United States Department of Agriculture

Food Safety and Inspection Service

CLG-MRM3.04

Screening and Confirmation of Animal Drug Residues by UHPLC-MS-MS

This method describes the laboratory procedure for screening and confirmation of animal drug residues in bovine, poultry, porcine, caprine, and ovine kidney and muscle tissue, liquid egg products, and fish of the order Siluriformes (catfish) muscle tissue at the minimum levels of applicability listed in Tables 20-26.

Notice of Change

This method has been modified for:

The requirements for water used in the method has been changed.

The MLA of Doramectin in Universal Blk Muscle has been changed.

Table of Contents

Safety Precautions

The personnel performing the analysis are to read the Safety Data Sheets for the standards and reagents used in this method. Follow all applicable federal, state, and local regulations regarding the disposal of chemicals listed in this method.

Introduction

Raising food producing animals depends on animal drugs to maintain good animal health. The animal drugs are used to prevent or treat diseases and increase growth and feed efficiency. The CLG-MRM3 method is used by the Food Safety and Inspection Service (FSIS) to detect animal drug residues from the use of animal drugs. The method analyzes for 107 animal drugs in 15 drug classes: 8 analgesics/anti-inflammatories, 5 β-agonists, 7 benzimidazoles, 6 avermectins, 10 β -lactam/cephalosporins, 8 fluoroquinolones, 3 hormones, 11 macrolides, 4 ionophores, 4 general drugs, 7 nitroimidazoles, 16 sulfonamides, 4 tetracyclines, 3 phenicols, and 11 tranquilizers/sedatives.

The Food and Drug Administration (FDA) through the Federal Food, Drug, and Cosmetic Act has the authority to approve and regulate the use of animal drugs. FDA establishes and publishes regulations setting tolerances for residues of animal drugs. The FSIS method CLG-MRM3 was initially developed in collaboration with the FDA by the Agricultural Research Service (ARS), and FSIS has further optimized the method. FSIS collects and tests samples of domestic and imported meat (including Siluriformes fish products), poultry, and egg products for animal drugs to verify that meat, poultry, and egg products meet tolerances and are safe, wholesome, and accurately labeled.

The National Residue Program (NRP) is an interagency program designed to identify, rank, and analyze for residues in meat, poultry, and egg products. FSIS publishes an Annual Sampling Plan to provide information on the process of sampling meat, poultry, and egg products for animal drugs of public health concern. The NRP is monitored and modified annually to set future priorities if data shows trends in detected residues.

Method Overview:
Chemical residues from animal drugs are extracted from tissue using a solution of acetonitrile and water. The extracted residues are examined using UHPLC-MS-MS with a tandem mass spectrometer under electrospray ionization (ESI) conditions.

This method describes the laboratory procedure for screening and confirmation of animal drug residues in bovine, poultry, porcine, caprine, and ovine kidney and muscle tissue, liquid egg products, and fish of the order Siluriformes (catfish) muscle tissue at the minimum levels of applicability (MLA) listed in Tables 20-26.

KEY DEFINITIONS

Reversed-phase HPLC: A type of chromatography that uses a non-polar stationary phase

UHPLC-MS-MS: An analytical technique where there is a physical separation of target compounds followed by their mass-based detection.

MLA: Lowest level at which an FSIS method has been successfully validated for a residue in each matrix.

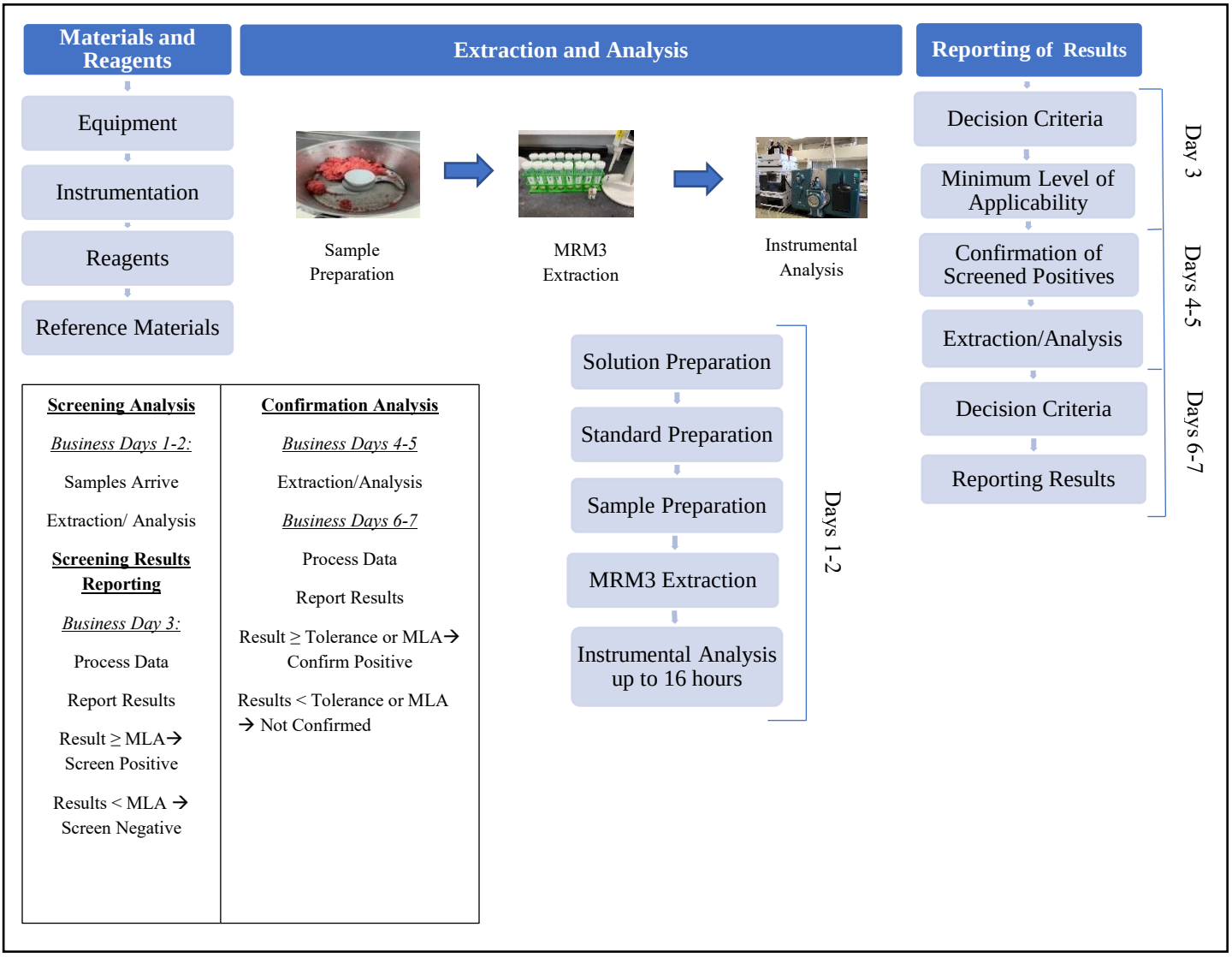


Figure 1: Overview and timeframe of MRM3. Materials and reagents are obtained and utilized to prepare solutions and standards. The samples arrive at laboratory, are prepared into a homogenized mixture, weighed, extracted, and analyzed by UHPLC-MS/MS on business days 1-2. Screening results are reported on business day 3. Confirmation analysis is done on business days 4-5. Confirmation results are reported on business days 6-7.

Decision Criteria

A sample is considered negative if the results are less the than the Minimum Level of Applicability (MLA). A sample is considered a screened positive if the results are greater than or equal to the MLA. Screened positive results will require further analysis through additional methods.

Disclosure Statement

FSIS does not specifically endorse any test products listed in this method. FSIS acknowledges that equivalent equipment, reagents, or solutions may be suitable for laboratory use. The FSIS laboratory system uses method performance requirements when evaluating the equivalence of an alternative equipment, reagent, or solution for a given analyte and sample matrix pair. Significant equivalence changes would require FSIS laboratory leadership approval.

Materials and Reagents

Equipment

Table 1: Equipment Required to Perform CLG-MRM3

Equipment	Supplier and Part Number	Purpose
Pulsating vortex platform shaker	General lab supplier	Facilitates extraction of residue from the sample.
Centrifuge capable of ~ 4600 RPM	General lab supplier	Separates the solid sample material from the extraction solution.
Top Loading Balance	General lab supplier	Record weight of quality controls and samples. Minimum accuracy ±0.01g.
Centrifuge tubes Polypropylene (PP), 50 mL	General lab supplier	Contain sample material and extraction vessel
LC vials with screw cap lids - Amber glass, 4 mL	General lab supplier	Store standard solutions
Plastic screw cap vials - Polypropylene, 4 mL	General lab supplier	Store standard solutions
Screw top, amber glass, autosampler vials, PTFE septa, 2 mL	General lab supplier	Storage of extract
Food Processor	Robot Coupe USA Inc.	Homogenize sample
Freezer, -10 °C	General lab supplier	Storage of standards and reagents

Instrumentation

Table 2: Instrumentation

Instrument	Supplier and Model Number	Purpose
1290 Infinity UHPLC with Sciex QTrap 6500+ mass spectrometer	Agilent/Sciex	Sample extract analysis
Kinetex core-shell C18 column, 50 × 3 mm, 1.7 µm	Phenomenex, 00B-4475-Y0	Sample extract analysis
SecurityGuard ULTRA Cartridges, UHPLC C18 3.0mm ID Columns	Phenomenex, AJ0-8775	Sample extract analysis
SecurityGuard ULTRA Holder, for UHPLC Columns 2.1 to 4.6mm ID	Phenomenex, AJ0-9000	Sample extract analysis

Reagents

Table 3: Reagents

Reagent	Supplier and Part Number
Acetonitrile (ACN) - LC-MS Grade	General lab supplier
Formic acid, LC-MS grade	General lab supplier
Water – Resistivity of > 18 MΩ-cm	House system
Sodium hydroxide (NaOH) - pellets	General lab supplier
Methanol (MeOH)	General lab supplier
Dimethyl Sulfoxide (DMSO)	General lab supplier
Acetone	General lab supplier

Reference Materials

Table 4: Reference Materials

Standard	Supplier	Catalog Number
2-amino-Flubendazole	Sigma Aldrich	32841
2-Aminosulfone Albendazole	Toronto Research Co.	A580950
2-Quinoxaline Carboxylic Acid (QCA)	Absolute Standards	91819
Abamectin	Sigma Aldrich	31732
Acepromazine	Sigma Aldrich	A7111
Albendazole	Sigma Aldrich	A4673
Amoxicillin	US Pharmacopeia	1031503
Ampicillin	Sigma Aldrich	A1593
Azaperone	Sigma Aldrich	34223
Butorphanol	Sigma Aldrich	B9156
Carazolol	Sigma Aldrich	53787
Carbadox	MP Biomedicals, LLC	194154
Cefazolin	Sigma Aldrich	C5020
Chloramphenicol	Sigma Aldrich	31667
Chlorpromazine	Sigma Aldrich	C8138
Chlortetracycline	US Pharmacopeia	1129007
Cimaterol	Sigma Aldrich	32568
Ciprofloxacin	US Pharmacopeia	1134313
Clenbuterol	Sigma Aldrich	C5423
Clindamycin	Sigma Aldrich	C5269
Cloxacillin	US Pharmacopeia	1142005
Danofloxacin	Sigma Aldrich	33700
DCCD	Toronto Research	D289905
Desacetyl Cephapirin	Toronto Research	D288970
Desethylene Ciprofloxacin	Toronto Research	D289150

Diclofenac	Sigma Aldrich	D6899
Dicloxacillin	US Pharmacopeia	1189009
Difloxacin	Sigma Aldrich	33984
Dimetridazole	Sigma Aldrich	D4025
Dimetridazole - OH	Sigma Aldrich	34003
Dipyrone	Sigma Aldrich	46232
Doramectin	Sigma Aldrich	33993
Doxycycline	Sigma Aldrich	D9891
Emamectin Benzoate	Sigma Aldrich	31733
Enrofloxacin	Sigma Aldrich	33699
Eprinomectin	Sigma Aldrich	32526
Erythromycin A	Sigma Aldrich	E0774
Fenbendazole	Sigma Aldrich	F5396
Fenbendazole sulphone	Sigma Aldrich	32544
Florfenicol	Sigma Aldrich	F1427
Florfenicol Amine	Sigma Aldrich	32492
Flubendazole	Sigma Aldrich	34091
Flunixin	US Pharmacopeia	1274607
Flunixin - d_3	Sigma Aldrich	34083
Gamithromycin	Sigma Aldrich	32161
Haloperidol	Sigma Aldrich	H1512
Ipronidazole	Sigma Aldrich	32173
Ipronidazole - OH	Sigma Aldrich	34004
Ivermectin	US Pharmacopeia	1354309
Ketamine	Sigma Aldrich	K2753
Ketoprofen	Sigma Aldrich	K1751
Lasalocid A	Sigma Aldrich	33339
Levamisole	Sigma Aldrich	31742

Lincomycin	Sigma Aldrich	L6004
Melengestrol Acetate	US Pharmacopeia	1379254
Meloxicam	Sigma Aldrich	M3935
Metronidazole	Sigma Aldrich	M3761
Metronidazole - OH	Sigma Aldrich	34007
Monensin	Sigma Aldrich	46468
Morantel tartrate	Sigma Aldrich	M5529
Moxidectin	Sigma Aldrich	33746
Nafcillin	US Pharmacopeia	1450007
Narasin	US Pharmacopeia	1457458
Norfloxacin	Sigma Aldrich	N9890
Orbifloxacin	Sigma Aldrich	34041
Oxacillin	US Pharmacopeia	1481000
Oxyphenylbutazone	Toronto Research	876950
Oxytetracycline	Sigma Aldrich	O5875
Penicillin G	US Pharmacopeia	1502508
Penicillin G - d_7	Toronto Research	B288600
Phenylbutazone	MP Biochemicals	153567
Pirlimycin	Toronto Research	P509300
Prednisone	Sigma Aldrich	P6254
Promethazine	Sigma Aldrich	P4651
Propionylpromazine	Sigma Aldrich	P7780
Ractopamine	Sigma Aldrich	34198
Ronidazole	Sigma Aldrich	R7635
Salbutamol	Sigma Aldrich	S8260
Salinomycin	Sigma Aldrich	46729
Sarafloxacin	Sigma Aldrich	33497
Selamectin	Sigma Aldrich	32476

Sulfachloropyridazine	Sigma Aldrich	46778
Sulfadiazine	Sigma Aldrich	S8626
Sulfadimethoxine	Sigma Aldrich	46794
Sulfadoxine	US Pharmacopeia	1626500
Sulfaethoxypyridazine	Fluka	2743
Sulfamerazine	Sigma Aldrich	S8876
Sulfamethazine	Sigma Aldrich	S6256
Sulfamethazine Phenyl - $^{13}C_6$	Sigma Aldrich	32519
Sulfamethizole	Sigma Aldrich	S5632
Sulfamethoxazole	Sigma Aldrich	S7507
Sulfamethoxypyridazine	Sigma Aldrich	S7257
Sulfanilamide	Sigma Aldrich	46874
Sulfanitran	Sigma Aldrich	46882
Sulfapyridine	Sigma Aldrich	S6252
Sulfaquinoxaline	Sigma Aldrich	45662
Sulfathiazole	Sigma Aldrich	S9876
Sulfisoxazole	Sigma Aldrich	31739
Taleranol (B-Zearalanol)	Sigma Aldrich	Z0417
Tetracycline	US Pharmacopeia	1651009
Thiabendazole	Sigma Aldrich	T8904
Tildipirosin	Toronto Research	T440150
Tilmicosin	Sigma Aldrich	33864
Tolfenamic Acid	Sigma Aldrich	T0535
Triflupromazine	Sigma Aldrich	46976
Tulathromycin A	Pfizer	CP-472,295
Tylosin	Sigma Aldrich	T6134
Tylvalosin	Toronto Research	T898210
Virginiamycin	Sigma Aldrich	V2753

Xylazine	Sigma Aldrich	X1126
Zilpaterol	Sigma Aldrich	32379

Purity and counterions are to be taken into account when calculating standard concentrations. In-house prepared standards are to be assigned an expiration date that is no later than the stability stated in the method.

Extraction and Analysis

Solution Preparation

Table 5: Solutions

80:20 Acetonitrile/Water	1) Measure 800 mL of acetonitrile using a graduated cylinder and transfer to a container. 2) Measure 200 mL of deionized water using a graduated cylinder and add to the container containing the acetonitrile. 3) Mix solution and transfer to a dispenser bottle.
50:50 Acetonitrile/Methanol	1) Add equal volumes of acetonitrile and methanol to a container and mix. 2) Transfer solution to a storage vessel.
0.03 M Sodium Hydroxide	1) Add 0.12 g of NaOH to a 100 ml volumetric flask containing 80 mL of deionized water. 2) Mix and allow solution to cool. 3) Adjust to final volume using deionized water. 4) Store in a plastic container.
UHPLC Aqueous Mobile Phase (0.1% Formic Acid in water)	1) Add 1.0 mL of formic acid to a 1 L volumetric flask. 2) Dilute to volume with deionized water. 3) Mix and transfer to the aqueous reservoir of the LC.
UHPLC Organic Mobile Phase (Acetonitrile, 0.1% Formic Acid)	1) Add 1.0 mL of formic acid into a 1 L volumetric flask. 2) Bring to volume using acetonitrile. 3) Mix and transfer to the organic reservoir of the LC.

Standard Preparation

Table 6: Single Analyte Stock Standards

Single-analyte Stock Standard Solutions Beta-Lactam Stock Standard Solutions expire after 2 months. Acetonitrile mix stock standards expire after 6 months. Internal Standard Mix" stock standards expire after 2 months for Penicillin G - d_7, or 6 months for Flunixin - d_3 and Sulfamethazine Phenyl - $^{13}C_6$. Store at ≤ -10°C.	1) For each stock solution, calculate the amount of base material needed (ex. accounting for purity and/or water and counterion content) to prepare at the concentration listed in Table 7 using the appropriate solvent listed. 2) Other concentrations are to be used based on two criteria: a) Solubility of the drug in the solvent b) Cost and availability of the drug 3) When DMSO is referenced in Table 7, Solvent used, dissolve the weighed standard with an appropriate volume of DMSO and dilute to volume with appropriate solvent. 4) The stock standard solutions identified with an asterisk (*) symbol in Table 7 may require gentle heating at the time of preparation and before preparation of mixed working standards to aid in the dissolution of material.

Table 7: Stock Standard Concentrations

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
2-amino-Flubendazole	Acetonitrile Mix	12.5% DMSO in Acetonitrile	1000
2-Aminosulfone Albendazole	Acetonitrile Mix	12.5% DMSO in Methanol	1000
2-Quinoxaline Carboxylic Acid (QCA)	Acetonitrile Mix	Purchased	15
Abamectin	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Acepromazine	Acetonitrile Mix	Acetonitrile	1000
* Albendazole	Acetonitrile Mix	12.5% DMSO in Acetonitrile	1000
Amoxicillin	Beta Lactam Mix	Water	350
Ampicillin	Beta Lactam Mix	Water	250
Azaperone	Acetonitrile Mix	Methanol	1000
Butorphanol	Acetonitrile Mix	Methanol	1000
Carazolol	Acetonitrile Mix	Acetonitrile	1000
Carbadox	Acetonitrile Mix	100% DMSO	1000
Cefazolin	Beta Lactam Mix	Water	400
Chloramphenicol	Acetonitrile Mix	Acetonitrile	1000
Chlorpromazine	Acetonitrile Mix	Acetonitrile	1000
Chlortetracycline	Acetonitrile Mix	Methanol	500
Cimaterol	Acetonitrile Mix	Acetonitrile	1000
Ciprofloxacin	Acetonitrile Mix	0.03 M NaOH	1000
* Clenbuterol	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
* Clindamycin	Acetonitrile Mix	Acetonitrile	1000
Cloxacillin	Beta Lactam Mix	Water	200
Danofloxacin	Acetonitrile Mix	0.03 M NaOH	1000
* DCCD	Beta Lactam Mix	Water	300
Desacetyl Cephaprin	Beta Lactam Mix	Water	250
Desethylene Ciprofloxacin	Acetonitrile Mix	0.03 M NaOH	300
Diclofenac	Acetonitrile Mix	6% DMSO in Acetonitrile	1000
Dicloxacillin	Beta Lactam Mix	Water	200
Difloxacin	Acetonitrile Mix	50% ACN/MeOH	500
Dimetridazole	Acetonitrile Mix	Acetonitrile	1000
Dimetridazole - OH	Acetonitrile Mix	Acetone	1000
Dipyrone	Acetonitrile Mix	Methanol	1000
Doramectin	Acetonitrile Mix	Acetonitrile	1000
Doxycycline	Acetonitrile Mix	Methanol	1000
Emamectin Benzoate	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Enrofloxacin	Acetonitrile Mix	Acetonitrile	500
Eprinomectin	Acetonitrile Mix	Acetonitrile	1000
Erythromycin A	Acetonitrile Mix	Acetonitrile	1000
* Fenbendazole	Acetonitrile Mix	12.5% DMSO in Methanol	1000
* Fenbendazole sulphone	Acetonitrile Mix	12.5% DMSO in Acetonitrile	1000
Florfenicol	Acetonitrile Mix	Acetonitrile	1000
Florfenicol Amine	Acetonitrile Mix	Acetonitrile	1000
* Flubendazole	Acetonitrile Mix	12.5% DMSO in Acetonitrile	1000
Flunixin	Acetonitrile Mix	Methanol	1000
Flunixin - d_3	Internal Standard Mix	Methanol	1000
Gamithromycin	Acetonitrile Mix	Acetonitrile	500
Haloperidol	Acetonitrile Mix	Methanol	1000
Ipronidazole	Acetonitrile Mix	Acetonitrile	250
Ipronidazole - OH	Acetonitrile Mix	Acetonitrile	250
Ivermectin	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Ketamine	Acetonitrile Mix	Purchased	1000
Ketoprofen	Acetonitrile Mix	Acetonitrile	1000
Lasalocid A	Acetonitrile Mix	Purchased	100
Levamisole	Acetonitrile Mix	12.5% DMSO in Methanol	1000
Lincomycin	Acetonitrile Mix	50% ACN/MeOH	500
Melengestrol Acetate	Acetonitrile Mix	Acetonitrile	1000
Meloxicam	Acetonitrile Mix	Acetonitrile	1000
Metronidazole	Acetonitrile Mix	Acetonitrile	1000
Metronidazole - OH	Acetonitrile Mix	Acetonitrile	500
Monensin	Acetonitrile Mix	Methanol	1000
Morantel tartrate	Acetonitrile Mix	Water	1000
Moxidectin	Acetonitrile Mix	Acetonitrile	1000
Nafcillin	Beta Lactam Mix	Water	300
Narasin	Acetonitrile Mix	Methanol	1000
* Norfloxacin	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
* Orbifloxacin	Acetonitrile Mix	Methanol	500
Oxacillin	Beta Lactam Mix	Water	200
Oxyphenylbutazone	Acetonitrile Mix	Acetonitrile	1000
Oxytetracycline	Acetonitrile Mix	Methanol	1000
Penicillin G	Beta Lactam Mix	Water	250
Penicillin G - d_7	Internal Standard Mix	Water	500
Phenylbutazone	Acetonitrile Mix	Acetonitrile	1000
Pirlimycin	Acetonitrile Mix	50% ACN/MeOH	1000
Prednisone	Acetonitrile Mix	Methanol	1000
Promethazine	Acetonitrile Mix	Acetonitrile	1000
Propionylpromazine	Acetonitrile Mix	Acetonitrile	1000
Ractopamine	Acetonitrile Mix	Water	1000
Ronidazole	Acetonitrile Mix	Acetonitrile	1000
* Salbutamol	Acetonitrile Mix	Acetonitrile	1000
Salinomycin	Acetonitrile Mix	Acetonitrile	1000

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Sarafloxacin	Acetonitrile Mix	Methanol	1000
Selamectin	Acetonitrile Mix	Acetonitrile	1000
Sulfachloropyridazine	Acetonitrile Mix	Acetonitrile	1000
* Sulfadiazine	Acetonitrile Mix	Acetonitrile	1000
Sulfadimethoxine	Acetonitrile Mix	Acetonitrile	1000
Sulfadoxine	Acetonitrile Mix	Acetonitrile	1000
Sulfaethoxypyridazine	Acetonitrile Mix	Acetonitrile	1000
Sulfamerazine	Acetonitrile Mix	Acetonitrile	1000
Sulfamethazine	Acetonitrile Mix	Acetonitrile	1000
Sulfamethazine Phenyl - $^{13}C_6$	Internal Standard Mix	Acetonitrile	1000
Sulfamethizole	Acetonitrile Mix	Acetonitrile	1000
Sulfamethoxazole	Acetonitrile Mix	Acetonitrile	1000
Sulfamethoxypyridazine	Acetonitrile Mix	Acetonitrile	1000
Sulfanilamide	Acetonitrile Mix	Acetonitrile	500
Sulfanitran	Acetonitrile Mix	Acetonitrile	500

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Sulfapyridine	Acetonitrile Mix	Acetonitrile	1000
* Sulfaquinoxaline	Acetonitrile Mix	Acetonitrile	500
Sulfathiazole	Acetonitrile Mix	Acetonitrile	1000
Sulfisoxazole	Acetonitrile Mix	Acetonitrile	1000
Taleranol (B-Zearalanol)	Acetonitrile Mix	Methanol	1000
Tetracycline	Acetonitrile Mix	Methanol	500
Thiabendazole	Acetonitrile Mix	Methanol	1000
Tildipirosin	Acetonitrile Mix	Methanol	1000
Tilmicosin	Acetonitrile Mix	Acetonitrile	1000
Tolfenamic Acid	Acetonitrile Mix	Acetonitrile	1000
Triflupromazine	Acetonitrile Mix	3% DMSO in Acetonitrile	1000
Tulathromycin A	Acetonitrile Mix	Acetonitrile	1000
Tylosin	Acetonitrile Mix	Acetonitrile	1000
Tyvalosin	Acetonitrile Mix	Methanol	1000
Virginiamycin	Acetonitrile Mix	Methanol	250

Standard Analyte	Category	Solvent used	Stock Standard Solution Concentration (ng/µL)
Xylazine	Acetonitrile Mix	Acetonitrile	1000
Zilpaterol	Acetonitrile Mix	Water	1000

Preparation of Intermediate Standard Solutions

Table 8: Intermediate standard solutions

Intermediate standard solutions Expires after 6 months. Store at ≤ -10°C.	1) Prepare individual intermediate standard solutions as described for the analytes in Table 9 in 10 mL volumetric flasks. 2) Calculate the volume based on the actual single analyte stock standard concentration to prepare at the concentration listed in Table 9 using the appropriate solvent listed.

Table 9: Intermediate Standard Solutions Preparation

Standard Analyte	Stock Standard Solution Concentration (ng/µL)	Stock Standard Solution Volume (µL)	Solvent Used	Intermediate Standard Solution concentration (ng/µL)
Azaperone	1000	1000	Methanol	100
Butorphanol	1000	1000	Methanol	100
Carazolol	1000	1000	Acetonitrile	100
Chloramphenicol	1000	500	Acetonitrile	50
Chlorpromazine	1000	1000	Acetonitrile	100
Cimaterol	1000	500	Acetonitrile	50
Dimetridazole	1000	1000	Acetonitrile	100
Haloperidol	1000	1000	Methanol	100
Metronidazole	1000	1000	Acetonitrile	100
Promethazine	1000	1000	Acetonitrile	100

Standard Analyte	Stock Standard Solution Concentration (ng/µL)	Stock Standard Solution Volume (µL)	Solvent Used	Intermediate Standard Solution concentration (ng/µL)
Propionylpromazine	1000	1000	Acetonitrile	100
Ractopamine	1000	500	Water	50
Ronidazole	1000	1000	Acetonitrile	100
Salbutamol	1000	500	Acetonitrile	50
Triflupromazine	1000	1000	Acetonitrile	100
Xylazine	1000	1000	Acetonitrile	100
Zilpaterol	1000	1000	Water	100

Photo courtesy: Getty Images

Composite working (spiking) and internal standard working (spiking) mix preparation

Table 10: Acetonitrile Mix Working Solution

Acetonitrile Mix Working Solution Expires after 6 months. Store at ≤ -10°C.	1) Calculate the volume of stock or intermediate stock solution required to give the working standard concentration listed for each analyte in Table 11. 2) Pipet the calculated volume of stock into a 100 mL volumetric flask. 3) Dilute to 100 mL volume with acetonitrile. 4) Cap the flask and mix. 5) Transfer into 4 mL amber glass LC vials with screw cap lids.

Table 11: "Acetonitrile Mix" Working Standard Solution Preparation

Standard Analyte	Stock or Intermediate Standard Solution Concentration (ng/µL)	Stock or Intermediate Standard Solution Volume (µL)	Acetonitrile Mix Working Standard Solution Concentration (ng/µL)
2-amino-Flubendazole	1000	50	0.5
2-Aminosulfone Albendazole	1000	125	1.25
2-Quinoxaline Carboxylic Acid (QCA)	15	5000	0.75
Abamectin	1000	125	1.25
Acepromazine	1000	20	0.2
Albendazole	1000	125	1.25
Azaperone	100	50	0.05
Butorphanol	100	50	0.05
Carazolol	100	50	0.05
Carbadox	1000	75	0.75
Chloramphenicol	50	300	0.15
Chlorpromazine	100	50	0.05
Chlortetracycline	500	10000	50
Cimaterol	50	300	0.15
Ciprofloxacin	1000	125	1.25
Clenbuterol	1000	15	0.15
Clindamycin	1000	250	2.5
Danofloxacin	1000	125	1.25
Desethylene Ciprofloxacin	300	417	1.25
Diclofenac	1000	25	0.25
Difloxacin	500	250	1.25
Dimetridazole	100	50	0.05

Standard Analyte	Stock or Intermediate Standard Solution Concentration (ng/µL)	Stock or Intermediate Standard Solution Volume (µL)	Acetonitrile Mix Working Standard Solution Concentration (ng/µL)
Dimetridazole - OH	1000	250	2.5
Dipyrone	1000	125	1.25
Doramectin	1000	37.5	0.375
Doxycycline	1000	125	1.25
Emamectin Benzoate	1000	37.5	0.375
Enrofloxacin	500	250	1.25
Eprinomectin	1000	37.5	0.375
Erythromycin A	1000	250	2.5
Fenbendazole	1000	1000	10
Fenbendazole sulphone	1000	1000	10
Florfenicol	1000	500	5
Florfenicol Amine	1000	750	7.5
Flubendazole	1000	50	0.5
Flunixin	1000	62.5	0.625
Gamithromycin	500	500	2.5
Haloperidol	100	50	0.05
Ipronidazole	250	20	0.05
Ipronidazole - OH	250	20	0.05
Ivermectin	1000	37.5	0.375
Ketamine	1000	100	1
Ketoprofen	1000	25	0.25
Lasalocid A	100	100	0.1
Levamisole	1000	250	2.5

Standard Analyte	Stock or Intermediate Standard Solution Concentration (ng/µL)	Stock or Intermediate Standard Solution Volume (µL)	Acetonitrile Mix Working Standard Solution Concentration (ng/µL)
Lincomycin	500	500	2.5
Melengestrol Acetate	1000	100	1
Meloxicam	1000	50	0.5
Metronidazole	100	50	0.05
Metronidazole - OH	500	40	0.2
Monensin	1000	100	1
Morantel tartrate	1000	1750	17.5
Moxidectin	1000	37.5	0.375
Narasin	1000	100	1
Norfloxacin	1000	125	1.25
Orbifloxacin	500	250	1.25
Oxyphenylbutazone	1000	250	2.5
Oxytetracycline	1000	2500	25
Phenylbutazone	1000	250	2.5
Pirlimycin	1000	1250	12.5
Prednisone	1000	250	2.5
Promethazine	100	50	0.05
Propionylpromazine	100	50	0.05
Ractopamine	50	300	0.15
Ronidazole	100	50	0.05
Salbutamol	50	300	0.15
Salinomycin	1000	100	1
Sarafloxacin	1000	125	1.25

Standard Analyte	Stock or Intermediate Standard Solution Concentration (ng/µL)	Stock or Intermediate Standard Solution Volume (µL)	Acetonitrile Mix Working Standard Solution Concentration (ng/µL)
Selamectin	1000	37.5	0.375
Sulfachloropyridazine	1000	250	2.5
Sulfadiazine	1000	250	2.5
Sulfadimethoxine	1000	250	2.5
Sulfadoxine	1000	250	2.5
Sulfaethoxypyridazine	1000	250	2.5
Sulfamerazine	1000	250	2.5
Sulfamethazine	1000	250	2.5
Sulfamethizole	1000	250	2.5
Sulfamethoxazole	1000	250	2.5
Sulfamethoxypyridazine	1000	250	2.5
Sulfanilamide	500	500	2.5
Sulfanitran	500	500	2.5
Sulfapyridine	1000	250	2.5
Sulfaquinoxaline	500	500	2.5
Sulfathiazole	1000	250	2.5
Sulfisoxazole	1000	100	1
Taleranol (B-Zearalanol)	1000	60	0.6
Tetracycline	500	5000	25
Thiabendazole	1000	250	2.5
Tildipirosin	1000	2500	25
Tilmicosin	1000	300	3
Tolfenamic Acid	1000	125	1.25

Standard Analyte	Stock or Intermediate Standard Solution Concentration (ng/µL)	Stock or Intermediate Standard Solution Volume (µL)	Acetonitrile Mix Working Standard Solution Concentration (ng/µL)
Triflupromazine	100	50	0.05
Tulathromycin A	1000	5000	50
Tylosin	1000	500	5
Tylvalosin	1000	125	1.25
Virginiamycin	250	1000	2.5
Xylazine	100	50	0.05
Zilpaterol	100	150	0.15

Table 12: "Beta-Lactam Mix" working solution preparation

"Beta-Lactam Mix" working solution Expires after 2 months Solutions will be stored at ≤ -10°C.	1) Calculate the volume of stock solution required to give the working standard concentration listed for each analyte in Table 13. 2) Pipet the calculated volume of stock into a 25 mL volumetric flask. 3) Dilute to 25 mL volume with water. 4) Cap flask and mix. 5) Transfer into 4 mL polypropylene vials with screw cap lids.

Table 13: "Beta-Lactam Mix" Working Standard Solution

Standard Analyte	Stock Standard Solution Concentration (ng/µL)	Stock Standard Solution Volume (µL)	Beta-Lactam Mix Working Standard Solution Concentration (ng/µL)
Amoxicillin	350	71.4	1
Ampicillin	250	25	0.25
Cefazolin	400	156.3	2.5
Cloxacillin	200	31.3	0.25
DCCD	300	208	2.5
Desacetyl Cephaprin	250	250	2.5
Dicloxacillin	200	312.5	2.5
Nafcillin	300	208.3	2.5
Oxacillin	200	312.5	2.5
Penicillin G	250	125	1.25

Photo courtesy: Getty Images

Table 14: Internal Standard Mix Working Standard Solution Preparation

Internal Standard Mix Working Standard Solution Expires after 2 months Store at ≤ -10°C.	1) Calculate the volume of stock solution required to give the working standard concentration listed for each analyte in Table 15. 2) Pipet the calculated volume of stock into a 25 mL volumetric flask. 3) Dilute to 25 mL with acetonitrile. 4) Cap flask and mix. 5) Transfer into 4 mL amber glass LC vials with screw cap lids.

Table 15 – "Internal Standard Mix" Working Standard Solution

Standard Analyte	Stock Standard Solution Concentration (ng/µL)	Stock Standard Solution Volume (µL)	Working Standard Solution Concentration (ng/µL)
Flunixin - d_3	1000	500	20
Penicillin G - d_7	500	1000	20
Sulfamethazine Phenyl - $^{13}C_6$	1000	500	20

When preparing an External Calibration Curve for system suitability, use Table 16 to prepare external standards. External Calibration Curve solutions are prepared the day of use.

Table 16 – Preparation of External Standards

Level	Acetonitrile Standard Mix Volume (µL)	Beta Lactam Standard Mix Volume (µL)	Internal Standard Mix Volume (µL)	80:20 Acetonitrile/ Water Volume (µL)
0 X	0	0	3	997
1/4 X	2	2	3	993
1/2 X	4	4	3	989
1 X	8	8	3	981
2 X	16	16	3	965
3 X	24	24	3	949

Sample Preparation

Samples must be kept cold before and during shipping to the laboratory. Once received at the laboratory, samples must be frozen (≤ -10 °C) prior to grinding if they cannot be prepared on the day of receipt. Once frozen, temper (partially thaw) while keeping it as cold as possible. Trim away fat and connective tissue. Grind tissue in blender or vertical cutter-mixer until homogeneous. Store samples frozen (≤ -10 °C) prior to analysis.

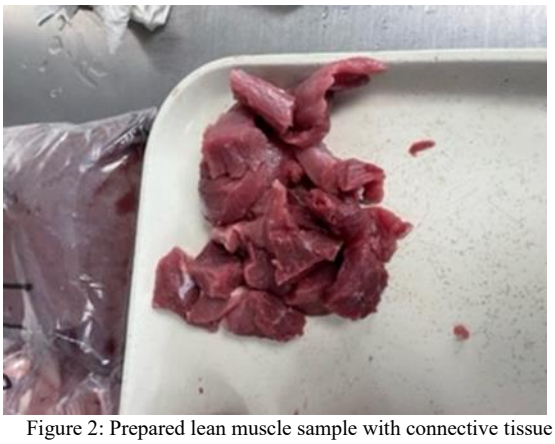


Figure 2: Prepared lean muscle sample with connective tissue removed. Photo courtesy of Hue Quach, USDA FSIS.

Figure 3: Homogenized sample. Photo courtesy of Hue Quach, USDA FSIS.

MRM Extraction

Samples

Weigh 2.0 ± 0.1 g of homogenized samples or egg product into labeled 50 mL polypropylene centrifuge tubes.

QUALITY CONTROL

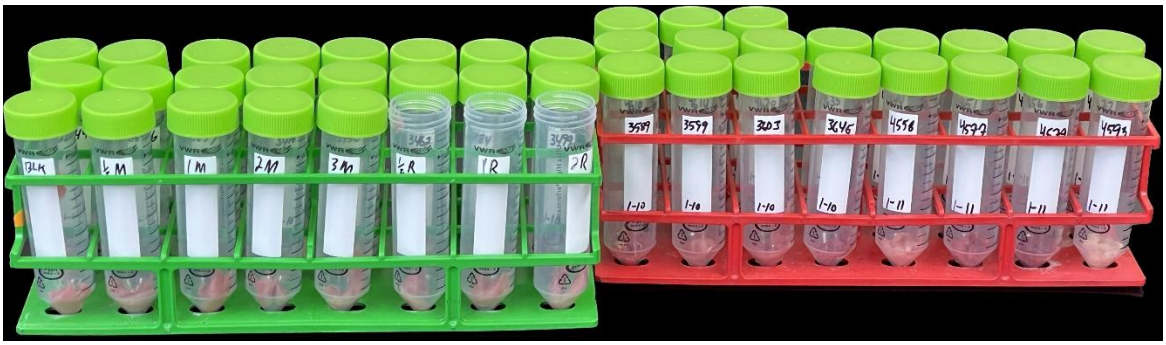
Muscle Controls

Either porcine or corresponding blank tissues are to be used for muscle controls. Use corresponding blank control tissues for each species being analyzed in kidney.

1) Weigh eight 2 g portions of blank tissue into 50 mL polypropylene centrifuge tubes. One for the blank (negative control), one each for the 1/2 X, 1 X, and 2 X recoveries (positive control), and one each for the 1/2 X, 1 X, 2 X, and 3 X matrix matched standards. Weigh one additional portion for a check sample, if necessary.
2) Prepare blank, recoveries, check samples, and samples using the solutions and volumes in Table 16:

Table 16: Preparation of Controls and Samples

Sample Type	Acetonitrile Standard Mix Volume (µL)	Beta Lactam Standard Mix Volume (µL)	Internal Standard Mix Volume (µL)
Samples and Negative Controls			25
1/2 X Recovery	40	40	25
1 X Recovery	80	80	25
2 X Recovery	160	160	25



Controls	Samples

Figure 4: Weighed controls and samples. Photo courtesy of Dagny Morales, USDA-FSIS.

Extraction

1) Vortex all tubes 10 seconds each to mix chemicals with matrix and allow to stand for 5 minutes (min).
2) Add 10 mL of 4/1 (v/v) acetonitrile/water to all tubes using a calibrated solvent dispenser. Cap tubes well.
3) Vortex the tubes using the pulsating vortex platform shaker at for 5 min.
4) Centrifuge the tubes at ~4600 RPM (4708 RCF) for 10 min.
5) Refer to Table 17 for appropriate spiking of matrix matched standards.
6) Spike directly into the matrix match 50 mL centrifuge tubes and swirl gently. Repeat step 4 as necessary if the tissue pellet is dispersed.
7) Pipette a minimum of 500 µL of sample extract to labeled amber glass autosampler vials.

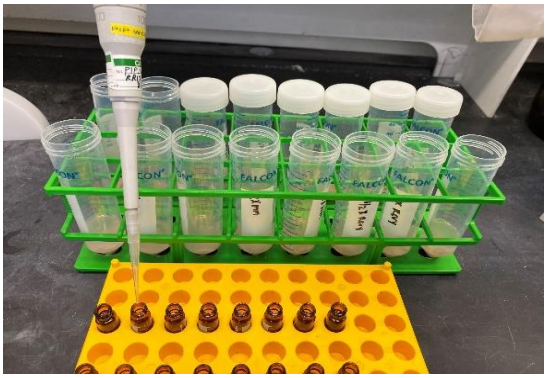


Figure 5: Extracted samples transferred to vials
Photo courtesy of Ryan Matsuda, USDA FSIS.

Table 17: Preparation of Matrix Matched Standards

Sample Type	Acetonitrile Standard Mix Volume (µL)	Beta Lactam Standard Mix Volume (µL)	Internal Standard Mix Volume (µL)
1/2 X Matrix Matched Standard	40	40	25
1 X Matrix Matched Standard	80	80	25
2 X Matrix Matched Standard	160	160	25
3 X Matrix Matched Standard	240	240	25

Instrumental Analysis

Chromatographic Parameters

1) Mobile phases for MRM Analysis
   a. Mobile Phase A – 0.1% Formic Acid in Water
   b. Mobile Phase B – 0.1% Formic Acid in ACN
2) Flow rate 0.3 mL/min
3) Run time: 12.9 min

Gradient Program

Table 18: UHPLC Gradient Program

Time (min)	*% Mobile Phase A*	*% Mobile Phase B*	*Gradient*
0.00	98	2	None
0.10	98	2	linear
8.00	0	100	linear
10.7	0	100	linear
10.8	98	2	linear
12.90	98	2	linear

Autosampler Program

a. Run time: 12.9 min
b. Injection Volume: 1 µL
c. Needle Level: 0.20 mm
d. Wash Time: 30 sec
e. Sample Temperature: 10 °C

Instrumental Note:

Autosampler parameters are to be modified or optimized if needed to ensure that all chromatographic peaks are present.

Column Oven

a. Column Valve Position: To match column location.
b. Column Temperature: 40 °C.

KEY DEFINITIONS

Negative control (Blank): A sample that is negative of all analytes.
Matrix matched standard: A sample prepared with the addition of analytes to have a specified concentration level.
Recovery (positive control): A sample is prepared by the addition of analytes that have a concentration level comparable to MLA. Samples are compared to the recovery.

Instrumental Note:

Mass spectrometer analyzer parameters are optimized and adjusted during annual preventative maintenance and calibration.

Mass Spectrometry Parameters

MS Method Parameters

a) Scan Type: Scheduled MRM
b) Polarity: Positive/Negative Switching
c) MRM Detection Window: 30 sec
d) Target Scan Time: 0.5000 sec
e) Resolution Q1: Unit
f) Resolution Q3: Unit
g) Settling Time: 20.0000 msec
h) Collision Energy: Variable – see Table 19 below

Electrospray Source Parameters

a) Curtain Gas: 25
b) Collision Gas: Medium
c) Temperature: 425 °C
d) Source Gas 1: 50
e) Source Gas 2: 50
f) Ion Spray Voltage ESI+: 5000 V
g) Ion Spray Voltage ESI-: -4500 V

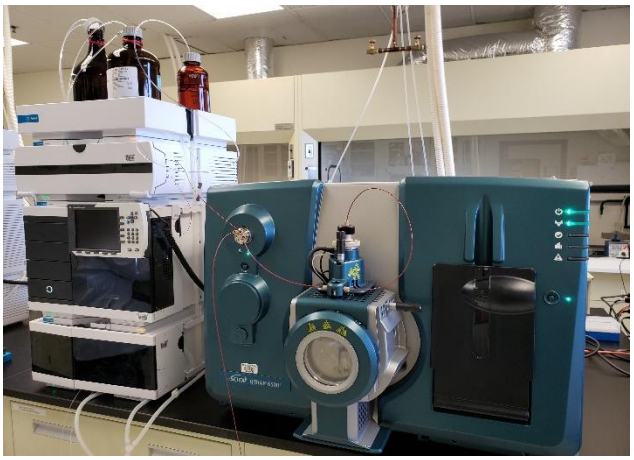


Figure 6: 1290 Infinity UHPLC with Sciex QTrap 6500+ mass spectrometer. Photo courtesy of Sam Zipperer, USDA FSIS.

Table 19: Scan Parameters

Product ions are listed with the expected screening ion as *analyte-1* along with corresponding confirmation ions listed as *analyte-2* and *analyte-3*.

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
248	230.1	1.37	Florfenicol Amine-1	34	8	15	12
248	130.1	1.37	Florfenicol Amine-2	34	8	30	6
248	91	1.37	Florfenicol Amine-3	34	8	62	6
173	93	1.56	Sulfanilamide-1	16	10	29	10
173	92	1.56	Sulfanilamide-2	16	10	22	16
173	65	1.56	Sulfanilamide-3	16	10	40	12
382.3	112	1.82	Desacetyl Cephapirin-1	66	7	31	12
382.3	124	1.82	Desacetyl Cephapirin-2	66	7	61	14
382.3	110.9	1.82	Desacetyl Cephapirin-3	66	7	65	12
188	123.1	1.99	Metronidazole-Hydroxy-1	5	3	18	6

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
188	126	1.99	Metronidazole-Hydroxy-2	5	3	22	6
188	68	1.99	Metronidazole-Hydroxy-3	5	3	27	8
262.1	185.1	2.07	Zilpaterol-1	47	11	33	10
262.1	202.1	2.07	Zilpaterol-2	47	11	27	10
262.1	157	2.07	Zilpaterol-3	47	11	43	8
240.2	148	2.07	Salbutamol-1	23	10	24	8
240.2	222	2.07	Salbutamol-2	23	10	15	10
240.2	166.1	2.07	Salbutamol-3	23	10	19	6
366.2	349	2.11	Amoxicillin-1	60	3	12	16
366.2	114	2.11	Amoxicillin-2	60	3	25	18
366.2	208	2.11	Amoxicillin-3	60	3	17	12
220.1	143.1	2.12	Cimaterol-1	34	6	30	6
220.1	116	2.12	Cimaterol-2	34	6	44	18
220.1	89	2.12	Cimaterol-3	34	6	58	10
158.1	139.9	2.22	Dimetridazole- 2-hydroxy-1	36	6	16	16
158.1	111.9	2.22	Dimetridazole- 2-hydroxy-2	36	6	26	12
158.1	94	2.22	Dimetridazole- 2-hydroxy-3	36	6	30	6
172.1	128	2.24	Metronidazole-1	37	11	19	14
172.1	82.1	2.24	Metronidazole-2	37	11	31	10
172.1	111	2.24	Metronidazole-3	30	11	29	15
218.1	97	2.28	Dipyrone-1	32	7	17	16
218.1	187.1	2.28	Dipyrone-2	32	7	14	10

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
218.1	125	2.28	Dipyrone-3	32	7	15	6
549	183	2.33	DCCD-1	95	7	38	10
549	241	2.33	DCCD-2	95	7	29	12
549	181.9	2.33	DCCD-3	95	7	49	10
368	98.1	2.44	Tildiprosin-1	65	5	24	11
368	464.3	2.44	Tildiprosin-2	65	5	26	28
368	174.1	2.44	Tildiprosin-3	65	5	26	10
201	140.1	2.49	Ronidazole-1	6	2	16	6
201	55.1	2.49	Ronidazole-2	6	2	28	8
201	54.1	2.49	Ronidazole-3	6	2	58	8
142	96	2.51	Dimetridazole-1	38	10	22	16
142	95	2.51	Dimetridazole-2	38	10	30	14
142	81	2.51	Dimetridazole-3	38	10	33	12
407.1	126.1	2.52	Lincomycin-1	66	2	34	14
407.1	359	2.52	Lincomycin-2	66	2	23	10
407.1	389.1	2.52	Lincomycin-3	66	2	16	22
205	178.1	2.56	Levamisole-1	82	10	29	8
205	91	2.56	Levamisole-2	82	10	45	10
205	123	2.56	Levamisole-3	82	10	38	13
240	133.1	2.57	Albendazole- 2-amino-sulfone-1	85	10	39	6
240	198	2.57	Albendazole- 2-amino-sulfone-2	85	10	27	10
240	105	2.57	Albendazole- 2-amino-sulfone-3	85	10	69	12
251	156	2.6	Sulfadiazine-1	25	9	21	8
251	92	2.6	Sulfadiazine-2	25	9	32	14

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
251	108	2.6	Sulfadiazine-3	25	9	30	18
202.1	175	2.66	Thiabendazole-1	105	7	35	18
202.1	131.1	2.66	Thiabendazole-2	105	7	44	14
202.1	65	2.66	Thiabendazole-3	105	7	63	10
350.1	106	2.68	Ampicillin-1	59	5	22	12
350.1	160	2.68	Ampicillin-2	59	5	17	8
350.1	174	2.68	Ampicillin-3	59	5	19	10
306.1	288	2.72	Desethylene Ciprofloxacin-1	51	4	25	16
306.1	217	2.72	Desethylene Ciprofloxacin-2	51	4	47	24
306.1	268	2.72	Desethylene Ciprofloxacin-3	51	4	35	14
250.1	156	2.78	Sulfapyridine-1	65	8	22	8
250.1	184	2.78	Sulfapyridine-2	65	8	24	10
250.1	92	2.78	Sulfapyridine-3	65	8	33	14
320.1	302	2.83	Norfloxacin-1	91	6	27	16
320.1	276.1	2.83	Norfloxacin-2	91	6	23	14
320.1	233.1	2.83	Norfloxacin-3	91	6	33	12
404	577.2	2.84	Tulathromycin A-1	45	10	20	27
404	158	2.84	Tulathromycin A-2	45	10	30	8
404	72	2.84	Tulathromycin A-3	45	10	64	8
461.1	426.1	2.85	Oxytetracycline-1	56	4	24	20
461.1	443.1	2.85	Oxytetracycline-2	56	4	18	20
461.1	444	2.85	Oxytetracycline-3	56	4	21	22
332.1	314.1	2.89	Ciprofloxacin-1	99	6	27	14
332.1	288.1	2.89	Ciprofloxacin-2	99	6	25	14

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
332.1	231.1	2.89	Ciprofloxacin-3	99	6	49	12
263.3	229	2.89	Carbadox-1	46	8	23	12
263.3	130	2.89	Carbadox-2	46	8	27	14
263.3	129	2.89	Carbadox-3	46	8	28	14
302.1	164.1	2.93	Ractopamine-1	48	7	23	8
302.1	121.1	2.93	Ractopamine-2	48	7	29	6
302.1	107	2.93	Ractopamine-3	48	7	47	14
265	156	2.93	Sulfamerazine-1	4	8	23	8
265	172	2.93	Sulfamerazine-2	4	8	23	10
265	108	2.93	Sulfamerazine-3	4	8	33	16
358.1	340	2.95	Danofloxacin-1	84	10	31	16
358.1	314	2.95	Danofloxacin-2	84	10	25	16
358.1	283	2.95	Danofloxacin-3	84	10	33	14
238.1	124.9	2.96	Ketamine-1	52	4	35	14
238.1	220	2.96	Ketamine-2	52	4	20	26
238.1	206.9	2.96	Ketamine-3	52	4	19	12
445.1	410	3	Tetracycline-1	52	4	27	20
445.1	427.1	3	Tetracycline-2	52	4	19	23
445.1	154	3	Tetracycline-3	52	4	35	18
360.1	342.1	3.04	Enrofloxacin-1	84	8	29	16
360.1	316.1	3.04	Enrofloxacin-2	84	8	27	16
360.1	245.1	3.04	Enrofloxacin-3	84	8	37	12
175	131.1	3.05	2QCA-1	63	4	20	6
175	129	3.05	2QCA-2	63	4	21	6
175	102	3.05	2QCA-3	63	4	40	14
328.2	165.1	3.09	Azaperone-1	83	6	28	8

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
328.2	121.1	3.09	Azaperone-2	83	6	28	6
328.2	123	3.09	Azaperone-3	83	6	44	14
396.2	352.1	3.12	Orbifloxacin-1	102	7	25	18
396.2	295	3.12	Orbifloxacin-2	102	7	33	16
396.2	226	3.12	Orbifloxacin-3	102	7	55	12
455	323	3.13	Cefazolin-1	35	4	15	16
455	156	3.13	Cefazolin-2	35	4	23	8
455	295	3.13	Cefazolin-3	35	4	23	14
270.9	156	3.16	Sulfamethizole-1	29	8	19	8
270.9	92	3.16	Sulfamethizole-2	29	8	37	14
270.9	108	3.16	Sulfamethizole-3	29	8	31	18
285	186.1	3.18	SMZ-d6-1	56	7	23	10
285	124.1	3.18	SMZ-d6-2	56	7	31	8
285	98	3.18	SMZ-d6-3	56	7	23	10
279	186	3.18	Sulfamethazine-1	41	7	23	10
279	124.1	3.18	Sulfamethazine-2	41	7	29	6
279	156	3.18	Sulfamethazine-3	41	7	25	8
221.1	90	3.2	Xylazine-1	90	6	29	8
221.1	164	3.2	Xylazine-2	90	6	35	14
221.1	147.1	3.2	Xylazine-3	90	6	31	12
281	156	3.2	Sulfamethoxy-pyridazine-1	52	6	22	8
281	108	3.2	Sulfamethoxy-pyridazine-2	52	6	31	14
281	92	3.2	Sulfamethoxy-pyridazine-3	52	6	39	14

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
186.1	106	3.23	Hydroxy-Ipronidazole-1	40	3	49	12
186.1	168.1	3.23	Hydroxy-Ipronidazole-2	40	3	17	14
186.1	122.1	3.23	Hydroxy-Ipronidazole-3	40	3	26	10
277	202.8	3.24	Clenbuterol-1	37	10	23	22
277	132	3.24	Clenbuterol-2	37	10	39	12
277	258.9	3.24	Clenbuterol-3	37	10	15	18
386.1	368	3.27	Sarafloxacin-1	106	6	31	18
386.1	342	3.27	Sarafloxacin-2	106	6	27	16
386.1	299	3.27	Sarafloxacin-3	106	6	37	16
400.1	382.1	3.3	Difloxacin-1	91	10	31	18
400.1	356	3.3	Difloxacin-2	91	10	27	18
400.1	299	3.3	Difloxacin-3	91	10	39	14
221	123	3.33	Morantel-1	74	6	47	6
221	111	3.33	Morantel-2	74	6	33	18
221	150	3.33	Morantel-3	74	6	39	10
411.1	112	3.38	Pirlimycin-1	96	2	32	6
411.1	363.1	3.38	Pirlimycin-2	96	2	23	18
411.1	56	3.38	Pirlimycin-3	96	2	85	8
479	444	3.48	Chlortetracycline-1	60	5	29	20
479	154	3.48	Chlortetracycline-2	60	5	37	8
479	461.2	3.48	Chlortetracycline-3	60	5	19	20
256	123	3.5	Flubendazole- 2-amino-1	145	9	37	6

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
256	95	3.5	Flubendazole- 2-amino-2	145	9	45	14
256	75	3.5	Flubendazole- 2-amino-3	145	9	85	10
425.1	126	3.51	Clindamycin-1	90	5	34	12
425.1	377	3.51	Clindamycin-2	90	5	26	20
425.1	389.2	3.51	Clindamycin-3	90	5	22	10
285	156	3.56	Sulfachloro-pyridazine-1	24	8	21	8
285	92	3.56	Sulfachloro-pyridazine-2	24	8	37	14
285	108	3.56	Sulfachloro-pyridazine-3	24	8	31	18
777.4	619.4	3.57	Gamithromycin-1	66	5	45	26
777.4	601.4	3.57	Gamithromycin-2	66	5	49	26
777.4	158.1	3.57	Gamithromycin-3	66	5	51	8
328.2	310.1	3.61	Butorphanol-1	66	5	32	26
328.2	157.1	3.61	Butorphanol-2	66	5	57	26
328.2	171.1	3.61	Butorphanol-3	66	5	55	26
445.1	428.1	3.62	Doxycycline-1	61	3	26	24
445.1	267	3.62	Doxycycline-2	61	3	50	30
445.1	321	3.62	Doxycycline-3	61	3	43	34
299.2	116.1	3.66	Carazolol-1	77	7	26	6
299.2	222.1	3.66	Carazolol-2	77	7	26	12
299.2	194.1	3.66	Carazolol-3	77	7	39	10
311	156	3.71	Sulfadoxine-1	69	6	25	8
311	108	3.71	Sulfadoxine-2	69	6	33	16

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
311	92	3.71	Sulfadoxine-3	69	6	39	14
435.4	99	3.72	Tilmicosin-1	66	3	26	34
435.4	696	3.72	Tilmicosin-2	66	3	24	8
435.4	174.1	3.72	Tilmicosin-3	66	3	33	10
254	156	3.72	Sulfamethoxazole-1	19	8	21	8
254	92	3.72	Sulfamethoxazole-2	19	8	35	14
254	108	3.72	Sulfamethoxazole-3	19	8	31	8
256	92	3.72	Sulfathiazole-1	22	8	37	14
256	108	3.72	Sulfathiazole-2	22	8	31	14
256	156	3.72	Sulfathiazole-3	22	8	21	8
295	156	3.74	Sulfaethoxy-pyridazine-1	47	6	25	8
295	140.1	3.74	Sulfaethoxy-pyridazine-2	47	6	25	8
295	108	3.74	Sulfaethoxy-pyridazine-3	47	6	35	16
358	241	3.75	Florfenicol-1	21	6	23	12
358	206.1	3.75	Florfenicol-2	21	6	34	12
358	170.1	3.75	Florfenicol-3	21	6	41	8
268.2	156.1	3.86	Sulfisoxazole-1	58	10	18	10
268.2	113	3.86	Sulfisoxazole-2	58	10	20	8
268.2	92	3.86	Sulfisoxazole-3	58	10	34	16
170	124.1	3.9	Ipronidazole-1	65	5	24	8
170	109.1	3.9	Ipronidazole-2	65	5	32	18
170	96	3.9	Ipronidazole-3	65	5	30	8
320.7	151.9	3.94	**Chloramphenicol-1	-75	-5	-22	-9
320.7	193.9	3.94	**Chloramphenicol-2	-75	-5	-16	-9

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
320.7	257	3.94	**Chloramphenicol-3	-75	-5	-15	-13
734.3	576.2	4.12	Erythromycin A-1	94	8	28	26
734.3	158.1	4.12	Erythromycin A-2	94	8	38	8
734.3	83	4.12	Erythromycin A-3	94	8	96	12
359.1	147.1	4.18	Prednisone-1	77	3	31	8
359.1	171	4.18	Prednisone-2	77	3	39	8
359.1	115.1	4.18	Prednisone-3	77	3	111	14
311.1	156	4.18	Sulfadimethoxine-1	69	6	27	8
311.1	108	4.18	Sulfadimethoxine-2	69	6	35	18
311.1	92	4.18	Sulfadimethoxine-3	69	6	43	14
301	156	4.19	Sulfaquinoxaline-1	66	6	23	8
301	108	4.19	Sulfaquinoxaline-2	66	6	33	16
301	92	4.19	Sulfaquinoxaline-3	66	6	41	10
327.1	86	4.22	Acepromazine-1	72	6	25	14
327.1	254	4.22	Acepromazine-2	72	6	33	14
327.1	222.1	4.22	Acepromazine-3	72	6	51	12
916.6	174	4.27	Tylosin-1	98	6	47	10
916.6	772.4	4.27	Tylosin-2	98	6	41	32
916.6	83	4.27	Tylosin-3	98	6	135	14
285	86	4.27	Promethazine-1	50	5	21	10
285	198	4.27	Promethazine-2	50	5	33	10
285	71.1	4.27	Promethazine-3	50	5	61	12
376.1	165.1	4.27	Haloperidol-1	101	10	32	8
376.1	123	4.27	Haloperidol-2	101	10	43	6
376.1	95	4.27	Haloperidol-3	101	10	93	14

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
332	300	4.31	Fenbendazole sulphone-1	123	7	31	16
332	159	4.31	Fenbendazole sulphone-2	123	7	49	8
332	131	4.31	Fenbendazole sulphone-3	123	7	61	6
266	234	4.33	Albendazole-1	89	9	27	12
266	191	4.33	Albendazole-2	89	9	45	10
266	192	4.33	Albendazole-3	89	9	39	10
342.2	160	4.38	Penicillin G-d7-1	40	6	14	10
342.2	183	4.38	Penicillin G-d7-2	40	6	17	10
342.2	114	4.38	Penicillin G-d7-3	40	6	46	20
335	160	4.4	Penicillin G-1	40	6	13	10
335	176.1	4.4	Penicillin G-2	40	6	16	10
335	114	4.4	Penicillin G-3	40	6	43	20
314	282	4.55	Flubendazole-1	123	6	31	14
314	123	4.55	Flubendazole-2	123	6	47	6
314	95	4.55	Flubendazole-3	123	6	55	14
341.1	86	4.56	Propionyl-promazine-1	55	2	25	12
341.1	268.1	4.56	Propionyl-promazine-2	55	2	31	14
341.1	236.2	4.56	Propionyl-promazine-3	55	2	49	12
319	86	4.71	Chlorpromazine-1	72	6	25	14
319	246	4.71	Chlorpromazine-2	72	6	33	14
319	214	4.71	Chlorpromazine-3	72	6	53	12
334	135.9	4.74	**Sulfanitran-1	-172	-3	-38	-7

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
334	270	4.74	**Sulfanitran-2	-172	-3	-34	-13
334	133	4.74	**Sulfanitran-3	-172	-3	-36	-9
402	243	4.9	Oxacillin-1	34	8	19	12
402	160	4.9	Oxacillin-2	34	8	19	8
402	114	4.9	Oxacillin-3	34	8	49	18
321	277	4.92	**Zearalanol-1	-130	-2	-28	-15
321	303.1	4.92	**Zearalanol-2	-130	-2	-28	-21
321	259	4.92	**Zearalanol-3	-130	-2	-32	-15
353.1	86	4.95	Triflupromazine-1	93	2	25	14
353.1	280	4.95	Triflupromazine-2	93	2	35	14
353.1	248.1	4.95	Triflupromazine-3	93	2	57	12
300	268	4.97	Fenbendazole-1	104	5	29	14
300	159	4.97	Fenbendazole-2	104	5	47	8
300	131.1	4.97	Fenbendazole-3	104	5	59	15
526.2	355.1	4.98	Virginiamycin M1-1	75	4	25	16
526.2	337	4.98	Virginiamycin M1-2	75	4	29	16
526.2	133	4.98	Virginiamycin M1-3	75	4	33	6
436	277	5.13	Cloxacillin-1	27	5	23	14
436	160	5.13	Cloxacillin-2	27	5	16	8
436	114.1	5.13	Cloxacillin-3	27	5	37	6
415.1	199	5.26	Nafcillin-1	41	5	17	11
415.1	171	5.26	Nafcillin-2	41	5	48	19
415.1	115	5.26	Nafcillin-3	41	5	88	12
255	105	5.28	Ketoprofen-1	70	9	28	12
255	77	5.28	Ketoprofen-2	70	9	59	10
255	194	5.28	Ketoprofen-3	70	9	31	16

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
1042.5	174.1	5.31	Tyvalosin -1	90	7	48	12
1042.5	814.3	5.31	Tyvalosin -2	90	7	45	20
1042.5	109	5.31	Tyvalosin -3	90	7	106	2
325.1	204.1	5.35	Oxyphenyl-butazone-1	57	6	21	8
325.1	120.1	5.35	Oxyphenyl-butazone-2	57	6	23	6
325.1	148.1	5.35	Oxyphenyl-butazone-3	57	6	35	8
352	115	5.44	Meloxicam-1	66	2	23	8
352	141	5.44	Meloxicam-2	66	2	25	6
352	73	5.44	Meloxicam-3	66	2	71	12
297.1	259.1	5.46	Flunixin-1	70	3.5	39	14
297.1	236.1	5.46	Flunixin-2	70	3.5	59	14
297.1	279	5.46	Flunixin-3	70	3.5	60	14
300	282	5.46	Flunixin-d3-1	90	7	33	14
300	264.1	5.46	Flunixin-d3-2	90	7	47	14
300	112	5.46	Flunixin-d3-3	90	7	33	14
470	160	5.47	Dicloxacillin-1	40	7	19	10
470	311	5.47	Dicloxacillin-2	40	7	19	16
470	114	5.47	Dicloxacillin-3	40	7	65	18
296	215	6.08	Diclofenac-1	30	7	27	12
296	214	6.08	Diclofenac-2	30	7	45	12
296	250	6.08	Diclofenac-3	30	7	19	12
886.5	158.1	6.13	Emamectin Benzoate-1	56	4	40	10

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
886.5	82.1	6.13	Emamectin Benzoate-2	56	4	124	2
886.5	126.1	6.13	Emamectin Benzoate-3	56	9	84	14
309.1	188.1	6.38	Phenylbutazone-1	20	4	23	10
309.1	120.1	6.38	Phenylbutazone-2	20	4	25	8
309.1	211.1	6.38	Phenylbutazone-3	20	4	21	12
397.2	337.2	6.68	Melengesterol Acetate-1	88	8	19	16
397.2	279.2	6.68	Melengesterol Acetate-2	88	8	27	14
397.2	236.2	6.68	Melengesterol Acetate-3	88	8	39	12
262	244	6.72	Tolfenamic Acid-1	2	5	17	14
262	209.1	6.72	Tolfenamic Acid-2	2	5	38	12
262	180.1	6.72	Tolfenamic Acid-3	2	5	57	10
914.5	186.1	7.6	Eprinomectin-1	80	2	23	8
914.5	112.1	7.6	Eprinomectin-2	80	2	103	16
914.5	330.1	7.6	Eprinomectin-3	80	2	21	16
895.4	751.3	7.99	Abamectin-Na-1	280	7	58	30
895.4	449.2	7.99	Abamectin-Na-2	280	7	64	20
895.4	327.2	7.99	Abamectin-Na-3	280	7	66	16
921.4	777.1	8.33	Doramectin-1	45	2	61	16
921.4	449.2	8.33	Doramectin-2	45	2	67	6
921.4	353.1	8.33	Doramectin-3	45	2	69	6
640.4	528.3	8.53	Moxidectin-1	65	9	13	12
640.4	498.3	8.53	Moxidectin-2	65	9	17	24

Precursor Ion (*m/z*)	Fragment Ion (*m/z*)	Retention Time (min)	Name	Declustering Potential (V)	Entrance Potential (V)	Collision Energy (V)	Cell Exit Potential (V)
640.4	496.2	8.53	Moxidectin-3	65	9	17	12
589.2	235	8.6	**Lasalocid A-1	-160	-9	-44	-13
589.2	173	8.6	**Lasalocid A-2	-160	-9	-56	-9
589.2	191	8.6	**Lasalocid A-3	-160	-9	-49	-11
770.3	626.3	8.72	Selamectin-1	140	5	25	26
770.3	608.4	8.72	Selamectin-2	140	5	29	6
770.3	333.1	8.72	Selamectin-3	140	5	31	16
897.2	753.2	8.75	Ivermectin-1	290	2	59	30
897.2	329.0	8.75	Ivermectin-2	290	2	69	16
897.2	609.1	8.75	Ivermectin-3	290	2	64	20
773.3	430.9	9.02	Salinomycin-1	50	4	71	10
773.3	531.2	9.02	Salinomycin-2	50	4	63	8
773.3	264.9	9.02	Salinomycin-3	50	4	70	6
693.4	461.3	9.07	Monensin-1	40	8	68	10
693.4	479.3	9.07	Monensin-2	40	8	74	13
693.4	501.3	9.07	Monensin-3	40	8	70	17
787.5	431.2	9.33	Narasin-1	30	13	69	7
787.5	531.2	9.33	Narasin-2	30	13	65	13
787.5	512.9	9.33	Narasin-3	30	13	67	12

Analytes denoted with (**) are monitored in negative ESI mode.

Instrumental Note:

Retention time windows and collision energies were set and utilized at time of method validation.

- Retention time windows may be adjusted to account for aging of UHPLC columns or for improved separation to ensure that all chromatographic peaks are present.
- Collision energies may be adjusted and optimized for improved mass spectrometry detection.
- Target masses for precursor and product ions can be optimized to a *m/z* value that falls within the unit mass resolution of the exact mass, but not to exceed the next integer value (e.g., if the exact mass is 787.5, an allowable target mass range includes 787.0-787.9).

The injection sequence below can be modified, as needed, but must include required controls.

1) External standards (optional)
2) Blank (negative control)
3) Matrix matched standards
4) Recoveries (positive controls)
5) Intra-laboratory check sample (if applicable)
6) Up to 35 samples
7) Trailing External standard, matrix matched standard, or recovery (positive control) (for system suitability)

INTRA-LABORATORY CHECK SAMPLE

Defined on the CLG website here.

System suitability is to be demonstrated prior to sample set injection.

Reporting of Results

Decision Criteria

Screening

1) The screening ion for a given analyte must be present at the minimum level of applicability (Tables 20-26). The required ion for each compound is listed in Table 19.
2) The retention times for the screening ion in the fortified recoveries must match the retention time of the screening ion in the matrix-matched standard within 5%.
3) Retention time for the screening ions in the samples must match the retention time of the screening ions in a fortified recovery or the matrix matched standard within 5%.
4) The screening ion must have a signal-to-noise ratio ≥ 3. This will be verified by visual inspection. Visual inspection for detection also includes assessment of peak shape or drift in relation to standard peaks and evaluating the presence or absence of monitored secondary or tertiary ions.
5) The recovery fortified at the minimum level of applicability of the analyte must exceed 10% of the matrix matched standard at the corresponding level.
6) The sample response equals or exceeds the recovery fortified at the MLA.
7) The level of the screening ion in the blank (negative control) must be less than 10% of the matrix-matched standard at the minimum level of applicability.
8) If a sample shows a positive response for an analyte that did not meet screening criteria in the associated QC samples, then rescreen the sample for that analyte.

QUALITY CONTROL

Quality Control Procedures for Screening Identification

1) For set acceptance, 90% of the monitored analytes must meet screening criteria in the recovery (positive control) fortified at the minimum level of applicability (Tables 20-26). For sample reporting purposes, the analytes of interest in the fortified recovery (positive control) must meet screening criteria.
2) For set acceptance, 90% of the monitored analytes in the blank (negative control) must not meet screening criteria. The blank (negative control) must be negative using the screening criteria for samples containing corresponding presumptive positive analytes.

Intralaboratory Check Samples (If applicable)

1) Acceptability criteria.
    a. 90% of the monitored analytes in a fortified Intra-Laboratory Check must meet screening criteria.
    b. 90% of the monitored analytes in an unfortified Intra-Laboratory Check must be negative using the screening criteria.
    c. FSIS Field Service Laboratories are to refer to internal FSIS Quality Control Procedures when unacceptable values are obtained:
        i. Refer to LW-Q1002, Chemistry Non-Conformance Tables, for how to proceed and whether to take corrections or corrective actions.

Confirmation

A sample is confirmed positive for an analyte if the following criteria are met:

1) The recovery retention times must match the retention time of the matrix matched standard within 5%.
2) The retention time for the samples must match the retention time of the positive control or the matrix matched standard within 5%.
3) All product ions specified for ratio matching are present with a signal-to-noise ratio ≥ 3. This will be verified by visual inspection. Visual inspection for detection will also include assessment of peak shape or drift in relation to standard peaks and evaluating the presence or absence of monitored secondary or tertiary ions.

4) One of the following ion ratio matching conditions is met:

   i. If two product ions are assessed, one sample ion ratio should match the calculated average ratio of the matrix-matched standards within a ± 10% absolute difference.

   ii. If three product ions are monitored, the presence of two sample ion ratios should match the calculated average ratio of the matrix-matched standards within a ± 20% absolute difference.

Key Facts:

Ratios are calculated by dividing the area count of each diagnostic ion by the area count of the base ion. Ion ratios should be less than 1. If the ratio is not less than 1 for a sample set, the inverse of this ratio is to be used.

5) The recovery fortified at the minimum level of applicability (Tables 20-26) of the analyte must exceed 10% of the matrix matched standard at the corresponding level.
6) The sample response equals or exceeds the recovery fortified at the MLA.
7) The level of the screening ion in the blank (negative control) must be less than 10% of the matrix-matched standard at the MLA.

QUALITY CONTROL

Quality Control Procedures for Confirmation

1) For set acceptance, nine of the following ten analytes must meet confirmation criteria (Dicloxacillin, Erythromycin A, Fenbendazole sulphone, Florfenicol, Flunixin, Meloxicam, Orbifloxacin, Penicillin G, Ractopamine, and Sulfadimethoxine). For sample reporting purposes, the analytes of interest in the fortified recovery (positive control) must meet confirmation criteria.
2) The blank (negative control) must be negative using the confirmation criteria for the analytes of interest.

Intralaboratory Check Samples (If applicable)

1) Acceptability criteria.
   a. Nine of the following ten analytes must meet confirmation criteria (Dicloxacillin, Erythromycin A, Fenbendazole sulphone, Florfenicol, Flunixin, Meloxicam, Orbifloxacin, Penicillin G, Ractopamine, and Sulfadimethoxine) in a fortified Intra-Laboratory Check.
   b. 95% of the monitored analytes in an unfortified Intra-Laboratory Check must be negative using the screening criteria.
   c. FSIS Field Service Laboratories are to refer to internal FSIS Quality Control Procedures when unacceptable values are obtained:
      i. Refer to LW-Q1002, Chemistry Non-Conformance Tables, for how to proceed and whether to take corrections or corrective actions.

Minimum Level of Applicability

Table 20: Minimum Level of Applicability (MLA) for Kidney Screening

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15
Abamectin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ampicillin	1/2 X	5	1/2 X	5	1 X	10	1 X	10	1/2 X	5
Azaperone	1/2 X	1	1/2 X	1	1 X	2	2 X	4	2 X	4
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Carbadox	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Chlortetracycline	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Cimaterol	1/2 X	3	1/2 X	3	1 X	6	1/2 X	3	1/2 X	3
Ciprofloxacin	1/2 X	25	1/2 X	25	1 X	50	1/2 X	25	1/2 X	25
Clenbuterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
DCCD	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Dimetridazole	1/2 X	1	1/2 X	1	N/A	N/A	N/A	N/A	N/A	N/A
Dimetridazole - OH	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25	2 X	100	1 X	50
Doramectin	1/2 X	7.5	1/2 X	7.5	2 X	30	N/A	N/A	2 X	30
Doxycycline	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole - OH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ivermectin	1/2 X	7.5	1/2 X	7.5	2 X	30	N/A	N/A	N/A	N/A
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ketoprofen	1/2 X	5	1/2 X	5	1 X	10	2 X	20	2 X	20
Lasalocid A	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Metronidazole - OH	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Monensin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	2 X	100
Orbifloxacin	1 X	50	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	2 X	2000	2 X	2000	2 X	2000	2 X	2000	2 X	2000
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1 X	100
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Salbutamol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Selamectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1 X	15
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	1/2 X	50	1/2 X	50	1 X	100	1 X	100	2 X	200
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	2 X	200
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12
Tetracycline	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Thiabendazole	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60
Tolfenamic Acid	1/2 X	25	1 X	50	1/2 X	25	1/2 X	25	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2
Zilpaterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3

Table 21: Minimum Level of Applicability (MLA) for Kidney Confirmation

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1/2 X	15	1/2 X	15	1 X	30	N/A	N/A	1/2 X	15
Abamectin	1/2 X	25	1/2 X	25	1/2 X	25	1 X	50	1/2 X	25
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ampicillin	1/2 X	5	1/2 X	5	1 X	10	1 X	10	1/2 X	5
Azaperone	N/A	N/A	N/A	N/A	1 X	2	2 X	4	N/A	N/A
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Carbadox	2 X	60	1 X	30	N/A	N/A	1 X	30	1 X	30
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1/2 X	3	1 X	6	1 X	6	1/2 X	3	1 X	6
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Chlortetracycline	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Cimaterol	1/2 X	3	1/2 X	3	1 X	6	1 X	6	1 X	6

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Ciprofloxacin	1 X	50	1/2 X	25	1 X	50	1/2 X	25	1/2 X	25
Clenbuterol	1/2 X	3	1 X	6	N/A	N/A	1 X	6	1 X	6
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	2 X	20	1/2 X	5	1 X	10
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
DCCD	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1 X	10	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	N/A	N/A	1/2 X	25	N/A	N/A	N/A	N/A	2 X	100
Dimetridazole	2 X	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dimetridazole - OH	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25	2 X	100	1 X	50
Doramectin	1 X	15	2 X	30	N/A	N/A	N/A	N/A	N/A	N/A
Doxycycline	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	N/A	N/A	1/2 X	25	1/2 X	25	1 X	50	2 X	100
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1 X	2	1 X	2	2 X	4	2 X	4	1/2 X	1
Ipronidazole - OH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ivermectin	1/2 X	7.5	1 X	15	N/A	N/A	N/A	N/A	N/A	N/A
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ketoprofen	1/2 X	5	1/2 X	5	1 X	10	2 X	20	2 X	20
Lasalocid A	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	1/2 X	1	1/2 X	1	N/A	N/A	1/2 X	1	2 X	4
Metronidazole - OH	1/2 X	4	1/2 X	4	1 X	8	1 X	8	1 X	8
Monensin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	2 X	30	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	2 X	80	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	N/A	N/A
Orbifloxacin	1 X	50	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	2 X	2000	2 X	2000	2 X	2000	2 X	2000	2 X	2000
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1 X	100
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	2 X	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Salbutamol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	N/A	N/A	1/2 X	25	N/A	N/A	N/A	N/A	1/2 X	25
Selamectin	N/A	N/A	N/A	N/A	1 X	15	N/A	N/A	1 X	15
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	1/2 X	50	1/2 X	50	2 X	200	N/A	N/A	2 X	200
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1/2 X	50	1/2 X	50	2 X	200	1 X	100	2 X	200
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12
Tetracycline	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Thiabendazole	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60
Tolfenamic Acid	1/2 X	25	1 X	50	1/2 X	25	1/2 X	25	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zilpaterol	1 X	6	1/2 X	3	1 X	6	1/2 X	3	1 X	6

Table 22: Minimum Level of Applicability (MLA) for Muscle Screening

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1/2 X	15	1/2 X	15	1/2 X	15	1 X	30	1/2 X	15	1/2 X	15
Abamectin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ampicillin	1/2 X	5	1/2 X	5	1/2 X	5	1 X	10	1/2 X	5	1/2 X	5
Azaperone	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2	1/2 X	1
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Carbadox	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15	1/2 X	15
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Chlortetracycline	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Cimaterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Clenbuterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
DCCD	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1 X	100
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Dimetridazole	1/2 X	1	1/2 X	1	1 X	2	1 X	2	1/2 X	1	1/2 X	1
Dimetridazole – OH	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Doramectin	1/2 X	7.5	1/2 X	7.5	N/A	N/A	2 X	30	1/2 X	7.5	1/2 X	7.5
Doxycycline	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole – OH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2 X	4
Ivermectin	1/2 X	7.5	1/2 X	7.5	1 X	15	2 X	30	1/2 X	7.5	1 X	15
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ketoprofen	1/2 X	5	1/2 X	5	1 X	10	2 X	20	1/2 X	5	1/2 X	5
Lasalocid A	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2	1/2 X	1	1/2 X	1
Metronidazole – OH	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Monensin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1 X	50	1/2 X	25
Orbifloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	1 X	1000	1 X	1000	1 X	1000	1 X	1000	1 X	1000	1 X	1000
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Salbutamol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Selamectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1 X	100	1 X	100
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1 X	100
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12
Tetracycline	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Thiabendazole	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Tolfenamic Acid	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Zilpaterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3

Table 23: Minimum Level of Applicability (MLA) for Muscle Screening Universal Blank Matrix

Analyte	Universal Blk Muscle	
	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1X	30
Abamectin	1/2 X	25
Acepromazine	1/2 X	4
Albendazole	1/2 X	25
Amoxicillin	1/2 X	20
Ampicillin	1X	10
Azaperone	1X	2
Butorphanol	1X	2
Carazolol	1/2 X	1
Carbadox	1/2 X	15
Cefazolin	1/2 X	50
Chloramphenicol	1/2 X	3
Chlorpromazine	1/2 X	1
Chlortetracycline	1/2 X	1000
Cimaterol	1/2 X	3

Analyte	Universal Blk Muscle	
	Level	Conc. (ng/g)
Ciprofloxacin	1/2 X	25
Clenbuterol	1/2 X	3
Clindamycin	1/2 X	50
Cloxacillin	1/2 X	5
Danofloxacin	1/2 X	25
DCCD	1 X	100
Desacetyl Cephapirin	1X	100
Desethylene Ciprofloxacin	1/2 X	25
Diclofenac	1/2 X	5
Dicloxacillin	1/2 X	50
Difloxacin	1/2 X	25
Dimetridazole	NA	NA
Dimetridazole – OH	1X	100
Dipyrone	1/2 X	25
Doramectin^	1/2 X	7.5
Doxycycline	1/2 X	25
Emamectin Benzoate	1/2 X	7.5
Enrofloxacin	1/2 X	25
Eprinomectin	1/2 X	7.5
Erythromycin A	1/2 X	50
Fenbendazole	1/2 X	200
Fenbendazole sulphone	1/2 X	200
Florfenicol	1/2 X	100
Florfenicol Amine	1/2 X	150
Flubendazole	1/2 X	10
Flunixin	1/2 X	12.5
Gamithromycin	1/2 X	50
Haloperidol	1/2 X	1
Ipronidazole	1/2 X	1
Ipronidazole – OH	NA	NA
Ivermectin	2X	30
Ketamine	1/2 X	20

Analyte	Universal Blk Muscle	
	Level	Conc. (ng/g)
Ketoprofen	2X	10
Lasalocid A	2X	8
Levamisole	1/2 X	50
Lincomycin	1/2 X	50
Melengestrol Acetate	1/2 X	20
Meloxicam	1/2 X	10
Metronidazole	1X	2
Metronidazole – OH	1/2 X	4
Monensin	1/2 X	20
Morantel tartrate	1/2 X	350
Moxidectin	1/2 X	7.5
Nafcillin	1/2 X	50
Narasin	1/2 X	20
Norfloxacin	1X	50
Orbifloxacin	1/2 X	25
Oxacillin	1/2 X	50
Oxyphenylbutazone	1/2 X	50
Oxytetracycline	1 X	1000
Penicillin G	1/2 X	25
Phenylbutazone	1/2 X	50
Pirlimycin	1/2 X	250
Prednisone	1/2 X	50
Promethazine	1/2 X	1
Propionylpromazine	1/2 X	1
Ractopamine	1/2 X	3
Ronidazole	NA	NA
Salbutamol	1/2 X	3
Salinomycin	1/2 X	20
Sarafloxacin	1/2 X	25
Selamectin	1/2 X	7.5
Sulfachloropyridazine	1/2 X	50
Sulfadiazine	1/2 X	50

Analyte	Universal Blk Muscle	
	Level	Conc. (ng/g)
Sulfadimethoxine	1/2 X	50
Sulfadoxine	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50
Sulfamerazine	1/2 X	50
Sulfamethazine	1/2 X	50
Sulfamethizole	1/2 X	50
Sulfamethoxazole	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50
Sulfanilamide	1 X	100
Sulfanitran	1/2 X	50
Sulfapyridine	1/2 X	50
Sulfaquinoxaline	1/2 X	50
Sulfathiazole	1 X	100
Sulfisoxazole	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12
Tetracycline	1/2 X	500
Thiabendazole	1X	100
Tildipirosin	1/2 X	500
Tilmicosin	1/2 X	60
Tolfenamic Acid	1/2 X	25
Triflupromazine	1/2 X	1
Tulathromycin A	1/2 X	1000
Tylosin	1/2 X	100
Tylvalosin	1/2 X	25
Virginiamycin	1/2 X	50
Xylazine	1/2 X	1
Zilpaterol	1/2 X	3

^ - Not applicable in poultry

Table 24: Minimum Level of Applicability (MLA) for Muscle Confirmation

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1/2 X	15	1/2 X	15	1/2 X	15	N/A	N/A	1/2 X	15	1/2 X	15
Abamectin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ampicillin	1/2 X	5	1/2 X	5	1/2 X	5	1 X	10	1 X	10	1/2 X	5
Azaperone	1 X	2	2 X	4	1 X	2	1/2 X	1	N/A	N/A	2 X	4
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1 X	2	1/2 X	1
Carbadox	1/2 X	15	1/2 X	15	2 X	60	1/2 X	15	1 X	30	1 X	30
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1/2 X	3	1/2 X	3	2 X	12	1 X	6	1 X	6	1 X	6
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Chlortetracycline	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Cimaterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	2 X	100
Clenbuterol	1/2 X	3	1/2 X	3	1 X	6	1/2 X	3	1/2 X	3	1 X	6
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	N/A	N/A	N/A	N/A
DCCD	1/2 X	50	1/2 X	50	1 X	100	1 X	100	1 X	100	1 X	100
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	N/A	N/A	1/2 X	25	N/A	N/A	1/2 X	25	1/2 X	25	2 X	100
Dimetridazole	1/2 X	1	1 X	2	1 X	2	1 X	2	N/A	N/A	1 X	2

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Dimetridazole – OH	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Doramectin	1 X	15	1 X	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Doxycycline	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	1/2 X	25	1/2 X	25	2 X	100	1/2 X	25	N/A	N/A	N/A	N/A
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150	1/2 X	150
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1 X	2	1 X	2	N/A	N/A	N/A	N/A	2 X	4	1/2 X	1
Ipronidazole – OH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2 X	4
Ivermectin	1 X	15	1 X	15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Ketoprofen	1/2 X	5	1/2 X	5	1 X	10	2 X	20	1/2 X	5	1 X	10
Lasalocid A	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8	2 X	8
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	1 X	2	1/2 X	1	1 X	2	1 X	2	1/2 X	1	1 X	2
Metronidazole – OH	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4	1/2 X	4
Monensin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	N/A	N/A	1/2 X	25	N/A	N/A	N/A	N/A

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Orbifloxacin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	1 X	1000	1 X	1000	1 X	1000	1 X	1000	1 X	1000	1 X	1000
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250	1/2 X	250
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	1/2 X	1	1 X	2	2 X	4	1 X	2	2 X	4	1 X	2
Salbutamol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	N/A	N/A	1/2 X	25	N/A	N/A	1/2 X	25	1/2 X	25	N/A	N/A
Selamectin	N/A	N/A	N/A	N/A	2 X	30	2 X	30	1 X	15	1/2 X	7.5
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	1/2 X	50	1/2 X	50	1 X	100	N/A	N/A	1 X	100	1 X	100
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1/2 X	50	1 X	100	2 X	200	1 X	100	2 X	200	1 X	100
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12	1/2 X	12

Analyte	Bovine		Porcine		Poultry		Caprine		Ovine		Siluriformes	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Tetracycline	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Thiabendazole	1/2 X	50	1/2 X	50	1 X	100	1/2 X	50	1/2 X	50	1/2 X	50
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60	1/2 X	60
Tolfenamic Acid	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100	1/2 X	100
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zilpaterol	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1/2 X	3	1 X	6

Table 25: Minimum Level of Applicability (MLA) for Liquid Egg Product Screening

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25
2-Quinoxaline Carboxylic Acid (QCA)	1/2 X	15	1 X	30	1/2 X	15
Abamectin	1/2 X	25	N/A	N/A	1/2 X	25
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1 X	40	1/2 X	20
Ampicillin	1/2 X	5	1/2 X	5	1/2 X	5
Azaperone	1/2 X	1	1/2 X	1	2 X	4
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1
Carbadox	1/2 X	15	1/2 X	15	1/2 X	15
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1/2 X	3	1/2 X	3	1/2 X	3
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Chlortetracycline	N/A	N/A	1/2 X	1000	N/A	N/A
Cimaterol	1/2 X	3	1/2 X	3	1/2 X	3
Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Clenbuterol	1/2 X	3	1/2 X	3	1/2 X	3
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	1/2 X	5
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
DCCD	1/2 X	50	N/A	N/A	2 X	200
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Dimetridazole	N/A	N/A	N/A	N/A	N/A	N/A
Dimetridazole - OH	1/2 X	50	1/2 X	50	1/2 X	50
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25
Doramectin	1/2 X	7.5	N/A	N/A	N/A	N/A
Doxycycline	1/2 X	25	1/2 X	25	1/2 X	25
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	N/A	N/A	2 X	600
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole - OH	2 X	4	N/A	N/A	N/A	N/A
Ivermectin	1/2 X	7.5	N/A	N/A	N/A	N/A
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Ketoprofen	1/2 X	5	1/2 X	5	1/2 X	5
Lasalocid A	2 X	8	2 X	8	2 X	8
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	2 X	80	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	1/2 X	1	1/2 X	1	1/2 X	1
Metronidazole - OH	1/2 X	4	1/2 X	4	1 X	8
Monensin	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Orbifloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	1/2 X	500	1/2 X	500	N/A	N/A
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	1/2 X	1	1/2 X	1	1 X	2
Salbutamol	1/2 X	3	1/2 X	3	1/2 X	3
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Selamectin	1/2 X	7.5	N/A	N/A	2 X	30
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	1/2 X	50	1 X	100	1/2 X	50
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1/2 X	50	1/2 X	50	1 X	100
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12
Tetracycline	N/A	N/A	1/2 X	500	N/A	N/A
Thiabendazole	1/2 X	50	1/2 X	50	1/2 X	50
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60
Tolfenamic Acid	1/2 X	25	N/A	N/A	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	1/2 X	1	1/2 X	1	1/2 X	1
Zilpaterol	1/2 X	3	1/2 X	3	1/2 X	3

Table 26 - Minimum Level of Applicability (MLA) for Liquid Egg Product Confirmation

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-amino-Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10
2-Aminosulfone Albendazole	1/2 X	25	1/2 X	25	1/2 X	25

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
2-Quinoxaline Carboxylic Acid (QCA)	N/A	N/A	1 X	30	1/2 X	15
Abamectin	1/2 X	25	N/A	N/A	1/2 X	25
Acepromazine	1/2 X	4	1/2 X	4	1/2 X	4
Albendazole	1/2 X	25	1/2 X	25	1/2 X	25
Amoxicillin	1/2 X	20	1 X	40	1/2 X	20
Ampicillin	1/2 X	5	N/A	N/A	1/2 X	5
Azaperone	1/2 X	1	1/2 X	1	2 X	4
Butorphanol	1/2 X	1	1/2 X	1	1/2 X	1
Carazolol	1/2 X	1	1/2 X	1	1/2 X	1
Carbadox	1 X	30	1 X	30	1/2 X	15
Cefazolin	1/2 X	50	1/2 X	50	1/2 X	50
Chloramphenicol	1 X	6	1 X	6	1 X	6
Chlorpromazine	1/2 X	1	1/2 X	1	1/2 X	1
Chlortetracycline	N/A	N/A	1/2 X	1000	N/A	N/A
Cimaterol	1/2 X	3	1/2 X	3	1/2 X	3
Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Clenbuterol	N/A	N/A	1/2 X	3	1/2 X	3
Clindamycin	1/2 X	50	1/2 X	50	1/2 X	50
Cloxacillin	1/2 X	5	1/2 X	5	1/2 X	5
Danofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
DCCD	1 X	100	N/A	N/A	2 X	200
Desacetyl Cephapirin	1/2 X	50	1/2 X	50	1/2 X	50
Desethylene Ciprofloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Diclofenac	1/2 X	5	1/2 X	5	1/2 X	5
Dicloxacillin	1/2 X	50	1/2 X	50	1/2 X	50
Difloxacin	1 X	50	2 X	100	N/A	N/A
Dimetridazole	N/A	N/A	N/A	N/A	N/A	N/A
Dimetridazole - OH	1/2 X	50	1/2 X	50	1/2 X	50
Dipyrone	1/2 X	25	1/2 X	25	1/2 X	25
Doramectin	2 X	30	N/A	N/A	N/A	N/A
Doxycycline	1/2 X	25	1/2 X	25	1 X	50
Emamectin Benzoate	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Enrofloxacin	1/2 X	25	1/2 X	25	N/A	N/A
Eprinomectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Erythromycin A	1/2 X	50	1/2 X	50	1/2 X	50
Fenbendazole	1/2 X	200	1/2 X	200	1/2 X	200
Fenbendazole sulphone	1/2 X	200	1/2 X	200	1/2 X	200
Florfenicol	1/2 X	100	1/2 X	100	1/2 X	100
Florfenicol Amine	1/2 X	150	N/A	N/A	2 X	600
Flubendazole	1/2 X	10	1/2 X	10	1/2 X	10
Flunixin	1/2 X	12.5	1/2 X	12.5	1/2 X	12.5
Gamithromycin	1/2 X	50	1/2 X	50	1/2 X	50
Haloperidol	1/2 X	1	1/2 X	1	1/2 X	1
Ipronidazole	1 X	2	1 X	2	1 X	2
Ipronidazole - OH	2 X	4	N/A	N/A	N/A	N/A
Ivermectin	2 X	30	N/A	N/A	N/A	N/A
Ketamine	1/2 X	20	1/2 X	20	1/2 X	20
Ketoprofen	1/2 X	5	1/2 X	5	1/2 X	5
Lasalocid A	2 X	8	2 X	8	2 X	8
Levamisole	1/2 X	50	1/2 X	50	1/2 X	50
Lincomycin	1/2 X	50	1/2 X	50	1/2 X	50
Melengestrol Acetate	1/2 X	20	2 X	80	1/2 X	20
Meloxicam	1/2 X	10	1/2 X	10	1/2 X	10
Metronidazole	2 X	4	1/2 X	1	1/2 X	1
Metronidazole - OH	1/2 X	4	1/2 X	4	N/A	N/A
Monensin	1/2 X	20	1/2 X	20	1/2 X	20
Morantel tartrate	1/2 X	350	1/2 X	350	1/2 X	350
Moxidectin	1/2 X	7.5	1/2 X	7.5	1/2 X	7.5
Nafcillin	1/2 X	50	1/2 X	50	1/2 X	50
Narasin	1/2 X	20	1/2 X	20	1/2 X	20
Norfloxacin	1/2 X	25	1/2 X	25	1 X	50
Orbifloxacin	1/2 X	25	1/2 X	25	1/2 X	25
Oxacillin	1/2 X	50	1/2 X	50	1/2 X	50
Oxyphenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50
Oxytetracycline	1/2 X	500	1/2 X	500	N/A	N/A
Penicillin G	1/2 X	25	1/2 X	25	1/2 X	25
Phenylbutazone	1/2 X	50	1/2 X	50	1/2 X	50
Pirlimycin	1/2 X	250	1/2 X	250	1/2 X	250

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Prednisone	1/2 X	50	1/2 X	50	1/2 X	50
Promethazine	1/2 X	1	1/2 X	1	1/2 X	1
Propionylpromazine	1/2 X	1	1/2 X	1	1/2 X	1
Ractopamine	1/2 X	3	1/2 X	3	1/2 X	3
Ronidazole	2 X	4	1 X	2	N/A	N/A
Salbutamol	1/2 X	3	1/2 X	3	2 X	12
Salinomycin	1/2 X	20	1/2 X	20	1/2 X	20
Sarafloxacin	N/A	N/A	2 X	100	N/A	N/A
Selamectin	N/A	N/A	N/A	N/A	2 X	30
Sulfachloropyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadiazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadimethoxine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfadoxine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamerazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethizole	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxazole	1/2 X	50	1/2 X	50	1/2 X	50
Sulfamethoxypyridazine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfanilamide	N/A	N/A	2 X	200	1 X	100
Sulfanitran	1/2 X	50	1/2 X	50	1/2 X	50
Sulfapyridine	1/2 X	50	1/2 X	50	1/2 X	50
Sulfaquinoxaline	1/2 X	50	1/2 X	50	1/2 X	50
Sulfathiazole	1 X	100	1 X	100	1 X	100
Sulfisoxazole	1/2 X	20	1/2 X	20	1/2 X	20
Taleranol (B-Zearalanol)	1/2 X	12	1/2 X	12	1/2 X	12
Tetracycline	N/A	N/A	1/2 X	500	N/A	N/A
Thiabendazole	1/2 X	50	1/2 X	50	1/2 X	50
Tildipirosin	1/2 X	500	1/2 X	500	1/2 X	500
Tilmicosin	1/2 X	60	1/2 X	60	1/2 X	60
Tolfenamic Acid	1/2 X	25	N/A	N/A	1/2 X	25
Triflupromazine	1/2 X	1	1/2 X	1	1/2 X	1
Tulathromycin A	1/2 X	1000	1/2 X	1000	1/2 X	1000
Tylosin	1/2 X	100	1/2 X	100	1/2 X	100

Analyte	Egg White		Egg Yolk		Whole Egg	
	Level	Conc. (ng/g)	Level	Conc. (ng/g)	Level	Conc. (ng/g)
Tylvalosin	1/2 X	25	1/2 X	25	1/2 X	25
Virginiamycin	1/2 X	50	1/2 X	50	1/2 X	50
Xylazine	1/2 X	1	N/A	N/A	1 X	2
Zilpaterol	1/2 X	3	1/2 X	3	1/2 X	3

N/A=Not applicable

References

21CFR 556 for tolerance values set by FDA.

The National Residue Program sets the number of samples analyzed each year for animal drugs.
The National Residue Program Roles Functions and Responsibilities | Food Safety and Inspection Service (usda.gov)

Contact Information and Inquiries

Inquiries about methods can be submitted through the USDA website via the "Ask USDA" portal at https://ask.usda.gov or please contact:

Chemistry Section
Laboratory Quality Assurance, Response, and Coordination Staff
USDA/FSIS/OPHS
950 College Station Road
Athens, GA 30605
OPHS.LQAD@usda.gov

This method has been validated, reviewed, approved, and deemed suitable and fit for purpose for use in the USDA FSIS Field Service Laboratories.

William K. Shaw, Jr., PhD
Executive Associate for Laboratory Services