Approval Date: November 18, 2005

FREEDOM OF INFORMATION SUMMARY

SUPPLEMENTAL NEW ANIMAL DRUG APPLICATION

NADA 095-735

Monensin Sodium (RUMENSIN 80)

Type A Medicated Article for Beef Cattle

For increased rate of weight gain; for the prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii* in growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers).

This supplement provides for a change in the species class from pasture cattle (stocker and feeder cattle and dairy and beef replacement heifers) to growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers).

Sponsored By:

Elanco Animal Health
A Division of Eli Lilly & Co.
Lilly Corporate Center
Indianapolis, IN 46285

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RUMENSIN 80
Type A Medicated Article for growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers)

1. GENERAL INFORMATION:

a. File Number:	NADA 095-735
b. Sponsor:	Elanco Animal Health A Division of Eli Lilly & Co. Lilly Corporate Center Indianapolis, IN 46285 Drug Labeler Code: 000986
c. Established Name:	Monensin sodium
d. Proprietary Name:	RUMENSIN 80
e. Dosage Form:	Type A Medicated Article
f. How Supplied:	50 lb bag
g. How Dispensed:	OTC
h. Amount of Active Ingredients:	80 grams per pound (176 g/kg)
i. Route of Administration:	Oral in feed
j. Species/Class:	Growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers)
k. Recommended Dosage:	<u>For increased rate of weight gain</u>: Feed at the rate of not less than 50 nor more than 200 mg per head per day in not less than one pound of Type C Medicated Feed; or after the 5th day, feed at the rate of 400 mg per head per day every other day in not less than 2 pounds of Type C Medicated Feed. The monensin concentration in the pasture Type C Medicated Feed must be between 25 and 400 grams per ton. During the first 5 days, cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed. Do not self feed.

	Prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii*: Feed at a rate to provide 0.14 to 0.42 mg per pound body weight per day depending upon severity of challenge up to a maximum of 200 mg per head per day. The monensin concentration in Type C Medicated Feed must be between 25 and 400 g/ton. During the first 5 days, cattle should receive no more than 100 mg per day contained in not less than 1 pound of feed.
l. Pharmacological Category:	Ionophore
m. Indications:	For increased rate of weight gain; for the prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii* in growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers).
n. Effect of Supplement:	This supplement provides for a change in the species class from pasture cattle (stocker and feeder cattle and dairy and beef replacement heifers) to growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers).

2. EFFECTIVENESS:

a. Dosage Characterization

The dosage for growing cattle fed on pasture or in a drylot was characterized in nine pasture dose titration trials and three greenchop (drylot) dose titration trials in the Freedom on Information (FOI) Summary for the supplemental approval for monensin in pasture cattle (slaughter, stocker, and feeder) (NADA 095735) approved July 28, 1978 (FR 32749, Vol: 43, No. 146, July 28, 1978).

b. Substantial Evidence

The data presented serve as justification for changing the Code of Federal Regulations (CFR) Title 21 §558.355(f)(3)(iii)(b) to more accurately reflect the feeding and management systems utilized in the studies that were the subject of the original approval. The data demonstrated a statistically significant weight gain advantage to growing cattle whether they were fed on pasture or in a drylot.

A. GROWING CATTLE (INCLUDING REPLACEMENT HEIFERS) ON PASTURE

Eleven trials (T1F067839, T1F187834, T1F207848, T1F307853, T1F387568, T1F207630, T1F367767, T1F487435, T1F427824, T1F4876A3, and T1F407804) were submitted on December 16, 1980, supporting the indication for increased rate of weight gain in replacement heifers on pasture (21 CFR §558.355(f)(3)(iii)). Supplements were fed at rates of 1 lb/head/day or mixed into a supplemental ration to deliver 200 mg monensin/head/day. These trials are summarized in Table 1.

Trial T1F407804 measured the effect of monensin on reproduction efficiency and weight change in first-calf replacement beef heifers on pasture. In the remaining 10 trials, heifers were maintained on pasture or in dirt or concrete lots. In trials T1F067839 and T1F187834, beef heifers were maintained on pasture. In trial T1F067839, supplemental barley was either hand-fed or offered free-choice in a self-feeder. In that same trial, some of the pastures were over-grazed, thus requiring alfalfa cubes to be fed for 75 of the 105 days. In trial T1F187834, corn was fed (*ad libitum* to one group) to supplement grazing in two of the treatment groups.

In three trials (T1F207848, T1F307853, and T1F387568), beef heifers were confined in dirt lots. These animals were fed similar rations consisting predominantly of hay, oats, corn, corn silage, and/or sorghum milo silage.

Three trials, (T1F207630, dairy heifers; T1F367767, dairy heifers; and T1F487435 beef heifers) utilized a combination of both pasture and dirt lots. The feeding program in those trials included hay, milo, corn silage and range cubes in addition to bromegrass, and wheat-oat-rye grass pastures.

In one trial (T1F427824) dairy heifers were housed on concrete in pens and fed ensiled hay and corn and supplemented with ground corn and trace minerals.

In 1 trial, (T1F4876A3), beef heifers were fed alfalfa hay and concentrate with three pens of heifers confined to dirt lots and the other three pens on concrete.

In summary, Table 1 shows that heifers fed 200 mg monensin/day grew an average of 0.13 lb/day faster ($P<0.001$) than controls. It also shows that heifers were maintained either on pasture, in confinement or on a combination of pasture plus confinement during the trials.

Table 1 Average Daily Gain (lb) of Heifers Supplemented with Monensin

Trial Number	Pasture	Dirt	Concrete	Monensin Intake (mg/head/day)		Advantage
				0	200	
T1F067839	X			1.17	1.41	+0.24
T1F187834	X			1.85	2.10	+0.25
T1F207848		X		1.40	1.48	+0.08
T1F307853		X		1.08	1.45	+0.37
T1F387568		X		1.36	1.49	+0.13
T1F207630	X	X		1.58	1.71	+0.31
T1F367767	X	X		1.49	1.59	+0.10
T1F487435	X	X		1.00	1.04	+0.04
T1F427824			X	1.33	1.52	+0.19

T1F4876A3		X	X	1.43	1.32	-0.11
T1F407804[a]	X			1.36	1.42	+0.06
Average response				1.37[b]	1.50[c]	+0.13

[a] Long-term reproductive study with first-calf heifers.
[b,c] Means with different superscripts differ significantly ($P<0.001$).

B. GROWING CATTLE FED IN DRYLOTS

The seven trials submitted on May 25, 1983 are summarized in Table 2.

The trials ranged in length from 88 to 126 days and included both steers and heifers. Four of the trials (306-739-4-29, heifers; CA-251, steers; T1F3876D4, heifers; and 306-T1F-5-30, heifers) were conducted on concrete, and two of the trials (306-739-3-1, heifers and 306-739-4-8, steers) were conducted in dirt lots. The report for 306-739-3-12 (steers and heifers) did not state whether dirt or concrete pens were used.

In these trials, 200 mg monensin was fed per head daily with the exception of trial 306-739-3-1 in which monensin was included at 1, 10, 20, or 30 g/ton. Average monensin intake of that trial was 0, 94, 170, and 263 mg/head/day, respectively, assuming that air-dry feed contains 90% dry matter.

Trial CA-251 was designed as a dose titration study and included the following levels of monensin: 0, 50, 100, 200, 300, and 400 mg/head/day. Cattle were fed freshly harvested pasture grass (greenchop) and were maintained on concrete floors. All levels of monensin increased daily live weight gain (1.09, 1.18, 1.20, 1,29, 1.29, and 1.14 lb/day, respectively) with the largest improvement at the 200 mg/head/day level (18.3%). Feed efficiency was also improved by all levels of monensin (13.93, 13.08, 12.92, 11.91, 12.26, and 12.84, respectively) with 200 mg showing the largest improvement over controls.

Trial 306-739-4-29 measured the effect of monensin on the rate of daily weight gain and reproductive efficiency on growing beef heifers fed high-silage rations. Conception rates were 91% for the monensin-fed heifers compared with 87% for the control heifers (no significant difference {$P<0.05$}). Rate of weight change is summarized in Table 2.

The seven trials were conducted in either dirt or concrete lots. Four trials utilized heifers, two trials utilized steers, and one trial utilized both heifers and steers. The pooled least squares treatment means indicated that monensin increased gains by 0.12 lb and improved feed efficiency by 12.6% compared to the controls.

Table 2 Average Daily Gain (lb) of Cattle Fed Medium- to High-Roughage Diets Supplemented with Monensin (Unadjusted Treatment Means by Trial/LS Means)

Trial Number	Sex	Pasture	Dirt	Concrete	Monensin (mg/head/day)		
					0	200	Advantage
CA-251	Steers			X	1.09	1.29	+0.20
T1F3876D4	Heifers			X	1.57	1.68	+0.11
306-T1F-5-30	Heifers			X	1.95	2.04	+0.09
306-739-3-1	Heifers		X		2.35	2.44	+0.09

306-739-3-12[a]	Mixed				1.51	1.62	+0.11
306-739-4-29	Heifers			X	1.46	1.57	+0.11
306-739-4-8	Steers		X		1.14	1.36	+0.22
Average					1.43	1.57	+0.14
LS Treatment Means[b]					1.57	1.69	+0.12

LS = least squares

[a] The report for this study did not indicate whether pasture of dirt or concrete lots were used.

[b] Adjusted for experiment and group within experiment effects

3. TARGET ANIMAL SAFETY:

No new target animal safety data are required for the approval of this supplement. The product's target animal safety in pasture cattle (slaughter, stocker, and feeder) has been established in the Freedom of Information (FOI) Summary for the new animal drug application for RUMENSIN (NADA 095735) dated July 28, 1978 (FR 32749, Vol: 43, No. 146, July 28, 1978). The product's target animal safety in pasture cattle (dairy and beef replacement heifers) has been established in the Freedom of Information (FOI) Summary for the new animal drug application for RUMENSIN (NADA 095735) dated September 28, 1983 (FR 44204, Vol: 48, No. 189, September 28, 1983).

4. HUMAN SAFETY:

No new target animal safety data are required for the approval of this supplement. The product's target animal safety in beef cattle has been established in the Freedom of Information (FOI) Summary for the new animal drug application for RUMENSIN (NADA 095735) in cattle fed in confinement for slaughter dated (FR 58289-58290, Vol:40, No. 242, December 16, 1975).

5. AGENCY CONCLUSIONS:

The data submitted in support of this NADA satisfy the requirements of section 512 of the Federal Food, Drug, and Cosmetic Act and 21 CFR Part 514 of the implementing regulations. The data demonstrate that monensin sodium fed at the rate of not less than 50 nor more than 200 mg per head per day in not less than one pound of Type C Medicated Feed; or after the 5th day, feed at the rate of 400 mg per head per day every other day in not less than 2 pounds of Type C Medicated Feed for increased rate of weight gain or fed at a rate to provide 0.14 to 0.42 mg per pound body weight per day depending upon severity of challenge up to a maximum of 200 mg per head per day for the prevention and control of coccidiosis due to *Eimeria bovis* and *Eimeria zuernii* in growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers) is safe and effective for the claims indicated in section 1 of this FOI Summary.

This approval does not qualify for marketing exclusivity under section 512(c)(2)(F)(iii) of the Federal Food, Drug, and Cosmetic Act.
Pursuant to 21 CFR 514.106 (b)(2)(vi), this supplemental NADA approval is regarded as a Category II supplemental change which required a reevaluation of safety and efficacy data in the parent NADA.

The drug is to be fed in Type C medicated feeds in accordance with section 1 of the FOI Summary and the Blue Bird labeling that is attached to this document.

The Center for Veterinary Medicine has concluded that, for this product, adequate directions for use by the layperson have been provided and the product will have over-the-counter (OTC) status. Label directions provide detailed instruction in plain language. The drug product is not a controlled substance. Thus, the drug product is assigned OTC status, and the labeling is adequate for the intended use.

No patent information was submitted by the sponsor with this application.

6. ATTACHMENTS:

Facsimile Labeling is attached as indicated below:

Type A Medicated Article
Type B Blue Bird Label
Type C Blue Bird Label
Type C Free Choice Mineral Granules Label