

**NATIONAL MILK DRUG RESIDUE DATA BASE  
FISCAL YEAR 2018 ANNUAL REPORT  
October 1, 2017 - September 30, 2018**

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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" and non-Grade "A", commonly known as manufacturing grade. 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 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 data base is operated by an independent third party, under contract to the FDA. The data base 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 data base 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. Information regarding individual firm's data is not submitted to the data base contractor.

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 data base 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 to assure that outdated codes are removed and new test codes have been created for new test kits. The most recent drug code list can be found on the data base 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-three (53) data reporters utilized the web-based software to submit all or part of their data for the FY 2018 Annual Report.

On July 1, 2017, a pilot project began to test a percentage of bulk milk tankers for tetracyclines. The testing portion of the pilot project is scheduled to be completed on December 31, 2018. This Annual Report includes the results of the testing for tetracyclines conducted during FY 2018. Further details regarding the pilot can be found at: <http://ncims.org/programs/appendix-n-pilot-program/>. Eighty-one (81) percent of data reporters indicated testing for tetracyclines was performed in their jurisdiction.

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**

This report presents summary data on samples and tests conducted during Fiscal Year 2018 (October 1, 2017 to September 30, 2018). Fifty (50) States and Puerto Rico and two (2) Third Party Certifiers (TPCs) authorized under the International Certification Program (ICP) submitted data for this report. Puerto Rico submitted partial 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, found positive is rejected for human consumption.

During this period **4,042,300** samples were analyzed for animal drug residues. Of these samples **584** were positive for a drug residue. A total of **4,200,969** tests were reported on the samples for five (5) different groups of families or individual drugs. Twenty-two (22) testing methods were used to analyze the samples for drug residues. Details are presented in the Tables in this report.

## **SAMPLE RESULTS**

A SAMPLE is defined as representing a load or lot of milk sampled and analyzed, for example, a bulk milk pickup tanker, or raw milk supply that has not been transported in a bulk milk pickup tanker, producer, milk transport tankers, a silo, etc.

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.

<b>TABLE 1 -- Sample Results October 1, 2017 to September 30, 2018</b>				
<b>Source of Sample</b>	<b>Total Samples</b>	<b>Number Positive</b>	<b>Percent Positive</b>	<b>Disposition per PMO (Pounds)</b>
<b>Bulk Milk Pickup Tanker</b>	3,598,118	364	0.010%	15,467,000
<b>Pasteurized Fluid Milk and Milk Products</b>	32,847	4	0.012%	45,000
<b>Producer</b>	355,732	210	0.059%	384,000
<b>Other</b>	55,603	6	0.011%	163,000
<b>TOTALS</b>	4,042,300	584	*	16,059,000

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  
October 1, 2017 to September 30, 2018**

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)
<b>GRADE "A"</b>								
Bulk Milk Pickup Tanker	3,377,091	334	45,458	5	3,422,549	339	0.010%	14,479,000
Pasteurized Fluid Milk and Milk Products	1,984	1	30,173	3	32,157	4	0.012%	45,000
Producer	225,331	152	108,509	31	333,840	183	0.055%	332,000
Other	42,538	2	10,258	4	52,796	6	0.011%	163,000
<b>NON-GRADE "A"</b>								
Bulk Milk Pickup Tanker <sup>1</sup>	161,339	24	14,230	1	175,569	25	0.014%	988,000
Pasteurized Fluid Milk and Milk Products	565	0	125	0	690	0	0.000%	0
Producer	18,664	24	3,228	3	21,892	27	0.123%	52,000
Other	2,439	0	368	0	2,807	0	0.000%	0
<b>TOTALS</b>	<b>3,829,951</b>	<b>537</b>	<b>212,349</b>	<b>47</b>	<b>4,042,300</b>	<b>584</b>	<b>*</b>	<b>16,059,000<sup>2</sup></b>

<sup>1</sup> It is a common practice in some States, including two large milk production States, that bulk milk pickup tankers pickup 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".

<sup>2</sup> Note that this represents 0.01% of the total milk supply of the United States with an annual production of 217 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 (4,200,969) is greater than the number of samples (4,042,300). 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, 2017 to September 30, 2018. 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. Several test procedures for tetracyclines became validated at various times during FY 2018. For ease of reporting, all samples conducted using a validated procedure, regardless of the effective date of validation, are reported as validated tests.

<b>TABLE 3 -- Tests Conducted October 1, 2017 to September 30, 2018</b>			
<b>Source of Sample</b>	<b>Total Tests</b>	<b>Number of Positive Tests</b>	<b>Percent Positive</b>
<b>Bulk Milk Pickup Tanker</b>	3,755,276	364	0.010%
<b>Pasteurized Fluid Milk and Milk Products</b>	32,890	4	0.012%
<b>Producer</b>	356,537	210	0.059%
<b>Other</b>	56,266	6	0.011%
<b>TOTALS</b>	4,200,969	584	*

\* See Table 1 for explanation

<b>TABLE 3A -- Validated Tests Conducted October 1, 2017 to September 30, 2018</b>			
<b>Source of Sample</b>	<b>Total Tests</b>	<b>Number of Positive Tests</b>	<b>Percent Positive</b>
<b>Bulk Milk Pickup Tanker</b>	3,550,685	358	0.010%
<b>Pasteurized Fluid Milk and Milk Products</b>	32,864	4	0.012%
<b>Producer</b>	356,155	210	0.059%
<b>Other</b>	51,515	6	0.012%
<b>TOTALS</b>	3,991,219	578	*

\* See Table 1 for explanation

<b>TABLE 3B -- Non-Validated Tests Conducted October 1, 2017 to September 30, 2018</b>			
<b>Source of Sample</b>	<b>Total Tests</b>	<b>Number of Positive Tests</b>	<b>Percent Positive</b>
<b>Bulk Milk Pickup Tanker</b>	204,591	6	0.003%
<b>Pasteurized Fluid Milk and Milk Products</b>	26	0	0.000%
<b>Producer</b>	382	0	0.000%
<b>Other</b>	4,751	0	0.000%
<b>TOTALS</b>	209,750	6	*

\* 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. Several test procedures for tetracyclines became validated at various times during FY 2018. For ease of reporting, all samples conducted using a validated procedure, regardless of the effective date of validation, are reported as validated tests.

<b>TABLE 4 -- Tests Conducted by Industry and Regulatory Agencies October 1, 2017 to September 30, 2018</b>							
<b>Source of Sample</b>	<b>Number of Industry Tests</b>	<b>Number of Positive Industry Tests</b>	<b>Number of Regulatory Tests</b>	<b>Number of Positive Regulatory Tests</b>	<b>Total Tests</b>	<b>Total Positive Tests</b>	<b>Total Percent Positive</b>
<b>GRADE "A"</b>							
Bulk Milk Pickup Tanker	3,532,576	334	46,887	5	3,579,463	339	0.009%
Pasteurized Fluid Milk and Milk Products	1,984	1	30,211	3	32,195	4	0.012%
Producer	225,594	152	109,051	31	334,645	183	0.055%
Other	42,787	2	10,456	4	53,243	6	0.011%
<b>NON-GRADE "A"</b>							
Bulk Milk Pickup Tanker <sup>1</sup>	161,523	24	14,290	1	175,813	25	0.014%
Pasteurized Fluid Milk and Milk Products	570	0	125	0	695	0	0.000%
Producer	18,664	24	3,228	3	21,892	27	0.123%
Other	2,655	0	368	0	3,023	0	0.000%
<b>TOTALS</b>	<b>3,986,353</b>	<b>537</b>	<b>214,616</b>	<b>47</b>	<b>4,200,969</b>	<b>584</b>	<b>*</b>

<sup>1</sup> It is a common practice in some States, including two large milk production States, that bulk milk pickup tankers pickup 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  
October 1, 2017 to September 30, 2018**

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
<b>GRADE "A"</b>							
Bulk Milk Pickup Tanker	3,330,824	328	44,235	5	3,375,059	333	0.010%
Pasteurized Fluid Milk and Milk Products	1,959	1	30,210	3	32,169	4	0.012%
Producer	225,380	152	108,883	31	334,263	183	0.055%
Other	39,240	2	10,403	4	49,643	6	0.012%
<b>NON-GRADE "A"</b>							
Bulk Milk Pickup Tanker <sup>1</sup>	161,336	24	14,290	1	175,626	25	0.014%
Pasteurized Fluid Milk and Milk Products	570	0	125	0	695	0	0.000%
Producer	18,664	24	3,228	3	21,892	27	0.123%
Other	1,504	0	368	0	1,872	0	0.000%
<b>TOTALS</b>	<b>3,779,477</b>	<b>531</b>	<b>211,742</b>	<b>47</b>	<b>3,991,219</b>	<b>578</b>	<b>*</b>

<sup>1</sup> It is a common practice in some States, including two large milk production States, that bulk milk pickup tankers pickup 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  
October 1, 2017 to September 30, 2018**

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
<b>GRADE "A"</b>							
Bulk Milk Pickup Tanker	201,752	6	2,652	0	204,404	6	0.003%
Pasteurized Fluid Milk and Milk Products	25	0	1	0	26	0	0.000%
Producer	214	0	168	0	382	0	0.000%
Other	3,547	0	53	0	3,600	0	0.000%
<b>NON-GRADE "A"</b>							
Bulk Milk Pickup Tanker <sup>1</sup>	187	0	0	0	187	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	1,151	0	0	0	1,151	0	0.000%
<b>TOTALS</b>	<b>206,876</b>	<b>6</b>	<b>2,874</b>	<b>0</b>	<b>209,750</b>	<b>6</b>	<b>*</b>

<sup>1</sup> It is a common practice in some States, including two large milk production States, that bulk milk pickup tankers pickup 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 and by individual drug. Tables 5A and 5B present these data by validated and non-validated tests. Several test procedures for tetracyclines became validated at various times during FY 2018. For ease of reporting, all samples conducted using a validated procedure, regardless of the effective date of validation, are reported as validated tests.

<b>TABLE 5 -- Number of Tests Conducted by Family/Drug October 1, 2017 to September 30, 2018</b>		
<b>Family/Drug</b>	<b>Total Tests</b>	<b>Total Positive</b>
<b>BETA lactams</b>	3,837,461	578
CLOXACILLIN	24	0
<b>SULFONAMIDES</b>	56,816	0
SULFAMETHAZINE	2,379	0
<b>TETRACYCLINES</b>	304,289	6
<b>TOTALS</b>	4,200,969	584

<b>TABLE 5A -- Number of Validated Tests Conducted by Family/Drug October 1, 2017 to September 30, 2018</b>		
<b>Family/Drug</b>	<b>Total Tests</b>	<b>Total Positive</b>
<b>BETA lactams</b>	3,837,461	578
CLOXACILLIN	24	0
<b>SULFONAMIDES</b>	52,938	0
<b>TETRACYCLINES</b>	100,796	0
<b>TOTALS</b>	3,991,219	578

**TABLE 5B -- Number of Non-Validated Tests Conducted by  
Family/Drug  
October 1, 2017 to September 30, 2018**

<b>Family/Drug</b>	<b>Total Tests</b>	<b>Total Positive</b>
<b>SULFONAMIDES</b>	3,878	0
SULFAMETHAZINE	2,379	0
<b>TETRACYCLINES</b>	203,493	6
<b>TOTALS</b>	209,750	6

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. The testing methods with the largest use were: Charm SL - Beta lactams, which was used more than 1.9 million times, Charm 3 SL-3, which was used over 1.2 million times, Delvotest P 5 Pack - Beta lactams, which was used more than 371 thousand times, Charm SL-Tetracyclines which was used more than 196 thousand times and IDEXX New SNAP, which was used for more than 113 thousand tests. Table 6A shows a comparison of tests conducted using Validated and Non-Validated test methods for Sulfonamides and Tetracyclines.

<b>TABLE 6 -- Number of Tests by Method by Family/Drug October 1, 2017 to September 30, 2018</b>			
<b>Tests Used by Family/Drug</b>	<b>Number of Tests</b>	<b>Number Positive</b>	<b>Percent Positive</b>
<b>BETA lactams</b>			
Charm 3 SL-3	1,298,404	134	0.010%
Charm BSDA Tablet - Beta lactams <sup>++</sup>	29,484	16	0.054%
Charm II Tablet Competitive	19,196	0	0.000%
Charm II Tablet Quantitative	162	0	0.000%
Charm II Tablet Sequential	11,382	2	0.018%
Charm SL Beta lactams	1,978,362	207	0.010%
Charm Trio Test-Beta lactams	766	0	0.000%
Delvotest P 5 Pack - Beta lactams <sup>++</sup>	371,633	187	0.050%
Delvotest P/Delvotest P Mini <sup>++</sup>	14,675	4	0.027%
IDEXX New SNAP	113,397	28	0.025%
<b>CLOXACILLIN</b>			
Charm II Test for Cloxacillin	24	0	0.000%
<b>SULFONAMIDES</b>			
Charm II Tablet Competitive	1,130	0	0.000%
Charm II Tablet Sequential <sup>**</sup>	3,878	0	0.000%
Charm Rosa Sulf-Sulfonamides	51,042	0	0.000%
Charm Trio Test-Sulf	766	0	0.000%
<b>SULFAMETHAZINE</b>			
IDEXX SNAP Sulfa(SMZ) <sup>**</sup>	2,379	0	0.000%



**TABLE 6 -- Number of Tests by Method by Family/Drug  
October 1, 2017 to September 30, 2018**

<b>Tests Used by Family/Drug</b>	<b>Number of Tests</b>	<b>Number Positive</b>	<b>Percent Positive</b>
<b>TETRACYCLINES</b>			
Charm II Tablet Competitive	1,221	0	0.000%
Charm ROSA Tetracycline-SL (Dil. Conf.) Orange	98,790	0	0.000%
Charm SL - Tetracyclines**	196,859	6	0.003%
Charm Trio Test-Tetra	766	0	0.000%
IDEXX SNAP - Tetracycline**	6,634	0	0.000%
Neogen BetaStar Advanced For Tetracycline	19	0	0.000%
<b>TOTALS</b>	<b>4,200,969</b>	<b>584</b>	<b>*</b>

\* 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 -- Comparison of Validated and Non-Validated Tests for Sulfonamides and Tetracyclines  
October 1, 2017 to September 30, 2018**

<b>Tests By Method by Family/Drug</b>	<b>Number of Tests</b>	<b>Number Positive</b>	<b>Percent Positive</b>
<b>VALIDATED FOR SULFONAMIDES</b>			
Charm II Tablet Competitive	1,130	0	0.000%
Charm Rosa Sulf-Sulfonamides	51,042	0	0.000%
Charm Trio Test-Sulf	766	0	0.000%
<b>NON-VALIDATED FOR SULFONAMIDES</b>			
Charm II Tablet Sequential**	3,878	0	0.000%
<b>NON-VALIDATED FOR SULFAMETHAZINE</b>			
IDEXX SNAP Sulfa(SMZ)**	2,379	0	0.000%
<b>VALIDATED FOR TETRACYCLINES</b>			
Charm II Tablet Competitive	1,221	0	0.000%
Charm ROSA Tetracycline-SL (Dil. Conf.) Orange	98,790	0	0.000%
Charm Trio Test-Tetra	766	0	0.000%
Neogen BetaStar Advanced For Tetracycline	19	0	0.000%
<b>NON-VALIDATED FOR TETRACYCLINES</b>			
Charm SL - Tetracyclines**	196,859	6	0.003%
IDEXX SNAP - Tetracycline**	6,634	0	0.000%
<b>TOTALS</b>	<b>363,484</b>	<b>6</b>	<b>*</b>

\* 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. Data on individual drugs listed in these Tables, e.g., Cloxacillin, Sulfamethazine, etc., are not included in the Totals for the family of drugs, e.g, Beta lactams, Sulfonamides, etc.

<b>TABLE 7-1 -- Grade “A” Bulk Milk Pickup Tanker Testing October 1, 2017 to September 30, 2018</b>						
<b>Family/Drug</b>	<b>Number of Industry Tests</b>	<b>Number of Positive Industry Tests</b>	<b>Number of Regulatory Tests</b>	<b>Number of Positive Regulatory Tests</b>	<b>Total Tests</b>	<b>Total Positive Tests</b>
<b>BETA lactams</b>	3,179,848	328	42,827	5	3,222,675	333
Cloxacillin	0	0	17	0	17	0
<b>SULFONAMIDES</b>	56,800	0	0	0	56,800	0
Sulfamethazine	2,236	0	0	0	2,236	0
<b>TETRACYCLINES</b>	293,692	6	4,043	0	297,735	6
<b>TOTALS</b>	<b>3,532,576</b>	<b>334</b>	<b>46,887</b>	<b>5</b>	<b>3,579,463</b>	<b>339</b>

<b>TABLE 7-2 -- Grade “A” Pasteurized Fluid Milk and Milk Products Testing October 1, 2017 to September 30, 2018</b>						
<b>Family/Drug</b>	<b>Number of Industry Tests</b>	<b>Number of Positive Industry Tests</b>	<b>Number of Regulatory Tests</b>	<b>Number of Positive Regulatory Tests</b>	<b>Total Tests</b>	<b>Total Positive Tests</b>
<b>BETA lactams</b>	1,959	1	30,210	3	32,169	4
<b>TETRACYCLINES</b>	25	0	1	0	26	0
<b>TOTALS</b>	<b>1,984</b>	<b>1</b>	<b>30,211</b>	<b>3</b>	<b>32,195</b>	<b>4</b>

**TABLE 7-3 – Grade “A” Producer Testing  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>	225,108	152	108,867	31	333,975	183
<b>SULFONAMIDES</b>	0	0	16	0	16	0
Sulfamethazine	43	0	16	0	59	0
<b>TETRACYCLINES</b>	443	0	152	0	595	0
<b>TOTALS</b>	225,594	152	109,051	31	334,645	183

**TABLE 7-4 -- Grade “A” Other Testing (Milk from Milk plant tanks/silos, milk transport tankers, etc.)  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>	38,240	2	10,394	4	48,634	6
Cloxacillin	0	0	7	0	7	0
<b>SULFONAMIDES</b>						
Sulfamethazine	84	0	0	0	84	0
<b>TETRACYCLINES</b>	4,463	0	55	0	4,518	0
<b>TOTALS</b>	42,787	2	10,456	4	53,243	6

**TABLE 7-5 -- Non-Grade “A” Bulk Milk Pickup Tanker Testing  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>	161,259	24	14,290	1	175,549	25
<b>TETRACYCLINES</b>	264	0	0	0	264	0
<b>TOTALS</b>	161,523	24	14,290	1	175,813	25

**TABLE 7-6 -- Non-Grade "A" Pasteurized Fluid Milk and Milk Products Testing  
October 1, 2017 to September 30, 2018**

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	570	0	125	0	695	0
<b>TOTALS</b>	570	0	125	0	695	0

**TABLE 7-7 -- Non-Grade "A" Producer Testing  
October 1, 2017 to September 30, 2018**

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	18,664	24	3,228	3	21,892	27
<b>TOTALS</b>	18,664	24	3,228	3	21,892	27

**TABLE 7-8 -- Non-Grade "A" Other Testing (Milk from Milk plant tanks/silos,  
milk transport tankers, etc.)  
October 1, 2017 to September 30, 2018**

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	1,504	0	368	0	1,872	0
TETRACYCLINES	1,151	0	0	0	1,151	0
<b>TOTALS</b>	2,655	0	368	0	3,023	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  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	1,181,766	115	20,409	3	1,202,175	118	0.010%
Charm BSDA Tablet - Beta lactams**	22,234	5	2	0	22,236	5	0.022%
Charm II Tablet Competitive	19,133	0	0	0	19,133	0	0.000%
Charm II Tablet Quantitative	0	0	1	0	1	0	0.000%
Charm II Tablet Sequential	11,353	2	22	0	11,375	2	0.018%
Charm SL Beta lactams	1,825,536	180	18,312	1	1,843,848	181	0.010%
Charm Trio Test-Beta lactams	766	0	0	0	766	0	0.000%
Delvotest P 5 Pack - Beta lactams**	10,147	0	3,452	0	13,599	0	0.000%
Delvotest P/Delvotest P Mini**	2,030	1	180	0	2,210	1	0.045%
IDEXX New SNAP	106,883	25	449	1	107,332	26	0.024%
<b>Cloxacillin</b>							
Charm II Test for Cloxacillin	0	0	17	0	17	0	0.000%
<b>Sulfonamides</b>							
Charm II Tablet Competitive	1,114	0	0	0	1,114	0	0.000%
Charm II Tablet Sequential**	3,878	0	0	0	3,878	0	0.000%
Charm Rosa Sulf-Sulfonamides	51,042	0	0	0	51,042	0	0.000%
Charm Trio Test-Sulf	766	0	0	0	766	0	0.000%
<b>Sulfamethazine</b>							
IDEXX SNAP Sulfa(SMZ)**	2,236	0	0	0	2,236	0	0.000%

**Table 8-1 -- Number of Tests by Method by Family/Drug  
Grade "A" Bulk Milk Pickup Tanker  
October 1, 2017 to September 30, 2018**

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
<b>Tetracyclines</b>							
Charm II Tablet Competitive	1,144	0	0	0	1,144	0	0.000%
Charm ROSA Tetracycline-SL (Dil. Conf.) Orange	96,143	0	1,391	0	97,534	0	0.000%
Charm SL - Tetracyclines**	191,311	6	2,041	0	193,352	6	0.003%
Charm Trio Test-Tetra	766	0	0	0	766	0	0.000%
IDEXX SNAP - Tetracycline**	4,327	0	611	0	4,938	0	0.000%
Neogen BetaStar Advanced For Tetracycline	1	0	0	0	1	0	0.000%
<b>TOTALS</b>	<b>3,532,576</b>	<b>334</b>	<b>46,887</b>	<b>5</b>	<b>3,579,463</b>	<b>339</b>	<b>0.009%</b>

\*\* 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  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	591	1	287	0	878	1	0.114%
Charm BSDA Tablet - Beta lactams <sup>++</sup>	624	0	626	0	1,250	0	0.000%
Charm SL Beta lactams	14	0	383	0	397	0	0.000%
Delvotest P 5 Pack - Beta lactams <sup>++</sup>	663	0	28,093	3	28,756	3	0.010%
Delvotest P/Delvotest P Mini <sup>++</sup>	67	0	258	0	325	0	0.000%
IDEXX New SNAP	0	0	563	0	563	0	0.000%
<b>Tetracyclines</b>							
Charm SL - Tetracyclines <sup>**</sup>	25	0	1	0	26	0	0.000%
<b>TOTALS</b>	<b>1,984</b>	<b>1</b>	<b>30,211</b>	<b>3</b>	<b>32,195</b>	<b>4</b>	<b>0.012%</b>

<sup>\*\*</sup> Non-Validated Test Method

<sup>++</sup> 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  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	7,277	3	1,629	1	8,906	4	0.045%
Charm BSDA Tablet - Beta lactams <sup>++</sup>	5,067	10	167	1	5,234	11	0.210%
Charm II Tablet Quantitative	0	0	161	0	161	0	0.000%
Charm SL Beta lactams	7,285	9	3,420	1	10,705	10	0.093%
Delvotest P 5 Pack - Beta lactams <sup>++</sup>	199,726	128	96,945	27	296,671	155	0.052%
Delvotest P/Delvotest P Mini <sup>++</sup>	4,262	2	6,519	1	10,781	3	0.028%
IDEXX New SNAP	1,491	0	26	0	1,517	0	0.000%
<b>Sulfonamides</b>							
Charm II Tablet Competitive	0	0	16	0	16	0	0.000%
<b>Sulfamethazine</b>							
IDEXX SNAP Sulfa(SMZ) <sup>**</sup>	43	0	16	0	59	0	0.000%
<b>Tetracyclines</b>							
Charm ROSA Tetracycline-SL (Dil. Conf.) Orange	261	0	0	0	261	0	0.000%
Charm SL - Tetracyclines <sup>**</sup>	168	0	33	0	201	0	0.000%
IDEXX SNAP - Tetracycline <sup>**</sup>	3	0	119	0	122	0	0.000%
Neogen BetaStar Advanced For Tetracycline	11	0	0	0	11	0	0.000%
<b>TOTALS</b>	<b>225,594</b>	<b>152</b>	<b>109,051</b>	<b>31</b>	<b>334,645</b>	<b>183</b>	<b>0.055%</b>

<sup>\*\*</sup> Non-Validated Test Method

<sup>++</sup> 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.)  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	5,647	0	145	0	5,792	0	0.000%
Charm BSDA Tablet - Beta lactams**	0	0	2	0	2	0	0.000%
Charm II Tablet Competitive	61	0	2	0	63	0	0.000%
Charm II Tablet Sequential	0	0	7	0	7	0	0.000%
Charm SL Beta lactams	30,629	2	2,058	0	32,687	2	0.006%
Delvotest P 5 Pack - Beta lactams**	272	0	8,018	2	8,290	2	0.024%
Delvotest P/Delvotest P Mini**	84	0	25	0	109	0	0.000%
IDEXX New SNAP	1,547	0	137	2	1,684	2	0.119%
<b>Cloxacillin</b>							
Charm II Test for Cloxacillin	0	0	7	0	7	0	0.000%
<b>Sulfamethazine</b>							
IDEXX SNAP Sulfa(SMZ)**	84	0	0	0	84	0	0.000%
<b>Tetracyclines</b>							
Charm ROSA Tetracycline-SL (Dil. Conf.) Orange	993	0	2	0	995	0	0.000%
Charm SL - Tetracyclines**	3,040	0	53	0	3,093	0	0.000%
IDEXX SNAP - Tetracycline**	423	0	0	0	423	0	0.000%
Neogen BetaStar Advanced For Tetracycline	7	0	0	0	7	0	0.000%
<b>TOTALS</b>	<b>42,787</b>	<b>2</b>	<b>10,456</b>	<b>4</b>	<b>53,243</b>	<b>6</b>	<b>0.011%</b>

\*\* 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 8-5 -- Number of Tests by Method by Family/Drug  
Non-Grade "A" Bulk Milk Pickup Tanker  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	66,294	10	14,286	1	80,580	11	0.014%
Charm SL Beta lactams	89,800	14	0	0	89,800	14	0.016%
Delvotest P 5 Pack - Beta lactams**	1,736	0	4	0	1,740	0	0.000%
Delvotest P/Delvotest P Mini**	1,128	0	0	0	1,128	0	0.000%
IDEXX New SNAP	2,301	0	0	0	2,301	0	0.000%
<b>Tetracyclines</b>							
Charm II Tablet Competitive	77	0	0	0	77	0	0.000%
Charm SL - Tetracyclines**	187	0	0	0	187	0	0.000%
<b>TOTALS</b>	<b>161,523</b>	<b>24</b>	<b>14,290</b>	<b>1</b>	<b>175,813</b>	<b>25</b>	<b>0.014%</b>

\*\* 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 8-6 -- Number of Tests by Method by Family/Drug  
Non-Grade "A" Pasteurized Fluid Milk and Milk Products  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	0	0	52	0	52	0	0.000%
Delvotest P 5 Pack - Beta lactams**	570	0	73	0	643	0	0.000%
Delvotest P/Delvotest P Mini**	0	0	0	0	0	0	0.000%
<b>TOTALS</b>	<b>570</b>	<b>0</b>	<b>125</b>	<b>0</b>	<b>695</b>	<b>0</b>	<b>0.000%</b>

\*\*\* 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  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm BSDA Tablet - Beta lactams <sup>++</sup>	762	0	0	0	762	0	0.000%
Charm SL Beta lactams	72	0	259	0	331	0	0.000%
Delvotest P 5 Pack - Beta lactams <sup>++</sup>	17,764	24	2,914	3	20,678	27	0.131%
Delvotest P/Delvotest P Mini <sup>++</sup>	66	0	55	0	121	0	0.000%
<b>TOTALS</b>	<b>18,664</b>	<b>24</b>	<b>3,228</b>	<b>3</b>	<b>21,892</b>	<b>27</b>	<b>0.123%</b>

<sup>++</sup> 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.)  
October 1, 2017 to September 30, 2018**

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
<b>BETA lactams</b>							
Charm 3 SL-3	10	0	11	0	21	0	0.000%
Charm SL Beta lactams	278	0	316	0	594	0	0.000%
Delvotest P 5 Pack - Beta lactams <sup>++</sup>	1,215	0	41	0	1,256	0	0.000%
Delvotest P/Delvotest P Mini <sup>++</sup>	1	0	0	0	1	0	0.000%
<b>Tetracyclines</b>							
IDEXX SNAP - Tetracycline <sup>**</sup>	1,151	0	0	0	1,151	0	0.000%
<b>TOTALS</b>	<b>2,655</b>	<b>0</b>	<b>368</b>	<b>0</b>	<b>3,023</b>	<b>0</b>	<b>0.000%</b>

<sup>\*\*</sup> Non-Validated Test Method

<sup>++</sup> 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/>