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

FY 2015 RESIDUE SAMPLE RESULTS[1]

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

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[1] Cover October 2014 through September 2015

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Preface

The “FY2015 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, FY2015 List of Chemical Residues by Class/Method ;Appendix IV, Summary of Scheduled Sampling Data from 2013 to 2015, Appendix V, Summary of Import Re-inspection Sampling Data from 2013 to 2015 and Appendix VI, Inspector Generated Sampling Data from 2013 to 2015 (includes KIS™ 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 Integration and Food Protection (ODIFP) members for providing the data and feedback.

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 2015, (October 2014 to September 2015), FSIS reported **1,041** residue violations **17** stemmed from the Domestic Scheduled Sampling Program and **1,024** from the Inspector-generated Sampling Program) in **808** samples (**12** under the Domestic Scheduled Sampling Program and **796** under the Inspector-generated Sampling Program). Additionally, FSIS reported **seven** residue violations in **2,922** samples under the Import Reinspection Sampling.

By comparison, in FY2014, there were **1,420** residue violations (**12** from the domestic scheduled sampling program and **1,408** from the Inspector-generated sampling program) in **1,146** 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 2015, under the Domestic Scheduled Sampling program, FSIS Inspection Program Personnel (IPP) collected **6,445** residue samples (This includes **5,894** samples from U.S. Federal establishments and **551** from U.S. State plants), from which **17** violative residues were reported from **12** samples, which is less than 1 % of the 6,445 samples collected under the Domestic Scheduled Sampling program. In FY 2014, FSIS IPP collected **6,066** residue samples, from which **12** violative residues were reported from **10** samples (less than 1%).

During FY 2015, two ampicillin, one doramectin, one flunixin, one melengestrol acetate, one moxidectin, two piperonyl butoxide, four sulfadimethoxine and five 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 2015, **23** samples (less than 1% of 6,445 samples collected) were considered non-violative. By comparison, in FY 2014 the number of non-violative samples was somewhat lower, at **34** non-violative positives (less than 1%)

Inspector-generated Sampling

In FY 2015, under the Inspector-generated sampling program, FSIS IPP screened **184,010** samples using the Kidney Inhibition Swab (KIS™) test. Subsequently, **4,022** KIS™ test screened positive samples were submitted to FSIS field laboratories for further analysis. For FY 2015, **1,017** KIS™ test residue violations were confirmed in **792** samples (Note: multiple residue violations may be found in many samples. For comparison, in FY2014, FSIS IPP submitted **4,859** (from **210,516** KIS™ test) samples for laboratory confirmation. Of those samples sent, in FY 2014, **1,384** KIS™ test residue violations analytes were identified in **1,125** 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. In FY2015, under these sampling programs **seven** residue violative analystes were confirmed in **four** samples.

Examination of the FY 2015 Inspector-generated Sampling Program showed that the predominant violative residues were Ceftiofur (**256**), Penicillin (**213**) and Sulfamethazine (**121**), which accounts for 25, 20 and 12% of total violative residues, respectively. In FY 2014, the top violative residues were Ceftiofur, Penicillin, and Neomycin.

In FY 2015, **873** samples with non-violative positives were observed in the Inspector-generated Sampling Program, which was down, when compared to the **1,150** reported in FY 2014.

Import Reinspection Sampling

Of the **2,922** import samples analyzed, under the FY 2015 Import Reinspection Sampling Program, **seven** samples had residues exceeding an acceptable or tolerable level set by FDA and/or EPA. These were from samples originating from Brazil (**1**), Canada (**1**), and Nicaragua (**5**). In comparison to FY2014, where **eight** samples with violative residues were detected (**1,967** import samples) originating from Brazil (**4**) and Mexico (**4**).

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:

http://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/residue-chemistry

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

"*"**: 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

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.

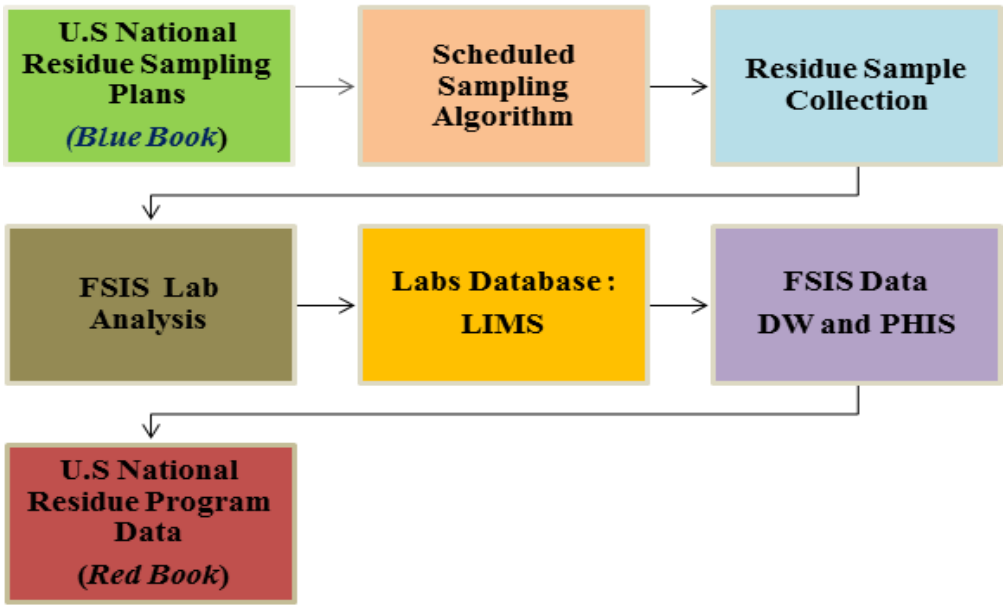

Figure 1. National Residue Program: The figure illustrates the intricate steps of the NRP. The NRP begins with interagency planning (Blue Book) of sampling program, which is followed by collection and analysis of samples reported (Red Book).

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 FY2015 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 FY2015, 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 FY2015, IPP completed in-plant residue screens using the Kidney Inhibition Swab test (KIS™ 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 KIS™ 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 KIS ™ test and chapter four for performing KIS™ 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 FY2015, 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 FY2015, 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 FY2015, FSIS collected approximately 2,922 import samples.

[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 (sub-category). 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 FY2015 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 "*******" indicate instances when residues were detected, but were not quantitated.

Summary of Domestic Residue Sampling Program

Table 1. FY 2015 Tier I and II List of Animal Class by Method/Chemical Class (Analyses Performed)

Animal Class	Chemical Class Oct 2014- Sep 2015								
	Aminoglycosides	**Arsenic**	**Avermectins**	**βeta-Agonists**	**Carbadox**	**Hormones**	**MRM**	**Metals**	**Pesticides**
Beef Cows	√	√	√	√	-	√	√	√	√
Bob Veal	√	√	√	√	-	√	√	√	√
Dairy Cows	√	√	√	√	-	√	√	√	√
Goats	√	√	√	-	-	-	√	-	√
Heifers	√	√	√	√	-	√	√	√	√
Market Swine	√	√	√	√	√	√	√	√	√
Mature Turkeys	√	√	-	-	-	-	√	√	-
Mature Sheep	√	√	√	√	-	-	√	-	√
Sows	√	√	√	√	-	-	√	√	√
Steers	√	√	√	√	-	√	√	√	√
Young Chickens	√	√	-	-	-	-	√	√	√
Young Turkeys	√	√	-	-	-	-	√	√	√

Table 2. FY 2015 Number of Scheduled Residue Samples Tested, by Animal Class

Animal Class	Domestic Scheduled Sampling		Inspector-generated Sampling Tier-2 Suspect Animals	
	Tier-1 & Tier- 2* U.S. Federal Plants	Tier-1 U.S. State Plants	KIS™ Test	COLLEGEN/ SHOW/STATE
Beef Cows	689	61	16,138	5
Boars/Stags			185	
Bob Veal	483	3	19,613	1
Bulls			1,721	5
Dairy Cows	687	46	102,071	29
Formula-Fed Veal			531	
Goats**	242		554	10
Heavy Calves			724	2
Heifers	375	101	3,094	7
Lambs**			1,174	
Market Swine	695	110	17,440	53
Mature Sheep	285		331	14
Mature Turkeys**	27			
Non-Formula-Fed Veal			148	
Roaster Swine			1,600	1
Sows	699	56	9,359	1
Steers	362	118	9,327	29
Young Chickens	667	34		
Young Turkeys	683	22		
Total	**5,894**	**551**	**184,010***	**157**

***** An additional **157** inspector-generated samples were collected and sent to FSIS labs for analysis. These samples are associated with project codes: **102** COLLGEN, **37** SHOW, and **18** STATE, samples respectively.

****** Animal Classes associated with NRP Tier 2 domestic sampling

Table 3. FY 2015 NRP Domestic Scheduled Samples Analyzed by Animal Class – and Summary Results

Animal Class	Number of Non-Detect Samples	Number of Non-Violative Positives Samples	Number of Violative Samples	Total Samples
Beef Cows	745	3	**2**	**750**
Bob Veal	480	3	**3**	**486**
Dairy Cows	729	4	**-**	**733**
Goats	242	-	**-**	**242**
Heifers	472	3	**1**	**476**
Market Swine	801	2	**2**	**805**
Mature Sheep	279	4	**2**	**285**
Mature Turkeys	27	**-**	**-**	**27**
Sows	754	1	**-**	**755**
Steers	479	-	**1**	**480**
Young Chickens	700	1	**-**	**701**
Young Turkeys	702	2	**1**	**705**
Total	**6,410**	**24**	**12**	**6,445**

Note: The results include Tier 1 and Tier 2 animal classes
Data Source: FSIS Data Warehouse and PHIS databases.

Table 4. FY2015 NRP Residue Scheduled Samples -Number of Residue Samples Tested Per Chemical Method by Animal Class

Animal Class (# Samples Collected)	Number of Samples per Chemical Method								
	Aminoglycosides	**Arsenic**	**Avermectins**	**βeta-Agonists**	**Carbadox**	**Hormones**	**MRM**	**Metals**	**Pesticides**
Beef Cows (750)	749	372	372	377	-	328	750 **(2)**	121	266
Bob Veal (486)	485	263	263	222	-	229	486 **(3)**	117	146
Dairy Cows (733)	732	378	378	354	-	327	733	116	248
Goats (242)	141	142	142	-	-	-	240	-	98
Heifers (476)	475	262	262 **(1)**	214	-	230	476	94	143
Market Swine (805)	802	417	417	385	384	1	804 **(1)**	134	298 **(1)**
Mature Sheep (285)	144	143	143 **(1)**	1	-	-	285	-	138 **(1)**
Mature Turkeys (27)	4	4	-	-	-	-	4	27	-
Sows (755)	753	396	396	2	-	-	755	130	255
Steers (480)	476	264	264	214	-	222 **(1)**	480	102	145
Young Chickens (701)	697	364	-	-	-	-	701	116	241
Young Turkeys (705)	705	352	-	-	-	-	704 **(1)**	121	254
Total (6,445)	**6,163**	**3,357**	**2,637**	**1,769**	**384**	**1,337**	**6,418**	**1,078**	**2,232**

Note: Number of violative samples (**in parenthesis)**

Data Source: FSIS Data Warehouse and PHIS databases.

Table 5. FY 2015 NRP Residue Scheduled Samples - Number of Chemical Analytes Tested Per Chemical Method by Animal Class

Animal Class (# Samples Collected)	Number of Chemical Analytes per Chemical Method									
	Aminoglycosides	**Arsenic**	**Avermectins**	**βeta-Agonists**	**Carbadox**	**Hormones**	**MRM**	**Metals**	**Pesticides**	**Total**
Beef Cows (750)	7,490	372	1,858	2,262	-	1,633	41,696	486	21,805	**77,602**
Bob Veal (486)	4,850	263	1,315	1,332	-	1,138	27,102	583	12,004	**48,587**
Dairy Cows (733)	7,320	378	1,888	2,124	-	1,632	40,807	445	20,393	**74,987**
Goats (242)	1,410	142	708	-	-	-	13,880	-	8,348	**24,488**
Heifers (476)	4,750	262	1,307	1,226	-	1,148	26,556	518	11,916	**47,683**
Market Swine (805)	8,020	417	2,085	2,308	384	5	46,216	647	24,917	**84,999**
Mature Sheep (285)	1,440	143	716	6	-	-	16,238	-	11,722	**30,265**
Mature Turkeys (27)	40	4	-	-	-	-	236	29	-	**309**
Sows (755)	7,530	396	1,980	12	-	-	44,744	594	20,890	**76,146**
Steers (480)	4,760	264	1,320	1,220	-	1,102	26,812	479	12,083	**48,040**
Young Chickens (701)	6,970	364	-	-	-	-	41,295	502	19,827	**68,958**
Young Turkeys (705)	7,050	352	-	-	-	-	41,452	502	20,771	**70,127**
Total (6,445)	**61,630**	**3,357**	**13,177**	**10,490**	**384**	**6,658**	**367,034**	**4,785**	**184,676**	**652,191**

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 2015 Domestic Scheduled Sampling Plan Violations

Animal Class	Tissue	Compound	Concentration	Unit	Tolerance Level Value	Authority (CFR Citation)
Beef Cows	Liver	Sulfamethazine	58.174	ppm	0.1	21 CFR 556.640
Beef Cows	Muscle	Sulfadimethoxine	0.190	ppm	0.1	21 CFR 556.670
	Liver	Sulfadimethoxine	0.248	ppm	0.1	21 CFR 556.640
Bob Veal	Muscle	Ampicillin	0.06	ppm	0.01	21 CFR 556.40
	Kidney	Ampicillin	0.11	ppm	0.01	21 CFR 556.40
Bob Veal	Kidney	Flunixin	***		0	21 CFR 522.970
Bob Veal	Muscle	Sulfamethazine	50.57	ppm	0.1	21 CFR 556.670
	Liver	Sulfamethazine	51.97	ppm	0.1	21 CFR 556.670
Heifers	Muscle	Doramectin	481	ppb	30	21 CFR 556.225
Market Swine	Muscle	Piperonyl Butoxide	0.1242	ppm	0.1	40 CFR 180.127
Market Swine	Liver	Sulfamethazine	1.163	ppm	0.1	21 CFR 556.670
	Muscle	Sulfamethazine	0.472	ppm	0.1	21 CFR 556.670
Mature Sheep	Muscle	Moxidectin	115.5	ppb	50	21 CFR 556.426
Mature Sheep	Muscle	Piperonyl Butoxide	0.105	ppm	0.1	40 CFR 180.127
Steers	Muscle	Melengestrol Acetate	2.2	ppb	None	21 CFR 556.380
Young Turkeys	Muscle	Sulfadimethoxine	1.494	ppm	0.1	21 CFR 556.640
	Liver	Sulfadimethoxine	2.9	ppm	0.1	21 CFR 556.640

Note:
*****:** Violative residue results were residue were detected but not quantified
The Food and Drug Administration has not set a tolerance level.

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 KIS™ test. If KIS™ 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 KIS™ 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 KIS™) across animal class.

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

Note: Data in this document were obtained from the FSIS Data Warehouse and PHIS databases.

Table 7. FY 2015 Tier II Inspector Generated Sampling (KIS ™) Test

Animal Class	KIS ™ Test			
	Total Number of In-plant Samples	**Number of In-plant Negative Samples**	**Number of In-plant Positive Samples**	**Number of Samples With Confirmed Lab Violations**
Beef Cows	**16,138**	15,730	408	**84**
Boars/Stags	**185**	183	2	**1**
Bob Veal calves	**19,613**	19,289	324	**103**
Bulls	**1,721**	1,662	59	**17**
Dairy Cows	**102,071**	99,577	2,494	**469**
Formula-Fed Veal	**531**	526	5	**1**
Goats	**554**	546	8	**3**
Heavy Calves	**724**	615	109	**19**
Heifers	**3,094**	3,013	81	**11**
Lambs	**1,174**	1,165	9	**-**
Market Swine	**17,440**	17,289	151	**8**
Mature Sheep	**331**	324	7	**3**
Non-Formula-Fed Veal	**148**	126	22	**11**
Roaster Swine	**1,600**	1,585	15	**2**
Sows	**9,359**	9,262	97	**27**
Steers	**9,327**	9,096	231	**33**
Total	**184,010**	**179,988**	**4,022**	**792**

****** **1017** KIS ™ test violative analytes in **792** 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 2015 Tier II Inspector-Generated Sampling (COLLGEN/ STATE/ SHOW) Projects

Animal Class	COLLGEN		SHOW		STATE	
	Number of Samples	**Number of Samples With Confirmed Lab Violations**	Number of Samples	**Number of Samples With Confirmed Lab Violations**	Number of Samples	**Number of Samples With Confirmed Lab Violations**
Beef Cows	3	--	--	--	2	--
Boars/Stags	--	--	--	--	--	--
Bob Veal calves	--	--	1	--	--	--
Bulls	3	--	--	--	2	--
Dairy Cows	29	--	--	--	--	--
Formula-Fed Veal	--	--	--	--	--	--
Goats	6	--	4	--	--	--
Heavy Calves	2	--	--	--	--	--
Heifers	4	--	2	--	1	--
Lambs	--	--	--	--	--	--
Market Swine	33	**2**	13	--	7	--
Mature Sheep	6	--	8	--	--	--
Non-Formula-Fed Veal	--	--	--	--	--	--
Roaster Swine	--	--	1	**1**	--	--
Sows	1	--	--	--	--	--
Steer	15	**1**	8	--	6	--
Total	**102**	**3**	**37**	**1**	**18**	--

Note: Results include four violative residues from two market swine (penicillin and sulfamethazine), one steer (ractopamine) and a roaster swine (flunixin) and 3 non-violative residues from three market swine (all lincomycin)

Data Source: FSIS Data Warehouse and PHIS databases.

Table 9. FY 2015 Number of Residue Violations results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS ™ test, COLLGEN/ STATE/ SHOW project codes)

Chemical Residue	Beef Cows	Boars/Stags	Bob Veal	Bulls	Dairy Cow	Formula Fed Veal	Goats	Heavy Calves	Heifer	Market Swine	Market Sheep	Non Formula -Fed Veal	Roaster Swine	Sows	Steer	Total
Amikacin	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	**1**
Ampicillin	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	**23**
Apramycin	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Cefazolin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
Ciprofloxacin	1	-	3	3	1	-	-	3	-	-	-	-	-	-	3	**14**
Desethylene ciprofloxacin	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	**2**
Desfuroylceftiofur	23	-	21	2	196	-	1	1	1	-	1	-	-	-	10	**256**
Dihydrostreptomycin	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Enrofloxacin	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Erythromycin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
Florfenicol	12	-	2	5	9	-	-	13	-	-	-	4	-	-	15	**60**
Flunixin	7	-	6	1	51	-	-	4	-	-	-	-	2	1	5	**77**
Gamithromycin	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Gentamycin Sulfate	1	-	1	1	9	-	-	1	2	-	-	1	-	2	1	**19**
Lincomycin	-	-	-	-	2	-	3	2	-	-	-	-	-	-	-	**7**
Neomycin	-	-	37	-	1	-	-	1	-	-	-	-	-	-	1	**40**

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 2015 Number of Residue Violations results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS ™ test, COLLGEN/ STATE/ SHOW project codes) (*cont.*)

Chemical Residue	Beef Cows	Boars/Stags	Bob Veal	Bulls	Dairy Cow	Formula Fed Veal	Goats	Heavy Calves	Heifer	Market Swine	Market Sheep	Non Formula -Fed Veal	Roaster Swine	Sows	Steer	Total
Oxytetracycline	6	-	1	1	10	-	-	-	-	-	-	-	-	-	-	**18**
Penicillin	26	1	4	3	135	-	-	4	4	2	1	-	-	30	3	**213**
Ractopamine	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	**3**
Salbutamol	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Spectinomycin	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	**3**
Sulfadiazine	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Sulfadimethoxine	5	-	5	-	57	-	-	1	1	1	-	2	1	-	3	**76**
Sulfadoxine	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	**5**
Sulfamethazine	14	-	23	4	30	-	-	11	-	7	1	17	-	3	11	**121**
Sulfamethoxazole	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	**15**
Sulfamethoxypyridazine	-	-	-	-	3	-	-	-	-	-	-	-	-	-	2	**5**
Tetracycline	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	**2**
Tilmicosin	13	-	4	2	12	-	-	-	4	-	-	-	-	-	6	**41**
Tulathromycin	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	**4**
Tylosin	2	-	2	-	1	-	-	-	-	-	-	-	1	-	-	**6**
Zearalanol	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	**1**
TOTAL	**110**	**1**	**138**	**22**	**548**	**1**	**7**	**41**	**12**	**13**	**3**	**24**	**4**	**37**	**63**	**1,024**

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 2015 Number of Non-Violative results in Inspector Generated Sampling by Chemical Residue and Animal Class (include KIS ™ test, COLLGEN/ STATE/ SHOW project codes)

Chemical Residue	Beef Cows	Bob Veal	Bulls	Dairy Cow	Heavy Calf	Heifer	Market Swine	Non Formula -Fed Veal	Roaster Pigs	Sows	Steers	Total
Chlortetracycline	1	-	-	-	1	-	1	-	-	-	-	3
Cloxacillin	1	1	-	-	-	-	-	-	-	-	-	2
Danofloxacin	1	-	-	1	1	1	-	-	-	-	4	8
Desfuroylceftiofur	6	4	-	42	-	-	1	-	-	-	1	54
Enrofloxacin	1	-	2	-	2	-	2	-	-	-	3	10
Florfenicol	6	-	1	7	2	-	-	-	-	-	3	19
Flunixin	6	-	-	27	1	-	-	-	-	2	2	38
Gamithromycin	6	-	1	12	1	-	-	-	-	-	5	25
Lincomycin	-	-	-	-	-	-	9	-	1	3	-	13
Neomycin	3	46	-	9	4	2	-	-	1	-	1	66
Oxytetracycline	58	31	13	48	6	3	1	-	-	3	8	171
Penicillin	14	3	2	70	2	-	-	-	-	-	-	91
Piperonyl Butoxide	-	-	-	-	-	-	1	-	-	-	-	1
Pirlimycin	1	-	-	13	-	-	-	-	-	-	-	14
Ractopamine	1	-	-	-	-	3	4	-	-	-	5	13
Spectinomycin	7	10	-	27	3	-	-	-	-	-	1	48
Sulfadimethoxine	1	-	-	17	-	1	-	-	-	-	1	20
Sulfamethazine	2	-	2	1	1	-	3	1	-	-	2	12
Tetracycline	-	12	-	42	-	1	-	-	-	-	-	55
Tilmicosin	2	1	-	6	-	-	2	-	1	3	6	21
Tulathromycin	39	5	13	35	9	17	-	2	-	-	69	189
TOTAL	**156**	**113**	**34**	**357**	**33**	**28**	**24**	**3**	**3**	**11**	**111**	**873**

Note: Multiple non-violative residue results may be associated with the same sample (carcass).

Data Source: FSIS Data Warehouse and PHIS databases.

Import Residue Reinspection Sampling Program

In FY2015, FSIS collected **2,922** import samples and analyzed for **143,944** residue analytes from **26** export countries. Seven violations were detected (five from Nicaragua, one from Brazil, and one form Canada). 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

Table 11. FY 2015 NRP Import Residue Samples - Number of Residue Samples Tested Per Chemical Method by Production Class and Product Type

Methods	Number of Samples Tested										
	Beef		Pork		Veal	Lamb/Mutton	Goat	Chicken		Turkey	
	Fresh	Processed	Fresh	Processed	Fresh	Fresh	Fresh	Fresh	Processed	Fresh	Processed
MRM	445	-	322	-	73	108	16	158	-	59	-
Aminoglycoside	445	-	322	3	73	86	10	158	-	59	
Pesticides	281	-	180	-	41	106	21	81	-	37	
Hormones	172	-	-	-	1	-	-	-	-	-	-
βeta-Agonists	223	-	159	-	47	-	-	1	-	-	-
Avermectins	225	196	168	100	26	112	17	-	-	-	-
Arsenic	225	203	168	114	26	112	17	80	40	24	41
Metals	108	23	67	54	18	-	-	21	13	11	15
Sulfonamides	-	65	-	90	-	-	-	-	2	-	22

Data Source: FSIS Data Warehouse and PHIS databases.

Table 12. FY 2015 Number of Import Residue Samples by Inspection Level, per Exporting Country and Production Type

Country	Normal		Increased	Intensified		Grand Total
	Fresh	Processed	Processed	Fresh	Processed	
Argentina	-	10	-	-	-	**10**
Australia	216	4	-	-	-	**220**
Brazil	39	39	27	-	37	**142**
Canada	638	225	-	10	-	**873**
Chile	185	7	-	-	-	**192**
Costa Rica	16	-	-	-	-	**16**
Denmark	35	7	-	-	-	**42**
Finland	7	-	-	-	-	**7**
France	-	2	-	-	-	**2**
Honduras	10		-	-	-	**10**
Hungary	-	6	-	-	-	**6**
Iceland	48	-	-	-	-	**48**
Ireland	117	-	-	-	-	**117**
Israel	-	36	-	-	8	**44**
Italy	-	37	-	-	-	**37**
Japan	16	-	-	-	-	**16**
Korea, Republic Of	-	20	-	-	-	**20**
Mexico	495	51	-	-	10	**556**
Netherlands	14	7	-	-	-	**21**
New Zealand	118	2	-	-	-	**120**
Nicaragua	58	-	-	42	-	**100**
Northern Ireland	18	-	-	-	-	**18**
Poland	33	84	-	-	-	**117**
San Marino	-	3	-	-	-	**3**
Spain	52	15	-	-	-	**67**
United Kingdom	20	-	-	-	-	**20**
Uruguay	48	50	-	-	-	**98**
Total	**2183**	**605**	**27**	**52**	**55**	**2,922**

Data Source: FSIS Data Warehouse and PHIS databases.

Table 13. FY 2015 Number of Import Residue Samples Analyzed, by Exporting Country and Production Type

Country	Production Type											
	Beef		Pork		Veal	Lamb Mutton	Goat	Chicken		Turkey		Total
	Fresh	Processed	Fresh	Processed	Fresh	Fresh	Fresh	Fresh	Processed	Fresh	Processed	
Argentina	-	10	-	-	-	-	-	-	-	-	-	**10**
Australia	141	4	-	-	21	22	32	-	-	-	-	**220**
Brazil	-	103	39	-	-	-	-	-	-	-	-	**142**
Canada	140	78	146	97	69	2	-	217	14	74	36	**873**
Chile	60	-	20	-	-	30	-	43	7	32	-	**192**
Costa Rica	16	-			-	-	-	-	-	-	-	**16**
Denmark	-	6	35	1	-	-	-	-	-	-	-	**42**
Finland	-	-	7	-	-	-	-	-	-	-	-	**7**
France	-	-	-	2	-	-	-	-	-	-	-	**2**
Honduras	10	-	-	-	-	-	-	-	-	-	-	**10**
Hungary	-	-	-	6	-	-	-	-	-	-	-	**6**
Iceland	-	-	-	-	-	48	-	-	-	-	-	**48**
Ireland	92	-	25	-	-	-	-	-	-	-	-	**117**
Israel	-	-	-	9	-	-	-	-	5	-	30	**44**
Italy	-	2	-	35	-	-	-	-	-	-	-	**37**
Japan	16	-	-	-	-	-	-	-	-	-	-	**16**

Table 13. FY 2015 Number of Import Residue Samples Analyzed, by Exporting Country and Production Type (*Cont.*)

Country	Production Type											
	Beef		Pork		Veal	Lamb Mutton	Goat	Chicken		Turkey		Total
	Fresh	Processed	Fresh	Processed	Fresh	Fresh	Fresh	Fresh	Processed	Fresh	Processed	
Korea, Republic Of	-	1	-	-	-	-	-	-	19	-	-	**20**
Mexico	328	29	165	10	-	-	2	-	10	-	12	**556**
Netherlands	-	4	14	2	-	-	-	-	1	-	-	**21**
New Zealand	58	2	-	-	42	14	4	-	-	-	-	**120**
Nicaragua	100	-	-	-	-	-	-	-	-	-	-	**100**
Northern Ireland	-	-	18	-	-	-	-	-	-	-	-	**18**
Poland	-	6	33	78	-	-	-	-	-	-	-	**117**
San Marino	-	-	-	3	-	-	-	-	-	-	-	**3**
Spain	-	-	52	15	-	-	-	-	-	-	-	**67**
United Kingdom	-	-	20	-	-	-	-	-	-	-	-	**20**
Uruguay	46	50	-	-	-	2		-	-	-	-	**98**
Total	**1,007**	**295**	**574**	**258**	**132**	**118**	**38**	**260**	**56**	**106**	**78**	**2,922**

Data Source: FSIS Data Warehouse and PHIS databases.

Table 14. FY 2015 Number of Chemical Analytes Tested Per Exporting Country and Production Type

Country	Production Type											
	Beef		Pork		Veal	Lamb Mutton	Goat	Chicken		Turkey		Total
	Fresh	Processed	Fresh	Processed	Fresh	Fresh	Fresh	Fresh	Processed	Fresh	Processed	
Argentina	-	35	-	-	-	-	-	-	-	-	-	35
Australia	8,226	24	-	-	1,396	1,701	2,436	-	-	-	-	13,783
Brazil	-	546	2,282	-	-	-	-	-	-	-	-	2,828
Canada	8,370	279	10,488	365	4,544	149	-	14,949	35	5,049	36	44,264
Chile	3,174	-	1,199	-	-	2,334	-	2,872	22	2,172	-	11,773
Costa Rica	880	-	-	-	-	-	-	-	-	-	-	880
Denmark	-	16	2,324	3	-	-	-	-	-	-	-	2,343
Finland	-	-	447	-	-	-	-	-	-	-	-	447
France	-	-	-	7	-	-	-	-	-	-	-	7
Honduras	466	-	-	-	-	-	-	-	-	-	-	466
Hungary	-	-	-	38	-	-	-	-	-	-	-	38
Iceland	-	-	-	-	-	3,770	-	-	-	-	-	3,770
Ireland	5,122	-	1,655	-	-	-	-	-	-	-	-	6,777
Israel	-	-	-	10	-	-	-	-	6	-	48	64
Italy	-	7	-	201	-	-	-	-	-	-	-	208
Japan	887	-	-	-	-	-	-	-	-	-	-	887

Table 14. FY 2015 Number of Chemical Analyates Tested Per Exporting Countries and Production Type (*Cont.*)

Country	Production Class											
	Beef		Pork		Veal	Lamb Mutton	Goat	Chicken		Turkey		Total
	Fresh	Processed	Fresh	Processed	Fresh	Fresh	Fresh	Fresh	Processed	Fresh	Processed	
Korea, Republic Of	-	1	-	-	-	-	-	-	34	-	-	35
Mexico	17,071	81	11,235	31	-	-	162	-	11	-	16	28,607
Netherlands	-	14	865	7	-	-	-	-	1	-	-	887
New Zealand	3,304	18	-	-	2,731	971	280	-	-	-	-	7,304
Nicaragua	6,986	-	-	-	-	-	-	-	-	-	-	6,986
Northern Ireland	-	-	1,166	-	-	-	-	-	-	-	-	1,166
Poland	-	16	2,433	355	-	-	-	-	-	-	-	2,804
San Marino	-	-		24	-	-	-	-	-	-	-	24
Spain	-	-	3,380	75	-	-	-	-	-	-	-	3,455
United Kingdom	-	-	1,376	-	-	-	-	-	-	-	-	1,376
Uruguay	2,350	254	-	-	-	126	-	-	-	-	-	2,730
Total	**56,836**	**1,291**	**38,850**	**1,116**	**8,671**	**9,051**	**2,878**	**17,821**	**109**	**7,221**	**100**	**143,944**

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 2015 Number of Samples and Chemical Residues under the Import Residue Sample Program, by Exporting Country

Country	Number of Samples	Samples with Detected Non-Violative	Samples with Residue Detected Violative	Chemical Residues Analysis*
Argentina	10	-	-	35
Australia	220	-	-	13,783
Brazil	142	41	**1 (Beef)**	2,828
Canada	873	-	**1 (Pork)**	44,264
Chile	192	-	-	11,773
Costa Rica	16	-	-	880
Denmark	42	-	-	2,343
Finland	7	-	-	447
France	2	-	-	7
Honduras	10	-	-	466
Hungary	6	-	-	38
Iceland	48	-	-	3770
Ireland	117	-	-	6,777
Israel	44	-	-	64
Italy	37	-	-	208
Japan	16	-	-	887
Korea, republic of	20	-	-	35
Mexico	556	2	-	28,607
Netherlands	21	-	-	887
New Zealand	120	-	-	7,304
Nicaragua	100	-	**5 (Beef)**	6,986
Northern Ireland	18	-	-	1,166
Poland	117	-	-	2,804
San Marino	3	-	-	24
Spain	67	-	-	3,455
United kingdom	20	-	-	1,376
Uruguay	98	-	-	2,730
TOTAL	**2,922**	**43**	**7**	**143,944**

**Note: ***Multiple residue results may be associated with the same sample (carcass).
Data Source: FSIS Data Warehouse and PHIS databases.

Table 16. FY 2015 Import Residue Sample Program (Non-Violative and Violative) Results, by Exporting Countries, Chemical Residues and Production Class

Country	Chemical Residue	Beef		Pork
		Number of Non-Violative Positives Samples	Number of Violative Samples	Number of Violative Samples
Brazil	Abamectin		**1**	**-**
	Doramectin	5	**-**	**-**
	Ivermectin	36	**-**	**-**
Canada	Piperonyl Butoxide	-	**-**	**1**
Mexico	Ivermectin	2	**-**	**-**
Nicaragua	Ethion		**5**	**-**
	Grand Total	**43**	**6**	**1**

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 FY2015 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:

https://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/red-books/red-book

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 postive violative), chemcial 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 – FY2015 U.S. National Residue Program

Percentage % Violative in the population (v)	Number of samples required to detect at least one violation in (n) samples with a probability (p)				
	0.90	0.95	0.98	0.99	0.9997
	Sample Size required "n"				
10	22	29	37	44	77
5	45	59	76	90	158
1	230	300	389	459	***807***
0.57	403	525	684	***806***	1,419
0.50	460	598	***780***	919	1,618
0.37	620	***808***	1,055	1,242	2,188
0.29	***793***	1,032	1,347	1,586	2,793
0.10	2,302	2,995	3,910	4,603	8,108

The procedure to calculate the required sample size needed:

$p = 1 - (1 - v)^n$ ← Probability of detecting at least one violation in n sample of binomial distribution with violation rate v

$1 - p = (1 - v)^n$ ← Subtract one from both side of the equation. This gives the probability of detecting No violations in n samples

$\log(1 - p) = \log(1 - v)^n$ ← Apply logarithmic function to both side of the equation

$\log(1 - p) = n * \log(1 - v)$ ← A logarithmic function property

$n = \frac{\log(1 - p)}{\log(1 - v)}$ ← Sample size based on violation rate (v) and probability of detecting (p)

Appendix III

FY2015 List of Chemical Residues by Class/Method

Multi-Residue Method Analytes[3]				
2-Aminosulfone Albendazole	DCCD	Flunixin	Oxacillin	Sulfamethazine
2-amino-Flubendazole	Desethylene Ciprofloxacin	Gamithromycin	Oxyphenylbutazone	Sulfamethizole
2-Quinoxaline Carboxylic Acid (QCA)	Diclofenac	Haloperidol	Oxytetracycline	Sulfamethoxazole
Abamectin	Dicloxacillin	Ipronidazole	Penicillin G	Sulfamethoxypyridazine
Albendazole	Difloxacin	Ipronidazole - OH	Phenylbutazone	Sulfanitran
Amoxicillin	Dimetridazole	Ketamine	Pirlimycin	Sulfapyridine
Ampicillin	Dimetridazole - OH	Ketoprofen	Prednisone	Sulfaquinoxaline
Azaperone	Dipyrone	Levamisole	Ractopamine	Sulfathiazole
Butorphanol	Doramectin	Lincomycin	Ronidazole	Tetracycline
Carazolol	Doxycycline	Melengestrol Acetate	Salbutamol	Thiabendazole
Cefazolin	Emamectin Benzoate	Meloxicam	Sarafloxacin	Tildipirosin
Chloramphenicol	Enrofloxacin	Metronidazole	Selamectin	Tilmicosin
Chlortetracycline	Eprinomectin	Metronidazole - OH	Sulfachloropyridazine	Tolfenamic Acid
Cimaterol	Erythromycin A	Morantel tartrate	Sulfadiazine	Tulathromycin A
Ciprofloxacin	Fenbendazole	Moxidectin	Sulfadimethoxine	Tylosin
Clindamycin	Fenbendazole sulphone	Nafcillin	Sulfadoxine	Tyvalosin
Cloxacillin	Florfenicol	Norfloxacin	Sulfaethoxypyridazine	Virginiamycin
Danofloxacin	Flubendazole	Orbifloxacin	Sulfamerazine	Xylazine

Metals Method Analytes		
Iron	Barium	Selenium
Zinc	Chromium	Manganese
Copper	Vanadium	Molybdenum
Nickel	Strontium	Thallium
Aluminum	Lead	Cobalt
Boron	Cadmium	

Hormones Method Analytes			
Megestrol	Melengestrol Acetate	Hexestrol	Zeranol

[3] As of September 2015. Methods on the FSIS website are presented as current to date – older versions of methods are removed from the website once replaced by more current versions of the methods.

***Continued*…. FY2015 List of Chemical Residues by Class/Method**

Pesticide Method Analytes[4]			
Alachlor	Dieldrin	Piperonyl butoxide	Diflubenzuron
Aldrin	Difenoconazole	Pronamide	Diuron
Benoxacor	Endosulfan I	Propachlor	Ethofumesate
Bifenthrin	Endosulfan II	Propanil	Fluroxypyr-1-Methylhepyl-Ester
Boscalid	Endosulfan sulfate	Propetamphos	Imazalil
Buprofezin	Fenoxaprop-ethyl	Propiconazole	Imidacloprid
Carfentrazone ethyl	Fenpropathrin	Pyriproxyfen	Indoxacarb
Chlordane cis	Fenvalerate	Resmethrin (cis & trans)	Linuron
Chlordane trans	Fipronil	Tefluthrin	Metalaxyl
Chloroneb	Fipronil desulfinyl	3-Hydroxycarbofuran	Methomyl
Chlorpropham	Fipronil sulfide	Acephate	Methoxyfenozide
Chlorpyrifos	Fluridone	Acetamiprid	Myclobutanil
Chlorpyrifos methyl	Fluvalinate	Atrazine	Norflurazon
Cyhalothrin	Heptachlor	Azoxystrobin	Profenofos
(Cyhalothrin-L)	Hexazinone	Carbaryl	Pyraclostrobin
Cypermethrin	Malathion	Carbofuran	Pyridaben
DDD, o,p'-	Metolachlor	Carboxin	Simazine
DDD, p,p'-	Metribuzin	Clofentezine	Tebufenozide
DDE, o,p'-	Mirex	Clothianidin	Thiabendazole
DDE, p,p'-	Nonachlor, trans-	Coumaphos O	Thiamethoxam
DDT, o,p'- + p,p'-	Oxychlordane	Coumaphos S	Thiobencarb
Deltamethrin	Permethrin (cis & trans)	De-Ethyl Atrazine	Trifloxystrobin
Dichlorvos (DDVP)			

Aminoglycosides Method Analytes		
Amikacin	Gentamicin	Neomycin
Apramycin	Hygromycin B	Spectinomycin
Dihydrostreptomycin	Kanamycin	Streptomycin

Beta- Agonist Method Analytes		
Cimaterol	Ractopamine	Zilpaterol
Clenbuterol	Salbutamol	

Avermectin Method Analytes		
Doramectin	Ivermectin	Moxidectin

Nitrofuran Method Analytes		
amino-2-oxazolidinone (AOZ)	1-aminohydatoin (AHD)	semicarbazide (SEM)
3-amino-5-morpholinomethyl-2-oxazolidinone (AMOZ)		

[4] As of September 2015. Methods on the FSIS website are presented as current to date – older versions of methods are removed from the website once replaced by more current versions of the methods.

Appendix IV

U.S. NRP – Domestic Scheduled Sampling Program

Year	Number of Samples	Number of Violative Samples	Number of Non-Violative Positive Analytes	Number of Violative Chemical Residues
*** FY2013**	**4,583**	**19**	**23**	**8**
FY2014	**6,066**	**10**	**34**	**10**
FY2015	**6,445**	**12**	**23**	**8**

* **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

Year	Number of Samples	Number of Violative Samples	Violative Residues
*** FY2013**	**817**	**4**	**Avermectins**
FY2014	**1,967**	**8**	**Ivermectin (7), Zilpaterol (1)**
FY2015	**2,922**	**7**	**Abamectin (1) Ethion (5), Piperonyl Butoxide (1)**

*** 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* KIS™ *test*) & lab confirmed residue results

Year	Number of Samples / (Include In-plant KIS™ Screens Tests)	Number of Samples Tested in FSIS Labs / (include in-plant KIS™ screens positive)	Number of Lab-Confirmed Violative Analytes / Number of Violative Carcasses	Top Three Violative Chemical Residue	Number of Lab-Confirmed Non-Violative Positive Analytes	Top Three Non-Violative Chemical Residue
***FY2013**	170,692 / (**170,560**)	4,100 / (**3,968**)	1,265 / **1,053**	Ceftiofur Penicillin Neomycin	1,099	Oxytetracyline Neomycin Ceftiofur
FY2014	210,705 / (**210,516**)	5,048 / (**4,859**)	1,408 / **1,136**	Ceftiofur Penicillin Neomycin	1,150	Oxytetracyline Tulathromycin Penicillin
FY2015	184,167 / **(184,010)**	4,179 / (**4,022**)	1,024 / **796**	Ceftiofur Penicillin Sulfamethazine	873	Tulathromycin Oxytetracyline Neomycin

Note:

- (**Number of KIS™ 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.