

**NATIONAL MILK DRUG RESIDUE DATABASE
FISCAL YEAR 2022 ANNUAL REPORT**

October 1, 2021 - September 30, 2022

Submitted to:

**Office of Regulatory Affairs
U. S. Food and Drug Administration
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**NATIONAL MILK DRUG RESIDUE DATABASE
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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 safe, high quality 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 GLH, Incorporated, 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 established to promote maximum voluntary participation by the dairy industry in reporting all of their testing results, without compromising any confidential data. The information submitted to the database is not specific to individual firms, but instead 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.

FY 2022 ACTIVITIES

During FY 2022, GLH, Inc. completed an update for the web reporting application to a new PHP version and program framework. The updated programming language (PHP 7.4) and development framework (Fat – Free Framework Version 3.7) were available as a web reporting application refresh on March 21st.

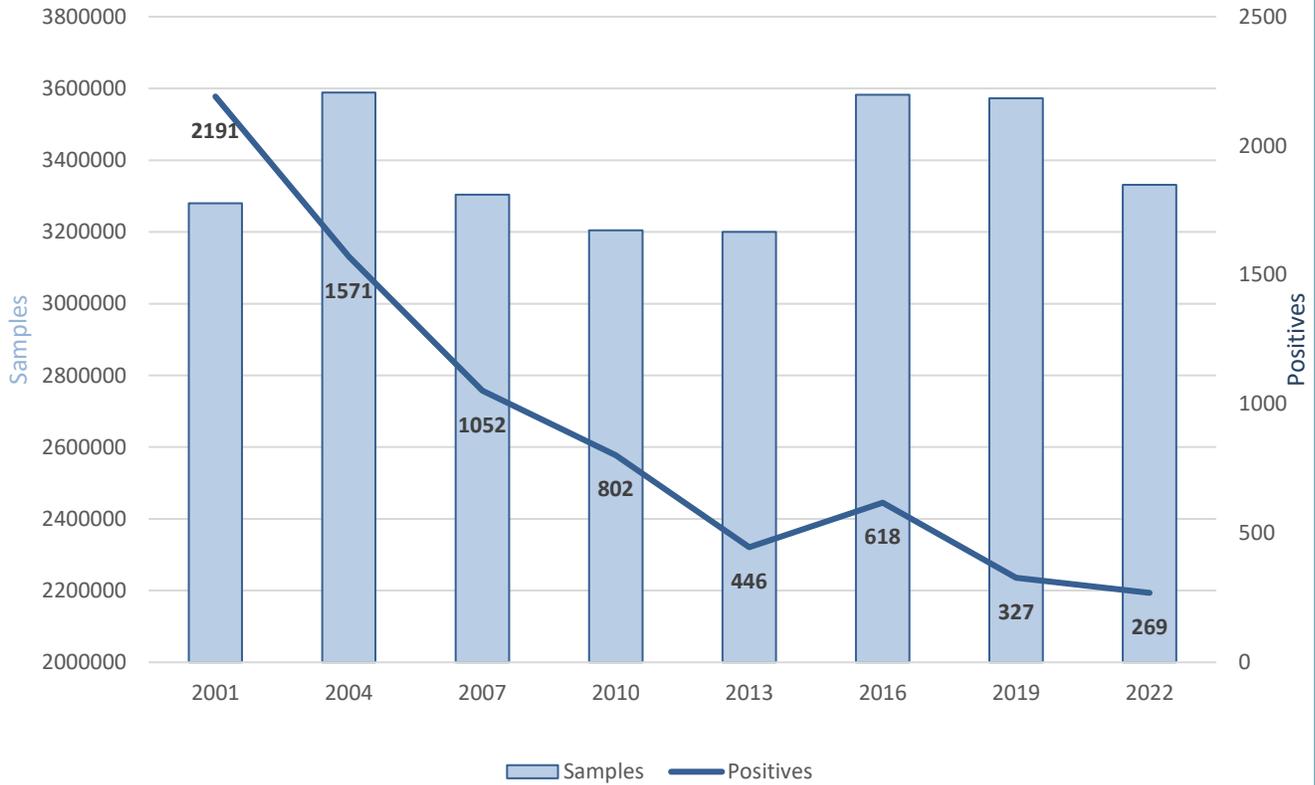
In conjunction with the web-application update, GLH also revised the NMDRD Drug Code List to include the NCIMS laboratory codes as a cross reference to the current drug test method codes that were listed. Two additional FY 2022 Drug Code List updates were completed – one in June and a second in July – to remain current with changes to the drug test kit status of two manufacturers. The most recent revision of the NMDRD Drug Test Kit List was placed on the NMDRD website and in the web-based application on July 29, 2022. The Link for the 07/2022 revision containing all these edits is <https://www.nmdrd.com/DrugCodeList-07-29-2022.pdf>.

This annual report and all previous annual reports are available on the NMDRD website at <https://www.nmdrd.com>. Complete reports are available in portable document file (pdf) format and the tables are provided in Microsoft Excel and Open Document Spreadsheet (ods) formats.

GLH, Inc. has supported the FDA and the NCIMS in the design, management, and operation of the NMDRD since the national database was approved by the delegates during the 1991 NCIMS. This third party database has been very successful in documenting the hard work done by the dairy industry to prevent drug residues in our milk supply, thus helping to meet the NCIMS standard as “the Safest Possible Milk Supply for All the People.” The two charts that are included below represent data taken from NMDRD Annual Reports over the last 20 years. The reduction of Bulk Milk Pickup Tanker sample positives and the resulting reduction in test positive milk represent a commendable achievement by the dairy industry and that story is told through the NMDRD.

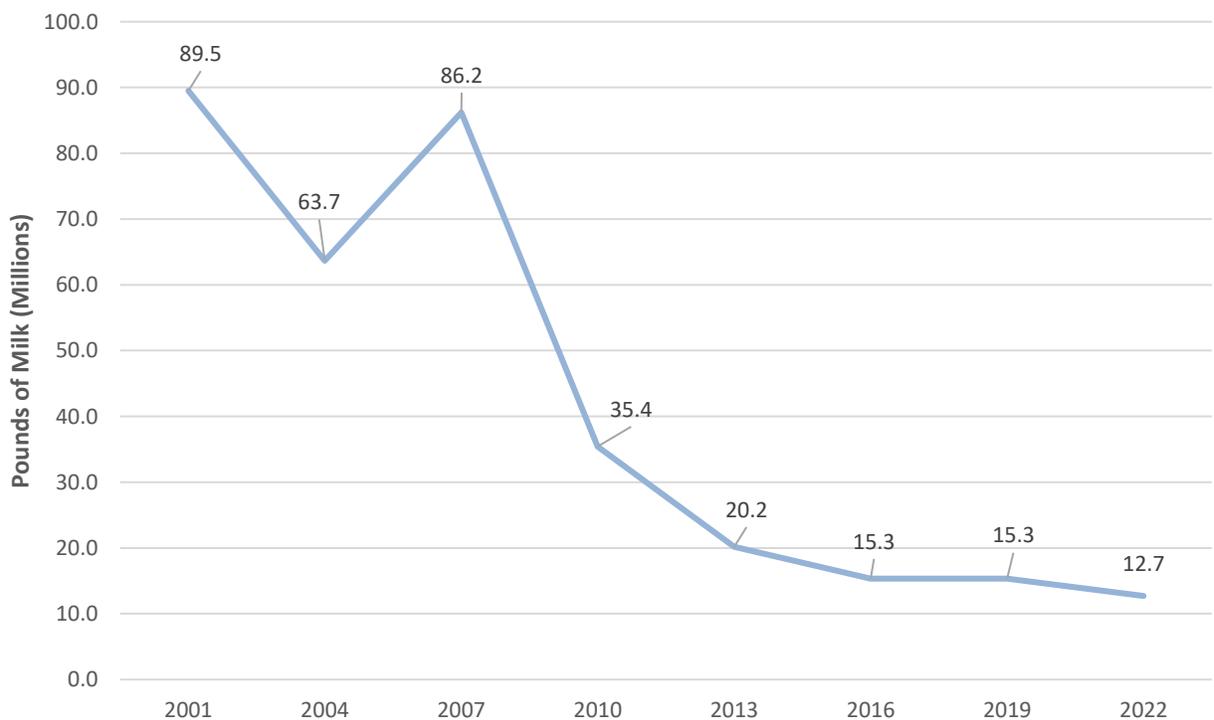
Bulk Milk Pickup Tanker Samples and Positives

Source: NMDRD



Pounds of Milk Properly Disposed (Millions)

Source: NMDRD



SAMPLES AND TESTS REPORTED

This report presents summary data on samples and tests conducted during Fiscal Year 2022 (October 1, 2021 to September 30, 2022). **Forty-nine** (49) States, 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 programs, requires that all bulk milk pickup tankers and/or all raw milk supplies that have not been transported in bulk milk pickup tankers - regardless of final use - be sampled and analyzed for animal drug residues before the milk is processed. Any bulk milk pickup 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 FY 2022, **3,689,753** samples were analyzed for animal drug residues. Of these samples **424** were positive for a drug residue. A total of **3,879,182** 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 is greater than the number of samples. During FY 2022, a total of **436** tests were reported as positive for a drug residue. Nineteen (19) 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.

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 dairy farm(s).
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 tanks/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 (refer to the latest version of M-I-96-10), 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	3,331,086	269	0.008%	12,389,000
Pasteurized Fluid Milk and Milk Products	29,195	2	0.007%	38,000
Producer	285,629	151	0.053%	187,000
Other	43,843	2	0.005%	95,000
TOTALS	3,689,753	424	*	12,709,000

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	3,237,281	263	3,628	0	3,240,909	263	0.008%	12,121,000
Pasteurized Fluid Milk and Milk Products	2,474	0	25,689	2	28,163	2	0.007%	38,000
Producer	197,144	114	75,262	21	272,406	135	0.050%	187,000
Other	34,508	1	7,617	1	42,125	2	0.005%	95,000
NON-GRADE "A"								
Bulk Milk Pickup Tanker ¹	90,177	6	0	0	90,177	6	0.007%	268,000
Pasteurized Fluid Milk and Milk Products	889	0	143	0	1,032	0	0.000%	0
Producer	11,836	13	1,387	3	13,223	16	0.121%	0
Other	1,174	0	544	0	1,718	0	0.000%	0
TOTALS	3,575,483	397	114,270	27	3,689,753	424	*	12,709,000²

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 0.006% of the total milk supply of the United States with an annual production of 226 billion pounds.

* See Table 1 for explanation

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 (3,879,182) is greater than the number of samples (3,689,753). 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, 2021 to September 30, 2022. 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. Fiscal year 2022 marks the first year in the history of the NMDRD since FY 1999 that usage of non-validated tests was not reported.

Table 3 -- Tests Conducted by Sample Sources

Source of Sample	Total Tests	Number of Positive Tests	Percent Positive
Bulk Milk Pickup Tanker	3,517,396	272	0.008%
Pasteurized Fluid Milk and Milk Products	29,252	2	0.007%
Producer	288,670	160	0.055%
Other	43,864	2	0.005%
TOTALS	3,879,182	436	*

* 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	3,517,396	272	0.008%
Pasteurized Fluid Milk and Milk Products	29,252	2	0.007%
Producer	288,670	160	0.055%
Other	43,864	2	0.005%
TOTALS	3,879,182	436	*

* 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	0	0	0.000%
Pasteurized Fluid Milk and Milk Products	0	0	0.000%
Producer	0	0	0.000%
Other	0	0	0.000%
TOTALS	0	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. Fiscal year 2022 marks the first year in the history of the NMDRD since FY 1999 that usage of non-validated tests was not reported.

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	3,423,508	266	3,711	0	3,427,219	266	0.008%
Pasteurized Fluid Milk and Milk Products	2,476	0	25,744	2	28,220	2	0.007%
Producer	200,166	123	75,281	21	275,447	144	0.052%
Other	34,508	1	7,632	1	42,140	2	0.005%
NON-GRADE "A"							
Bulk Milk Pickup Tanker ¹	90,177	6	0	0	90,177	6	0.007%
Pasteurized Fluid Milk and Milk Products	889	0	143	0	1,032	0	0.000%
Producer	11,836	13	1,387	3	13,223	16	0.121%
Other	1,180	0	544	0	1,724	0	0.000%
TOTALS	3,764,740	409	114,442	27	3,879,182	436	*

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	3,423,508	266	3,711	0	3,427,219	266	0.008%
Pasteurized Fluid Milk and Milk Products	2,476	0	25,744	2	28,220	2	0.007%
Producer	200,166	123	75,281	21	275,447	144	0.052%
Other	34,508	1	7,632	1	42,140	2	0.005%
NON-GRADE "A"							
Bulk Milk Pickup Tanker ¹	90,177	6	0	0	90,177	6	0.007%
Pasteurized Fluid Milk and Milk Products	889	0	143	0	1,032	0	0.000%
Producer	11,836	13	1,387	3	13,223	16	0.121%
Other	1,180	0	544	0	1,724	0	0.000%
TOTALS	3,764,740	409	114,442	27	3,879,182	436	*

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	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	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	0	0	0	0	0.000%
TOTALS	0	0	0	0	0	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. Fiscal year 2022 marks the first year in the history of the NMDRD since FY 1999 that usage of non-validated tests was not reported.

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

Family/Drug	Total Tests	Total Positive
BETA lactams	3,693,713	427
SULFONAMIDES	94,183	7
TETRACYCLINES	91,286	2
TOTALS	3,879,182	436

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

Family/Drug	Total Tests	Total Positive
BETA lactams	3,693,713	427
SULFONAMIDES	94,183	7
TETRACYCLINES	91,286	2
TOTALS	3,879,182	436

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

Family/Drug	Total Tests	Total Positive
TOTALS	0	0

Table 6 presents details on the tests used, and the total test numbers are the same as shown in Table 5. The test numbers for each drug test method are arranged by test method within each drug family. Test methods with the largest use to detect drug residues were: Charm 3 SL-3, used for **1,720,281** tests; Charm SL Beta lactams, used for **1,379,110** tests; Delvotest P 5 Pack, used for **301,358** tests, Charm BL30SEC, used for **102,262** tests and Charm TRIO used for **85,255** tests. Please note that the Charm TRIO – Beta lactams, the Charm TRIO – Sulfonamides, and the Charm TRIO - Tetracyclines methods are highlighted in the following tables since they are approved for screening purposes only and not for confirmation.

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	1,720,281	147	0.009%
Charm BL30SEC	102,262	11	0.011%
Charm BsDA**	7,279	5	0.069%
Charm II Tablet Competitive	4,039	0	0.000%
Charm II Tablet Sequential Beta lactams	2,613	0	0.000%
Charm SL Beta lactams	1,379,110	92	0.007%
Charm TRIO - Beta lactams	85,255	5	0.006%
Delvotest P 5 Pack**	301,358	151	0.050%
Delvotest P Mini - Beta lactams**	7,249	0	0.000%
IDEXX New SNAP Beta-Lactam	84,042	16	0.019%
Neogen BetaStar Advanced for Beta-lactams	225	0	0.000%
SULFONAMIDES			
Charm II Tablet Competitive	3	1	33.333%
Charm ROSA Sulfonamides	8,884	1	0.011%
Charm TRIO - Sulfonamides	85,255	5	0.006%
TLC Sulfonamide	41	0	0.000%
TETRACYCLINES			
Charm II Tablet Competitive	142	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	5,463	0	0.000%
Charm TRIO - Tetracyclines	85,255	2	0.002%
IDEXX SNAP Tetracycline (Dil. Conf.)	426	0	0.000%
TOTALS	3,879,182	436	*

* See Table 1 for explanation

** 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. Fiscal year 2022 marks the first year in the history of the NMDRD since FY 1999 that usage of non-validated tests was not reported.

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	3	1	33.333%
Charm ROSA Sulfonamides	8,884	1	0.011%
Charm TRIO - Sulfonamides	85,255	5	0.006%
TLC Sulfonamide	41	0	0.000%
VALIDATED FOR TETRACYCLINES			
Charm II Tablet Competitive	142	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	5,463	0	0.000%
Charm TRIO - Tetracyclines	85,255	2	0.002%
IDEXX SNAP Tetracycline (Dil. Conf.)	426	0	0.000%
TOTALS	185,469	9	*

* See Table 1 for explanation

Tables 7-1 to 7-8 present additional details of the testing conducted. These tables show the testing by the family of 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	3,238,337	258	3,673	0	3,242,010	258
SULFONAMIDES	94,138	6	1	0	94,139	6
TETRACYCLINES	91,033	2	37	0	91,070	2
TOTALS	3,423,508	266	3,711	0	3,427,219	266

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	2,476	0	25,744	2	28,220	2
TOTALS	2,476	0	25,744	2	28,220	2

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	200,165	123	75,237	20	275,402	143
SULFONAMIDES	0	0	3	1	3	1
TETRACYCLINES	1	0	41	0	42	0
TOTALS	200,166	123	75,281	21	275,447	144

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	34,344	1	7,581	1	41,925	2
SULFONAMIDES	6	0	35	0	41	0
TETRACYCLINES	158	0	16	0	174	0
TOTALS	34,508	1	7,632	1	42,140	2

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	90,177	6	0	0	90,177	6
TOTALS	90,177	6	0	0	90,177	6

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	889	0	143	0	1,032	0
TOTALS	889	0	143	0	1,032	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	11,836	13	1,387	3	13,223	16
TOTALS	11,836	13	1,387	3	13,223	16

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	1,180	0	544	0	1,724	0
TOTALS	1,180	0	544	0	1,724	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-98 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	1,645,889	143	359	0	1,646,248	143	0.009%
Charm BL30SEC	99,368	11	0	0	99,368	11	0.011%
Charm BsDA**	1,042	0	107	0	1,149	0	0.000%
Charm II Tablet Competitive	4,033	0	0	0	4,033	0	0.000%
Charm II Tablet Sequential Beta lactams	2,613	0	0	0	2,613	0	0.000%
Charm SL Beta lactams	1,311,992	82	550	0	1,312,542	82	0.006%
Charm TRIO - Beta lactams	85,255	5	0	0	85,255	5	0.006%
Delvotest P 5 Pack**	9,386	1	2,631	0	12,017	1	0.008%
Delvotest P Mini - Beta lactams**	2,901	0	0	0	2,901	0	0.000%
IDEXX New SNAP Beta-Lactam	75,684	16	26	0	75,710	16	0.021%
Neogen BetaStar Advanced for Beta-lactams	174	0	0	0	174	0	0.000%
Sulfonamides							
Charm ROSA Sulfonamides	8,883	1	1	0	8,884	1	0.011%
Charm TRIO - Sulfonamides	85,255	5	0	0	85,255	5	0.006%
Tetracyclines							
Charm II Tablet Competitive	142	0	0	0	142	0	0.000%
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	5,461	0	1	0	5,462	0	0.000%
Charm TRIO - Tetracyclines	85,255	2	0	0	85,255	2	0.002%
IDEXX SNAP Tetracycline (Dil. Conf.)	175	0	36	0	211	0	0.000%
TOTALS	3,423,508	266	3,711	0	3,427,219	266	0.008%

** 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 ³	1,266	0	17	0	1,283	0	0.000%
Charm BsDA ⁺⁺	0	0	561	0	561	0	0.000%
Charm II Tablet Competitive	0	0	6	0	6	0	0.000%
Charm SL Beta lactams ³	0	0	58	0	58	0	0.000%
Delvotest P 5 Pack ⁺⁺	1,210	0	24,476	2	25,686	2	0.008%
Delvotest P Mini - Beta lactams ⁺⁺	0	0	108	0	108	0	0.000%
IDEXX New SNAP Beta-Lactam ³	0	0	518	0	518	0	0.000%
TOTALS	2,476	0	25,744	2	28,220	2	0.007%

⁺⁺ 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/>

³ This test is not approved for official NCIMS Regulatory Testing of Pasteurized Milk and Milk Products, see M-a-98.

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	4,582	0	404	0	4,986	0	0.000%
Charm BL30SEC	2,826	0	0	0	2,826	0	0.000%
Charm BsDA ⁺⁺	3,494	5	292	0	3,786	5	0.132%
Charm SL Beta lactams	10,973	7	4,324	0	15,297	7	0.046%
Delvotest P 5 Pack ⁺⁺	173,578	111	68,849	20	242,427	131	0.054%
Delvotest P Mini - Beta lactams ⁺⁺	2,103	0	1,286	0	3,389	0	0.000%
IDEXX New SNAP Beta-Lactam	2,609	0	82	0	2,691	0	0.000%
Sulfonamides							
Charm II Tablet Competitive	0	0	3	1	3	1	33.333%
Tetracyclines							
Charm ROSA Tetracycline-SL(Dil. Conf.) Orange	1	0	0	0	1	0	0.000%
IDEXX SNAP Tetracycline (Dil. Conf.)	0	0	41	0	41	0	0.000%
TOTALS	200,166	123	75,281	21	275,447	144	0.052%

⁺⁺ 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 8-4 -- 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	4,653	1	244	0	4,897	1	0.020%
Charm BsDA ⁺⁺	1,274	0	0	0	1,274	0	0.000%
Charm SL Beta lactams	25,407	0	2,138	0	27,545	0	0.000%
Delvotest P 5 Pack ⁺⁺	172	0	5,050	1	5,222	1	0.019%
Delvotest P Mini - Beta lactams ⁺⁺	0	0	14	0	14	0	0.000%
IDEXX New SNAP Beta-Lactam	2,838	0	135	0	2,973	0	0.000%
Sulfonamides							
TLC Sulfonamide	6	0	35	0	41	0	0.000%
Tetracyclines							
IDEXX SNAP Tetracycline (Dil. Conf.)	158	0	16	0	174	0	0.000%
TOTALS	34,508	1	7,632	1	42,140	2	0.005%

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

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	62,856	3	0	0	62,856	3	0.005%
Charm BL30SEC	68	0	0	0	68	0	0.000%
Charm BsDA ⁺⁺	24	0	0	0	24	0	0.000%
Charm SL Beta lactams	23,474	3	0	0	23,474	3	0.013%
Delvotest P 5 Pack ⁺⁺	990	0	0	0	990	0	0.000%
Delvotest P Mini - Beta lactams ⁺⁺	762	0	0	0	762	0	0.000%
IDEXX New SNAP Beta-Lactam	1,952	0	0	0	1,952	0	0.000%
Neogen BetaStar Advanced for Beta-lactams	51	0	0	0	51	0	0.000%
TOTALS	90,177	6	0	0	90,177	6	0.007%

⁺⁺ 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 8-6 -- 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							
Delvotest P 5 Pack ⁺⁺	889	0	143	0	1,032	0	0.000%
TOTALS	889	0	143	0	1,032	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.nmrd.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 3 SL-3	0	0	2	0	2	0	0.000%
Charm BsDA ⁺⁺	442	0	43	0	485	0	0.000%
Charm SL Beta lactams	14	0	2	0	16	0	0.000%
Delvotest P 5 Pack ⁺⁺	11,146	13	1,301	3	12,447	16	0.129%
Delvotest P Mini - Beta lactams ⁺⁺	36	0	39	0	75	0	0.000%
IDEXX New SNAP Beta-Lactam	198	0	0	0	198	0	0.000%
TOTALS	11,836	13	1,387	3	13,223	16	0.121%

⁺⁺ 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 8-8 -- 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 3 SL-3	7	0	2	0	9	0	0.000%
Charm SL Beta lactams	24	0	154	0	178	0	0.000%
Delvotest P 5 Pack ⁺⁺	1,149	0	388	0	1,537	0	0.000%
TOTALS	1,180	0	544	0	1,724	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.nmrd.com/>