

**NATIONAL MILK DRUG RESIDUE DATABASE
FISCAL YEAR 2019 ANNUAL REPORT**

October 1, 2018 - September 30, 2019

Submitted to:

**Office of Regulatory Affairs
U. S. Food and Drug Administration
5630 Fishers Lane, Room 2129
Rockville, MD 20857**

Submitted by:

**GLH, Incorporated
501 V.E.S. Road, Suite W225
Lynchburg, VA 24503
434-386-3702**

Contract Number: HHSF 223 201810028C

December 13, 2019

Table of Contents

INTRODUCTION	1
BACKGROUND	1
SUMMARY AND DISCUSSION.....	2
SAMPLE RESULTS	3
TABLE 1 -- SAMPLE RESULTS	4
TABLE 2-- INDUSTRY AND REGULATORY SAMPLES	5
TESTS CONDUCTED	6
TABLE 3 -- TESTS CONDUCTED BY SAMPLE SOURCES.....	6
TABLE 3A-- VALIDATED TESTS CONDUCTED	7
TABLE 3B-- NON-VALIDATED TESTS CONDUCTED	7
TABLE 4 -- TESTS CONDUCTED BY INDUSTRY AND REGULATORY AGENCIES.....	8
TABLE 4A -- VALIDATED TESTS CONDUCTED BY INDUSTRY AND REGULATORY AGENCIES	9
TABLE 4B -- NON-VALIDATED TESTS CONDUCTED BY INDUSTRY AND REGULATORY AGENCIES	10
TABLE 5 -- NUMBER OF TESTS CONDUCTED BY FAMILY/DRUG	11
TABLE 5A -- NUMBER OF VALIDATED TESTS CONDUCTED BY FAMILY/DRUG	11
TABLE 5B -- NUMBER OF NON-VALIDATED TESTS CONDUCTED BY FAMILY/DRUG.....	11
TABLE 6 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG	12
TABLE 6A -- COMPARISON OF VALIDATED AND NON-VALIDATED TESTS FOR SULFONAMIDES AND TETRACYCLINES.....	13
TABLE 7-1 -- GRADE "A" BULK MILK PICKUP TANKER TESTING.....	14
TABLE 7-2 -- GRADE "A" PASTEURIZED FLUID MILK AND MILK PRODUCTS TESTING	14
TABLE 7-3 -- GRADE "A" PRODUCER TESTING.....	14
TABLE 7-4 -- GRADE "A" OTHER TESTING (MILK FROM MILK PLANT TANKS/SILOS, MILK TRANSPORT TANKERS, ETC.).....	14
TABLE 7-5 -- NON-GRADE "A" BULK MILK PICKUP TANKER TESTING	15
TABLE 7-6 -- NON-GRADE "A" PASTEURIZED FLUID MILK AND MILK PRODUCTS TESTING	15
TABLE 7-7 -- NON-GRADE "A" PRODUCER TESTING	15
TABLE 7-8 -- NON-GRADE "A" OTHER TESTING (MILK FROM MILK PLANT TANKS/SILOS, MILK TRANSPORT TANKERS, ETC.)	15
TABLE 8-1 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG GRADE "A" BULK MILK PICKUP TANKER.....	16
TABLE 8-2 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG GRADE "A" PASTEURIZED FLUID MILK AND MILK PRODUCTS	17
TABLE 8-3 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG GRADE "A" PRODUCER TESTING	17
TABLE 8-4 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG GRADE "A" OTHER TESTING (MILK FROM MILK PLANT TANKS/SILOS, MILK TRANSPORT TANKERS, ETC.).....	18
TABLE 8-5 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG NON-GRADE "A" BULK MILK PICKUP TANKER.....	18
TABLE 8-6 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG NON-GRADE "A" PASTEURIZED FLUID MILK AND MILK PRODUCTS	19

TABLE 8-7 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG NON-GRADE "A" PRODUCER TESTING 19
TABLE 8-8 -- NUMBER OF TESTS BY METHOD BY FAMILY/DRUG NON-GRADE "A" OTHER TESTING (MILK FROM MILK PLANT TANKS/SILOS, MILK TRANSPORT TANKERS, ETC.)..... 20

**NATIONAL MILK DRUG RESIDUE DATABASE
FISCAL YEAR 2019 ANNUAL REPORT
October 1, 2018 - September 30, 2019**

INTRODUCTION

The National Milk Drug Residue Data Base (NMDRD) is a voluntary industry reporting program. Mandatory reporting is required by Regulatory Agencies under the National Conference on Interstate Milk Shipments (NCIMS). Data are reported on the extent of the national testing activities, the analytical methods used, the kind and extent of the animal drug residues identified, and the amount of contaminated milk that was removed from the human food supply. The system includes all milk, Grade "A" as well as non-Grade "A", which is commonly known as manufacturing grade milk. Grade "A" milk represents approximately 99% of the milk supply in the United States and is regulated through the NCIMS by the Regulatory Agencies. Manufacturing grade milk is under the direction of the Regulatory Agencies in the States where it is produced and may be subject to the standards recommended by the United States Department of Agriculture (USDA). Data reported to the NMDRD are for educational and analytical purposes and are not intended or suitable for regulatory action or follow up.

BACKGROUND

The NCIMS is a voluntary organization directed and controlled by member States to promote the availability of a high quality and safe milk supply. The Food and Drug Administration (FDA) and the NCIMS through their collaborative efforts have developed a cooperative, federal-state program (the Grade "A" Interstate Milk Shippers Program) to ensure the sanitary quality of Grade "A" milk and milk products shipped in interstate commerce. During the 1991 meeting of the NCIMS, the Conference authorized a national program to compile the results of milk drug residue testing by industry and State Regulatory Agencies.

Subsequently, FDA awarded a contract to develop a NMDRD. The database is operated by an independent third party, under contract to the FDA. The database design was developed in consultation with a project advisory group with members from the FDA and a NCIMS committee representing dairy producers, dairy processors, USDA, State Regulatory Agencies, and academia. The database was designed to promote maximum participation by the dairy industry to report on a voluntary basis all of their testing results, without compromising any confidential data. The information submitted to the database is not specific to individual firms, but consists of numbers of milk drug residue tests organized by categories including test kit method, drug family, and sample type.

It is important to recognize that the samples and tests reported do not necessarily represent one hundred percent (100%) of the milk supply from every State. However, as State and industry participation in the database increased, reporting of the number of samples and tests similarly increased.

Continuing efforts are being made to ensure that there is uniform reporting among all the States and the industry and to ensure that the drugs and test methods reported are correct. Through collaboration with test kit manufacturers and FDA, the contractor is attempting to update the drug code list utilized with the reporting application at least every six months so that outdated

codes are removed and new test codes can be created for new test kits. The most recent drug code list can be found on the database contractor's web site at: <https://www.nmdrd.com/>.

During FY 2006, a web-based version of the reporting software was developed, field evaluated, and then made available to all data reporters on September 1, 2006. Instructions for registering and using the software are posted on the contractor's web site at: <https://www.nmdrd.com/>. Fifty-two (52) data reporters utilized the web-based software to submit all or part of their data for the FY 2019 Annual Report.

A pilot program for the testing of tetracycline residues in milk was developed by the Appendix N Modification Committee of the NCIMS in response to Proposal 2015 #211. The pilot program began to test a percentage of bulk milk pickup tanker samples and/or raw milk supplies that have not been transported in a bulk milk pickup tanker (BMP) for tetracycline drug residues on July 1, 2017 and concluded on December 31, 2018. The pilot program for testing of tetracyclines spanned three fiscal year annual reports of the NMDRD; FY 2017, FY 2018 and FY 2019. The FY 2019 Annual Report includes the results of the last three months of tetracycline testing under the pilot program. During this period, 79% of data reporters indicated testing for tetracyclines was performed in their jurisdiction. Further details regarding the pilot can be found at [the NCIMS website http://ncims.org/programs/appendix-n-pilot-program/](http://ncims.org/programs/appendix-n-pilot-program/).

On April 28, 2019, GLH, Inc. staff presented an update on the NMDRD to fifty-three (53) attendees of the NCIMS Conference in Saint Louis, MO. The presentation covered a brief history of the NMDRD, results of the Annual Reports for FY 2017 and 2018, a demonstration of the web-based reporting application as well as a question and answer session. The update also included a tribute to Dr. Ginger Levin and Mr. Alfred Place, deceased GLH, Inc. staff members, who were instrumental in the development of the Third Party Database in the 1990's.

At the request of one of the attendees at a meeting of the NCIMS, the contractor converted all of the tabular information from previous annual reports into Microsoft Excel format and posted them on the contractor's web site at: <https://www.nmdrd.com/>. All of the annual reports are now available in portable document file (pdf), Microsoft Excel and Open Document Spreadsheet (ods) formats.

SUMMARY AND DISCUSSION

This report presents summary data on samples and tests conducted during Fiscal Year 2019 (October 1, 2018 to September 30, 2019). Forty-nine (49) States and Puerto Rico and two (2) Third Party Certifiers (TPC) authorized under the International Certification Program (ICP) submitted data for this report. The contractor appreciates the cooperation of all the data reporters for this fiscal year's report.

The Grade "A" Pasteurized Milk Ordinance (PMO), the regulations which govern Regulatory Agencies in the implementation and enforcement of their Grade "A" milk safety program, requires that all bulk milk tankers and/or all raw milk supplies that have not been transported in bulk milk tankers regardless of final use be sampled and analyzed for animal drug residues before the milk is processed. Any bulk milk tanker and/or all raw milk supply that has not been transported in a bulk milk pickup tanker that is found positive is rejected for human consumption.

During this period **3,997,738** samples were analyzed for animal drug residues. Of these samples **556** were positive for a drug residue. A total of **4,128,838** tests were reported on the samples for three (3) different groups or families of drugs. Since some samples are analyzed for more than one (1) drug residue, the number of tests conducted **4,128,838** is greater than the number of samples **3,997,738**. During FY 2019, a total of **567** tests were reported as positive for a drug residue. Twenty-one (21) testing methods were used to analyze the samples for drug residues. Key residue findings, by test method and sample source, can be found in Tables 8-1 to 8-8 of this report. Additional details are presented in the Tables in this report.

The one positive pasteurized fluid milk or milk product that is referenced in multiple tables within this report represented product from an on-farm processor. The volume of pasteurized fluid milk or milk product that was found positive was too small to record in the NMDRD, however the product was removed from sale and properly discarded.

SAMPLE RESULTS

A SAMPLE is defined as representing a load or lot of milk sampled and analyzed. Samples may include, for example, milk collected from a bulk milk pickup tanker, a raw milk supply that has not been transported in a bulk milk pickup tanker, a producer's bulk milk tank, a milk transport tanker, a plant silo, or a pasteurized finished product.

Table 1 shows the results of the samples tested by source.

Data are reported by four (4) SOURCES OF SAMPLES:

1. Bulk Milk Pickup Tanker and/or Raw Milk Supply That Has Not Been Transported in a Bulk Milk Pickup Tanker - bulk raw milk from a dairy farm.
2. Pasteurized Fluid Milk and Milk Products - after pasteurization; finished product in package form or bulk. This term includes milk products such as milk and cream.
3. Producer - raw milk obtained from the bulk tank/silo from a dairy farm. Samples are reported by the permitting State, rather than by the analyzing State.
4. Other - milk from milk plant tank/silos, milk transport tankers, etc.

A POSITIVE result, as used in this report, means that the sample was found to be positive for a drug residue by a test acceptable for taking regulatory action in an accredited laboratory by a certified analyst, or the milk was rejected on the basis of an initial screening presumptive positive test by the milk processor.

The DISPOSITION per PMO column represents the amount of milk contained in the tanker, raw milk supply that has not been transported in a bulk milk pickup tanker, tank/silo or lot found to be positive and disposed of in accordance with the PMO and/or applicable State regulations.

Table 1 -- Sample Results

Sample	Total Samples	Source of Number Positive	Percent Positive	Disposition per PMO (Pounds)
Bulk Milk Pickup Tanker	3,572,766	327	0.009%	14,739,000
Pasteurized Fluid Milk and Milk Products	32,097	1	0.003%	0 ⁺⁺⁺
Producer	333,125	223	0.067%	138,000
Other	59,750	5	0.008%	456,000
TOTALS	3,997,738	556	*	15,333,000

⁺⁺⁺The Pasteurized Fluid Milk and milk product sample came from an on-farm processor and the volume represented was too small to record in the NMDRD. The product was properly removed from sale and discarded.

The asterisk (*) notes that a summary of the percent positive cannot be provided because there is no uniformity in terms of sampling in the four (4) categories. For example, the PMO sets forth specific sampling requirements for Beta lactams testing as follows:

1. Bulk Milk Pickup Tanker Samples and/or Raw Milk Supplies That Have Not Been Transported In A Bulk Milk Pickup Tanker -- samples are taken on receipt of every tanker load and/or raw milk supply that has not been transported in a bulk milk pickup tanker at a milk receiving facility;
2. Pasteurized Fluid Milk and Milk Products -- a minimum of four (4) samples in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days, shall be tested for each finished milk or milk product from each milk plant during any consecutive six (6) months;
3. Producer -- each producer shall be tested at least four (4) times in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days, during any consecutive six (6) months; and
4. Other -- samples are conducted on a random basis.

Table 2 presents these results in greater detail and indicates the number of samples conducted by industry and by Regulatory Agencies. Industry samples are taken by milk plants, receiving and transfer stations, and marketing groups or cooperatives. Industry sampling and testing may be conducted to meet the industry requirements of Appendix N of the PMO, which sets forth testing and reporting requirements for animal drug residues, or for quality control purposes. Regulatory samples are taken by Regulatory Agencies.

Table 2-- Industry and Regulatory Samples

Source of Sample	Number of Industry Samples	Number of Positive Industry Samples	Number of Regulatory Samples	Number of Positive Regulatory Samples	Total Samples	Total Positive Samples	Total Percent Positive	Disposition Per PMO (Pounds)
GRADE "A"								
Bulk Milk Pickup Tanker	3,343,693	300	40,452	4	3,384,145	304	0.009%	13,742,000
Pasteurized Fluid Milk and Milk Products	2,611	0	28,612	1	31,223	1	0.003%	0 ⁺⁺⁺
Producer	240,931	167	73,190	38	314,121	205	0.065%	138,000
Other	48,343	2	9,322	3	57,665	5	0.009%	456,000
NON-GRADE "A"								
Bulk Milk Pickup Tanker ¹	176,483	22	12,138	1	188,621	23	0.012%	997,000
Pasteurized Fluid Milk and Milk Products	429	0	445	0	874	0	0.000%	0
Producer	18,430	18	574	0	19,004	18	0.095%	0
Other	1,701	0	384	0	2,085	0	0.000%	0
TOTALS	3,832,621	509	165,117	47	3,997,738	556	*	15,333,000²

¹ It is a common practice in some states, including two large milk producing states, that bulk milk pickup tankers collect milk from both Grade "A" and non-Grade "A" milk producers on the same tanker. Then, these loads are delivered to non-Grade "A" processing facilities. Because of this commingling of the two grades of milk, all data related to these loads are reported under non-Grade "A".

² Note that this represents 0.007% of the total milk supply of the United States with an annual production of 218 billion pounds.

* See Table 1 for explanation

⁺⁺⁺The Pasteurized Fluid Milk and milk product sample came from an on-farm processor and the volume represented was too small to record in the NMDRD. The product was properly removed from sale and discarded.

TESTS CONDUCTED

An objective of the NMDRD is to record every test run on each sample analyzed. Since some samples are analyzed for more than one (1) drug residue, the number of tests conducted (4,128,838) is greater than the number of samples (3,997,738). To avoid duplicate reporting of samples, the number of samples analyzed is reported separately from the number of tests run in the data base.

Table 3 presents summary results of the number of tests which were conducted during October 1, 2018 to September 30, 2019. The term, "validated test", as used in this report, is a test used for the screening of raw milk for drug residue, which has been evaluated by FDA in accordance with the standards established for the evaluation of these types of tests, and found acceptable by the NCIMS in accordance with Appendix N of the PMO. In addition, FDA validated drug residue detection procedures for screening and quantification of drug residues in milk may be used. Table 3A presents summary results using validated tests and Table 3B presents summary results using non-validated tests.

Table 3 -- Tests Conducted by Sample Sources

Source of Sample	Total Tests	Number of Positive Tests	Percent Positive
Bulk Milk Pickup Tanker	3,703,667	331	0.009%
Pasteurized Fluid Milk and Milk Products	32,144	1	0.003%
Producer	333,160	230	0.069%
Other	59,867	5	0.008%
TOTALS	4,128,838	567	*

* See Table 1 for explanation

Table 3A-- Validated Tests Conducted

Source of Sample	Total Tests	Number of Positive Tests	Percent Positive
Bulk Milk Pickup Tanker	3,701,861	331	0.009%
Pasteurized Fluid Milk and Milk Products	32,144	1	0.003%
Producer	333,160	230	0.069%
Other	59,842	5	0.008%
TOTALS	4,127,007	567	*

* See Table 1 for explanation

Table 3B-- Non-Validated Tests Conducted

Source of Sample	Total Tests	Number of Positive Tests	Percent Positive
Bulk Milk Pickup Tanker	1,806	0	0.000%
Pasteurized Fluid Milk and Milk Products	0	0	0.000%
Producer	0	0	0.000%
Other	25	0	0.000%
TOTALS	1,831	0	*

* See Table 1 for explanation

Table 4 presents additional details in terms of the tests conducted by industry and by Regulatory Agencies. Tables 4A and 4B present these data by validated and non-validated tests.

Table 4 -- Tests Conducted by Industry and Regulatory Agencies

Source of Sample	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Total Percent Positive
GRADE "A"							
Bulk Milk Pickup Tanker	3,474,201	303	40,783	4	3,514,984	307	0.009%
Pasteurized Fluid Milk and Milk Products	2,611	0	28,657	1	31,268	1	0.003%
Producer	240,935	172	73,221	39	314,156	211	0.067%
Other	48,392	2	9,387	3	57,779	5	0.009%
NON-GRADE "A"							
Bulk Milk Pickup Tanker ¹	176,545	23	12,138	1	188,683	24	0.013%
Pasteurized Fluid Milk and Milk Products	431	0	445	0	876	0	0.000%
Producer	18,430	19	574	0	19,004	19	0.100%
Other	1,704	0	384	0	2,088	0	0.000%
TOTALS	3,963,249	519	165,589	48	4,128,838	567	*

¹ It is a common practice in some states, including two large milk producing states, that bulk milk pickup tankers collect milk from both Grade "A" and non-Grade "A" milk producers on the same tanker. Then, these loads are delivered to non-Grade "A" processing facilities. Because of this commingling of the two grades of milk, all data related to these loads are reported under non-Grade "A".

* See Table 1 for explanation

Table 4A -- Validated Tests Conducted by Industry and Regulatory Agencies

Source of Sample	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Total Percent Positive
GRADE "A"							
Bulk Milk Pickup Tanker	3,472,395	303	40,783	4	3,513,178	307	0.009%
Pasteurized Fluid Milk and Milk Products	2,611	0	28,657	1	31,268	1	0.003%
Producer	240,935	172	73,221	39	314,156	211	0.067%
Other	48,392	2	9,387	3	57,779	5	0.009%
NON-GRADE "A"							
Bulk Milk Pickup Tanker ¹	176,545	23	12,138	1	188,683	24	0.013%
Pasteurized Fluid Milk and Milk Products	431	0	445	0	876	0	0.000%
Producer	18,430	19	574	0	19,004	19	0.100%
Other	1,704	0	359	0	2,063	0	0.000%
TOTALS	3,961,443	519	165,564	48	4,127,007	567	*

¹ It is a common practice in some states, including two large milk producing states, that bulk milk pickup tankers collect milk from both Grade "A" and non-Grade "A" milk producers on the same tanker. Then, these loads are delivered to non-Grade "A" processing facilities. Because of this commingling of the two grades of milk, all data related to these loads are reported under non-Grade "A".

* See Table 1 for explanation

Table 4B -- Non-Validated Tests Conducted by Industry and Regulatory Agencies

Source of Sample	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Total Percent Positive
GRADE "A"							
Bulk Milk Pickup Tanker	1,806	0	0	0	1,806	0	0.000%
Pasteurized Fluid Milk and Milk Products	0	0	0	0	0	0	0.000%
Producer	0	0	0	0	0	0	0.000%
Other	0	0	0	0	0	0	0.000%
NON-GRADE "A"							
Bulk Milk Pickup Tanker ¹	0	0	0	0	0	0	0.000%
Pasteurized Fluid Milk and Milk Products	0	0	0	0	0	0	0.000%
Producer	0	0	0	0	0	0	0.000%
Other	0	0	25	0	25	0	0.000%
TOTALS	1,806	0	25	0	1,831	0	*

¹ It is a common practice in some states, including two large milk producing states, that bulk milk pickup tankers collect milk from both Grade "A" and non-Grade "A" milk producers on the same tanker. Then, these loads are delivered to non-Grade "A" processing facilities. Because of this commingling of the two grades of milk, all data related to these loads are reported under non-Grade "A".

* See Table 1 for explanation

Table 5 shows the number of tests conducted by the family of drugs.
 Tables 5A and 5B present these data by validated and non-validated tests.

Table 5 -- Number of Tests Conducted by Family/Drug

Family/Drug	Total Tests	Total Positive
BETA lactams	3,924,108	558
SULFONAMIDES	64,461	5
SULFAMETHAZINE	123	0
TETRACYCLINES	140,146	4
TOTALS	4,128,838	567

Table 5A -- Number of Validated Tests Conducted by Family/Drug

Family/Drug	Total Tests	Total Positive
BETA lactams	3,924,108	558
SULFONAMIDES	62,753	5
TETRACYCLINES	140,146	4
TOTALS	4,127,007	567

Table 5B -- Number of Non-Validated Tests Conducted by Family/Drug

Family/Drug	Total Tests	Total Positive
SULFONAMIDES	1,708	0
SULFAMETHAZINE	123	0
TOTALS	1,831	0

Table 6 presents details on the tests used. The data in this table are comparable to Table 5, but the data are arranged by tests within each family/drug. Therefore, the Totals are the same in both tables. Test methods with the largest use to detect drug residues were: Charm SL - Beta lactams, which was used almost 2.0 million times, Charm 3 SL-3, which was used 1.3 million times, Delvotest P 5 Pack, which was used more than 347 thousand times, and IDEXX New SNAP Beta lactam, which was used for more than 115 thousand tests.

Table 6 -- Number of Tests by Method by Family/Drug

Tests Used by Family/Drug	Number of Tests	Number Positive	Percent Positive
BETA lactams			
Charm 3 SL-3	1,370,426	132	0.010%
Charm BsDA ^{**}	18,936	13	0.069%
Charm II Tablet Competitive	12,575	1	0.008%
Charm II Tablet Quantitative	142	0	0.000%
Charm II Tablet Sequential	15,063	0	0.000%
Charm SL Beta lactams	1,998,501	161	0.008%
Charm Trio Test-Beta lactams	28,944	1	0.003%
Delvotest P 5 Pack ^{**}	347,007	205	0.059%
Delvotest P/Delvotest P Mini ^{**}	15,382	1	0.007%
IDEXX New SNAP Beta lactam	115,588	44	0.038%
Neogen BetaStar Advanced For Beta-Lactams	1,544	0	0.000%
SULFONAMIDES			
Charm II Tablet Competitive	1,942	3	0.154%
Charm II Tablet Sequential ^{**}	1,708	0	0.000%
Charm Rosa Sulf-Sulfonamides	38,431	0	0.000%
Charm Trio Test-Sulf	22,379	2	0.009%
TLC Sulfonamide	1	0	0.000%
SULFAMETHAZINE			
IDEXX SNAP Sulfa(SMZ) ^{**}	123	0	0.000%
TETRACYCLINES			
Charm II Tablet Competitive	2,880	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	109,178	4	0.004%
Charm Trio Test-Tetra	23,689	0	0.000%
IDEXX SNAP Tetracycline (Dil. Conf.)	4,399	0	0.000%
TOTALS	4,128,838	567	*

* See Table 1 for explanation

** Non-Validated Test Method

^{**} NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

Table 6A shows a comparison of tests conducted using Validated and Non-Validated test methods for Sulfonamides and Tetracyclines.

Table 6A -- Comparison of Validated and Non-Validated Tests for Sulfonamides and Tetracyclines

Tests By Method by Family/Drug	Number of Tests	Number Positive	Percent Positive
VALIDATED FOR SULFONAMIDES			
Charm II Tablet Competitive	1,942	3	0.154%
Charm Rosa Sulf-Sulfonamides	38,431	0	0.000%
Charm Trio Test-Sulf	22,379	2	0.009%
TLC Sulfonamide	1	0	0.000%
NON-VALIDATED FOR SULFONAMIDES			
Charm II Tablet Sequential**	1,708	0	0.000%
NON-VALIDATED FOR SULFAMETHAZINE			
IDEXX SNAP Sulfa(SMZ)**	123	0	0.000%
VALIDATED FOR TETRACYCLINES			
Charm II Tablet Competitive	2,880	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	109,178	4	0.004%
Charm Trio Test-Tetra	23,689	0	0.000%
IDEXX SNAP Tetracycline (Dil. Conf.)	4,399	0	0.000%
TOTALS	204,730	9	*

* See Table 1 for explanation

** Non-Validated Test Method

Tables 7-1 to 7-8 present additional details of the testing conducted. These Tables show the testing by the family of drugs and by individual drugs and present results in terms of Grade "A" and Non-Grade "A" testing.

Table 7-1 -- Grade "A" Bulk Milk Pickup Tanker Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	3,273,507	297	37,977	4	3,311,484	301
SULFONAMIDES	64,403	2	0	0	64,403	2
Sulfamethazine	123	0	0	0	123	0
TETRACYCLINES	136,168	4	2,806	0	138,974	4
TOTALS	3,474,201	303	40,783	4	3,514,984	307

Table 7-2 -- Grade "A" Pasteurized Fluid Milk and Milk Products Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	2,611	0	28,652	1	31,263	1
SULFONAMIDES	0	0	5	0	5	0
TOTALS	2,611	0	28,657	1	31,268	1

Table 7-3 -- Grade "A" Producer Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	240,926	172	73,191	38	314,117	210
SULFONAMIDES	0	0	17	1	17	1
TETRACYCLINES	9	0	13	0	22	0
TOTALS	240,935	172	73,221	39	314,156	211

Table 7-4 -- Grade "A" Other Testing (Milk from Milk plant tanks/silos, milk transport tankers, etc.)

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	47,475	2	9,359	1	56,834	3
SULFONAMIDES	0	0	10	2	10	2
TETRACYCLINES	917	0	18	0	935	0
TOTALS	48,392	2	9,387	3	57,779	5

Table 7-5 -- Non-Grade "A" Bulk Milk Pickup Tanker Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	176,545	23	12,138	1	188,683	24
TOTALS	176,545	23	12,138	1	188,683	24

Table 7-6 -- Non-Grade "A" Pasteurized Fluid Milk and Milk Products Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	431	0	445	0	876	0
TOTALS	431	0	445	0	876	0

Table 7-7 -- Non-Grade "A" Producer Testing

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	18,430	19	574	0	19,004	19
TOTALS	18,430	19	574	0	19,004	19

Table 7-8 -- Non-Grade "A" Other Testing (Milk from Milk plant tanks/silos, milk transport tankers, etc.)

Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests
BETA lactams	1,488	0	359	0	1,847	0
SULFONAMIDES	1	0	25	0	26	0
TETRACYCLINES	215	0	0	0	215	0
TOTALS	1,704	0	384	0	2,088	0

Tables 8-1 to 8-8 present details on the number of tests conducted by industry and by Regulatory Agencies. The data are arranged by test within each family/drug and present results in terms of sample type and Grade "A" and Non-Grade "A" testing. Please reference the latest revision of M-a-85 and/or test kit approval memoranda (M-I) for tests that are approved/validated or acceptable for testing milk and milk products for regulatory purposes.

Table 8-1 -- Number of Tests by Method by Family/Drug Grade "A" Bulk Milk Pickup Tanker

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	1,225,591	109	15,135	2	1,240,726	111	0.009%
Charm BsDA ⁺⁺	9,117	2	759	0	9,876	2	0.020%
Charm II Tablet Competitive	12,575	1	0	0	12,575	1	0.008%
Charm II Tablet Quantitative	138	0	0	0	138	0	0.000%
Charm II Tablet Sequential	15,038	0	0	0	15,038	0	0.000%
Charm SL Beta lactams	1,861,697	141	21,692	2	1,883,389	143	0.008%
Charm Trio Test-Beta lactams	28,944	1	0	0	28,944	1	0.003%
Delvotest P 5 Pack ⁺⁺	6,303	0	262	0	6,565	0	0.000%
Delvotest P/Delvotest P Mini ⁺⁺	2,903	0	0	0	2,903	0	0.000%
IDEXX New SNAP Beta lactam	109,678	43	129	0	109,807	43	0.039%
Neogen BetaStar Advanced For Beta-Lactams	1,523	0	0	0	1,523	0	0.000%
Sulfonamides							
Charm II Tablet Competitive	1,910	0	0	0	1,910	0	0.000%
Charm II Tablet Sequential ^{**}	1,683	0	0	0	1,683	0	0.000%
Charm Rosa Sulf-Sulfonamides	38,431	0	0	0	38,431	0	0.000%
Charm Trio Test-Sulf	22,379	2	0	0	22,379	2	0.009%
Sulfamethazine							
IDEXX SNAP Sulfa(SMZ) ^{**}	123	0	0	0	123	0	0.000%
Tetracyclines							
Charm II Tablet Competitive	2,810	0	0	0	2,810	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	107,540	4	1,058	0	108,598	4	0.004%
Charm Trio Test-Tetra	23,689	0	0	0	23,689	0	0.000%
IDEXX SNAP Tetracycline (Dil. Conf.)	2,129	0	1,748	0	3,877	0	0.000%
TOTALS	3,474,201	303	40,783	4	3,514,984	307	0.009%

^{**} Non-Validated Test Method

⁺⁺ NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

Table 8-2 -- Number of Tests by Method by Family/Drug Grade "A" Pasteurized Fluid Milk and Milk Products

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	1,039	0	0	0	1,039	0	0.000%
Charm BsDA ⁺⁺	100	0	732	0	832	0	0.000%
Charm SL Beta lactams	49	0	552	0	601	0	0.000%
Delvotest P 5 Pack ⁺⁺	1,423	0	26,539	1	27,962	1	0.004%
Delvotest P/Delvotest P Mini ⁺⁺	0	0	328	0	328	0	0.000%
IDEXX New SNAP Beta lactam	0	0	501	0	501	0	0.000%
Sulfonamides							
Charm II Tablet Competitive	0	0	5	0	5	0	0.000%
TOTALS	2,611	0	28,657	1	31,268	1	0.003%

⁺⁺ NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

Table 8-3 -- Number of Tests by Method by Family/Drug Grade "A" Producer Testing

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	3,485	4	214	1	3,699	5	0.135%
Charm BsDA ⁺⁺	5,742	8	699	0	6,441	8	0.124%
Charm II Tablet Sequential	0	0	25	0	25	0	0.000%
Charm SL Beta lactams	6,261	8	2,369	2	8,630	10	0.116%
Delvotest P 5 Pack ⁺⁺	215,275	152	68,649	35	283,924	187	0.066%
Delvotest P/Delvotest P Mini ⁺⁺	9,104	0	1,235	0	10,339	0	0.000%
IDEXX New SNAP Beta lactam	1,038	0	0	0	1,038	0	0.000%
Neogen BetaStar Advanced For Beta-Lactams	21	0	0	0	21	0	0.000%
Sulfonamides							
Charm II Tablet Competitive	0	0	17	1	17	1	5.882%
Tetracyclines							
Charm II Tablet Competitive	0	0	1	0	1	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	9	0	12	0	21	0	0.000%
TOTALS	240,935	172	73,221	39	314,156	211	0.067%

⁺⁺ NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

Table 8-4 -- Number of Tests by Method by Family/Drug Grade "A" Other Testing (Milk from Milk plant tanks/silos, milk transport tankers, etc.)

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	5,915	1	108	0	6,023	1	0.017%
Charm BsDA ⁺⁺	215	0	11	0	226	0	0.000%
Charm II Tablet Quantitative	4	0	0	0	4	0	0.000%
Charm SL Beta lactams	37,154	1	2,084	0	39,238	1	0.003%
Delvotest P 5 Pack ⁺⁺	2,535	0	7,015	1	9,550	1	0.010%
Delvotest P/Delvotest P Mini ⁺⁺	85	0	55	0	140	0	0.000%
IDEXX New SNAP Beta lactam	1,567	0	86	0	1,653	0	0.000%
Sulfonamides							
Charm II Tablet Competitive	0	0	10	2	10	2	20.000%
Tetracyclines							
Charm II Tablet Competitive	69	0	0	0	69	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	541	0	18	0	559	0	0.000%
IDEXX SNAP Tetracycline (Dil. Conf.)	307	0	0	0	307	0	0.000%
TOTALS	48,392	2	9,387	3	57,779	5	0.009%

⁺⁺ NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmrd.com/>

Table 8-5 -- Number of Tests by Method by Family/Drug Non-Grade "A" Bulk Milk Pickup Tanker

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	106,766	14	12,138	1	118,904	15	0.013%
Charm SL Beta lactams	66,055	7	0	0	66,055	7	0.011%
Delvotest P 5 Pack ⁺⁺	184	0	0	0	184	0	0.000%
Delvotest P/Delvotest P Mini ⁺⁺	1,295	1	0	0	1,295	1	0.077%
IDEXX New SNAP Beta lactam	2,245	1	0	0	2,245	1	0.045%
TOTALS	176,545	23	12,138	1	188,683	24	0.013%

⁺⁺ NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmrd.com/>

Table 8-6 -- Number of Tests by Method by Family/Drug Non-Grade "A" Pasteurized Fluid Milk and Milk Products

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm 3 SL-3	0	0	35	0	35	0	0.000%
Delvotest P 5 Pack**	431	0	410	0	841	0	0.000%
TOTALS	431	0	445	0	876	0	0.000%

** NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

Table 8-7 -- Number of Tests by Method by Family/Drug Non-Grade "A" Producer Testing

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm BsDA**	1,560	3	0	0	1,560	3	0.192%
Charm SL Beta lactams	32	0	0	0	32	0	0.000%
Delvotest P 5 Pack**	16,345	16	574	0	16,919	16	0.095%
Delvotest P/Delvotest P Mini**	377	0	0	0	377	0	0.000%
IDEXX New SNAP Beta lactam	116	0	0	0	116	0	0.000%
TOTALS	18,430	19	574	0	19,004	19	0.100%

** NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>

**Table 8-8 -- Number of Tests by Method by Family/Drug Non-Grade "A" Other Testing
(Milk from Milk plant tanks/silos, milk transport tankers, etc.)**

Tests Used by Family/Drug	Number of Industry Tests	Number of Positive Industry Tests	Number of Regulatory Tests	Number of Positive Regulatory Tests	Total Tests	Total Positive Tests	Percent Positive
BETA lactams							
Charm BsDA ^{**}	1	0	0	0	1	0	0.000%
Charm SL Beta lactams	276	0	280	0	556	0	0.000%
Delvotest P 5 Pack ^{**}	983	0	79	0	1,062	0	0.000%
IDEXX New SNAP Beta lactam	228	0	0	0	228	0	0.000%
Sulfonamides							
Charm II Tablet Sequential ^{**}	0	0	25	0	25	0	0.000%
TLC Sulfonamide	1	0	0	0	1	0	0.000%
Tetracyclines							
IDEXX SNAP Tetracycline (Dil. Conf.)	215	0	0	0	215	0	0.000%
TOTALS	1,704	0	384	0	2,088	0	0.000%

^{**} Non-Validated Test Method

^{**} NCIMS evaluated these kits for detection of Beta lactams; however, unless the kits are used with Beta lactamase, they do not specifically identify the presence of Beta lactams. The reporting of these tests does not make it possible to separate the use/nonuse of Beta lactamase. A finding of "Not Found" would indicate the test did not detect any inhibitor for which it is sensitive, including, but not limited to, antibiotics or non-specific inhibitors such as sanitizers. See technical bulletin on the contractor's website at: <https://www.nmdrd.com/>