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

FY 2014 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 2013 through September 2014

Acronyms

CSI- Consumer Safety Inspector

COLLGEN – Collector-Generated Samples sent directly to the laboratory

DW – FSIS Data Warehouse

FSIS – Food Safety and Inspection Service

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.

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Executive Summary

2014 United States National Residue Program Data

Administered by the Food Safety and Inspection Program (FSIS), the United States National Residue Program for meat, poultry, and egg products (hereafter the U.S. NRP) is an interagency program that examines food samples for the presence of several different chemical compounds, classes, including veterinary drugs, pesticides, and metals. In collaboration with its federal partners, FSIS selected the chemical compounds based on their potential public health concern. All samples were analyzed at one of three FSIS International Organization for Standardization (ISO) 17025-accredited laboratories: the Eastern Laboratory (EL) in Athens, GA; the Midwestern Laboratory (MWL) in St. Louis, MO; or the Western Laboratory (WL) in Alameda, CA.

The U.S. NRP domestic sampling program is comprised of both scheduled sampling and inspector-generated sampling. The former program is designed as a surveillance program while the latter exists to test suspect animals or carcasses that OFO inspection personnel suspect may have levels of chemical residues above established tolerances. By having both a surveillance and targeted program, FSIS can more effectively monitor the level of chemical hazards in regulated products. FSIS recently modified the number of samples allocated to the scheduled sampling program to accommodate enhanced laboratory methodology that allows for the analysis of dozens of chemical residue compounds per sample. Beginning in January 2013, FSIS reduced the total number of scheduled samples from approximately 20,000 to about 6,400 samples to accommodate the more effective and efficient testing regime.

From October 2013 to September 2014 (the twelve months reporting period reflects the change from calendar-year to fiscal year reporting period) FSIS identified **1,420** residue tissue violations (12 under the domestic scheduled sampling program and 1,408 under the inspector-generated program) in **1,146 unique,** violative carcasses (10 under the domestic scheduled sampling program and 1,136 under the inspector-generated program). For comparison, in FY 2013 (Jan-Sept 2013) there were 1,284 residue tissue violations identified in 1,068 violative carcasses, and in CY 2012 there were 1,201 residue tissue violations identified in 953 violative carcasses. Note: A single carcass may have multiple tissue violations. **Note: Oct-Dec 2013 residue results are part of the FY 2014 FSIS residue sample results.**

Under the domestic scheduled sampling program, in FY 2014 FSIS collected **6,066** residue samples (5,789 from U.S. federal plants and 277 from U.S. state plants), from which **12** violative analytes were reported from **10** samples. These 10 samples account for 9 unique carcasses violations, which is less than 1 % of the samples collected.

For comparison, in FY 2013 (Jan-Sept, 2013), FSIS collected 4,583 residue samples, from which 19 violative analytes were reported from 15 samples. Similarly in CY 2012 FSIS collected 5,838 residue samples, from which 17 violative analytes were reported from 12 samples.

Analysis of the FY 2014 domestic scheduled samples showed that the drug violations identified were Flunixin (1), Penicillin (1), Piperonyl Butoxide (1), Sulfamethazine (3), Oxytetracycline (1), Ciprofloxacin (1), Enfrofloxacin (1), Ivermectin (1), Moxidectin (1), and DDT & Metabolites (1). Generally, such drug residue violation results from an inadequate withdrawal time for the drugs to clear the animal's system. Additionally, this sampling program identified 34 samples (again, less than 1%) with non-violative positive residue levels, i.e. a sample where the residue level is detected below the established tolerance. For comparison, in FY 2013 (Jan-Sept, 2013) there were 23 such samples and in CY 2012, 26 such samples.

Under the inspector-generated sampling program, FSIS IPP collected **210,516** samples for Kidney Inhibition Swab Test (KIS™) testing in the field and submitted 4,859 (KIS™ test) samples for laboratory confirmation. A total of **1,384** residue tissue violations in **1,125** carcasses were identified. For comparison, in FY 2013 (Jan-Sept 2013 only), there were 1,253 residue tissue violations in 1,045 violative carcasses and in CY 2012 there were 1,166 residue tissue violations in 928 violative carcasses.

Additional violative results in FY 2014 (24 residue tissue violations in 11 carcasses) were identified through other inspector-generated sampling programs. This includes samples sent from plants directly to labs, sample from show animals, and samples from the U.S. States testing programs.

Analysis of the FY 2014 inspector-generated program samples showed that the predominant drug violations were Ceftiofur, which accounted for (344 or 25%)of violative samples, followed by Penicillin (306 or 22%), and Neomycin (160 or 11%). For comparison, in FY 2013 (Jan-Sept 2013 only), the top three drugs found at violative levels were Ceftiofur, Penicillin, and Neomycin, respectively, and in CY 2012, the top three drugs found at violative levels were Penicillin, Neomycin, and Ceftiofur. This sampling program also identified **1,150** samples with non-violative positive residue levels in FY 2014. For comparison, in FY 2013 and CY 2012 the numbers were 1,099 and 1,363 respectively.

In addition, FSIS plans and administers an import reinspection program as part of the NRP. After U.S. Customs and Border Protections and USDA/APHIS requirements are met, shipments imported into the United States must be reinspected by FSIS at an approved import inspection facility. FSIS inspectors carry out reinspection in official import plants. Of the **1,967** samples analyzed in FY 2014, **eight** violative residue samples were detected (4 from Brazil and 4 from Mexico). In FY 2013 (Jan-Sep 2013 only), **817** samples were analyzed, and **four** violative residue samples were detected (3 from Brazil and 1 from Nicaragua), and in CY 2012, **1,299** samples were analyzed with no violations were detected.

FSIS continually strives to improve methods for reporting the NRP data. These reports and previous years' residue sample results are publicly available on the FSIS website.
http://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/residue-chemistry

Introduction

FSIS administers the U.S. National Residue Program (U.S. NRP) as a risk-based testing program. This program focuses on chemical residues in domestic meat, poultry, and egg products. The U.S. NRP domestic sampling program is comprised of scheduled sampling and inspector-generated sampling from food animals that have passed ante-mortem inspection. This approach allows for the detection of residues or contaminants in food at concentrations that could adversely affect human health. The levels at which violations occur (e.g., those above an established tolerance) are based on toxicological studies evaluating the potential human health risk from exposure to these residues or contaminants as determined by FDA (under 21 CFR Part 556) and EPA (under 41CFR Part 180).

All U.S. NRP samples were analyzed at one of three FSIS laboratories: the Eastern Laboratory (EL) in Athens, GA; the Midwestern Laboratory (MWL) in St. Louis, MO; or the Western Laboratory (WL) in Alameda, CA. All of them are accredited under International Organization for Standardization (ISO) 17025.

In 2012, FSIS made the decision to harmonize the U.S NRP with other Agency sampling programs and shifted the 12-month cycle to a fiscal period. To accomplish this, FY 2013 FSIS chemical residue results represent the period from January 2013 through September 2013, allowing for 2012 to be the last full calendar report cycle and 2014 to be the first complete fiscal reporting cycle. Thus FY 2014 is the first full fiscal year (Oct 2013 through Sept 2014) of residue sampling results.

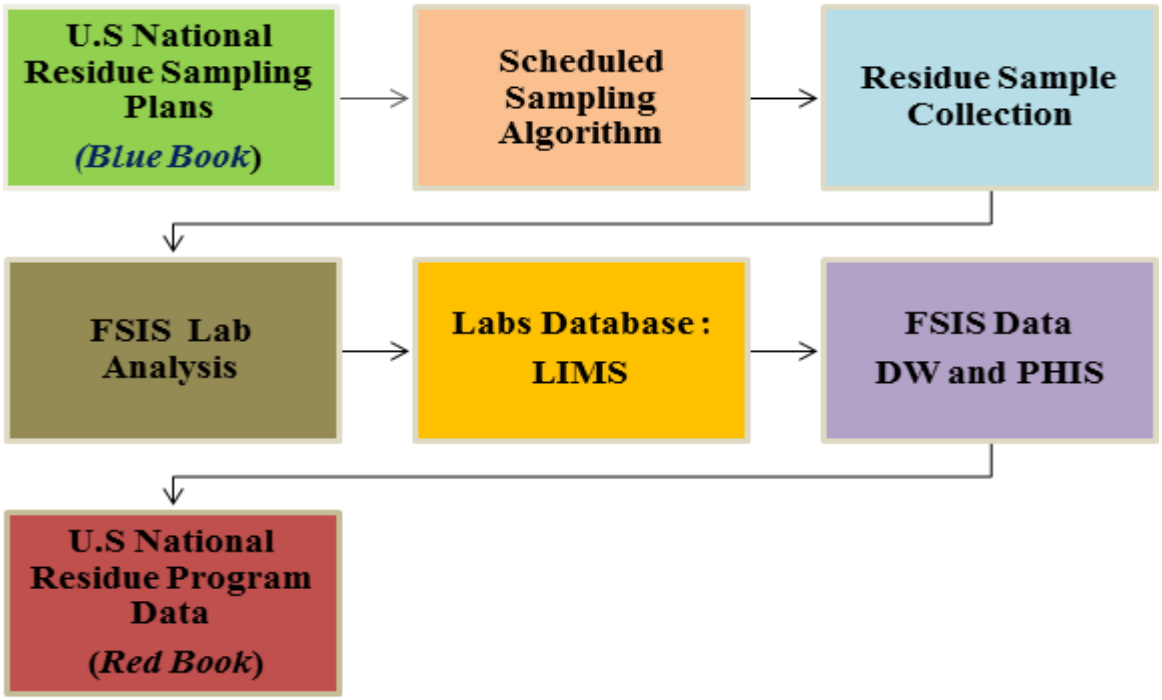
In July 2012, FSIS issued a Federal Register notice to announce restructuring of the U.S. NRP with respect to how sampling of chemical compounds in slaughter classes and egg product classes is scheduled. Beginning in August 2012, FSIS implemented two new multi-residue chemical methods. Because these methods are capable of evaluating several classes of veterinary drugs, FSIS discontinued testing slaughter class for single chemical or chemical classes i.e. “paired sampling.” These changes are detailed in the July 2012 Federal Register Notice: (http://www.fsis.usda.gov/wps/wcm/connect/96433e1b-d3b6-42b0-93a8-f0beee77e520/2012-0012.pdf?MOD=AJPERES)

Under the scheduled sampling program in FY 2014, FSIS tested eleven slaughter classes (beef cows, bob veal, dairy cows, goats, heifers, Market Swine , mature sheep, sows, steers, young chickens, and young turkeys); representing 96% of domestic meat and poultry slaughter production.

Tier-1 Domestic Scheduled Sampling

Tier-1 constitutes the domestic scheduled sampling portion of the U.S. NRP and serves as a baseline for chemical residue exposure levels. While the traditional program required random sample collection from each slaughter subclass regulated, under the new program, tier-1 sampling includes only major animal classes.

Figure 1. National Residue Program: Domestic Scheduled Sampling



Note: The residue sample results of establishments with multiple violations also are reported in the Residue Violation Information System (RVIS). These results are provided in PDF and Excel spreadsheet format, and contain information to help establishments; Livestock Markets and inspection program personnel identify producers with a history of residue violations. For more information please refer to:
http://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/residue-chemistry

Tier-2 Targeted sampling

Tier-2 sampling constitutes the inspector-generated sampling program administered by FSIS Inspection Program Personnel (IPP) (Public Health Veterinarians (PHV), and Consumer Safety Inspectors (CSI), at the establishment level. When IPP suspect evidence of disease or use of a drug, they hold the carcass and collect samples to test for violative levels of chemical residues. If the in-plant screen test result is negative, the carcass is released. If the in-plant screen test result is positive, muscle, liver, and kidney samples are collected and sent for laboratory confirmation, and the carcass is held at the establishment pending the results of laboratory confirmation testing. The PHV will condemn carcasses confirmed to contain violative levels of residues. Additionally, tier-2 sampling may also include any exploratory testing, usually for a limited number of samples collected over a short period of time in order for FSIS to gather information on a particular chemical residue in a given animal class.

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 and 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 use of a drug, they retain the carcass and test samples from those carcasses to screen for the presence of chemical residues. If the in-plant test is negative for antimicrobial residues, the carcass is released to the establishment. If the in-plant test is positive, 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 the FY 2014 NRP, IPP completed in-plant residue screens using the Kidney Inhibition Swab test (KIS™ test). The screen-positive samples were submitted to the FSIS Midwestern Laboratory and analyzed by the lab to identify, quantify and confirm the contaminants. The lab used the multi-residue screening method to test in-plant screen positives.

Sampling for 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 Public Health Information System (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 test. If the result of a screening test 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.

- **Sampling for 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 health- appearing bob veal calves and show animals.

- **Targeted Sampling**

  FSIS implements targeted sampling projects (exploratory assessments) to respond to information about misuse of animal drugs and/or exposure to environmental chemicals provided by other agencies (such as FDA and EPA), as well as in response to Tier 1 analytical results. These projects may or may not be conducted over a twelve-month period. FSIS may conduct studies to develop information on the frequency and concentration at which some residues such as trace metals and industrial components may be inadvertently present in animals. A tier 2 project 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. The sample request forms appear as a directed task on the PHIS. The sampling task provides information to the IPP on when to collect the sample (collection window) and which slaughter production class to sample. The establishment holds or controls livestock carcasses selected for testing pending the test results. For directed residue testing of poultry, the IPP recommend to the establishment that the establishments hold the specific poultry carcasses selected for residue testing pending the test results.

Tier-3 Targeted Flock/Herd Sampling

The Tier 3 sampling plan is similar in structure to the 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 herds 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.

Definitions of FSIS Animal Production Classes

Bovine

- Beef cows are mature, female cattle bred for muscle development, ordinarily having given birth to one or more calves.
- Bulls are mature, uncastrated male cattle.
- Calves/veal: The agency is currently engaging in rulemaking to define "veal." For sampling purposes under the NRP, veal calves are defined as immature cattle (including dairy breeds) lacking a functional rumen and intended for meat production. They are recognized as a separate class from suckling calves because of their handling, housing, and proximity to slaughter.
- Dairy cows are mature, female cattle bred for milk production, ordinarily having given birth to one or more calves.
- Heifers are young, female cattle more than 1 year old that have not yet given birth to a calf.
- Steers are male cattle castrated before sexual maturity.

Porcine

- Boars are mature swine showing male sexual characteristics.
- Market Swine are swine, usually marketed near 6 months of age and 200 to 300 pounds live weight.
- Roaster Swine are animals of both sexes and any age that are marketed with the carcass unsplit and with the head on.
- Sows are mature, female swine, ordinarily having given birth to one or more litters.
- Stags are male swine castrated after they have reached sexual maturity.

Poultry

- Ducks are birds of both sexes and any age.
- Egg products include yolks, whites, or whole eggs after breaking; eggs are processed as dried, frozen, or liquid.
- Geese are birds of both sexes and any age.
- Mature chickens are adult female birds, usually more than 10 months of age.
- Mature turkeys are birds of both sexes and usually more than 15 months of age.
- Young chickens include broilers/fryers birds of both sexes that are usually less than 10 weeks of age. Roasters are birds of both sexes, usually less than 12 weeks of age; capons are surgically castrated male birds usually less than 8 months of age.
- Young turkeys include fryer/roaster birds that are of both sexes and usually less than 12 weeks of age.
- Other poultry include ratites (e.g., ostriches, emus, and rheas), guineas, squabs (young, unfledged pigeons), adult pigeons, pheasants, grouse, partridge, quail, etc.

Other Livestock

- Goats are animals of both sexes and any age.
- Lambs are sheep younger than 14 months and having a break joint in at least one leg.
- Rabbits are any of several lagomorph mammals of both sexes and any age.

Summary of Domestic Residue Sampling Program

Table 1. FY 2014 Number of Scheduled Residue Samples Tested, by Slaughter Class

Slaughter Class	Domestic Scheduled Sampling Tier-1 U.S. Federal Plants	Domestic Scheduled Sampling Tier-1 U.S. State Plants	Inspector-generated Sampling Tier-2 Suspect Animals KIS™
Beef Cows	687	42	20,092
Boars/Stags			281
Bob Veal	501	7	29,839
Bulls			2,470
Dairy Cows	703	26	108,195
Formula-Fed Veal			713
Goats	143		496
Heavy Calves			1,286
Heifers	390	28	356
Lambs			1,132
Market Swine	720	55	17,354
Mature Sheep	158		331
Non-Formula-Fed Veal			322
Roaster Swine			1,456
Sows	709	39	12,582
Steers	375	39	10,431
Young Chickens	697	32	
Young Turkeys	706	9	
Total	**5,789**	**277**	**210,516***

* An additional **189** inspector-generated samples were collected and sent to FSIS labs for analysis. These samples are associated with project codes: 132 COLLGEN, 33 SHOW, and 24 STATE, samples.

Domestic Residue Scheduled Sampling Program

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

Table 2a identifies the methods/chemical classes and slaughter classes for which the methods are validated.

Table 2b identifies the chemical residue by Class/Method

Table 3 summarizes the number of domestic scheduled samples analyzed by slaughter class.

Table 4 summarizes the number of domestic scheduled samples by analytes completed for the identified slaughter class.

Table 5 summarizes violation results by slaughter class.

Note: Residue detected results with "**8888**" indicate instances when residues were detected, but were not quantitated.

Table 2a. FY 2014 List of Slaughter Class by Chemical Class (Analyses Performed) (Tier 1)

Slaughter Class by Compound Class Oct 2013- Sep 2014									
Methods/Classes	**Beef Cows**	**Bob veal**	**Dairy cows**	**Heifers**	**Steers**	**Market Swine**	**Sows**	**Young chickens**	**Young turkeys**
Multi-class	√	√	√	√	√	√	√	√	√
Aminoglycoside	√	√	√	√	√	√	√	√	√
Pesticides	√	√	√	√	√	√	√	√	√
Metals	√	√	√	√	√	√	√	√	√
***beta*-Agonists**	√	√	√	√	√				
Avermectins	√	√	√	√	√	√	√		
Carbadox						√			
Nitrofurans			√			√	√		
Arsenic	√	√	√	√	√	√	√	√	√

Table 2b. FY 2014 List of Chemical Residues by Class/Method

Multi-Residue Method Analytes[4]			
2-Quinoxaline Carboxylic Acid (QCA)	Difloxacin	Penicillin G	Sulfamethazine
Amoxicillin	Enrofloxacin	Phenylbutazone	Sulfamethizole
Ampicillin	Erythromycin A	Pirlimycin	Sulfamethoxazole
Cefazolin	Florfenicol	Prednisone	Sulfamethoxypyridazine
Chloramphenicol	Flunixin	Ractopamine	Sulfanitran
Chlortetracycline	Gamithromycin	Salbutamol	Sulfapyridine
Cimaterol	Lincomycin	Sarafloxacin	Sulfaquinoxaline
Ciprofloxacin	Melengestrol Acetate	Sulfachloropyridazine	Sulfathiazole
Clindamycin	Naficillin	Sulfadiazine	Tetracycline
Cloxacillin	Norfloxacin	Sulfadimethoxine	Tilmicosin
Danofloxacin	Oxacillin	Sulfadoxine	Tulathromycin A
DCCD	Oxyphenylbutazone	Sulfaethoxypyridazine	Tylosin
Desethylene Ciprofloxacin	Oxytetracline	Sulfamerazine	Zeranol (Zearalanol)
Dicloxacillin	Difloxacin	Penicillin G	Sulfamethazine
2-Quinoxaline Carboxylic Acid (QCA)			

Metals Method Analytes[5]		
Iron	Barium	Selenium
Zinc	Chromium	Manganese
Copper	Vanadium	Molybdenum
Nickel	Strontium	Thallium
Aluminum	Lead	Cobalt
Boron	Cadmium	

[4] As of September 2014. 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.

[5] Ibid

*Continued…***Table 2b. FY 2014 List of Chemical Residues by Class/Method**

PESTICIDE METHOD - ANALYTES[6]			
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)			

[6] As of September 2014. 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.

Table 3. FY 2014 Status of Total Number of Domestic Scheduled Samples Analyzed by Slaughter Class – and Summary Results

Slaughter Class	Number of Non-Detect Samples	Number of Non-Violative Positives	Number of Lab-Confirmed Violative Samples	Total Samples
Beef Cows	721	7	1	729
Bob Veal	499	1	8	508
Dairy Cows	726	3	-	729
Goats	143	-	-	143
Heifers	406	12	-	418
Market Swine	774	1	-	775
Mature Sheep	157	-	1	158
Sows	744	4	-	748
Steers	408	6	-	414
Young Chickens	729	-	-	729
Young Turkeys	715	-	-	715
TOTAL	**6,021**	**34**	**10**	**6,066**

Table 4. FY 2014 Domestic Scheduled Sampling Results

Slaughter Class	Number of Non-Detect Analytes	Number of Non-Violative Positives Analytes	Number of Lab Confirmed Violative Analytes	Total Number of Analyses Performed
Beef Cows	69,987	169	2	70,158
Bob Veal	49,304	74	9	49,387
Dairy Cows	69,011	151	-	69,162
Goats	11,648	-	-	11,648
Heifers	39,093	153	-	39,246
Market Swine	74,320	28	-	74,348
Mature Sheep	13,308	1	1	13,310
Sows	71,699	58	-	71,757
Steers	38,795	130	-	38,925
Young Chickens	69,863	9	-	69,872
Young Turkeys	68,311	16	-	68,327
TOTAL	**575,339**	**789**	**12**	**576,140**

Note: Multiple violative and/or non-violative results may be associated with a single sample (carcass)

Data Source: FSIS Data Warehouse and PHIS databases.

Table 5a. FY 2014 Domestic Scheduled Sampling Plan Violations – Federal Plants

Slaughter Class	Tissue	Compound	Concentration	Unit	Tolerance Level Value
Beef Cow	Muscle	Sulfamethazine	1.26	ppm	0.1
	Liver	Sulfamethazine	1.83	ppm	0.1
Bob Veal	Kidney	Flunixin	* 8888		Not approved for use in Veal
Bob Veal	Muscle	Piperonyl Butoxide	0.1517	ppm	0.1
Bob Veal	Kidney	Ciprofloxacin	* 8888		Not approved for use in Veal
	Kidney	Enrofloxacin	* 8888		Not approved for use in Veal
Bob Veal		Ivermectin	14.45	ppb	650
Bob Veal	Kidney	Penicillin	0.646	ppm	0.05
Bob Veal	Muscle	Oxytetracycline	5.18	ppm	2.0
Bob Veal	Liver	Sulfamethazine	0.113	ppm	0.1
Bob Veal	Muscle	DDT and Metabolites	0.0125	ppm	Not approved for use in Veal
Mature Sheep	Muscle	Moxidectin	167.5	ppb	50

* 8888: Violative residue results were detected but not quantified.

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 possibly contains violative levels of chemical residues. The PHVs and CSIs also are encouraged to collect samples for residue testing by the FSIS labs when a chemical contamination is suspected. Sample screening is performed using the KIS™ test. FSIS began incorporating the KIS™ test in all dual slaughter plants in August 2011. Since CY 2012, the agency has phased in the KIS™ test as the only in-plant screening test. If KIS™ test kits are not available, the PHV submits the sample to the FSIS laboratory for testing.

Table 6 summarizes the total number in-plants screens tests using the KIS™ test, which includes the number of in-plants screens with negative results, and number of positive screens sent to FSIS labs for conformation

Table 7 summarizes the total number of samples analyzed and the number of carcasses with violations for each slaughter class.

Tables 8 summarizes the results for specific compounds that were detected (violative) within the slaughter class across inspector-generated projects names (i.e., collector-generated –COLLGEN-, KIS™ test, etc.) respectively.

Tables 9–10 summarize the results for specific chemical compounds that were detected (violative) within several inspector-generated project codes and within slaughter class across inspector-generated program respectively.

Tables 11–13 summarize the inspector-generated sampling results for non-violative positive residue samples for a specific compounds that were detected (non-violative) within the slaughter class (i.e., collector-generated or COLLGEN, KIS™ test,…etc.).

Tables 12–13 summarize the results for specific chemical compounds that were detected (non-violative) within several inspector generated project codes and within slaughter class across inspector-generated program respectively.

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

2014 Domestic Residue Scheduled Sampling: Inspector-Generated Sampling

Table 6. FY 2014 In-plant Screen Results (by Test Type)

Slaughter Class	KIS ™ test		
	Number of In-plant (screened) Negative Samples	Number of In-plant (screened) Positive Samples	Number of In-plant (screened) Samples
Beef Cows	19,595	497	20,092
Boars/Stags	279	2	281
Bob Veal calves	29,119	720	29,839
Bulls	2,399	71	2,470
Dairy Cows	105,417	2,778	108,195
Formula-Fed Veal	696	17	713
Goats	492	4	496
Heavy Calves	1,140	146	1,286
Heifers	3,455	81	3,536
Lambs	1,113	19	1,132
Market Swine	17,220	134	17,354
Mature Sheep	328	3	331
Non-Formula-Fed Veal	299	23	322
Roaster Swine	1,448	8	1,456
Sows	12,439	143	12,582
Steers	10,218	213	10,431
Total	**205,657**	**4,859**	**210,516**

Table 7. FY 2014 Number of Violative Residue Carcasses in inspector generated sampling, by Project Code

Slaughter Class	COLLGEN		KIS ™ test		SHOW		STATE	
	Number of Samples	**Number of Carcasses With Confirmed Lab Violations**	* Number of In-plant (screened) Positive Samples	Number of Carcasses With Confirmed Lab Violations	Number of Samples	**Number of Carcasses With Confirmed Lab Violations**	Number of Samples	**Number of Carcasses With Confirmed Lab Violations**
Beef Cows	5	--	497	**81**	--	--	2	--
Boars/Stags	--	--	2	--	--	--	--	--
Bob Veal calves	2	--	720	**252**	--	--	1	**1**
Bulls	5	--	71	**14**	--	--	1	**1**
Dairy Cows	69	**1**	2,778	**628**	--	--	1	--
Formula-Fed Veal	--	--	17	--	--	--	--	--
Goats	3	--	4	--	3	--	--	--
Heavy Calves	1	--	146	**21**		--	2	**1**
Heifers	4	--	81	**21**	2	--	3	**1**
Lambs	--	--	19	**3**	8	--	--	--
Market Swine	23	**1**	134	**8**	10	**1**	5	**1**
Mature Sheep	1		3	--	--	--	2	**1**
Non-Formula-Fed Veal	2	**1**	23	**10**	--	--	--	--
Roaster Swine	2	--	8	**3**	--	--	--	--
Sows	--	--	143	**47**	--	--	1	--
Steer	15	**1**	213	**37**	10	--	6	--
Total	132	**4**	4,859	**1,125**	33	**1**	24	**6**

Table 8. FY 2014 Number of Violative Residue Carcasses in inspector generated sampling, by Project Code

Slaughter Class	Project Code				
	KIS™ Test	COLLGEN	SHOW	STATE	Total
Beef Cows	118	--	--	--	**118**
Bob Veal	295	--	--	1	**296**
Bulls	27	--	--	1	**28**
Dairy Cows	743	1	--	--	**744**
Formula-Fed Veal	--	--	--	--	--
Goats	--	--	--	--	--
Heavy Calves	33	--	--	7	**40**
Heifers	23	--	--	1	**24**
Lamb	3	--	--		**3**
Market Swine	10	2	2	2	**16**
Mature Sheep	--	--	--	1	**1**
Non-Formula-Fed Veal	24	4	--	--	**28**
Roster Pigs	5	--	--	--	**5**
Sows	54	--	--	--	**54**
Steers	49	2	--	--	**51**
TOTAL	**1,384**	**9**	**2**	**13**	**1,408**

Table 9. FY 2014 : Number of Violative Residue Carcasses in inspector generated sampling, by chemical residue and Project Code

Chemical Residue detected	Project code				Total
	KIS ™ Test	COLLGEN	SHOW	STATE	
Amikacin	2	-	-	-	2
Ampicillin	18	-	-	-	18
Cefazolin	8	-	-	1	9
Chloramphenicol	1	-	-	-	1
Ciprofloxacin	21	-	-	1	22
Desethylene ciprofloxacin	1	-	-	-	1
Ceftiofur	344	-	-	-	344
Dihydrostreptomycin	10	-	-	-	10
Enrofloxacin	4	-	-	-	4
Florfenicol	63	2	-	2	67
Flunixin	106	1	-	1	108
Gamithromycin	1	-	-	-	1
Gentamycin Sulfate	25	-	-	-	25
Ivermectin	-	1	-	-	1
Lincomycin	5	-	-	-	5

Note: Multiple violative results may be associated with a single sample (carcass)

Table 9. FY 2014 Number of Violative Residue results in inspector generated sampling, by chemical residue and Project Code *(Continued)*

Chemical Residue detected	Project code				Total
	KIS ™ Test	COLLGEN	SHOW	STATE	
Neomycin	160	-	-	-	160
Oxyphenylbutazone	1	-	-	-	1
Oxytetracycline	19	-	-	-	19
Penicillin	305	-	-	1	306
Ractopamine	1	-	-	-	1
Spectinomycin	1	-	-	-	1
Sulfadiazine	3	-	-	-	3
Sulfadimethoxine	79	-	-	2	81
Sulfadoxine	4	-	-	-	4
Sulfamethazine	112	5	2	3	122
Sulfamethoxazole	18	-	-	-	18
Sulfaquinoxaline	-	-	-	1	1
Tetracycline	7	-	-	-	7
Tilmicosin	49	-	-	-	49
Tulathromycin	15	-	-	1	16
Zeranol	1	-	-	-	1
TOTAL	**1,384**	**9**	**2**	**13**	**1,408**

Table 10. FY 2014 Number of Residue Violations results in inspector generated sampling by Chemical Residue and Slaughter Class

Chemical Residue detected	Beef Cows	Bob Veal	Bulls	Dairy Cow	Heavy Calf	Heifer	Lamb	Market Swine	Market Sheep	Non Formula -Fed Veal	Roaster Swine	Sows	Steers	Total
Amikacin	-	-	-	2	-	-	-	-	-	-	-	-	-	**2**
Ampicillin	-	2	-	16	-	-	-	-	-	-	-	-	-	**18**
Cefazolin	1	1	-	6	-	1	-	-	-	-	-	-	-	**9**
Chloramphenicol	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Ciprofloxacin	3	6	1	8	2	-	-	-	-	1	-	1	-	**22**
Desethylene ciprofloxacin	-	1	-	-	-	-	-	-	-	-	-	-	-	**1**
Ceftiofur	16	26	3	283	-	5	-	-	-	-	-	-	11	**344**
Dihydrostreptomycin	-	4	-	6	-	-	-	-	-	-	-	-	-	**10**
Enrofloxacin	-	4	-	-	-	-	-	-	-	-	-	-	-	**4**
Florfenicol	18	7	4	18	9	-	-	-	-	9	-	-	2	**67**
Flunixin	15	8	5	64	8	3	-	-	-	1	-	1	3	**108**
Gamithromycin	-	1	-	-	-	-	-	-	-	-	-	-	-	**1**
Gentamycin Sulfate	2	2	-	12	1	2	-	1	-	-	1	2	2	**25**
Ivermectin	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Lincomycin	-	2	-	3	-	-	-	-	-	-	-	-	-	**5**

Note: Multiple violative results may be associated with a single sample (carcass)

Table 10. FY 2014 Number of Residue Violations results in inspector generated sampling by Chemical Residue and Slaughter Class *(Continued)*

Chemical Residue detected	Beef Cows	Bob Veal	Bulls	Dairy Cow	Heavy Calf	Heifer	Lamb	Market Swine	Market Sheep	Non Formula -Fed Veal	Roaster Swine	Sows	Steers	Total
Neomycin	2	147	-	9	1	-	-	-	-	-	-	-	1	**160**
Oxyphenylbutazone	-	-	-	1	-	-	-	-	-	-	-	-	-	**1**
Oxytetracycline	7	5	2	4	-	-	-	-	-	-	-	-	1	**19**
Penicillin	18	13	7	199	4	5	-	2	-	4	2	47	5	**306**
Ractopamine	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
Spectinomycin	-	-	-	-	-	-	-	-	-	-	1	-	-	**1**
Sulfadiazine	-	-	-	2	1	-	-	-	-	-	-	-	-	**3**
Sulfadimethoxine	4	5	-	54	3	2	3	-	-	4	-	-	6	**81**
Sulfadoxine	-	-	-	4	-	-	-	-	-	-	-	-	-	**4**
Sulfamethazine	23	19	4	29	5	1	-	13	-	9	1	2	16	**122**
Sulfamethoxazole	-	18	-	-	-	-	-	-	-	-	-	-	-	**18**
Sulfaquinoxaline	-	-	-	-	-	-	-	-	1	-	-	-	-	**1**
Tetracycline	-	-	-	7	-	-	-	-	-	-	-	-	-	**7**
Tilmicosin	9	9	2	15	6	5	-	-	-	-	-	-	3	**49**
Tulathromycin	-	16	-	-	-	-	-	-	-	-	-	-	-	**16**
Zeranol	-	-	-	-	-	-	-	-	-	-	-	1	-	**1**
TOTAL	**118**	**296**	**28**	**744**	**40**	**24**	**3**	**16**	**1**	**28**	**5**	**54**	**51**	**1,408**

Table 11. FY 2014 Number of Positive Non-Violative Residue in Inspector generated Sampling by Slaughter Class and Project Code

Slaughter Class	Project Code				
	KIS™ Test	COLLGEN	SHOW	STATE	Total
Beef Cows	170	-	-	-	**170**
Boar/Stags	1	-	-	-	**1**
Bob Veal	229	-	-	-	**229**
Bulls	33	1	-	1	**35**
Dairy Cows	461	5	-	1	**467**
Formula-fed Veal	2	-	-	-	**2**
Goats	3	-	-	-	**3**
Heavy Calves	63	-	-	3	**66**
Heifers	38	-	-	-	**38**
Lamb	3	-	2	-	**5**
Market Swine	10	-	3	1	**14**
Non Formula-fed Veal	11	1	-	-	**12**
Roaster Swine	2	-	-	-	**2**
Sows	8	-	-	-	**8**
Steers	97	1	-	-	98
TOTAL	**1,131**	**8**	**5**	**6**	**1,150**

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

Table 12. 2014 Number of Positive Non-Violative Residue in Inspector generated Sampling by Chemical Residue and Project Code

Chemical Residue detected	Project Code				Total
	KIS ™ Test	COLLGEN	SHOW	STATE	
Ampicillin	9	-	-	-	**9**
Chlortetracycline	9	-	-	-	**9**
Cloxacillin	1	-	-	-	**1**
Danofloxacin	8	-	-	-	**8**
Desethylene ciprofloxacin	1	-	-	-	**1**
Desfuroylceftiofur	88	1	-	-	**89**
Dexamethasone	2	1	-	-	**3**
Dihydrostreptomycin	1	-	-	-	**1**
Doramectin	1	-	-	-	**1**
Enrofloxacin	11	-	-	1	**12**
Florfenicol	26	-	-	-	**26**
Flunixin	61	1	-	-	**62**
Gamithromycin	20	-	-	1	**21**
Lincomycin	9	-	-	1	**10**
Neomycin	118	-	-	1	**119**
Oxytetracycline	**266**	**2**	**-**	**1**	**269**

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

Table 12. FY 2014 Number of Positive Non-Violative Residue in Inspector generated Sampling by Chemical Residue and Project Code *(Continued)*

Chemical Residue detected	Project Code				Total
	KIS ™ Test	COLLGEN	SHOW	STATE	
Penicillin	116	-	-	-	**116**
Piperonyl Butoxide	-	-	5	-	**5**
Pirlimycin	20	-	-	-	**20**
Ractopamine	28	-	-	-	**28**
Spectinomycin	43	-	-	1	**44**
Sulfadimethoxine	24	-	-	-	**24**
Sulfamethazine	14	-	-	-	**14**
Tetracycline	54	-	-	-	**54**
Tilmicosin	20	-	-	-	**20**
Tulathromycin	175	3	-	-	**178**
Tylosin	2	-	-	-	**2**
UMI	4	-	-	-	**4**
TOTAL	**1,131**	**8**	**5**	**6**	**1,150**

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

Table 13. FY 2014 Number of Positive but Non-Violative Residue Results by Chemical Residue and Slaughter Class

Chemical Residue	Beef Cows	Boars/Stags	Bob Veal	Bulls	Dairy Cow	Formula-fed Veal	Goats	Heavy Calf	Heifer	Lamb	Market Swine	Non Formula - Fed Veal	Roaster, Pigs	Sows	Steers	Total
Ampicillin	1	-	-	-	7	-	-	-	1	-	-	-	-	-	-	**9**
Chlortetracycline	2	-	3	1	-	-	-	2	-	-	-	-	-	-	1	**9**
Cloxacillin	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Danofloxacin	1	-	-	-	1	-	-	-	1	-	-	-	-	-	5	**8**
Desethylene ciprofloxacin	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	**1**
Desfuroylceftiofur	5	-	13	2	68	-	-	1	-	-	-	-	-	-	-	**89**
Dexamethasone	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	**3**
Dihydrostreptomycin	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Doramectin	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Enrofloxacin	2	-	-	1	3	-	-	3	-	-	-	1	-	1	1	**12**
Florfenicol	6	-	-	-	12	-	-	6	-	-	1	-	-	-	1	**26**
Flunixin	3	-	-	-	51	-	-	1	4	-	-	2	-	-	1	**62**
Gamithromycin	6	-	-	2	5	-	-	2	2	-	-	-	-	-	4	**21**
Lincomycin	-	-	-	-	-	-	-	-	-	-	7	-	1	2	-	**10**
Neomycin	2	-	86	1	9	1	-	18	-	-	-	-	-	-	2	**119**
Oxytetracycline	72	-	105	13	55	1	-	5	6	2	-	-	1	1	8	**269**

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

Table 13. FY 2014 Number of Positive but Non-Violative Residue Results by Chemical Residue and Slaughter Class *(Continued)*

Chemical Residue	Beef Cows	Boars/Stags	Bob Veal	Bulls	Dairy Cow	Formula-fed Veal	Goats	Heavy Calf	Heifer	Lamb	Market Swine	Non Formula -Fed Veal	Roaster, Pigs	Sows	Steers	Total
Penicillin	10	-	6	2	94	-	-	2	1	-	-	-	-	-	1	**116**
Piperonyl Butoxide	-	-	-	-	-	-	-	-	-	2	3	-	-	-	-	**5**
Pirlimycin	-	-	1	-	19	-	-	-	-	-	-	-	-	-	-	**20**
Ractopamine	-	-	-	-	-	-	-	-	5	-	3	-	-	-	20	**28**
Spectinomycin	3	-	4	1	29	-	-	4	1	-	-	-	-	-	2	**44**
Sulfadimethoxine	4	-	-	-	17	-	-	1	1	-	-	-	-	-	1	**24**
Sulfamethazine	4	-	2	1	1	-	-	2	2	-	-	1	-	-	1	**14**
Tetracycline	2	-	8	-	43	-	-	-	-	-	-	-	-	-	1	**54**
Tilmicosin	5	1	1	-	5	-	-	-	1	-	-	-	-	4	3	**20**
Tulathromycin	41	-	-	11	42	-	-	17	13	-	-	8	-	-	46	**178**
Tylosin	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	**2**
UMI	-	-	-	-	-	-	3	-	-	1	-	-	-	-	-	**4**
TOTAL	**170**	**1**	**229**	**35**	**467**	**2**	**3**	**66**	**38**	**5**	**14**	**12**	**2**	**8**	**98**	**1,150**

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

Import Reinspection Sampling Program

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 of product before it enters the U. S. Chemical residue sampling is included in the reinspection of imported products.

Note: 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.

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 when import product does not meet US standards

The import-sampling program will be structured using the Tier 1 and 2 frameworks. It also intends to screen a subset of these samples for unknown compounds in the FSIS Food Emergency Response Network (FERN) laboratory.

In FY 2014 , FSIS collected 1,967 import residue samples (5,104 residue analytes results) from 26 export countries. Eight violations were detected (4 from Brazil samples, and 4 from Mexico). For more information, refer to the list of tables below.

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

Import Residue Reinspection Sampling Program

Table 14. FY 2014 Number of NRP Import Samples Analyzed, by Exporting Country and Production Class

Country	Production Class								Total
	Beef	Chicken	Goat	Lamb	Mutton	Pork	Turkey	Veal	
Argentina	5	-	-	-	-	-	-	-	5
Australia	70	-	41	27	12	-	-	15	165
Brazil	18	-	-	-	-	-	-	-	18
Canada	95	192	-	13	-	183	114	83	680
Chile	5	69	-	22	16	-	27	-	139
Costa Rica	25	-	-	-	-	-	-	-	25
Croatia	-	-	-	-	-	3	-	-	3
Denmark	-	-	-	-	-	36	-	-	36
Finland	-	-	-	-	-	37	-	-	37
Germany	-	-	-	-	-	12	-	-	12
Honduras	3	-	-	-	-	-	-	-	3
Hungary	-	-	-	-	-	11	-	-	11
Iceland	-	-	-	6	-	-	-	-	6
Ireland	-	-	-	-	-	4	-	-	4
Israel	-	15	-	-	-	-	78	-	93
Italy	-	-	-	-	-	78	-	-	78
Japan	47	-	-	-	-	-	-	-	47
Mexico	104	10	-	-	-	49	22	-	185
Netherlands	-	-	-	-	-	26	-	-	26
New Zealand	48	-	-	15	6	-	-	13	82
Nicaragua	10	-	-	-	-	-	-	-	10
Northern Ireland	-	-	-	-	-	28	-	-	28
Poland	-	-	-	-	-	157	-	-	157
Spain	-	-	-	-	-	56	-	-	56
United Kingdom	-	-	-	-	-	16	-	-	16
Uruguay	38	-	-	6	-	1	-	-	45
Total	**468**	**286**	**41**	**89**	**34**	**697**	**241**	**111**	**1,967**

Table 15. FY 2014 Import Testing Results by Exported Countries

Country	Chemical Residue Results			
	Residue Not Detected	Residue Detected Non-violative	Residue Detected Violative	Total
Argentina	5	1	-	**6**
Australia	461	9	-	**470**
Brazil	25	4	**4**	**33**
Canada	1,831	81	-	**1,912**
Chile	428	28	-	**456**
Costa Rica	83	3	-	**86**
Croatia	3	2	-	**5**
Denmark	76	8	-	**84**
Finland	112	7	-	**119**
Germany	12	4	-	**16**
Honduras	7	-	-	**7**
Hungary	12	3	-	**15**
Iceland	11	-	-	**11**
Ireland	11	1	-	**12**
Israel	67	47	-	**114**
Italy	84	26	-	**110**
Japan	154	5	-	**159**
Mexico	450	42	**4**	**496**
Netherlands	65	6	-	**71**
New Zealand	235	4	-	**239**
Nicaragua	37	-	-	**37**
Northern Ireland	95	2	-	**97**
Poland	261	33	-	**294**
Spain	80	16	-	**96**
United Kingdom	45	3	-	**48**
Uruguay	95	16	-	**111**
Total	**4,745**	**351**	**8**	**5,104**

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

Table 16. FY 2014 Import Testing Results by Chemical Compound and Production Class

Chemical Compound	Production Class								Total
	Beef	Chicken	Goat	Lamb	Mutton	Pork	Turkey	Veal	
Arsenic	158	95	19	52	26	238	69	18	**675**
Avermectins	148	8	19	52	26	238	4	18	**513**
Beta Agonists	209	138	13	30	24	168	82	54	**718**
Boron	3	-	-	-	-	-	-	2	**5**
Cadmium	2	4	-	-	-	2	-	-	**8**
Doramectin	1	-	-	-	-	-	-	-	**1**
Fluoroquninolones	212	138	13	30	24	168	82	53	**720**
Hormones	212	138	13	30	24	168	82	53	**720**
Ivermectin	10	-	-	-	-	1	-	-	**11**
Lead	4	2	-	-	-	5	-	-	**11**
Manganese	26	26	-	-	-	50	17	1	**120**
Molybdenum	6	20	-	-	-	6	3	-	**35**
Pesticides	121	69	23	37	9	99	45	41	**444**
Selenium	5	-	-	-	-	8	-	-	**13**
Strontium	1	-	-	-	-	-	-	-	**1**
Sulfas	254	138	13	30	24	315	125	56	**955**
Trace Elements	11	27	-	-	-	79	26	10	**153**
Zilpaterol	1	-	-	-	-	-	-	-	**1**
Total	**1,384**	**803**	**113**	**261**	**157**	**1,545**	**535**	**306**	**5,104**

Note Multiple residue results may be associated with the same sample (carcass).

Table 17. FY 2014 Residue Results under the Import Reinspection Program, by Chemical Compound

Chemical Compound	Chemical Residue Results			
	Residue Not Detected	Residue Detected Non-violative	Residue Detected Violative	Total
Arsenic	675	-	-	**675**
Avermectins	513	-	-	**513**
Beta Agonists	718	-	-	**718**
Boron	-	5	-	**5**
Cadmium	-	8	-	**8**
Doramectin	-	-	-	**1**
Fluoroquninolones	720	1	-	**720**
Hormones	720	-	-	**720**
Ivermectin	-	4	**7**	**11**
Lead	-	11	-	**11**
Manganese	-	120	-	**120**
Molybdenum	-	35	-	**35**
Pesticides	444	-	-	**444**
Selenium	-	13	-	**13**
Strontium	-	1	-	**1**
Sulfas	955	-	-	**955**
Trace Elements	-	153	-	**153**
Zilpaterol	-	-	**1**	**1**
Total	**4,745**	**351**	**8**	**5,104**

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

Table 18. FY 2014 Number OF Samples Analyzed under the Import Reinspection Program, by Production Class and Residue Result

Production Class	Chemical Residue Results			
	Residue Not Detected	Residue Detected Non-violative	Residue Detected Violative	Total
Beef	1,314	62	8	**1,384**
Chicken	724	79	-	**803**
Goat	113	-	-	**113**
Lamb	261	-	-	**261**
Mutton	157	-	-	**157**
Pork	1,394	151	-	**1,545**
Turkey	489	46	-	**535**
Veal	293	13	-	**306**
Total	**4,745**	**351**	**8**	**5,104**

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

Table 19. FY 2014 Number of Samples Analyzed under the Import Reinspection Program, by Production Class and Product Type

Production Class	Product Type		Total
	Fresh	Processed	
Beef	1,192	192	**1,384**
Chicken	714	89	**803**
Goat	113	-	**113**
Lamb	261	-	**261**
Mutton	157	-	**157**
Pork	962	583	**1,545**
Turkey	422	113	**535**
Veal	303	3	**306**
TOTAL	**4,124**	**980**	**5,104**

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

Table 20. FY 2014 Samples Analyzed under the Import Reinspection Program by Chemical Residue and Product Type

Chemical Residue	Product Type		
	Fresh	Processed	Total
Arsenic	412	263	**675**
Avermectins	304	209	**513**
Beta Agonists	715	3	**718**
Boron	4	1	**5**
Cadmium	-	8	**8**
Doramectin	-	1	**1**
Fluoroquninolones	717	3	**720**
Hormones	717	3	**720**
Ivermectin	-	11	**11**
Lead	1	10	**11**
Manganese	11	109	**120**
Molybdenum	-	35	**35**
Pesticides	444	-	**444**
Selenium	1	12	**13**
Strontium	-	1	**1**
Sulfas	717	238	**955**
Trace Elements	80	73	**153**
Zilpaterol	1	-	**1**
Total	**4,124**	**980**	**5,104**

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

Table 21. FY 2014 Number of Samples Analyzed under the Import Reinspection Program by Product Type

Production Class	Chemical Residue Results;			
	Residue Not Detected	Residue Detected Non violative	Residue Detected violative	Total
Fresh	4,026	97	1	**4,124**
Processed	719	254	7	**980**
Total	**4,745**	**351**	**8**	**5,104**

Appendix I

NRP Positive Non-Violative and Positive Violative Residue Samples Results

In addition to the publication of the FY 2014 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: http://www.fsis.usda.gov/wps/portal/fsis/topics/data-collection-and-reports/chemistry/residue-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 samples population.

Prior to 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 chemical residue violations if the violation rate is equal to or greater than 1 percent in the population being sampled.

Starting 2012, FSIS stated in its residue sampling plan that sample size selected/tested would increase its goal to about 800 samples for each of the nine major production class tested under tier-I. By increasing the number of samples taken, it would increase its statistical probability of finding a violation to at even lower true violation rates.

Table III provides the calculated number of samples required to ensure detection of a violation that affects a given percentage of the sampled population. Statistically, for a binomial distribution with sample size "n" and violation rate "v", 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,

Based on a <u>1% true violation rate assumption</u>:

- The probability of detecting at least one violation with 230 samples is 0.90. This means that If no violations were found in 230 samples, then we are 90% confident that that the true population violation rate is less than 1%. On the other hand, if at least one violation were found in 230 samples, then we are 90% confident that the true population violation rate is at least 1%.

- The probability of detecting at least one violation with 300 samples is 0.95. This means that If no violations were found in 300 samples, then we are 95% confident that that the true population violation rate is less than 1%. On the other hand, if at least one violation were found in 300 samples, then we are 95% confident that the true population violation rate is at least 1%.

- The probability of detecting at least one violation with 460 samples is 0.99. This means that If no violations were found in 460 samples, then we are 99% confident that that the true population violation rate is less than 1%. On the other hand, if at least one violation were found in 460 samples, then we are 99% confident that the true population violation rate is at least 1%.

- The probability of detecting at least one violation with 800 samples is 0.9997. This means that If no violations were found in 800 samples, then we are 99.97 % confident that that the true population violation rate is less than 1%. On the other hand, if at least one violation were found in 800 samples, then we are 99.97% confident that the true population violation rate is at least 1%.

<u>Using 800 samples</u>

- The probability of detecting at least one violation with 800 samples is 0.90. This means that If no violations were found in 800 samples, then we are 90 % confident that that the true population violation rate is less than **0.29 %**. On the other hand, if at least one violation were found in 800 samples, then we are 90% confident that the true population violation rate is at least **0.29** %.

- The probability of detecting at least one violation with 800 samples is 0.95. This means that If no violations were found in 800 samples, then we are 95 % confident that that the true population violation rate is less than **0.37 %.** On the other hand, if at least one violation were found in 800 samples, then we are 95 % confident that the true population violation rate is at least **0.37 %.**

- The probability of detecting at least one violation with 800 samples is 0.99. This means that If no violations were found in 800 samples, then we are 99 % confident that that the true population violation rate is less than **0.57 %.** On the other hand, if at least one violation were found in 800 samples, then we are 99 % confident that the true population violation rate is at least **0.57 %.**

Table II. Statistical Table - 2014 U.S. National Residue Program

Percentage % Violative in the population (v)	Probability (p) of detecting at least one violation in (n) samples					
	0.90	**0.95**	**0.990**	**0.999**	**0.9997**	**0.9999**
	Sample Size required "***n***"					
10	22	29	44	66	77	87
5	45	59	90	135	158	180
1	230	300	459	688	807	916
0.57	403	525	806	1,208	1,419	1,611
0.50	460	598	919	1,378	1,618	1,837
0.37	620	808	1,242	1,864	2,188	2,485
0.29	793	1,032	1,586	2,379	2,793	3,171
0.10	2,302	2,995	4,,603	6,904	8,108	9,206
0.05	4,605	5,990	9,208	13,812	16,219	18,416

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.

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

Appendix III

Table III. U.S. NRP – Domestic Scheduled Sampling Program

Year	Number of Samples	Number of Lab-Confirmed Violative Samples	Number of Lab-Confirmed Non-Violative Positive Analytes	Number of Distinct Violative Chemical Residues
CY 2012	**5,838**	**14**	**26**	**9**
*** FY 2013**	**4,583**	**19**	**23**	**8**
FY 2014	**6,066**	**10**	**12**	**10**

* **Note:** FSIS moved to a fiscal evaluation period beginning with FY13. FY 2013 covers only Jan-Sept, 2013.

Appendix IV

Table IV. U.S. NRP – Import Re-inspection Sampling Program

Year	Number of Samples	Number of Lab-Confirmed Violative Samples	Violative Residues
CY 2012	**1,299**	**0**	**N/A**
*** FY 2013**	**817**	**4**	**Avermectins**
FY 2014	**1,967**	**8**	**Ivermectin (7), Zilpaterol (1)**

*** Note:** FSIS moved to a fiscal evaluation period beginning with FY13. FY 2013 covers only Jan-Sept, 2013.

Appendix V

Table V. NRP – Domestic Inspector Generated Sampling Program (*include* KIS™ *Test*)

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)	Number of Lab-Confirmed Non-Violative Positive Analytes	Number of Distinct Violative Chemical Residue
CY 2012	214,864 / **(214,654)**	5,398 / (**5,188**)	1,182 / **(939)**	1,363	28
***FY 2013**	170,692 / (**170,560**)	4,100 / (**3,968**)	1,265 / **(1,053)**	1,099	29
FY 2014	210,705 / (**210,516**)	5,048 / (**4,859**)	1,408 / **(1,136)**	1,150	31

* Note: FSIS moved to a fiscal evaluation period beginning w/FY13. FY 2013 covers Jan-Sept, 2013 only-.

Table A V. U.S NRP Domestic Inspector Generated Sampling Program -Lab confirmed residue results

(Multiple Results may be associated with same carcass sample)

Year	# of Lab confirmed violative Analytes	Top Three Violative Chemical Residue
CY2012	**1,182**	Penicillin Neomycin Ceftiofur
***FY2013**	**1,265**	Ceftiofur Penicillin Neomycin
FY2014	**1,408**	Ceftiofur Penicillin Neomycin

Year	# of Lab confirmed Non-violative Positive Analytes	Top Three Positive Non-violative Chemical Residue
CY2012	**1,363**	Oxytetracycline Neomycin Tetracycline
***FY2013**	**1,099**	Oxytetracycline Neomycin Ceftiofur
FY2014	**1,150**	Oxytetracycline Tulathromycin Penicillin