilbestrol. Rumensin<sup>R</sup> has not been cleared for use in liquid supplements.
10. Rumensin<sup>R</sup> has not been cleared for use in feeds for dairy cattle, swine, sheep or horses. At the recommended levels (30 grams or less per ton of complete ration) no harmful effects would be expected if other species of

animals accidentally consume cattle feed containing Rumensin<sup>®</sup>. Because horses seem to be sensitive to higher levels of Rumensin<sup>®</sup>, they should not be allowed to consume feeds containing 100 grams or more per ton.

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# Common Rabbit Diseases

by  
Warren S. Thompson\*

## SUMMARY

This article deals with six of the most common problems associated with commercial and laboratory rabbit raising. It deals specifically with pasteurellosis, hepatic coccidiosis, cysticercosis [*Taenia pisiformis*], ear canker, sore hocks, and malocclusion. Each disease will be discussed from the aspects of general information, gross clinical signs, and treatments.

## INTRODUCTION

Although the rabbit is no longer as popular as an experimental animal or a source of meat and fur, one can still find an abundance of the rabbit in small meat production units and laboratory colonies. Northern Arkansas has the largest rabbit population for commercial means in our area. Even in this situation, people admit they can make little money raising rabbits but they still do it to produce for themselves an inexpensive source of meat. Prices for live rabbits vary from 32-49c/lb., which makes a five pound animal worth about two dollars, or close to 75c profit over the cost of

feed, water, and equipment. The veterinarian will seldom be called to the commercial rabbitry because slaughter of any problem animals is cheaper than a seven to eight dollar service call. It is probably best this way as he would no doubt have some problems making a diagnosis and recommending adequate treatment, unless he makes a special effort to gain experience in this area. Therefore, he may expect to see the pet rabbit, the Easter bunny, or the wild rabbit caught early in the spring. A telephone call will be more likely his experience and less expensive to the low budget rabbit raiser.

## PASTEURELLOSIS

Pasteurellosis is the principle disease of domestic rabbits. It is a highly contagious, persistent infection of rabbits world-wide. The many forms it takes will be discussed, as will aids in diagnosis and prevention. The organism causing pasteurellosis is *Pasteurella multocida*, which is a gram-negative, bipolar rod easily isolated from nasal exudate or blood. It grows easily on blood agar causing no hemolysis and forming either smooth, rough, or mucoid colonies on various other culture media.<sup>6,9</sup>

Clinical signs vary with the part of the body affected by the organism. Primary

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