UNITED STATES
National Residue Program for Meat, Poultry, and Egg Products

FY 2016 RESIDUE SAMPLE RESULTS

United States Department of Agriculture
Food Safety and Inspection Service
Office of Public Health Science

May 2017

1 Cover October 2015 through September 2016
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Preface

The “2016 Food Safety and Inspection Service (FSIS) National Residue Program Data” publication (the ‘Red Book’) explains FSIS’ chemical residue sampling plans and presents National Residue Program (NRP) testing results by fiscal year. [For those reading this electronically, this document has been commonly known as the “Red Book” because the covers of the printed versions are red.] In addition, the following appendices are included for the convenience of the reader: Appendix I, NRP Positive Non-Violative and Positive Violative Residue Samples Results; Appendix II, Statistical Table; Appendix III, FY2016 List of Chemical Residues by Class/Method; Appendix IV, Summary of Scheduled Sampling Data from 2013 to 2016, Appendix V, Summary of Import Re-inspection Sampling Data from 2013 to 2016 and Appendix VI, Inspector Generated Sampling Data from 2013 to 2016 (includes KISTM test).

Acknowledgements

We would like to extend our gratitude to the thousands of FSIS field inspection personnel who collected and submitted the residue samples and to all the laboratory staff who prepared the residue samples for analysis, analyzed the residue samples and documented the results from the analysis of the residue samples. We would like to acknowledge the Office of Data Intergration and Food Protection (ODIFP) members for providing the data.

Contacts and Comments

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Executive Summary

The United States National Residue Program (NRP) is comprised of the following programs:

- Domestic Sampling Plan
  - Scheduled
  - Inspector-Generated
- Import Reinspection Sampling Plan

During FY 2016, (October 2015 to September 2016), FSIS reported 922 residue violations 29 stemmed from the Domestic Scheduled Sampling Program and 893 from the Inspector-generated Sampling Program) in 758 samples (26 under the Domestic Scheduled Sampling Program and 732 under the Inspector-generated Sampling Program). Additionally, FSIS reported 22 residue violations in 2,676 samples under the Import Reinspection Sampling.

By comparison, in FY2015, there were 1,041 residue violations (17 from the domestic scheduled sampling program and 1,024 from the Inspector-generated sampling program) in 808 samples. Note: Multiple violative (exceeding an acceptable or tolerable level set by FDA and/or EPA) residue may be detected in a single sample.

Domestic Scheduled Sampling

In FY 2016, under the Domestic Scheduled Sampling program, FSIS Inspection Program Personnel (IPP) collected 7,067 residue samples (This includes 6,535 samples from U.S. Federal establishments and 532 from U.S. State plants), from which 29 violative residues were reported from 26 samples, which is less than 1 % of the 6,445 samples collected under the Domestic Scheduled Sampling program. In FY 2015, FSIS IPP collected 6,445 residue samples, from which 17 violative residues were reported from 12 samples (less than 1%).

During FY 2016, four carbadox, two DDT/metabolites, one doramectin, one ivermectin, two melengestrol acetate, seven moxidectin, one pentachlorobenzene, one permethrin, one piperonyl butoxide, two sulfadimethoxine and seven sulfamethazine violations were reported in the Domestic Scheduled Sampling Program.

In some cases, chemical residues were detected in samples at levels below the set tolerance levels non-violative levels). In FY 2016, 24 samples (less than 1% of 7,067 samples collected) were considered non-violative. By comparison, in FY 2015 the number of non-violative samples was similar, at 23 non-violative positives (less than 1%).

Inspector-generated Sampling

In FY 2016, under the Inspector-generated sampling program, FSIS IPP screened 182,184 samples using the Kidney Inhibition Swab (KIST™) test. Subsequently, 3,649 KIST™ test screened positive samples were submitted to FSIS field laboratories for further analysis. For FY 2016, 883 KIST™ test residue violations analytes were confirmed in 724 KIST™ test samples (Note: multiple residue violations may be found in same samples.
For comparison, in FY2015, FSIS IPP submitted 4,022 (from 184,010 KIST™ test) samples for laboratory confirmation. Of the 4,022 KIST™ submitted 1,017 KIST™ residue violatons were confirmed in 792 samples.

Under the Inspector-generated Sampling Program, samples from show animals, state testing program and collected-generated were sent directly to FSIS labs, for residue Analysis. For FY 2016, under these sampling programs Ten additional reside violative analystes were identified in eight samples submitted under this unique sampling.

Examination of the FY 2016 Inspector-generated Sampling Program showed that the predominant violative residues were Ceftiofur (223), Penicillin (216) and Sulfadimethoxine (76), which accounts for 25, 24 and 9% of total violative residues, respectively. In FY 2015, the top violative residues were Ceftiofur, Penicillin, and Sulfamethazine.

In FY 2016, 728 samples with non-violative positives were observed in the Inspector-generated Sampling Program, which was down, when compared to the 873 reported in FY 2015.

Import Reinspection Sampling

Of the 2,676 import samples analyzed, under the FY 2016 Import Reinspection Sampling Program, 22 samples had residues exceeding an acceptable or tolerable level set by FDA and/or EPA. These were from samples originating from Nicaragua (2) and Uruguay (20). In comparison to FY2015, where seven samples with violative residues were detected (2,922 import samples) originating from Brazil (1), Canada (1), and Nicaragua (5).

FSIS continually strives to improve its methods for reporting of NRP data. These reports and previous years’ residue sample results are publicly available on the FSIS website at:

Acronyms

CSI - Consumer Safety Inspector

COLLGEN – Collector-Generated Samples sent directly to the laboratory

DW – FSIS Data Warehouse

EPA - Environmental Protection Agency

FDA - Food and Drug Administration

FSIS – Food Safety and Inspection Service

HACCP – Hazard Critical Control Point

IPP – Inspection Program Personnel

KIS™ Test – Kidney Inhibition Swab Test

MRM – Multi Residue methods

ND – Non-detect

NRP- National Residue Program

OPHS – Office of Public Health Science

PHIS – Public Health Information System

PHV – Public Health Veterinarian

PPB – parts per billion

PPM – parts per million

SAT – Surveillance Advisory Team

STATE – State or Government Agency Testing

SHOW – Show Animals

U.S NRP – U.S. National Residue Program

“8888”: A numerical entry that indicate instances when chemical residues results were detected, but were not quantitated.
Introduction

The U.S. National Residue Program (NRP) for Meat, Poultry, and Egg Products, administered by the U.S. Department of Agriculture’s (USDA), Food Safety and Inspection Service (FSIS), is an interagency program designed to identify, rank, and analyze for chemical contaminants in meat, poultry, and egg products. FSIS publishes the NRP Residue Sampling Plans (traditionally known as the Blue Book) each year to provide information on the process of sampling meat, poultry, and egg products for chemical contaminants of public health concern.

Background

FSIS administers this regulatory program under the Federal Meat Inspection Act (FMIA) (21 U.S.C. 601 et seq.), the Poultry Products Inspection Act (PPIA) (21 U.S.C. 453 et seq.), and the Egg Products Inspection Act (EPIA) (21 U.S.C. 1031 et seq.). The NRP is an important component of FSIS mission to protect the health and welfare of the consumers by regulating the meat, poultry, and egg products produced in federally inspected establishments and to prevent the distribution in commerce of any such products that are adulterated or misbranded.

The NRP requires the cooperation and collaboration of several agencies for its successful design and implementation. FSIS, along with the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) are the primary Federal agencies managing this program. The FDA, under the Federal Food, Drug, and Cosmetic Act (FFDCA), establishes tolerances for veterinary drugs and action levels for food additives and environmental contaminants. The EPA, under the FFDCA, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA) establishes tolerances for registered pesticides. Title 21 Code of Federal Regulations (CFR) includes tolerance levels established by FDA; and Title 40 CFR includes tolerance levels established by EPA.

The Surveillance Advisory Team (SAT) meets annually to evaluate chemical compounds for inclusion in the NRP scheduled sampling plans. The SAT includes representatives from FSIS, FDA, EPA, USDA’s Agricultural Research Service (ARS), and the USDA’s Agricultural Marketing Service (AMS), as well as HHS’ Centers for Disease Control and Prevention (CDC). The SAT consists of experts in veterinary medicine, toxicology, chemistry, and public health who provide professional advice, as well as information on veterinary drug and pesticide use in animal husbandry. SAT discussions are used to decide which compounds represent a public health concern and warrant inclusion in the NRP scheduled sampling plans. In addition, the SAT may propose, based on professional judgment and reliable field information, the initiation of exploratory assessments for directed sampling on a production class or region of the country. These agencies work together to create the annual sampling plan, based on the following: prior NRP findings of chemical residues in meat, poultry, and egg products; FDA veterinary drug inventories completed during on-farm visits and investigation information; and pesticides and environmental contaminants of current importance to EPA.
Chemical compounds analyzed in the program include approved and unapproved veterinary drugs, pesticides, and environmental compounds. The NRP is designed to: (1) provide a structured process for identifying and evaluating chemical compounds used in food animals; (2) analyze chemical compounds of concern; (3) collect, analyze, and report results; and (4) identify the need for regulatory follow-up subsequent to the identification of violative levels of chemical residues.

**Actions taken on violations**

FSIS has administered the NRP by collecting and analyzing meat, poultry, and egg product samples for specific chemical compounds at FSIS laboratories since 1967 for meat and poultry, and beginning in 1995 for egg products. A violation occurs when an FSIS laboratory detects a chemical compound level in excess of an established tolerance or action level as well as if the residue detected has no approved tolerance. Once the laboratory analysis is complete, FSIS enters the detailed residue violation information into the Residue Violation Information System (RVIS), an FSIS/FDA interagency database. FSIS provides establishment and the designated FSIS Inspection Program Personnel (IPP) with the analysis results and also notifies the producer via certified letter. Under best practices, the establishment also should notify the producer that an animal from that business has been identified as having a residue violation. In addition, FSIS shares the violation data with EPA and FDA, where the latter Agency has on-farm jurisdiction. FDA and cooperating State agencies investigate producers linked to residue violations and, if conditions leading to residue violations are not corrected, can enforce legal action.

To notify the public and the industry of repeated residue violations by the same producer, FSIS posts a weekly Residue Repeat Violators List on its Web site that identifies producers with more than one violation on a rolling 12-month period. In addition, the list provides helpful information to the AMS-School Lunch Program purchase clearance processors and producers who are working to avoid illegal levels of residues, serves as a deterrent for violators, and enables FSIS and FDA to make better use of resources (list for processors and producers). Because FSIS updates are posted weekly, FDA may not have investigated each violation at the time of publication.

**FSIS Laboratory Analytical Methods**

In January 1997, FSIS implemented the Hazard Analysis and Critical Control Point (HACCP) inspection system in all federally inspected establishments. The HACCP regulation (HACCP GPO CFR) requires FSIS-inspected slaughter and processing establishments to identify all food safety hazards (including drug residues, chemical contaminants, and pesticides) that are reasonably likely to occur before, during, and after the food animal or product enters the slaughter establishment. The regulation also requires establishments to identify preventive measures to control these hazards. FSIS takes regulatory action against establishments that do not have an effective chemical residue control program in place. Minimizing food safety hazards from farm-to-fork protects consumers from the public health risks associated with chemical contaminants in food.

With greater public concern about the risks of chemical contaminants, focus has increased on strengthening the identification, prioritization, and testing for chemical hazards in meat, poultry, and egg products in the United States. The sampling plan for residues in FSIS-regulated products includes strengthening the focus of public health-based sampling. This approach includes broader screens for veterinary drugs, pesticides, and heavy metals, as well as conducting more analyses per sample.
FSIS uses analytical methods to detect, identify, and quantify residues that may be present in meat, poultry, and processed egg products. The Agency utilizes these methods for monitoring and for surveillance activities to determine product adulteration and for evaluations of human health risk. The Agency uses available methodologies to take appropriate regulatory action against adulterated products in a manner consistent with the reliability of the analytical data. The FSIS Analytical Chemistry Laboratory Guidebook lists the analytical methods used by the agency.

**Figure 1. National Residue Program:** The figure illustrates the intricate steps of the NRP. The NRP begins with interagency planning (Blue Book) of sampling program, which is followed by collection and analysis of samples reported (Red Book).
Overview of the Sampling Plans

The United States Government Fiscal Year (FY) runs from October 1 through September 30. To match this, since 2012, FSIS switched from implementing the NRP on a Calendar Year (CY) to a FY basis. This change allows the program to run concurrently with the Federal budget cycle.

The NRP consists of three separate, but interrelated, chemical residue testing programs: scheduled sampling (Tier 1), targeted sampling at the production or compound class level (Tier 2), and targeted sampling at the herd/flock or compound class level (Tier 3). This basic structure has been in existence since 1967. These testing programs provide data for FSIS to detect chemical residues of public health concern and have been modified annually in response to emerging chemical residue concerns and improved testing methodologies.

The 2016 NRP Residue Sampling Plan focuses on chemical residues in domestic meat, poultry, and egg products and the import reinspection of meat, poultry, and egg products. The domestic sampling plan includes scheduled sampling and inspector-generated sampling. The import reinspection sampling plan encompasses normal sampling, increased sampling, and intensified sampling. Directive 10.800.1, Rev 1 provides further detail on those sampling procedures.

Domestic Sampling Plan

1. Tier 1

The Tier 1 sampling plan is the scheduled sampling of specified slaughter subclasses at the time of slaughter, after they have passed antemortem inspection. Carcasses are randomly selected for sampling. The number of samples scheduled each year is based on the probability of detecting at least one violation (Appendix II). Data collected from Tier 1 sampling serves as a baseline level for chemical residue exposure. Sampling tasks are assigned each month through the Public Health Information System (PHIS). The sampling task provides information to the Inspection Program Personnel (IPP) on when to collect the sample (collection window) and which production class to sample. The establishment holds or controls livestock carcasses selected for testing pending the results of analysis. For directed testing of poultry, the IPP recommends to the establishment that the establishment holds the specific poultry carcasses selected for residue testing pending the analysis results.

Tier 1 sampling results also can be used to identify producers or other entities marketing animals with violative levels of residues. Thus, the Tier 1 sampling plan not only gathers information, but also assists in deterring practices that lead to violative residues.

In 2016, the Tier 1 sampling plan consisted of random samples collected from each of the following production classes: beef cows, bob veal, dairy cows, steers/heifers, market hogs, sows, young chickens, and young turkeys. These production classes represent 95 percent of domestic meat and poultry consumption.
2. **Tier 2**
   
a. **Inspector-Generated Sampling**

FSIS inspection program personnel (IPP) conduct inspector-generated sampling when they suspect that animals may have violative levels of chemical residues. Currently, inspector-generated sampling targets individual suspect animals, suspect populations of animals, and animals condemned for specific pathologies listed in [FSIS Directive 10,800.1, Rev 1](#). When Public Health Veterinarians (PHVs) detect evidence of a disease that may have been treated or suspect the administration of a drug, they retain the carcass and analyze samples from those carcasses using an in-plant method to screen for the presence of chemical residues. If the in-plant test is negative for antimicrobial residues included in the screen, the carcass is released to the establishment. If there are screen positive results, the carcass is held pending the results of laboratory testing. The PHV condemns carcasses of animals found to contain violative levels of residues in the muscle or if an unapproved drug is detected in any tissue.

In 2016, IPP completed in-plant residue screens using the Kidney Inhibition Swab test (KISTM test). The screen positive samples are submitted to the FSIS Midwestern Laboratory and analyzed by the laboratory to identify, quantify and confirm the contaminants.

i. **Sampling of Individual Suspect Animals**

Under the direction of the PHV, IPP are to conduct a KISTM test on any carcass that based on herd history or ante-mortem or post-mortem findings inspection findings may contain a violative drug residue. IPP are to follow the instructions provided in [Directive 10,800.1, Rev 1](#), chapter three for circumstances warranting a KISTM test and Chapter Four for performing KISTM tests and documenting the task in PHIS. The PHV selects a carcass for sampling based on the criteria outlined in [FSIS Directive 10,800.1, Rev 1](#) (i.e., animal with disease signs and symptoms, producer history, or as a follow-up to results from random scheduled sampling). Usually, the sample is screened in the plant by the IPP and the screen-result verified when necessary by a PHV. Other samples are sent directly to the laboratory for analysis. For example, if the IPP suspects the misuse of a veterinary drug in an animal, she/he can perform the relevant in-plant screening analysis. If the result of a screening analysis is positive, the carcass is held (if it is not already condemned for other pathology or conditions that would make it unfit for human consumption), and the liver, kidney, and muscle samples from the carcass are then sent to an FSIS laboratory for analysis and confirmation.

ii. **Sampling of Suspect Animal Populations**

Sampling for suspect animal populations is directed by an FSIS regulation (9 CFR 310.21) and [Directive 10,800.1, Rev 1](#). This is outlined for healthy appearing bob veal calves and show animals.

b. **Targeted Sampling**

FSIS implements targeted sampling plans (exploratory assessments) in response to information (obtained by FDA and EPA and provided to FSIS) about misuse of animal drugs and/or exposure to environmental chemicals, as well as in response to Tier 1 analytical results. The duration of these sampling plans vary based on the situation. FSIS may conduct studies to develop information on the frequency and concentration at which some residues like trace metals and industrial components may be inadvertently present in animals. These sampling plans could be designed to distinguish components of meat, poultry and egg products in which residue problems exist, to measure the extent of problems, and to evaluate the impact of actions taken to reduce the occurrence of residues in the food animal population.

Sampling tasks are assigned through PHIS. The sampling task provides instructions to the IPP on when to collect the sample (collection window) and which slaughter production class to collect from. The establishment holds or controls livestock carcasses selected for testing pending the test results. For
directed residue testing of poultry, the IPP recommends to the establishment that the establishments hold the specific poultry carcasses selected for residue testing pending the test results.

In 2016, targeted sampling included old breeder turkeys, and sheep, goats.

3. **Tier 3**

The Tier 3 sampling plan is similar in structure to the targeted sampling (exploratory assessment) program in Tier 2, with the exception that Tier 3 will encompass targeted testing at a herd or flock level. A targeted testing program designed for livestock or flocks originating from the same farm or geographic region may be necessary on occasion to determine the level of exposure to a chemical or chemicals. For instance, producers may administer some veterinary drugs to a herd or a flock (for example, growth promotants or antibiotics given in the feed) in a way that involves misuse. In addition, livestock and birds may be exposed unintentionally to an environmental contaminant. Therefore, a targeted testing program designed for livestock or flocks originating from the same farm or region may be necessary on occasion to determine the level of a chemical or chemicals to which the livestock or the birds in the flock have been exposed. Tier 3 will provide a vehicle for developing information that will support future policy development within the NRP.

In FY 2016, no Tier 3 sampling was performed.

**Import Reinspection Sampling Plan**

Imported meat, poultry, and egg products are sampled through the port-of-entry Import Reinspection Sampling Plan, a chemical residue monitoring program conducted to verify the equivalence of inspection systems in exporting countries to the United States standards. All imported products are subject to reinspection, and one or more types of inspection (TOI) are conducted on every lot\(^2\) of product before it enters the U. S. Chemical residue sampling is included in the reinspection of imported products. The following three levels of chemical residue reinspection include:

- normal sampling: random sampling from a lot;
- increased sampling: above-normal sampling resulting from an Agency management decision; and
- intensified sampling: additional samples taken when a previous sample for a TOI that failed to meet U. S. requirements.

The data obtained from laboratory analyses are entered into PHIS, an FSIS database designed to generate reinspection assignments, receive and store results, and compile histories for the performance of foreign establishments certified by the inspection system in the exporting country.

The import reinspection sampling program is structured using the Tier 1 and Tier 2 criteria used to develop the domestic plan. In FY2016, FSIS collected approximately 2676 import samples.

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\(^2\) An import lot is a group of products defined statistically and/or scientifically by production segments and certified from one country, one establishment. A lot consists entirely of the same species, process category, and product standard of identity (subcategory). A single lot can contain shipping cartons with varying sizes of immediate containers.
Policy and procedures for holding or controlling product under NRP

As of February 2013, the Agency requires official establishments and importers of record to hold or maintain control of lots of product tested for adulterants until acceptable results become available. FSIS stated that the policy would apply to livestock carcasses subject to FSIS testing for residue on domestic products. FSIS explained that it will not hold poultry carcasses pending test results for residues due to historically low residue problems and large lot size. This was outlined in a published Federal Register Notice 76 FRN 19955.

The Hold and Test policy also applies to normal and increased import reinspection sampling. Additionally, for intensified import sampling, the lot must be retained pending laboratory results.
Domestic Scheduled Sampling Program

This section reports the summary results from the FSIS Domestic Scheduled Sampling Plan. The summary results are associated with specific Animal Class. All data reported in the following tables were collected from the FSIS Data Warehouse and PHIS databases.

Table 1 identifies the animal classes and methods/chemical classes which are in the 2016 NRP.

Table 2 summarizes the number of Domestic Scheduled samples and Inspector-generated samples tested by animal class.

Table 3 summarizes the number of residue Domestic Scheduled samples analyzed by animal class, including summary results.

Table 4 summarizes the number of residue Domestic Scheduled samples tested per chemical method by animal class.

Table 5 summarizes Domestic Scheduled Sampling - number of chemical analyses tested per chemical method by animal class.

Table 6 summarizes domestic scheduled sampling violation results by animal class.

Note: Residue detected results with “8888” indicate instances when residues were detected, but were not quantitated.
Summary of Domestic Residue Sampling Program

Table 1. FY 2016 Tier I and II List of Animal Class by Method/Chemical Class (Analyses Performed)

<table>
<thead>
<tr>
<th>Animal Category</th>
<th>Animal Class</th>
<th>Aminoglycosides</th>
<th>Arsenic</th>
<th>Avermectins</th>
<th>Beta-Agonists</th>
<th>Carbadox</th>
<th>Hormones</th>
<th>Metals</th>
<th>MRM</th>
<th>Nitrofurans</th>
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<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>√</td>
</tr>
<tr>
<td>Poultry</td>
<td>Mature Turkeys</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>√</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Young Chickens</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>√</td>
<td>--</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Young Turkeys</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Minor Species</td>
<td>Goats</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>√</td>
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<td>--</td>
</tr>
<tr>
<td></td>
<td>Sheep</td>
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<td>√</td>
<td>√</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>√</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Table 2. FY 2016 Number of Scheduled Residue Samples Tested, by Animal Class

<table>
<thead>
<tr>
<th>Animal Category</th>
<th>Animal Class</th>
<th>Domestic Scheduled Sampling</th>
<th>Inspector-generated Sampling Tier-2 Suspect Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tier-1 &amp; Tier-2* U.S. Federal Plants</td>
<td>Tier-1 U.S. State Plants</td>
</tr>
<tr>
<td>Bovine</td>
<td>Beef Cows</td>
<td>670</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Bob Veal</td>
<td>574</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Bulls</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Dairy Cows</td>
<td>720</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Formula-Fed Veal</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Heavy Calves</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Heifers</td>
<td>397</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Non-Formula-Fed Veal</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Steers</td>
<td>366</td>
<td>145</td>
</tr>
<tr>
<td>Porcine</td>
<td>Boars/Stags</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Market Swine</td>
<td>684</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Roaster Swine</td>
<td>281</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Sows</td>
<td>733</td>
<td>36</td>
</tr>
<tr>
<td>Poultry</td>
<td>Mature Turkeys**</td>
<td>93</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Young Chickens</td>
<td>742</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Young Turkeys</td>
<td>648</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Goats**</td>
<td>337</td>
<td>--</td>
</tr>
<tr>
<td>Minor Species</td>
<td>Lambs**</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Sheep**</td>
<td>290</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td>Total</td>
<td>**</td>
</tr>
</tbody>
</table>

* An additional 129 inspector-generated samples were collected and sent to FSIS labs for analysis. These samples are associated with project codes: 75 COLLGEN, 42 SHOW, and 12 STATE, samples.

** Animal Classes associated with NRP Tier 2 domestic sampling
Table 3. FY 2016 NRP Domestic Scheduled Samples Analyzed by Animal Class –
and Summary Results

<table>
<thead>
<tr>
<th>Animal Category</th>
<th>Animal Class</th>
<th>Number of Non-Detect Samples</th>
<th>Number of Non-Violative Positives Samples</th>
<th>Number of Violative Samples</th>
<th>Total Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine</td>
<td>Beef Cows</td>
<td>727</td>
<td>2</td>
<td>1</td>
<td>730</td>
</tr>
<tr>
<td></td>
<td>Bob Veal</td>
<td>568</td>
<td>3</td>
<td>3</td>
<td>574</td>
</tr>
<tr>
<td></td>
<td>Dairy Cows</td>
<td>736</td>
<td>--</td>
<td>3</td>
<td>739</td>
</tr>
<tr>
<td></td>
<td>Heifers</td>
<td>519</td>
<td>5</td>
<td>2</td>
<td>526</td>
</tr>
<tr>
<td></td>
<td>Steers</td>
<td>507</td>
<td>4</td>
<td>--</td>
<td>511</td>
</tr>
<tr>
<td>Porcine</td>
<td>Market Swine</td>
<td>798</td>
<td>2</td>
<td>--</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>Roaster Swine</td>
<td>271</td>
<td>4</td>
<td>6</td>
<td>281</td>
</tr>
<tr>
<td></td>
<td>Sows</td>
<td>765</td>
<td>3</td>
<td>1</td>
<td>769</td>
</tr>
<tr>
<td>Poultry</td>
<td>Mature Turkeys</td>
<td>93</td>
<td>--</td>
<td>--</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Young Chickens</td>
<td>759</td>
<td>1</td>
<td>--</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>Young Turkeys</td>
<td>657</td>
<td>--</td>
<td>--</td>
<td>657</td>
</tr>
<tr>
<td>Minor Species</td>
<td>Goats</td>
<td>330</td>
<td>--</td>
<td>7</td>
<td>337</td>
</tr>
<tr>
<td></td>
<td>Sheep</td>
<td>287</td>
<td>--</td>
<td>3</td>
<td>290</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7017</strong></td>
<td><strong>24</strong></td>
<td><strong>26</strong></td>
<td><strong>7,067</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: The results include Tier 1 and Tier 2 animal classes.
Data Source: FSIS Data Warehouse and PHIS databases.
Table 4. FY2016 NRP Residue Scheduled Samples - Number of Residue Samples Tested Per Chemical Method by Animal Class

<table>
<thead>
<tr>
<th>Animal Class</th>
<th>Number of Samples per Chemical Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aminoglycosides</td>
</tr>
<tr>
<td>Beef Cows</td>
<td>725</td>
</tr>
<tr>
<td>Bob Veal</td>
<td>571</td>
</tr>
<tr>
<td>Dairy Cows</td>
<td>737</td>
</tr>
<tr>
<td>Heifers</td>
<td>524</td>
</tr>
<tr>
<td>Steers</td>
<td>510</td>
</tr>
<tr>
<td>Market Swine</td>
<td>798</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>280</td>
</tr>
<tr>
<td>Sows</td>
<td>764</td>
</tr>
<tr>
<td>Mature Turkeys</td>
<td>1</td>
</tr>
<tr>
<td>Young Chickens</td>
<td>759</td>
</tr>
<tr>
<td>Young Turkeys</td>
<td>656</td>
</tr>
<tr>
<td>Goats</td>
<td>260</td>
</tr>
<tr>
<td>Mature Sheep</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>6,785</td>
</tr>
</tbody>
</table>

Note: Number of violative samples (in parenthesis)

Data Source: FSIS Data Warehouse and PHIS databases.
Table 5. FY 2016 NRP Residue Scheduled Samples - Number of Chemical Analytes Tested Per Chemical Method by Animal Class

<table>
<thead>
<tr>
<th>Animal Class (# Samples Collected)</th>
<th>Aminoglycosides</th>
<th>Arsenic</th>
<th>Avermectins</th>
<th>beta-Agonists</th>
<th>Carbadox</th>
<th>Hormones</th>
<th>Metals</th>
<th>MRM</th>
<th>Nitrofurans</th>
<th>Pesticides</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cows (730)</td>
<td>7,259</td>
<td>397</td>
<td>1,958</td>
<td>1,732</td>
<td>--</td>
<td>1,785</td>
<td>1,198</td>
<td>58,305</td>
<td>--</td>
<td>24,417</td>
<td>97,051</td>
</tr>
<tr>
<td>Bob Veal (574)</td>
<td>5,728</td>
<td>326</td>
<td>1,612</td>
<td>1,296</td>
<td>--</td>
<td>1,470</td>
<td>1,361</td>
<td>46,094</td>
<td>--</td>
<td>17,751</td>
<td>75,638</td>
</tr>
<tr>
<td>Dairy Cows (739)</td>
<td>7,379</td>
<td>395</td>
<td>1,960</td>
<td>1,808</td>
<td>--</td>
<td>1,740</td>
<td>1,235</td>
<td>59,252</td>
<td>--</td>
<td>25,724</td>
<td>99,493</td>
</tr>
<tr>
<td>Heifers (526)</td>
<td>5,249</td>
<td>313</td>
<td>1,550</td>
<td>1,061</td>
<td>--</td>
<td>1,468</td>
<td>1,397</td>
<td>42,138</td>
<td>--</td>
<td>14,832</td>
<td>68,008</td>
</tr>
<tr>
<td>Steers (511)</td>
<td>5,109</td>
<td>306</td>
<td>1,513</td>
<td>1,033</td>
<td>--</td>
<td>1,380</td>
<td>1,262</td>
<td>41,071</td>
<td>--</td>
<td>14,647</td>
<td>66,321</td>
</tr>
<tr>
<td>Market Swine (800)</td>
<td>7,999</td>
<td>447</td>
<td>2,205</td>
<td>896</td>
<td>2</td>
<td>--</td>
<td>1,480</td>
<td>69,240</td>
<td>--</td>
<td>28,134</td>
<td>110,403</td>
</tr>
<tr>
<td>Roaster Swine (281)</td>
<td>2,836</td>
<td>65</td>
<td>320</td>
<td>--</td>
<td>215</td>
<td>--</td>
<td>298</td>
<td>28,137</td>
<td>--</td>
<td>--</td>
<td>31,871</td>
</tr>
<tr>
<td>Sows (769)</td>
<td>7,658</td>
<td>427</td>
<td>2,102</td>
<td>805</td>
<td>-</td>
<td>5</td>
<td>1,081</td>
<td>67,045</td>
<td>--</td>
<td>24,516</td>
<td>103,639</td>
</tr>
<tr>
<td>Mature Turkeys (93)</td>
<td>10</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,008</td>
<td>93</td>
<td>--</td>
<td>--</td>
<td>1,112</td>
</tr>
<tr>
<td>Young Chickens (760)</td>
<td>7,599</td>
<td>408</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,743</td>
<td>64,022</td>
<td>1,700</td>
<td>26,716</td>
<td>102,188</td>
</tr>
<tr>
<td>Young Turkeys (657)</td>
<td>6,569</td>
<td>371</td>
<td>5</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1,925</td>
<td>54,081</td>
<td>1,374</td>
<td>21,110</td>
<td>85,435</td>
</tr>
<tr>
<td>Goats (337)</td>
<td>2,600</td>
<td>195</td>
<td>984</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>28,061</td>
<td>--</td>
<td>11,826</td>
<td>43,672</td>
</tr>
<tr>
<td>Mature Sheep (290)</td>
<td>2,000</td>
<td>155</td>
<td>762</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>23,260</td>
<td>--</td>
<td>11,115</td>
<td>37,294</td>
</tr>
<tr>
<td>Total (7,067)</td>
<td>67,995</td>
<td>3,806</td>
<td>14,971</td>
<td>8,639</td>
<td>217</td>
<td>7,848</td>
<td>13,988</td>
<td>580,799</td>
<td>3,074</td>
<td>220,788</td>
<td>922,125</td>
</tr>
</tbody>
</table>

**Note:** Multiple analytes may be associated with the same sample. Not all samples are tested for all chemical method. Number of samples per chemical method is indicated in Table 4

**Data Source:** FSIS Data Warehouse and PHIS databases.
### Table 6. FY 2016 Domestic Scheduled Sampling Plan Violations

<table>
<thead>
<tr>
<th>Animal</th>
<th>Tissue</th>
<th>Compound</th>
<th>Concentration</th>
<th>Units</th>
<th>Tolerance Level Value</th>
<th>Authority (CFR Citation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cow</td>
<td>Muscle</td>
<td>Piperonyl Butoxide</td>
<td>0.162</td>
<td>ppm</td>
<td>0.1</td>
<td>40 CFR 180.127</td>
</tr>
<tr>
<td>Bob Veal</td>
<td>Muscle</td>
<td>Sulfamethazine</td>
<td>22.500</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Bob Veal</td>
<td>Muscle</td>
<td>Sulfamethazine</td>
<td>0.190</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Bob Veal</td>
<td>Liver</td>
<td>Sulfamethazine</td>
<td>0.304</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Bob Veal</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>16.1</td>
<td>ppb</td>
<td>0</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Dairy Cow</td>
<td>Liver</td>
<td>Sulfadimethoxine</td>
<td>0.114</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.640</td>
</tr>
<tr>
<td>Dairy Cow</td>
<td>Liver</td>
<td>Sulfadimethoxine</td>
<td>1.064</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.640</td>
</tr>
<tr>
<td>Dairy Cow</td>
<td>Muscle</td>
<td>Permethrin (Cis and Trans)</td>
<td>0.213</td>
<td>ppm</td>
<td>0.1</td>
<td>40 CFR 180.378</td>
</tr>
<tr>
<td>Heifer</td>
<td>Muscle</td>
<td>Melengestrol Acetate</td>
<td>2.2</td>
<td>ppb</td>
<td>None</td>
<td>21 CFR 556.380</td>
</tr>
<tr>
<td>Heifer</td>
<td>Muscle</td>
<td>Melengestrol Acetate</td>
<td>1.3</td>
<td>ppb</td>
<td>None</td>
<td>21 CFR 556.380</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Sulfamethazine</td>
<td>0.702</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Muscle</td>
<td>Sulfamethazine</td>
<td>0.237</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Carbadox</td>
<td>78.035</td>
<td>ppb</td>
<td>30</td>
<td>21 CFR 556.100</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Carbadox</td>
<td>131.001</td>
<td>ppb</td>
<td>30</td>
<td>21 CFR 556.100</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Carbadox</td>
<td>31.406</td>
<td>ppb</td>
<td>30</td>
<td>21 CFR 556.100</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Carbadox</td>
<td>68.511</td>
<td>ppb</td>
<td>30</td>
<td>21 CFR 556.100</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Muscle</td>
<td>Sulfamethazine</td>
<td>0.117</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Roaster Swine</td>
<td>Liver</td>
<td>Sulfamethazine</td>
<td>0.227</td>
<td>ppm</td>
<td>0.1</td>
<td>21 CFR 556.670</td>
</tr>
<tr>
<td>Sow</td>
<td>Muscle</td>
<td>DDT and Metabolites</td>
<td>***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>77.05</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>29.45</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>48.4</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>30.9</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
</tbody>
</table>
### Table 6. FY 2016 Domestic Scheduled Sampling Plan Violations – Federal Plants

<table>
<thead>
<tr>
<th>Animal</th>
<th>Tissue</th>
<th>Compound</th>
<th>Concentration</th>
<th>Units</th>
<th>Tolerance Level Value</th>
<th>Authority (CFR Citation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Moxidectin</td>
<td>56.8</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Goat</td>
<td>Muscle</td>
<td>Ivermectin</td>
<td>72.45</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.344</td>
</tr>
<tr>
<td>Goat</td>
<td>Liver</td>
<td>Moxidectin</td>
<td>224</td>
<td>ppb</td>
<td>Not Approved</td>
<td>21 CFR 556.426</td>
</tr>
<tr>
<td>Sheep</td>
<td>Muscle</td>
<td>DDT and Metabolites</td>
<td>***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>Muscle</td>
<td>Pentachlorobenzene</td>
<td>***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>Muscle</td>
<td>Doramectin</td>
<td>168.5</td>
<td>ppb</td>
<td>30</td>
<td>21 CFR 556.225</td>
</tr>
</tbody>
</table>

**Note:**

****: Violative residue results were residue detected but not quantified

Not Approved: Residue detected is not approved per species

**Data Source:** FSIS Data Warehouse and PHIS databases.
Summary of Domestic Inspector -Generated Sampling Program

PHVs, and CSIs under the guidance of a PHV, conduct Inspector-generated residue sampling when an animal is suspected to have undergone drug treatment and may possibly contains violative levels of chemical residues. The PHVs and CSIs also are encouraged to collect samples for residue testing at the FSIS labs when a chemical contamination is suspected. Samples are screened using the KIST™ test. If KIST™ test kits are not available; the PHV submits the sample to the FSIS laboratory for testing.

Table 7 summarizes the total number in-plants screens tests using the KIST™ test, which includes the number of in-plants screens with negative results, number of positive screens sent to FSIS labs for conformation, and the number of carcasses with violations for each animal class.

Table 8 summarizes the total number of samples analyzed and the number of carcasses with violations for each animal class under additional inspector-generated program projects such as COLLGEN, SHOW, and STATE.

Table 9 summarize the results for specific chemical compounds that were detected (violative) within inspector-generated sampling project (including the KIST™) across animal class.

Table 10 summarize the results for specific chemical compounds that were detected (non-violative) within inspector-generated sampling project (including the KIST™) across animal class.

Note: Data in this document were obtained from the FSIS Data Warehouse and PHIS databases.
Table 7. FY 2016 Tier II Inspector Generated Sampling (KIS ™) Test

<table>
<thead>
<tr>
<th>Animal Category</th>
<th>Animal Class</th>
<th>Total Number of In-plant Samples</th>
<th>Number of In-plant Negative Samples</th>
<th>Number of In-plant Positive Samples</th>
<th>Number of Samples With Confirmed Lab Violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovine</td>
<td>Beef Cows</td>
<td>15,936</td>
<td>15,582</td>
<td>354</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Bob Veal</td>
<td>23,333</td>
<td>22,961</td>
<td>372</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Bulls</td>
<td>1,618</td>
<td>1,565</td>
<td>53</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Dairy Cows</td>
<td>99,660</td>
<td>97,384</td>
<td>2276</td>
<td>480</td>
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<tr>
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<td>Formula-Fed Veal</td>
<td>640</td>
<td>627</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Heavy Calves</td>
<td>426</td>
<td>404</td>
<td>22</td>
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<tr>
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<td>Heifers</td>
<td>2,537</td>
<td>2,486</td>
<td>51</td>
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<tr>
<td></td>
<td>Non-Formula-Fed Veal</td>
<td>161</td>
<td>157</td>
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<tr>
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<td>Steers</td>
<td>8,705</td>
<td>8,530</td>
<td>175</td>
<td>33</td>
</tr>
<tr>
<td>Porcine</td>
<td>Boars/Stags</td>
<td>99</td>
<td>98</td>
<td>1</td>
<td>0</td>
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<tr>
<td></td>
<td>Market Swine</td>
<td>18,754</td>
<td>18,579</td>
<td>175</td>
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<td>Roaster Swine</td>
<td>1,527</td>
<td>1,507</td>
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<tr>
<td></td>
<td>Sows</td>
<td>6,461</td>
<td>6,354</td>
<td>107</td>
<td>21</td>
</tr>
<tr>
<td>Minor Species</td>
<td>Goats</td>
<td>618</td>
<td>614</td>
<td>4</td>
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</tr>
<tr>
<td></td>
<td>Lambs</td>
<td>1,224</td>
<td>1,212</td>
<td>12</td>
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<td>Sheep</td>
<td>485</td>
<td>475</td>
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<td></td>
<td><strong>Total</strong></td>
<td><strong>182,184</strong></td>
<td><strong>178,535</strong></td>
<td><strong>3,649</strong></td>
<td><strong>724</strong></td>
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</tbody>
</table>

** 883 KIS ™ test violative analytes in 724 lab confirmed KIS ™ test violative samples. Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).**

Data Source: FSIS Data Warehouse and PHIS databases.
Table 8. FY 2016 Tier II Inspector-Generated Sampling (COLLGEN/ STATE/ SHOW) Projects

<table>
<thead>
<tr>
<th>Animal Category</th>
<th>Animal Class</th>
<th>COLLGEN</th>
<th>SHOW</th>
<th>STATE</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number of Samples</td>
<td>Number of Samples With Confirmed Lab Violations</td>
<td>Number of Samples</td>
<td>Number of Samples With Confirmed Lab Violations</td>
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<tr>
<td>Bovine</td>
<td>Beef Cows</td>
<td>7</td>
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<td>--</td>
</tr>
<tr>
<td></td>
<td>Bob Veal</td>
<td>4</td>
<td>2</td>
<td>--</td>
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<tr>
<td></td>
<td>Bulls</td>
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<td>--</td>
</tr>
<tr>
<td></td>
<td>Dairy Cows</td>
<td>23</td>
<td>2</td>
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</tr>
<tr>
<td></td>
<td>Formula-Fed Veal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Heavy Calves</td>
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<td>--</td>
</tr>
<tr>
<td></td>
<td>Heifers</td>
<td>5</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Non-Formula-Fed Veal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Steers</td>
<td>4</td>
<td>--</td>
<td>11</td>
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<tr>
<td>Porcine</td>
<td>Boars/Stags</td>
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<td>Market Swine</td>
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</tr>
<tr>
<td>Minor Species</td>
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<tr>
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<td>Lambs</td>
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<td>--</td>
<td>6</td>
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<tr>
<td></td>
<td>Total</td>
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</table>

Note: Results include two violative residues from two dairy cow (penicillin, florfenicol and sulfamethazine), two bob veal (penicillin and sulfamethazine), a beef cow (desfuroylceftiofur) and one heifer (sulfadimethoxine), one market swine (sulfamethazine) and a lamb (penicillin).

Data Source: FSIS Data Warehouse and PHIS databases.
Table 9. FY 2016 Number of Residue Violations results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS™ test, COLLGEN/STATE/SHOW project codes)

<table>
<thead>
<tr>
<th>Chemical Residue</th>
<th>Beef Cows</th>
<th>Bob Veal</th>
<th>Bulls</th>
<th>Dairy Cow</th>
<th>Formula Fed Veal</th>
<th>Heavy Calves</th>
<th>Heifer</th>
<th>Steers</th>
<th>Market Swine</th>
<th>Roaster Swine</th>
<th>Sows</th>
<th>Lamb</th>
<th>Sheep</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
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<td>--</td>
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<td>--</td>
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<td>--</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:** Multiple violative analytes in different tissue types may be associated with a single sample (carcass).

**Data Source:** FSIS Data Warehouse and PHIS databases.
Table 9. FY 2016 Number of Residue Violations results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS™ test, COLLGEN/STATE/SHOW project codes) (cont.)

<table>
<thead>
<tr>
<th>Chemical Residue</th>
<th>Bed Cows</th>
<th>Bob Veal</th>
<th>Bulls</th>
<th>Dairy Cow</th>
<th>Formula Fed Veal</th>
<th>Heavy Calves</th>
<th>Heifer</th>
<th>Steers</th>
<th>Market Swine</th>
<th>Roaster Swine</th>
<th>Sows</th>
<th>Lamb</th>
<th>Sheep</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Neomycin</td>
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<td>Tetracycline</td>
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**Note:** Multiple violative analytes in different tissue types may be associated with a single sample (carcass)

**Data Source:** FSIS Data Warehouse and PHIS databases.
Table 10. FY 2016 Number of Non-Violative results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS™ test, COLLGEN/STATE/SHOW project codes)

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Note: Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).

Data Source: FSIS Data Warehouse and PHIS databases.
Table 10. FY 2016 Number of Non-Violative results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS™ test, COLLEGEN/STATE/SHOW project codes) (cont.)

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**Note:** Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).

**Data Source:** FSIS Data Warehouse and PHIS databases.
Import Residue Reinspection Sampling Program

In FY2016, FSIS collected 2,676 import samples and analyzed for 169,490 residue analytes from 25 export countries. Twenty Two violations were detected (20 from uruguaw, and two from Nicaragua). For more information, refer to the list of tables below.

**Table 11** summarizes the – import number of residue samples tested per chemical method by Production Class and Product Type

**Table 12** summarizes the number of import residue samples by inspection level, per exporting country and production type

**Table 13** summarizes the number of import residue samples analyzed, by exporting country and Production Type

**Table 14** summarizes the number of import residue samples analyzed, number of chemical analyates tested per exporting country and production type

**Table 15** summarize number of samples and chemical residues under the import residue sample program, by exporting country

**Table 16** summarize import residue sample program (Non-Violative and Violative) results, by exporting country chemical residues and production class

Information for countries wanting to import to the United States can be found at:  
[Importing products to the United States](#)

Information on US products eligible for export can be found at:  
[Export Library](#)
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**Data Source:** FSIS Data Warehouse and PHIS databases.
Table 12. FY 2016 Number of Import Residue Samples by Inspection Level, per Exporting Country and Production Type

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**Data Source:** FSIS Data Warehouse and PHIS databases.
### Table 13. FY 2016 Number of Import Residue Samples Analyzed, by Exporting Country and Production Type

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Table 13. FY 2016 Number of Import Residue Samples Analyzed, by Exporting Country and Production Type (Cont.)

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Data Source: FSIS Data Warehouse and PHIS databases.
Table 14. FY 2016 Number of Chemical Analytes Tested Per Exporting Country and Production Type

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Table 14. FY 2016 Number of Chemical Analytes Tested Per Exporting Countries and Production Type (Cont.)

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<th>Goat</th>
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Note: Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).
Data Source: FSIS Data Warehouse and PHIS databases.
Table 15. FY 2016 Number of Samples and Chemical Residues under the Import Residue Sample Program, by Exporting Country

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Note: * Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).

Data Source: FSIS Data Warehouse and PHIS databases.
Table 16. FY 2016 Import Residue Sample Program (Non-Violative and Violative) Results, by Exporting Countries, Chemical Residues and Production Class

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<td>Brazil</td>
<td>Doramectin</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ivermectin</td>
<td>--</td>
<td>7</td>
</tr>
<tr>
<td>Canada</td>
<td>Sulfamethazine</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Mexico</td>
<td>Ivermectin</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Levamisole</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Ethion</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Uruguay</td>
<td>Diazinon</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Ethion</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Ivermectin</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: Multiple violative analytes in different tissue types may be associated with a single sample (Carcass). Data Source: FSIS Data Warehouse and PHIS databases.
Appendix I

NRP Non-Violative Positive and Violative Residue Samples Results

In addition to the publication of the FY2016 United States National Residue Program samples results, FSIS will post the detailed positive non-violative, and positive violative residue results associated with the NRP sampling program in a spreadsheet format on the FSIS website:


This sheet includes detailed information regarding samples taken by FSIS in both the “scheduled” sampling and the “inspector-generated” sampling. FSIS plans to publish this detailed results on an ongoing basis. The purpose is to provide the residue testing results, and to increase program transparency for all stakeholders. The detailed results include: sample collection and reviewed date, the project code, the animal class, tissue type, chemical residue name, concentration value, sample results (whether positive non-violative or positive violative), chemical concentration values (if any) and the CFR reference per chemical listed in the data sheet.

Appendix II

Statistical Table

Scheduled sampling is done to provide some assurance of detection of a violation that affects a given percentage of the sample population.

Prior to FY 2012, FSIS tested 230 to 300 samples from each production class/residue compound class pairing to obtain results that were statistically meaningful. The testing sample sizes of 230 or 300 ensured FSIS a 90 percent or 95 percent probability, respectively, of detecting at least one chemical residue violation if the violation rate is equal to or greater than one percent in the population being sampled. Starting in FY 2012, FSIS stated in its residue sampling plan that the sample size selected/tested would increase to about 800 samples for each of the nine major production class tested under Tier 1.

The statistical table provides the calculated number of samples required to ensure detection of at least one violation that affects a given percentage of the sampled population. Statistically, for a binomial distribution with sample size “n” and violation rate “v” (in decimal), if v is the true violation rate in the population and n is the number of samples, the probability, p, of finding at least one violation among the n samples (assuming random sampling) is

\[ p = 1 - (1 - v)^n \]

For example, if the true violation rate is 1% the probability of detecting at least one violation with sample sizes of 230, 300, 390, 460, and 800 are 90%, 95%, 98%, 99%, and 99.97% respectively.
In the table below the probability of detecting at least one violation with a sample size of 800 is italicized and bolded.

### Statistical Table – 2016 U.S. National Residue Program

<table>
<thead>
<tr>
<th>Percentage % Violative in the population (v)</th>
<th>Number of samples required to detect at least one violation in (n) samples with a probability (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.90</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
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<tr>
<td>5</td>
<td>45</td>
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<tr>
<td>1</td>
<td>230</td>
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<td>0.57</td>
<td>403</td>
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<tr>
<td>0.50</td>
<td>460</td>
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<tr>
<td>0.37</td>
<td>620</td>
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<tr>
<td>0.29</td>
<td>793</td>
</tr>
<tr>
<td>0.10</td>
<td>2,302</td>
</tr>
</tbody>
</table>

**Sample Size required “n”**

The procedure to calculate the required sample size needed:

\[
\begin{align*}
p &= 1 - (1 - v)^n \\
1 - p &= (1 - v)^n \\
\log(1 - p) &= \log(1 - v)^n \\
\log(1 - p) &= n \cdot \log(1 - v) \\
n &= \frac{\log(1 - p)}{\log(1 - v)}
\end{align*}
\]

\( \Leftarrow \) Probability of detecting at least one violation in n sample of binomial distribution with violation rate v

\( \Leftarrow \) Subtract one from both side of the equation. This gives the probability of detecting No violations in n samples

\( \Leftarrow \) Apply logarithmic function to both side of the equation

\( \Leftarrow \) A logarithmic function property

\( \Leftarrow \) Sample size based on violation rate (v) and probability of detecting (p)
### Appendix III

#### List of Chemical Residues by Class/Method

**i. Veterinary Drugs**

For 2016 domestic sampling, FSIS has scheduled the following classes of veterinary drug analytes:

<table>
<thead>
<tr>
<th>Class/Method</th>
<th>Analytes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2-Aminosulfone</strong>&lt;br&gt;Albendazole</td>
<td>DCCD, Gamithromycin, Oxytetracycline, Sulfamethoxypyridazine</td>
</tr>
<tr>
<td><strong>2-Amino-Flubendazole</strong>&lt;br&gt;Ciprofloxacin</td>
<td>Desethylene Haloperidol, Penicillin G, Sulfaniltran</td>
</tr>
<tr>
<td><strong>2-Quinoxaline Carboxylic Acid (QCA)</strong>&lt;br&gt;Diclofenac</td>
<td>Dicloxacillin, Iproniazide - OH, Pirlimycin, Sulfadiazine</td>
</tr>
<tr>
<td><strong>Abamectin</strong>&lt;br&gt;Dimetridazole</td>
<td>Hygromycin, Neomycin, Sulfadimethoxine</td>
</tr>
<tr>
<td><strong>Ampicillin</strong>&lt;br&gt;Enrofloxacin</td>
<td>Flunixin, Sulfaethoxypyridazine, Tylosin</td>
</tr>
<tr>
<td><strong>Azaperone</strong>&lt;br&gt;Doxycycline</td>
<td>Metronidazole, Sulfadiazine, Tylosin</td>
</tr>
<tr>
<td><strong>Butoxynaphol</strong>&lt;br&gt;Erythromycin A</td>
<td>Neomycin, Sulfadimethoxine, Tylosin</td>
</tr>
<tr>
<td><strong>Carazolol</strong>&lt;br&gt;Fenbendazole</td>
<td>Norfloxacin, Sulfamerazine, Zeranol (β-Zearalanol)</td>
</tr>
<tr>
<td><strong>Cefazolin</strong>&lt;br&gt;Flunixin</td>
<td>Oxyphenylbutazone, Sulfamethoxazole</td>
</tr>
<tr>
<td><strong>Chloramphenicol</strong>&lt;br&gt;Flumethicin</td>
<td>Dihydrostreptomycin, Neomycin</td>
</tr>
<tr>
<td><strong>Cimaterol</strong>&lt;br&gt;Moxifloxacin</td>
<td>Hygromycin B, Spectinomycin</td>
</tr>
<tr>
<td><strong>Ciprofloxacin</strong>&lt;br&gt;Oxyphenylbutazone</td>
<td>Kanamycin, Streptomycin</td>
</tr>
<tr>
<td><strong>Clindamycin</strong>&lt;br&gt;Orbifloxacin</td>
<td>Melengestrol Acetate, Hexestrol, Zeranol</td>
</tr>
<tr>
<td><strong>Cloxacillin</strong>&lt;br&gt;Sulfaethoxypyridazine</td>
<td>Melengestrol Acetate, Hexestrol, Zeranol</td>
</tr>
</tbody>
</table>

#### Aminoglycoside Method

<table>
<thead>
<tr>
<th>Amikacin</th>
<th>Gentamicin</th>
<th>Neomycin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apramycin</td>
<td>Hygromycin B</td>
<td>Spectinomycin</td>
</tr>
<tr>
<td>Dihydrostreptomycin</td>
<td>Kanamycin</td>
<td>Streptomycin</td>
</tr>
</tbody>
</table>

#### Hormones Method

<table>
<thead>
<tr>
<th>Megestrol</th>
<th>Melengestrol Acetate</th>
<th>Hexestrol</th>
<th>Zeranol</th>
</tr>
</thead>
</table>
### Beta-Agonist Method

<table>
<thead>
<tr>
<th>Cimaterol</th>
<th>Ractopamine</th>
<th>Zilpaterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clenbuterol</td>
<td>Salbutamol</td>
<td></td>
</tr>
</tbody>
</table>

### Avermectin Method

<table>
<thead>
<tr>
<th>Doramectin</th>
<th>Ivermectin</th>
<th>Moxidectin</th>
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</thead>
</table>

### Nitrofuran Method

<table>
<thead>
<tr>
<th>3-Amino-2-oxazolidinone (AOZ)</th>
<th>1-Aminohydantoin (AHD)</th>
<th>Semicarbazide (SEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Amino-5-morpholinomethyl-2-oxazolidinone (AMOZ)</td>
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<td></td>
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</table>

### Carbadox Method

Quinoxaline-2-carboxylic acid
ii. Pesticides and environmental contaminants

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Pesticide Method</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Naphthol O</td>
<td>Fluroxypyr-1-Methylheptyl-Ester</td>
<td>Pentachlorobenzen e (PCB)</td>
<td></td>
</tr>
<tr>
<td>3-Hydroxycarbofuran O S</td>
<td>Fluvalinate</td>
<td>Permethrin (cis&amp;trans)</td>
<td></td>
</tr>
<tr>
<td>Acephate O, p'</td>
<td>Heptachlor</td>
<td>Piperonyl butoxide</td>
<td></td>
</tr>
<tr>
<td>Acetamiprid O, p'</td>
<td>Heptachlor epoxide (cis+ trans) or (B+A)</td>
<td>Pirimiphos methyl</td>
<td></td>
</tr>
<tr>
<td>Alachlor O, p'</td>
<td>Hexachlorobenzene (HCB)</td>
<td>Prallethrin</td>
<td></td>
</tr>
<tr>
<td>Aldicarb O, p'</td>
<td>Hexazinone</td>
<td>Profenofos</td>
<td></td>
</tr>
<tr>
<td>Aldicarb sulfone O, p'</td>
<td>Hexythiazox</td>
<td>Pronam ide</td>
<td></td>
</tr>
<tr>
<td>Aldicarb sulfoxide Deethylatrazine</td>
<td>Imazalil</td>
<td>Propachlor</td>
<td></td>
</tr>
<tr>
<td>Aldrin Diazinon</td>
<td>Imidacloprid</td>
<td>Propanil</td>
<td></td>
</tr>
<tr>
<td>Atrazine Dichlorvos (DDVP)</td>
<td>Indoxacarb</td>
<td>Propetamphos</td>
<td></td>
</tr>
<tr>
<td>Azinphos methyl Dieldrin</td>
<td>Lindane (BHC gamma)</td>
<td>Propiconazole</td>
<td></td>
</tr>
<tr>
<td>Azoxystrobin Difenconazole</td>
<td>Linuron</td>
<td>Pyraclostrobin</td>
<td></td>
</tr>
<tr>
<td>Benoxacor Diflubenzuron</td>
<td>Malathion</td>
<td>Pyrethrin I</td>
<td></td>
</tr>
<tr>
<td>Bifenthrin Dimethoate</td>
<td>Metalaxyl</td>
<td>Pyrethrin II</td>
<td></td>
</tr>
<tr>
<td>Boscalid Diuron</td>
<td>Methamidophos</td>
<td>Pyridaben</td>
<td></td>
</tr>
<tr>
<td>Buprofezin Endosulfan I</td>
<td>Methomyl</td>
<td>Pyriproxyfen</td>
<td></td>
</tr>
<tr>
<td>Carbaryl Endosulfan II</td>
<td>Methoxyfenozide</td>
<td>Resmethrin (cis&amp;trans)</td>
<td></td>
</tr>
<tr>
<td>Carbofuran Endosulfan sulfate</td>
<td>Metolachlor</td>
<td>Simazine</td>
<td></td>
</tr>
<tr>
<td>Carfentrazone ethyl Ethion</td>
<td>Metribuzin</td>
<td>Sulprofos</td>
<td></td>
</tr>
<tr>
<td>Chlordane cis Ethion monoxon</td>
<td>MGK-264 (isomers 1 &amp; 2)</td>
<td>Tebufenozide</td>
<td></td>
</tr>
<tr>
<td>Chlordane trans</td>
<td>Ethofumesate</td>
<td>Myclobutanil</td>
<td>Tefluthrin</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Chloroneb</td>
<td>Fenoxaprop ethyl</td>
<td>Nonachlor cis</td>
<td>Tetrachlorvinphos</td>
</tr>
<tr>
<td>Chlorothalonil</td>
<td>Fenpropathrin</td>
<td>Nonachlor trans</td>
<td>Tetraconazole</td>
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<td>Chlorpropham</td>
<td>Fipronil</td>
<td>Norflurazon</td>
<td>Thiabendazole</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>Fipronil desulfanyl</td>
<td>Omethoate</td>
<td>Thiamethoxam</td>
</tr>
<tr>
<td>Chlorpyrifos methyl</td>
<td>Fipronil sulfide</td>
<td>Oxychlordane</td>
<td>Thiobencarb</td>
</tr>
<tr>
<td>Clothianidin</td>
<td>Fluridone</td>
<td>Pentachloroaniline (PCA)</td>
<td>Trifloxystrobin</td>
</tr>
<tr>
<td>1-Naphthol</td>
<td>Coumaphos O</td>
<td>Fluroxypy-1-Methylhepyl-Ester</td>
<td>Pentachlorobenzenes (PCB)</td>
</tr>
<tr>
<td>3-Hydroxycarbofuran</td>
<td>Coumaphos S</td>
<td>Fluvalinate</td>
<td>Permethrin (cis&amp;trans)</td>
</tr>
<tr>
<td>Acephate</td>
<td>DDD o,p’</td>
<td>Heptachlor</td>
<td>Piperonyl butoxide</td>
</tr>
<tr>
<td>Acetamiprid</td>
<td>DDD p,p’ + DDT, o,p'</td>
<td>Heptachlor epoxide (cis+trans) or (B+A)</td>
<td>Pirimiphos methyl</td>
</tr>
<tr>
<td>Alachlor</td>
<td>DDE o,p’</td>
<td>Hexachlorobenzene (HCB)</td>
<td>Prallethrin</td>
</tr>
<tr>
<td>Aldicarb</td>
<td>DDE p,p’</td>
<td>Hexazinone</td>
<td>Profenofos</td>
</tr>
<tr>
<td>Aldicarb sulfone</td>
<td>DDT p,p’</td>
<td>Hexythiazox</td>
<td>Pronamide</td>
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<tr>
<td>Aldicarb sulfoxide</td>
<td>Deethylatrazine</td>
<td>Imazalil</td>
<td>Propachlor</td>
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<tr>
<td>Aldrin</td>
<td>Diazinon</td>
<td>Imidacloprid</td>
<td>Propanil</td>
</tr>
<tr>
<td>Atrazine</td>
<td>Dichlorvos (DDVP)</td>
<td>Indoxacarb</td>
<td>Propetamphos</td>
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<tr>
<td>Azinphos methyl</td>
<td>Dieldrin</td>
<td>Lindane (BHC gamma)</td>
<td>Propiconazole</td>
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<td>Difenconazole</td>
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<td>Pyrethrin I</td>
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<td>Dimethoate</td>
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<td>Pyrethrin II</td>
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<td>Boscalid</td>
<td>Diuron</td>
<td>Methamidophos</td>
<td>Pyridaben</td>
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<td>Buprofezin</td>
<td>Endosulfan I</td>
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<td>Pyriproxyfen</td>
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<td>Endosulfan II</td>
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<td>Endosulfan sulfate</td>
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<td>Simazine</td>
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<td>Ethion monoxon</td>
<td>MGK-264 (isomers 1 &amp; 2)</td>
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<td>Myclobutanil</td>
<td>Tefluthrin</td>
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<td>Chloroneb</td>
<td>Fenoxaprop ethyl</td>
<td>Nonachlor cis</td>
<td>Tetrachlorvinphos</td>
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<td>Fenpropathrin</td>
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<td>Tetraconazole</td>
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<td>Thiabendazole</td>
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<tr>
<td>Chlorpyrifos</td>
<td>Fipronil desulfanyl</td>
<td>Omethoate</td>
<td>Thiamethoxam</td>
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<tr>
<td>----------------------</td>
<td>------------------------</td>
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</tr>
<tr>
<td>Chlorpyrifos methyl</td>
<td>Fipronil sulfide</td>
<td>Oxychlorodane</td>
<td>Thiobencarb</td>
</tr>
<tr>
<td>Clothianidin</td>
<td>Fluridone</td>
<td>Pentachloroaniline (PCA)</td>
<td>Trifloxystrobin</td>
</tr>
</tbody>
</table>

**b. Metals Method**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Aluminum (Al)</td>
<td>Copper (Cu)</td>
<td>Selenium (Se)</td>
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</tr>
<tr>
<td>Barium (Ba)</td>
<td>Iron (Fe)</td>
<td>Strontium (Sr)</td>
<td></td>
</tr>
<tr>
<td>Boron (B)</td>
<td>Lead (Pb)</td>
<td>Thallium (Tl)</td>
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</tr>
<tr>
<td>Cadmium (Cd)</td>
<td>Manganese (Mn)</td>
<td>Vanadium (V)</td>
<td></td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>Molybdenum (Mo)</td>
<td>Zinc (Zn)</td>
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<tr>
<td>Cobalt (Co)</td>
<td>Nickel (Ni)</td>
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<td></td>
</tr>
</tbody>
</table>
### Appendix IV

**U.S. NRP – Domestic Scheduled Sampling Program**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Samples</th>
<th>Number of Violative Samples</th>
<th>Number of Non-Violative Positive Analytes</th>
<th>Number of Violative Chemical Residues</th>
</tr>
</thead>
<tbody>
<tr>
<td>* FY2013</td>
<td>4,583</td>
<td>19</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>FY2014</td>
<td>6,066</td>
<td>10</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>FY2015</td>
<td>6,445</td>
<td>12</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>FY2016</td>
<td>7,067</td>
<td>26</td>
<td>24</td>
<td>11</td>
</tr>
</tbody>
</table>

*Note: FSIS moved to a fiscal evaluation period beginning with FY12. FY 2013 covers only Jan-Sept, 2013.*

### Appendix V

**U.S. NRP – Import Re-inspection Sampling Program**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Samples</th>
<th>Number of Violative Samples</th>
<th>Violative Residues</th>
</tr>
</thead>
<tbody>
<tr>
<td>* FY2013</td>
<td>817</td>
<td>4</td>
<td>Avermectins</td>
</tr>
<tr>
<td>FY2014</td>
<td>1,967</td>
<td>8</td>
<td>Ivermectin (7), Zilpaterol (1)</td>
</tr>
<tr>
<td>FY2015</td>
<td>2,922</td>
<td>7</td>
<td>Abamectin (1) Ethion (5), Piperonyl Butoxide (1)</td>
</tr>
<tr>
<td>FY2016</td>
<td>2,676</td>
<td>22</td>
<td>Ethion (21), Diazinon (1)</td>
</tr>
</tbody>
</table>

*Note: FSIS moved to a fiscal evaluation period beginning with FY12. FY 2013 covers only Jan-Sept, 2013.*
Appendix VI

NRP – Domestic Inspector Generated Sampling Program (include KISTM test) & lab confirmed residue results

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Samples / (Include In-plant KISTM Screens Tests)</th>
<th>Number of Samples Tested in FSIS Labs / (include in-plant KISTM screens positive)</th>
<th>Number of Lab-Confirmed Violative Analytes / Number of Violative Carcasses</th>
<th>Top Three Violative Chemical Residue</th>
<th>Number of Lab-Confirmed Non-Violative Positive Analytes</th>
<th>Top Three Non-Violative Chemical Residue</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2013</td>
<td>170,692 / (170,560)</td>
<td>4,100 / (3,968)</td>
<td>1,265 / 1,053</td>
<td>Ceftiofur Penicillin Neomycin</td>
<td>1,099</td>
<td>Oxytetracycline Neomycin Ceftiofur</td>
</tr>
<tr>
<td>FY2014</td>
<td>210,705 / (210,516)</td>
<td>5,048 / (4,859)</td>
<td>1,408 / 1,136</td>
<td>Ceftiofur Penicillin Neomycin</td>
<td>1,150</td>
<td>Oxytetracyline Tulathromycin Penicillin</td>
</tr>
<tr>
<td>FY2015</td>
<td>184,167 / (184,010)</td>
<td>4,179 / (4,022)</td>
<td>1,024 / 796</td>
<td>Ceftiofur Penicillin Sulfamethazine</td>
<td>873</td>
<td>Tulathromycin Oxytetracyline Neomycin</td>
</tr>
<tr>
<td>FY2016</td>
<td>182,313 / (182,184)</td>
<td>3,778 / (3,649)</td>
<td>893 / 732</td>
<td>Ceftiofur Penicillin Sulfadimethoxine</td>
<td>728</td>
<td>Oxytetracyline Tulathromycin Penicillin</td>
</tr>
</tbody>
</table>

Note:
- (Number of KISTM test samples in paranthesis)
- Multiple violative analytes in different tissue types may be associated with a single sample (Carcass).
- FSIS moved to a fiscal evaluation period beginning w/FY13. FY 2013 covers Jan-Sept, 2013 only.
Appendix VII

2016 FSIS Residue Sampling for Siluriformes

On December 2, 2015, FSIS published the final rule, “Mandatory Inspection of Fish of the Order Siluriformes and Products Derived From Such Fish.” The 2008 Farm Bill amended the Federal Meat Inspection Act (FMIA), to make Siluriformes a species amendable to the FMIA and therefore, subject to FSIS inspection. FSIS is providing an 18 month transitional period for the inspection of Siluriformes and the residue testing will be done based on parameters set forth in the final rule. During the first 18 months, FSIS will schedule routine testing of Siluriformes for dyes (malachite green and gentian violet), nitrofurans, veterinary drugs, metals, and pesticides residues.

Note: The sampling scheme may change during the 18 month transitional period based on sampling results and findings by FSIS.

<table>
<thead>
<tr>
<th></th>
<th>Domestic</th>
<th>Imports</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siluriformes</td>
<td>77</td>
<td>84</td>
<td>161</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Siluriformes</th>
<th>Dyes</th>
<th>Metals</th>
<th>MRM</th>
<th>Nitrofurans</th>
<th>Pesticides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Imports</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Table 17. FY2016 NRP Residue Scheduled Samples - Number of Residue Samples Tested Per Chemical Method by Sampling Plan

<table>
<thead>
<tr>
<th>Siluriformes (# Samples Collected)</th>
<th>Number of Samples per Chemical Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dyes</td>
</tr>
<tr>
<td>Domestic (77)</td>
<td>31 (1)</td>
</tr>
<tr>
<td>Import (84)</td>
<td>42</td>
</tr>
<tr>
<td>Total (161)</td>
<td>73</td>
</tr>
</tbody>
</table>

Note: Number of violative samples (in parenthesis)

Data Source: FSIS Data Warehouse and PHIS databases.
Table 18. FY 2016 NRP Residue Scheduled Samples - Number of Chemical Analytes Tested Per Chemical Method by Sampling Plan

<table>
<thead>
<tr>
<th>Siluriformes (# Samples Collected)</th>
<th>Number of Chemical Analytes per Chemical Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dyes</td>
</tr>
<tr>
<td>Domestic (77)</td>
<td>154</td>
</tr>
<tr>
<td>Import (84)</td>
<td>203</td>
</tr>
<tr>
<td>Total (161)</td>
<td>357</td>
</tr>
</tbody>
</table>

Note: Multiple analytes may be associated with the same sample. Not all samples are tested for all chemical method. Number of samples per chemical method is indicated in Table 4

Data Source: FSIS Data Warehouse and PHIS databases.

Table 19. FY 2016 NRP Siluriformes Residue Inspection Program Violations

<table>
<thead>
<tr>
<th>Animal</th>
<th>Sampling</th>
<th>Compound</th>
<th>Concentration</th>
<th>Units</th>
<th>Tolerance Level Value</th>
<th>Authority (CFR Citation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siluriformes</td>
<td>Domestic</td>
<td>Crystal Violet</td>
<td>0.162</td>
<td>ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siluriformes</td>
<td>Import</td>
<td>Enrofloxacin</td>
<td>22.500</td>
<td>ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siluriformes</td>
<td>Import</td>
<td>Gentian Violet</td>
<td>16.1</td>
<td>ppb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>