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Effect of Lasalocid¹ or Monensin² on Feedlot (Grain) Bloat in Cattle

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Summary

Lasalocid or monensin (600 mg per 1000 lb body weight daily) was tested on cattle bloating on high grain diets. Bloat was reduced 92% by Lasalocid and 64% by monensin. When fed throughout the finishing period, lasalocid at 300 mg per 1000 lb body weight effectively prevented bloat from developing. However, 600 mg was required to control bloat in cattle that were already bloating.

Introduction

Feedlot (grain) bloat occurs in cattle fed large quantities of grain and little roughage. It is similar to legume pasture bloat in that both produce excessive foaming of the rumen contents. But in legume bloat, although rumen bacteria contribute to foaming, the primary foaming agents come from plants. In grain bloat, the major source of foaming agents appears to be a slime of bacterial origin that increases the viscosity of rumen contents; then fermentation gas becomes trapped in the viscous contents, creating foam.

This report describes the results of several studies that were initiated to study the effects of lasalocid and monensin on feedlot (grain) bloat.

Results

Experiment 1. Six rumen-fistulated adult cows were fed bloat-producing diets. Lasalocid or monensin was added to the grain diet to provide 600 mg drug per 1,000 lbs body weight per day. The six cows were divided into three groups of two cows, and each group was given either no drug (control), lasalocid, or monensin. The treatments and cows were rotated so each cow received each treatment. Each treatment period was 14 days followed by a 14 day control period. Bloat was scored (0 = no bloat to 5 = severe bloat), 2 to 3 hours after feeding.

¹Lasalocid is sold under the registered trademark of Bovatec® by Hoffmann-LaRoche, Inc., Nutley, NJ. The approved use level of lasalocid to improve feed efficiency and increase weight gain for beef cattle is not less than 250 nor more than 360 mg per head per day. The manufacturer makes no claims for bloat prevention.

²Monensin is sold under the registered trademark of Rumensin® by Elanco Products Co., Indianapolis, IN. The approved use level of monensin to improve feed efficiency for beef cattle is not less than 50 nor more than 360 mg per head per day. The manufacturer makes no claims for bloat prevention.

The bloat scores for a treatment period were compared with the bloat scores of the previous control period (Table 1.1.) Both drugs reduced the degree of bloat, with the greatest reduction at the end of each drug treatment period. Lasalocid was more effective in reducing the degree of grain bloat than monensin.

Table 1.1. Effect of Lasalocid or Monensin (600 mg per 1000 lb Body Weight per Day) on Grain Bloat (Exp. 1)

Time after drug feeding started (days)	Bloat score ^a	
	Lasalocid	Monensin
0 ^b	2.5	2.8
1 - 5	2.1	2.2
6 - 10	1.2	1.7
11 - 14	.2 ^c	1.0 ^d

^aMean of periods 1, 2 and 3. 0 = no bloat; 5 = severe bloat.

^bMean score for 2 days prior to initiation of drug feeding.

^cMeans in rows with unlike superscripts differ (P<.07).

Experiment 2. Two rumen-fistulated cows were used to determine if lasalocid would control bloat over an extended period of time. The cows were fed and managed as in Exp. 1, and lasalocid was fed daily at 600 mg per 1,000 lbs body weight. The cattle were bloating before drug feeding was initiated.

The effect of lasalocid appears to persist for an extended period, since it reduced the degree of bloat to zero and kept both animals bloat free for 64 days (Table 1.2). With antibiotics like tetracycline and penicillin, the bloat preventive effect wears off in a few days.

Table 1.2. Effect of Lasalocid (600 mg Per 1,000 lb Body Weight/Day) on Grain Bloat when Fed Continuously for 60 Days (Exp. 2)

Period	Elapsed time, days	Mean Bloat Index ^a	
		Animal No.1	Animal No.2
Preliminary	1-4	2.0	2.5
Drug feeding	5-8	0.8	1.4
	9-64	0	0
Post-drug Feeding period	65-71	0.4	0.5
	72-79	2.1	2.1
	80-87	2.1	2.2

^a0 = no bloat; 5 = severe bloat.

Experiment 3. Six rumen-fistulated cows were divided into two groups. One group received 300 mg and the other 600 mg lasalocid daily per 1,000 lbs body weight. This experiment was conducted like the previous trials.

While 300 mg reduced bloat somewhat (Table 1.3), 600 mg was clearly more effective.

Table 1.3. Effect of Lasalocid (300 or 600 mg per 1000 lb Body Weight per Day) Controlling Bloat in Cattle That Were Already Bloating (Exp 3)

Period	Elapsed time, days	Mean bloat score	
		Group I 300 mg	Group II 600 mg
Before drug feeding	1 to 7	2.83 ^a	2.16 ^c
Drug feeding	8 to 14	2.21	2.44
	15 to 21	1.72	1.38
	22 to 28	1.71 ^b	.11 ^d
After drug removed	29 to 35	1.43	1.23
	36 to 42	2.18 ^a	2.52 ^c

^{ab} Means in columns with unlike superscripts differ ($P < .05$).

^{cd} Means in columns with unlike superscripts differ ($P < .0001$).

Experiment 4. In the previous experiments, lasalocid and monensin were evaluated in animals that already were bloating. In Exp. 4 lasalocid at two daily dosage levels (300 and 600 mg per 1000 lbs) was tested on animals receiving non-bloating hay-feed, which was gradually changed to a high-grain, bloat-producing ration.

The animals were fed alfalfa hay ad libitum and then gradually changed over to the bloat-producing diet in 14 days. The nine fistulated cows were divided into three groups of three cows each, balanced as to previous bloat potential (Table 1.4). If animals were fed lasalocid before bloating started, both 300 and 600 mg lasalocid dosage levels effectively prevented moderate to severe bloat.

Table 1.4. Effect of Lasalocid (300 or 600 mg per 1000 lb per Body Weight) Controlling Bloat in Cattle Before Bloat Starts (Exp. 4).

Period	Elapsed time, days	Mean bloat score	
		Group I 300 mg	Group II 600 mg
Drug feeding	1 to 7	0	0
(hay only)	8 to 14	0 ^a	0 ^a
Drug feeding continued	15 to 21	.3	0
(grain bloat diet)	22 to 28	0	.3
	29 to 35	0	.4
	36 to 42	.5 ^a	0 ^a
Drug feeding discontin.	43 to 49	1.6	1.3
(grain bloat diet)	50 to 56	2.5	2.0
	57 to 63	2.6 ^b	3.0 ^b

^{ab} Means in columns with unlike superscripts differ ($P < .0001$).

The surprising effectiveness of lasalocid may be attributed to its unique ability to inhibit growth of all important strains of Streptococcus bovis. This bacterium has long been incriminated as a cause of feedlot bloat. We have screened hundreds of compounds for the prevention and control of feedlot or grain bloat, and lasalocid is undoubtedly the most effective agent we have tested.