Date of Approval: May 13, 2026

FREEDOM OF INFORMATION (FOI) SUMMARY

ORIGINAL NEW ANIMAL DRUG APPLICATION (NADA)

NADA 141-621

CRYSTALYX® IONO-LYX® R800

(monensin Type C free-choice medicated feed)

Growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture

For increased rate of weight gain and for the prevention and control of coccidiosis caused by *Eimeria bovis* and *Eimeria zuernii* in growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture.

Sponsored by:

Ridley USA, Inc.

Executive Summary

CRYSTALYX® IONO-LYX® R800 (monensin Type C free-choice medicated feed) is approved for increased rate of weight gain and for the prevention and control of coccidiosis caused by *Eimeria bovis* and *Eimeria zuernii* in growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture.

Target Animal Safety and Effectiveness

The effectiveness of CRYSTALYX® IONO-LYX® R800 was demonstrated by one multi-site field study that demonstrated that free-choice intake was between 50 and 200 mg monensin per head per day, consistent with the November 18, 2011, supplemental approval for the use of Rumensin™ (monensin Type A medicated article) in monensin Type C free-choice medicated feeds under New Animal Drug Application (NADA) 095-735. The supplemental approval of Rumensin™ estimated the coefficient of variation (CV) associated with monensin intake at 32.4%.

The pivotal consumption and environmental field study enrolled young, healthy steers of various beef breeds at four sites throughout the United States (U.S.). The sites represented typical management practices and forage types for pasture beef cattle in different regions of the U.S. Four replicates of twelve steers at each site were provided free-choice access to a CRYSTALYX® IONO-LYX® R800 block for 98 days following a 14-day adaptation to non-medicated blocks. Over the study period, cattle consumed between 0.26 and 0.43 pounds of the medicated block per head per day, equating to 103.3 to 172.2 mg monensin per head per day. The CV for monensin intake was estimated to be 25.3%. The abnormal health events observed during the study (mainly pinkeye, respiratory issues and lameness) were typical for pasture beef cattle.

The Food and Drug Administration (FDA) did not require the sponsor to conduct new target animal safety studies for the approval. Target animal safety was supported by the target animal safety information for previous approvals of Rumensin™ under NADA 095-735. Target animal safety information was also evaluated in the multi-site study described above. The study did not raise any animal safety concerns.

Human Food Safety

FDA did not require the sponsor to conduct new human food safety studies for the approval. Human food safety was supported by the human food safety information for previous approvals of Rumensin™ under NADA 095-735. FDA determined it was not necessary to reassess the acceptable daily intake (ADI) for total residue of monensin. FDA previously established the ADI for total residue of monensin is 12.5 µg/kg of body weight per day, as listed under 21 CFR 556.420. The safe concentrations for total residue of monensin in individual edible tissues of cattle are 0.05 parts per million (ppm) for muscle, 0.10 ppm for liver, 0.05 ppm for kidney, and 0.05 ppm for fat.

Conclusions

Based on the data submitted by the sponsor for the approval of CRYSTALYX® IONO-LYX® R800, FDA determined that the drug is safe and effective when used according to the labeling.

Table of Contents

I. GENERAL INFORMATION

A. File Number

NADA 141-621

B. Sponsor

Ridley USA, Inc.
111 W Cherry St.
Suite 500
Mankato, MN 56001

Drug Labeler Code: 067949

C. Proprietary Name

CRYSTALYX® IONO-LYX® R800

D. Drug Product Established Name

monensin Type C free-choice medicated feed

E. Pharmacological Category

Ionophore

F. Dosage Form

Type C free-choice medicated feed

G. Amount of Active Ingredient

800 grams monensin per ton (881.8 mg monensin per kg of block)

H. How Supplied

125-lb block
200-lb block
250-lb block

I. Dispensing Status

Over the Counter (OTC)

J. Dosage Regimen

Feed on a free-choice basis. To establish required block consumption, feed cattle a non-medicated low-moisture block for 14 days prior to introduction of this medicated block. After this introductory period, cattle should consume between 0.125 and 0.5 pounds of this medicated block per head per day, to provide 50 to 200 mg monensin per head per day. Feed at the rate of one container for every 10 to 30 head.

K. Route of Administration

Oral

L. Species/Classes

Growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture

M. Indications

For increased rate of weight gain and for the prevention and control of coccidiosis caused by *Eimeria bovis* and *Eimeria zuernii* in growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture.

II. EFFECTIVENESS

Monensin is a new animal drug, manufactured by Elanco US Inc. and approved as a Type A medicated article under NADA 095-735 (Rumensin™ (monensin Type A medicated article)). The medicated block, CRYSTALYX® IONO-LYX® R800 (monensin Type C free-choice medicated feed), was manufactured using Rumensin™ 90 as the source of monensin. The Rumensin™ NADA was supplemented on November 18, 2011, to allow for the use of Rumensin™ in monensin Type C free-choice medicated feeds for increased rate of weight gain and for prevention and control of coccidiosis due to *Eimeria bovis* and *E. zuernii* in growing cattle on pasture or in dry lot (stocker and feeder cattle and dairy and beef replacement heifers). As identified in the November 18, 2011, FOI Summary, the approved dose for Type C free-choice medicated feeds is 50 to 200 mg monensin per head per day. In addition to evaluating effectiveness, Elanco US Inc. measured free-choice intake of various formulations and medicated feed types (e.g., loose mineral, poured blocks) containing monensin and calculated the coefficient of variation (CV) associated with monensin intake (32.4%). The sponsor of a proprietary formulation of a monensin Type C free-choice medicated feed may seek approval by conducting studies to measure intake of their product (i.e., consumption studies) in lieu of conducting full effectiveness studies. This approach requires that the overall study design be similar to that which supported the approval of Rumensin™ in free-choice medicated feeds and that the results meet the established approval criteria: intake of monensin at each site is within the approved range, overall (pooled) monensin intake is within the approved range, and the CV associated with overall monensin intake is less than or equal to 32.4%.

A. Dosage Characterization

This original approval does not change the previously approved dosage range. The FOI Summary for the supplemental approval of NADA 095-735 dated November 18, 2011, contains dosage characterization information supporting the use of Rumensin™ 90 (monensin Type A medicated article) to be used in the manufacture of monensin Type C free-choice medicated feeds for increased rate of weight gain and for the prevention and control of coccidiosis caused by *Eimeria bovis* and *Eimeria zuernii* in growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture.

B. Substantial Evidence

1. Clinical Field Study

Title: Consumption and Environmental Stability Study for Free Choice Ridley R800 Low-moisture Block Medicated Feed Supplement – Monensin with Beef Cattle.

Study Dates: May 23, 2023, to September 22, 2025

Study Locations: This multi-site location consumption study was conducted at four sites: Sidney, NE; Hope, AR; Stillwater, OK; and Versailles, KY.

Study Design:

Objective: To verify consumption and environmental stability of CRYSTALYX® IONO-LYX® R800 during a 98-day feeding period.

Study Animals: The study enrolled 48 steers at each of the 4 sites for a total of 192 steers. Steers were selected as the representative class and the study results are also applicable to heifers. Cattle were of various beef breeds typical of U.S. grazing beef cattle and were estimated to be 5 to 18 months of age and weighed 434 to 836 pounds at the time of study enrollment. Cattle were sourced from university herds or regional auctions. Prior to initiation of the study, cattle were weighed and were examined by a veterinarian.

Animal Housing and Management: Study animals at each site were housed and managed on pastures representing typical management practices and forage types for pasture beef cattle in different regions of the U.S. Three sites (NE, OK, and KY) grazed cool season annual pastures and one site (AR) grazed warm season perennial pastures. Replicate pastures ranged in size from 6.7 to 103 acres. All animals had *ad libitum* access to water. Pastures were deemed sufficient for *ad libitum* intake at the beginning of the study, and provision of hay was only necessary at one site (OK) for a short duration due to limited forage availability. A summary of key dates at each location is in Table II.1.

Table II.1. Summary of Site Locations and Study Dates

Site	Day 0	Day 98
NE	June 14, 2023	September 20, 2023
AR	July 13, 2023	October 19, 2023
OK	January 24, 2024	May 1, 2024
KY	May 30, 2024	September 5, 2024

Experimental Design: This was a single treatment study that followed Good Clinical Practices (GCP) guidelines and was replicated across four locations. All animals were provided access to the same monensin Type C free-choice medicated feed.

Animals were randomly assigned to four replicates (12 animals per replicate) at each site at a stocking rate typical for the geographical area of the study location. Prior to study initiation, cattle were acclimated for 14 days to a non-medicated block similar to the investigational product.

Drug Administration: Upon study initiation, each replicate was provided with a single 250-pound CRYSTALYX® IONO-LYX® R800 block containing 400 g monensin per pound (800 g/ton). Access to the block was provided on a free-choice basis. Tubs were weighed weekly, and cattle and their respective tubs were rotated to a new pasture replicate every two weeks. Tubs were replaced when less than 70 pounds of block remained in the container. Tub location was altered if intake for the prior week was less than 0.125 pounds per head per day or greater than 0.5 pounds per head per day.

Measurements and Observations: Individual and final body weights (BW) were collected at each site. Tub weights were documented prior to placement in a pasture and upon removal from the study. Additionally, tubs were weighed at 7-day intervals once placed in a pasture. Tub weights were used to calculate monensin intake using the difference between the initial and final tub weights. The primary variable was the amount of monensin intake per head daily for each replicate, which was calculated by dividing the total amount consumed by the animal head days in the 14-day period.

All cattle were observed daily for health abnormalities. Any illnesses or injuries were recorded and any treatments documented.

Statistical Method:

Monensin intake was analyzed using a model with site, period, and site by period interaction as fixed effects. The CV was computed by taking the ratio of the square root of the residual mean square error and the overall mean consumption estimated from the model analysis, then multiplying by 100%.

Results:

Only one animal (OK) was removed from the study during week 9 due to chronic lameness. Data from that animal's replicate was omitted from the intake calculation for that week.

The overall mean monensin intake for the study was 144.2 mg monensin per head per day. The mean intake for each site is summarized in Table II.2. The CV for intake was estimated at 25.3%.

Table II.2. Least-Squares Means for Block (lb/head/day) and Monensin Intake (mg/head/day) By Site

Site	Block Intake	Monensin Intake
NE	0.32	131.9
AR	0.42	169.5
OK	0.26	103.3
KY	0.43	172.2

Monensin intake at each site and overall was within the approved intake range of 50 to 200 mg per head per day and the variation associated with intake was less than 32.4%.

Adverse Reactions:

Pinkeye, a common condition observed in grazing beef cattle, was the most frequently observed animal health observation, with multiple cases observed at AR and KY. Infrequent occurrences of respiratory issues, lameness/injury, and gastrointestinal issues were noted at one or more sites. One animal was removed from the study (OK) due to chronic lameness. No observed abnormal health events were attributed to the test article.

Conclusions:

The study demonstrated substantial evidence that consumption of the CRYSTALYX® IONO-LYX® R800 (monensin Type C free-choice medicated feed) is between 50 and 200 mg monensin per head per day and the variation associated with intake is below the accepted threshold established by Elanco US Inc. for the use of Rumensin™ 90 (monensin Type A medicated article) in free-choice medicated feeds.

III. TARGET ANIMAL SAFETY

FDA did not require target animal safety studies for this supplemental approval. The FOI Summary for the supplemental approval of NADA 095-735 dated November 18, 2011, contains target animal safety information for Rumensin™ (monensin Type A medicated article) for growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture when fed a monensin Type C free-choice medicated feed.

The safety of CRYSTALYX® IONO-LYX® R800 was evaluated under intended conditions of use in a multi-location field study, as described in Section II. As noted in that section, abnormal health events were typical for pasture beef cattle. The incidence of these events was less than or consistent with the incidence typically seen under commercial beef production conditions.

IV. HUMAN FOOD SAFETY

A. Microbial Food Safety

This drug is not an antimicrobial. Therefore, the Agency determined that a microbial food safety assessment is not required.

B. Toxicology

Reassessment of the codified ADI was not needed for this original approval. The codified ADI for total residue of monensin is 12.5 µg/kg of body weight per day, as listed under 21 CFR 556.420. The safe concentrations for total residue of monensin in individual edible tissues of cattle are 0.05 parts per million (ppm) for muscle, 0.10 ppm for liver, 0.05 ppm for kidney, and 0.05 ppm for fat.

The FOI Summary for the supplemental approval of NADA 095-735 dated November 18, 2011, contains summaries of all toxicology studies and information for the use of Rumensin™ (monensin Type A medicated article) in monensin Type C free-choice medicated feeds.

C. Residue Chemistry

FDA did not require residue chemistry studies for this original approval. The FOI Summary for the supplemental approval of NADA 095-735 dated November 18, 2011, contains a summary of residue chemistry studies for the use of Rumensin™ in growing beef steers and heifers on pasture (stocker, feeder, and slaughter) and replacement beef heifers on pasture when fed a monensin Type C free-choice medicated feed.

V. USER SAFETY

The product labeling contains the following information regarding safety to humans handling, administering, or exposed to CRYSTALYX® IONO-LYX® R800:

Not for use in humans. Keep out of reach of children.

VI. AGENCY CONCLUSIONS

The data submitted in support of this NADA satisfy the requirements of section 512 of the Federal Food, Drug, and Cosmetic Act (FD&C Act) and 21 CFR part 514. The data demonstrate that CRYSTALYX® IONO-LYX® R800, when used according to the label, is safe and effective for the conditions of use in the General Information Section above. Additionally, data demonstrate that residues in food products derived from species treated with CRYSTALYX® IONO-LYX® R800 will not represent a public health concern when the product is used according to the label.

A. Marketing Status

This product can be marketed OTC because the approved labeling contains adequate directions for use by laypersons and the conditions of use prescribed on the label are reasonably certain to be followed in practice.

B. Exclusivity

CRYSTALYX® IONO-LYX® R800, as approved in our approval letter, qualifies for THREE years of marketing exclusivity beginning as of the date of our approval letter. This drug qualifies for exclusivity under section 512(c)(2)(F)(ii) of the FD&C Act because the sponsor submitted an original NADA that contains new studies that demonstrate the effectiveness of CRYSTALYX® IONO-LYX® R800.

C. Patent Information

For current information on patents, see the Green Book Reports in the Animal Drugs @ FDA database.