Date of Approval: January 11, 2024

FREEDOM OF INFORMATION SUMMARY

ORIGINAL ABBREVIATED NEW ANIMAL DRUG APPLICATION

ANADA 200-766

EquiCoxib™

(firocoxib)

Oral Solution

Horses

EquiCoxib™ Oral Solution is administered for up to 14 days for the control of pain and inflammation associated with osteoarthritis in horses.

Sponsored by:

Aurora Pharmaceutical, Inc.

Executive Summary

EquiCoxib™ (firocoxib) oral solution is approved for administration for up to 14 days for the control of pain and inflammation associated with osteoarthritis in horses. The reference listed new animal drug (RLNAD) is Equioxx® (firocoxib) oral paste sponsored by Boehringer Ingelheim Animal Health USA, Inc. under NADA 141-253. This is the first generic firocoxib oral solution for horses.

Bioequivalence

For this approval, FDA approved a suitability petition to allow the sponsor to submit an ANADA for a generic animal drug that differs in dosage form and strength from the RLNAD.

The sponsor conducted one *in vivo* blood-level study in horses to show that the 9.0 mg/mL EquiCoxib™ (firocoxib) oral solution is bioequivalent to the 8.2 mg/g Equioxx® (firocoxib) oral paste. No serious adverse events were reported during the study.

Conclusions

Based on the data submitted by the sponsor for the approval of EquiCoxib™, FDA determined that the drug is safe and effective when used according to the label.

Table of Contents

I. GENERAL INFORMATION

A. File Number

ANADA 200-766

B. Sponsor

Aurora Pharmaceutical, Inc.
1196 Highway 3 South
Northfield, MN 55057-3009

Drug Labeler Code: 051072

C. Proprietary Name

EquiCoxib™

D. Drug Product Established Name

firocoxib

E. Pharmacological Category

Non-steroidal anti-inflammatory drug (NSAID)

F. Dosage Form

Oral solution

G. Amount of Active Ingredient

9.0 mg/mL

H. How Supplied

90 mL bottle

I. Dispensing Status

Prescription (Rx)

J. Dosage Regimen

0.045 mg/lb (0.1 mg/kg) of body weight once daily for up to 14 days

K. Route of Administration

Oral

L. Species/Class

Horses

M. Indication

EquiCoxib™ Oral Solution is administered for up to 14 days for the control of pain and inflammation associated with osteoarthritis in horses.

N. Reference Listed New Animal Drug

Equioxx®; firocoxib; NADA 141-253; Boehringer Ingelheim Animal Health USA, Inc.

II. BIOEQUIVALENCE

The Federal Food, Drug, and Cosmetic Act (FD&C Act), as amended by the Generic Animal Drug and Patent Term Restoration Act (GADPTRA) of 1988, allows for an abbreviated new animal drug application (ANADA) to be submitted for a generic version of an approved new animal drug (RLNAD). The ANADA sponsor is required to show that the generic product is bioequivalent to the RLNAD, which has been shown to be safe and effective. Effectiveness, target animal safety and human food safety data (other than tissue residue data) are not required for approval of an ANADA. If bioequivalence is demonstrated through a clinical endpoint study in a food-producing animal, then a tissue residue study to establish the withdrawal period for the generic product is also required.

The sponsor submitted a suitability petition (FDA-2020-P-2102) requesting permission to submit an ANADA for a generic new animal drug that differed in dosage form and concentration from the RLNAD. The dosage form was changed from an oral paste to an oral solution and the concentration was changed from 8.2 mg/g to 9.0 mg/mL. This petition was approved on January 13, 2021, under 512(n)(3)(C) of the FD&C Act.

For this ANADA, one *in vivo* blood-level study was conducted to demonstrate product bioequivalence using the generic 9.0 mg/mL EquiCoxib™ (firocoxib) oral solution and the RLNAD 8.2 mg/g Equioxx® (firocoxib) oral paste. The *in vivo* blood-level study was conducted in 24 healthy, fasted horses. The pivotal parameters to evaluate bioequivalence are the observed maximum plasma drug concentration (C_{MAX}) and area under the concentration-time curve (AUC) from time 0 to the last sampling time before the first unquantifiable concentration after C_{MAX}. Bioequivalence was demonstrated between the 8.2 mg/g Equioxx® (firocoxib) oral paste and the 9.0 mg/mL EquiCoxib™ (firocoxib) oral solution by the average bioequivalence approach as described in the Statistical Methods section below. The study information is summarized below.

A. Blood-level Bioequivalence Study in Horses

Title: A Plasma Bioequivalence Study of Aurora's Firocoxib Oral Solution Compared to the Reference Oral Paste in Mature Horses. (Study No. BE-002.00)

Study Dates: June 1, 2021 to May 31, 2022

Study Locations:

In-life phase:	Rockwood, TN
Bioanalytical testing:	Shawnee, KS

Study Design:

Objective: The objective of this study was to determine the comparative *in vivo* blood-level bioequivalence data for the generic 9.0 mg/mL EquiCoxib™ (firocoxib) oral solution and the RLNAD 8.2 mg/g Equioxx® (firocoxib) oral paste in fasted horses.

Study Animals: 24 horses (12 non-pregnant, non-lactating mares and 12 geldings) between 3 and 14 years of age and weighing 710 to 1,160 pounds.

Experimental Design: A randomized, masked, two-period, two-sequence, single-dose crossover study conducted according to Good Laboratory Practice for Nonclinical Laboratory Studies.

Drug Administration: Each animal received 0.045 mg/lb (0.1 mg/kg) of body weight of either the generic or RLNAD firocoxib according to their randomized treatment sequence (generic/RLNAD or RLNAD/generic).

Measurements and Observations: The plasma concentrations of firocoxib were measured using a validated bioanalytical method. Pharmacokinetic parameters were determined for each animal individually in each period. Animal observations were made throughout the study for assessment of general health and adverse events.

Statistical Methods:

The laboratory study was conducted as a randomized, masked two-period, two-sequence, two-treatment, single-dose crossover design using 24 horses with a 28-day washout between periods. Appropriate randomization of animal to sequence and pen/treatment order was performed. Primary variables evaluated were C_{MAX} and AUC. Time to maximum concentration (T_{MAX}) was summarized and evaluated clinically.

A mixed-effect model was used to evaluate bioequivalence. The model included fixed effects of treatment, sequence and period, and a random effects of cohort and subject nested within (sequence and cohort). Prior to the analysis, C_{MAX} and AUC were natural logarithm transformed. Bioequivalence is established because the back-transformed estimated upper and lower bounds of the 90% confidence interval for geometric mean ratios (generic/RLNAD) of both C_{MAX} and AUC are contained within the acceptance limits of 0.80 to 1.25.

Results:

As seen in the table below, C_{MAX} and AUC fall within the prescribed bounds (Table II.1). The mean values of T_{MAX} obtained for the generic article and RLNAD were summarized.

Table II.1. Bioequivalence Evaluation

Parameter	Generic Mean	RLNAD Mean	Ratio◊	Lower 90% CI	Upper 90% CI
AUC (ng/mL)*minute	180807†	179613†	1.01	0.97	1.04
C_{MAX} (ng/mL)	95†	89†	1.07	0.98	1.16
T_{MAX} (hours) (SD)‡	2.0 (1.27)‡	1.7 (0.99)‡	NE	NE	NE

† Geometric mean
‡ Arithmetic mean and standard deviation (SD)
◊ Ratio = Generic/RLNAD
CI = confidence interval
NE = not estimated

Adverse Reactions:

There were no serious adverse events reported during the study.

Conclusion:

The *in vivo* bioequivalence study demonstrated that the generic 9.0 mg/mL EquiCoxib™ (firocoxib) oral solution and the RLNAD 8.2 mg/g Equioxx® (firocoxib) oral paste are bioequivalent in horses.

III. HUMAN FOOD SAFETY

This drug is intended for use in horses. Because this new animal drug is not intended for use in food-producing animals, CVM did not require data pertaining to drug residues in food (i.e., human food safety) for approval of this ANADA.

The product labeling contains the following Warning statement: Do not use in horses intended for human consumption.

IV. USER SAFETY

The product labeling contains the following information regarding safety to humans handling, administering, or exposed to EquiCoxib™:

Human Warnings: Not for use in humans. Keep this and all medications out of the reach of children. Wash hands with soap and water after use. Consult a physician in case of accidental ingestion by humans.

V. AGENCY CONCLUSIONS

The data submitted in support of this ANADA satisfy the requirements of section 512(c)(2) of the FD&C Act. The data demonstrate that EquiCoxib™, when used according to the label, is safe and effective for the conditions of use in the General Information Section above.