

----- GENERAL INFORMATION -----

DATA TITLE: Data for: Plasma pharmacokinetics after administration of cephapirin or cloxacillin intramammary antibiotics in dairy goats

DATA ABSTRACT: Determining the pharmacokinetics of intramammary antimicrobials in goats can assist in predicting appropriate meat and milk withdrawal intervals for drugs that are effective at treating subclinical mastitis due to non-aureus *Staphylococci* during the dry period.

The tabular data presented here is focused on post-treatment drug concentration levels in the plasma at defined time increments and is in .csv format. Twenty-four healthy, lactating does were enrolled in this study, where the subjects were administered antimicrobials. Twelve does were treated with cephapirin benzathine and the other twelve were treated with cloxacillin benzathine.

AUTHORS:

Author: Michelle Buckely

Institution: Iowa State University

Email: mpbuck@iastate.edu

Author: Patrick J Gorden

ORCID: <https://orcid.org/0000-0002-6096-0965>

Institution: Iowa State University

Email: pgorden@iastate.edu

Author: Dwayne Schrunk

Institution: Iowa State University

Email: duey@iastate.edu

Author: Laura Burns

Institution: Iowa State University

Email: lburns@iastate.edu

Author: Kristen Hayman
Institution: Iowa State University

Corresponding author: Patrick Gorden

COLLECTION INFORMATION:

Time period(s): 2022
Location(s): Iowa commercial farm

ASSOCIATED PUBLICATIONS: Plasma pharmacokinetics after administration of cephalixin or cloxacillin intramammary antibiotics in dairy goats (submitted paper publication)

----- FILE DIRECTORY -----

----- FILE LIST-----

There are two spreadsheets in the dataset, one for cloxacillin data and one for cephalixin data.

Buckely-Ceph PK raw data.csv – contains the measured cephalixin plasma concentrations as determined by LC-MS.

Buckely –Clox PK raw data.csv – contains the measured cloxacillin plasma concentrations as determined by LC-MS.

----- CODEBOOK -----

Number Of Columns: 13

Number Of Cases/Rows: 13

Missing Data Codes: Listed as “none detected” if no drug residue was detected in the sample

----- VARIABLES -----

Name <i>[variable name]</i>	Description <i>[what is it?]</i>	Values <i>[units, valid data types, etc.]</i>
ID	Animal ID	Assigned numeric ID
Time	Measured time increments when samples were collected.	Hour count
Drug concentrations	Amount of cephapirin or cloxacillin present in plasma following treatment.	In ng/mL of plasma or none detected

----- METHODS AND MATERIALS -----

----- DATA COLLECTION METHODS -----

Twenty-four healthy, lactating does were enrolled in this study. Half were treated with 300 mg of cephapirin benzathine (ToMORROW, Boehringer Ingelheim Vetmedica, Duluth, GA) via intramammary infusion into each half of the udder. The remaining does were treated with 500 mg cloxacillin benzathine (Orbenin DC, Merck & Co., Rahway, NJ) per half.

Does were randomly assigned to one of two treatment groups: twelve does were selected for treatment with 300 mg of cephapirin benzathine per half (600 mg per doe) and the remaining twelve received 500 mg cloxacillin benzathine per half (1,000 mg per doe). Following treatment, samples were collected before IMM therapy and 3, 6, 12, 24, 36, 48, 73, 96, 120, 144, and 168 hours post-treatment.

Plasma samples were analyzed for cephapirin and cloxacillin based on assigned treatment group via liquid chromatography with tandem mass spectroscopy (LC-MS-MS) by the Iowa State University Analytical Chemistry Laboratory using standardized procedures developed in-house.

Pharmacokinetic parameters were determined using noncompartmental methods via commercial software (MonolixSuite). The mean maximum concentration (C_{max}) of cephapirin of 0.073 µg/mL was noted at 7.06 hours post-administration (T_{max}). The area under the plasma concentration curve based on the final sampling point (AUC_{last}) was 1.06. The mean residence time at the final sampling point (MRT_{last}) was 13.55 hours. Mean terminal half-life (T_{1/2}) of cephapirin was 6.98 hours. In cloxacillin-treated

does, C_{max} was 0.074 µg/mL with a T_{max} of 18 hours, AUC_{last} was 5.71, T_{1/2} was 77.45 hours and MRT_{last} was 65.36 hours.

----- LICENSING -----

This work is licensed under the Creative Commons Attribution (CC-BY) 4.0 International License. For more information visit: <https://creativecommons.org/licenses/by/4.0>