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Effect of Tetronasin on Frothy Bloat In Cattle Caused by High-Grain Diet¹

Lisa R. Neibarger and T.G. Nagaraja

Summary

Feeding Tetronasin reduced incidence of frothy bloat in cattle fed a high-grain diet. The effective dose was 0.25 mg/kg body weight when administered prior to the onset of frothy bloat. At 0.15 mg/kg body weight, the antibiotic was less effective but the degree of bloat was considerably less than that of steers fed no antibiotic. Tetronasin also reduced the severity of bloat in steers that were already bloating prior to its administration.

Introduction

Feedlot or grain bloat is a frothy bloat resulting from the development of foam in the rumen. When cattle are fed high-grain diets, gas from normal ruminal microbial fermentation becomes trapped in the digesta and forms foam. The foam inhibits eructation and causes bloat.

It is recognized that rumen microorganisms are involved in causing bloat. Coopers Animal Health, Inc. has developed a new feed additive ionophore antibiotic, Tetronasin, which has shown promise for improving feed efficiency and weight gain of feedlot cattle. We studied the effect of Tetronasin in controlling feedlot bloat.

Experimental Procedures

Nine ruminally cannulated steers adapted to an all-alfalfa hay diet were switched to a high-concentrate, bloat provocative diet. The diet was 60% cracked sorghum grain, 16% soybean meal, 22% dehydrated alfalfa pellets, 1% salt, and 1% dicalcium phosphate.

The change-over from the all-hay diet was accomplished in about 10 days. Steers were allocated at random to one of three treatment groups. The control group received no antibiotic and the remaining two groups received Tetronasin at 0.15 or 0.25 mg/kg body weight, respectively. Antibiotic feeding, administered as a top-dressing, was initiated with the grain feeding.

¹Tetronasin is an experimental feed additive and is not yet approved for use in cattle.

Ruminal contents of each steer were examined daily (3 hours after morning feeding) to assess the frothiness. The degree of bloat was visually scored in one-half units using the following scale:

- 0 = no froth
- 1 = slight froth in the rumen, but no pressure and abdominal distension
- 2 = definite froth with sufficient pressure to expel froth from the fistula when the cap was opened
- 3 = definite froth with sufficient pressure to cause abdominal distension on the left side
- 4 = definite froth with sufficient pressure to cause abdominal distension of the left and right side
- 5 = definite froth, severe abdominal distension, animal in extreme distress, terminal unless pressure is relieved

The treatment period lasted for 6 weeks. Then antibiotic feeding was terminated for the treatment group and the control group was fed the antibiotic at 0.25 mg/kg body weight. This "switchback" phase lasted for 4 weeks.

Results and Discussion

The control group (no antibiotic) began to bloat within 3 days after completing the switch to the bloat provocative diet. All three steers bloated consistently with a bloat score of 2.0 or higher. Steers fed Tetronasin at 0.15 mg/kg had consistently lower bloat scores than the control group (Table 32.1). However, after 3 weeks, two of the three steers began to bloat slightly (average bloat score less than 1.6) and there was a trend toward a gradual increase in the bloat score. Tetronasin at 0.25 mg/kg body weight was extremely effective in preventing bloat in steers fed the bloat-provocative grain diet. Only occasionally did those steers exhibit slight froth in the rumen.

During the switchback phase, both groups of steers that had the antibiotics withdrawn began to bloat and had an average bloat score of 2 within 2 weeks. Control steers that started receiving antibiotic in their feed began to respond to the drug in about 2 weeks.

Table 32.1. Effect of Tetronasin on Frothy Bloat Scores^a in Cattle Fed High Grain Diets

Days	Control	Tetronasin 0.15 mg/kg	Tetronasin 0.25 mg/kg
1-7	1.5 ^a	0.3	0.07
8-14	2.6	0.4	0.17
15-21	2.3	0.6	0.30
22-28	1.7	0.9	0.13
29-35	2.3	1.0	0.13
<u>Post-treatment (Tetronasin withdrawn)</u>			
1-7		0.87	0.63
8-14		1.90	2.00
15-21		2.03	2.10
22-28		1.77	2.40
<u>Tetronasin fed to controls (0.25 mg/kg)</u>			
1-7	0.93		
8-14	1.40		
15-21	0.63		
22-28	0.40		

^aMean bloat score of three steers in each group. 0 = no bloat, 5 = severe bloat, terminal unless relieved.