National Residue Program Quarterly Report (Oct–Dec 2021)

National Residue Program

In FY 2022 Q1, nine analytical methods were used by FSIS to detect approximately 260 different veterinary drugs, pesticides, and environmental contaminants. Key observations are below.

Surveillance Sampling Plan

Specified slaughter subclasses are sampled at the time of slaughter, after a carcass has passed antemortem inspection. Of the 1,894 samples analyzed by FSIS (1,834 from U.S. Federal plants and 60 from U.S. State inspected plants), six sample contained violative chemical residues. In total, more than 361,000 chemical residue analyses were conducted on the 1,894 samples collected under the surveillance sampling plan.

Table 1: Summary of FY 2022 Q1 Surveillance Sampling Results

FY 2022 Q1 summary of surveillance sampling results from FSIS inspector-collected muscle, kidney, and liver tissue from carcasses and parts is shown.

Animal Category	Animal Class	Total Number of Samples Planned for FY 2022	Number of Samples Analyzed this Quarter			
			Total Samples[1]	Number of Non-Detect Samples	Number of Non-Violative Positives Samples	Number of Violative Samples
Bovine	Beef Cows	800	198	195	1	1
	Bob Veal	400	78	78	0	0
	Dairy Cows	800	215	212	1	2
	Formula-Fed Veal	75	10	10	0	0
	Heifers	400	107	107	0	0
	Non-Formula-Fed Veal	75	12	11	1	0
	Steers	400	97	96	1	0
Porcine	Feral Swine	75	16	16	0	0
	Market Swine	800	198	197	1	0
	Roaster Swine	300	67	66	0	1
	Sows	800	183	181	2	0
Poultry	Young Chickens	400	104	103	1	0
	Whole Chickens	400	92	90	2	0
	Young Turkeys	800	217	215	2	0
Other Species	Goats	300	69	69	0	0
	Lambs	100	21	20	1	0
	Mature Sheep	100	23	22	1	0
	Siluriformes (Catfish)	650	157	150	5	2
	Egg Products	400	30	29	1	0
Annual Total		**8,075**	**1,894**	**1,867**	**20**	**6**

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[1] For raw product, a sample is a representative portion of a meat, poultry, or egg product collected to identify potential microbiological, chemical, or pathological hazards.

Table 2: FY 2022 Q1 Number Collected NRP Surveillance Sampling Residues by Chemical Methods

FY 2022 number collected surveillance sampling residue sampling summary is shown reflecting the number of samples (carcasses) analyzed per chemical method per animal class.

Animal Category	Animal Class	Number of Samples Analyzed per Chemical Method								
		Aminoglycosides	Antifungal Dyes	Carbadox	Metals	MRM[1]	Nitrofurans	Pesticides	PFAS[2]	Speciation
Bovine	Beef Cows	197	--	--	41	197	--	113	--	--
	Bob Veal	78	--	--	25	78	--	40	--	--
	Dairy Cows	215	--	--	47	215	--	108	--	--
	Formula-Fed Veal	10	--	--	--	10	--	2	--	--
	Heifers	107	--	--	34	107	--	57	--	--
	Non- Formula Fed Veal	12	--	--	1	12	--	1	--	--
	Steers	97	--	--	36	97	--	45	--	--
Porcine	Feral Swine	--	--	--	--	--	--	16	16	--
	Market Swine	198	--	--	46	198	--	116	44	--
	Roaster Swine	--	--	67	--	--	--	--	--	--
	Sows	183	--	--	41	183	--	111	43	--
Poultry	Young Chickens	104	--	--	20	104	19	68	14	--
	Whole Chickens	92	--	--	--	92	92	92	2	--
	Young Turkeys	217	--	--	51	217	45	132	--	--
Other Species	Goats	69	--	--	--	69	--	19	--	--
	Lambs	21	--	--	--	21	--	9	--	--
	Mature Sheep	23	--	--	--	23	--	9	--	--
	Siluriformes (Catfish)	--	50	--	50	141	91	110	21	66
	Egg Products	--	--	--	--	29	--	26	--	--
	Annual Total	1,623	50	67	392	1,793	247	1074	140	66

[1] MRM: multiresidue method

[2] PFAS: polyfluoroalkyl substances

Table 3. FY 2022 Q1 Surveillance Sampling Residue Violations

List of FY 2022 surveillance sampling residue violations, including specific compound, concentration, tolerance, and regulatory citation by animal class is shown.

Animal Class	Tissue	Compound	Concentration	Units	Tolerance Level Value	Authority (CFR Citation)
Beef Cow	Liver	Salbutamol	*	*	*	Not Approved[1]
	Muscle	Salbutamol	*	*	*	Not Approved[1]
Dairy Cow	Muscle	Piperonyl Butoxide	0.116	ppm	0.10	40 CFR 180.127
Dairy Cow	Kidney	Desfuroylceftiofur	2.75	ppm	0.40	21 CFR 556.113
Roaster Swine	Liver	Carbadox	199	ppb	30	21 CFR 556.100
Siluriformes	Muscle	Lasalocid	*	*	*	Not Approved[1]
Siluriformes	Muscle	Metolachlor	*	*	*	Not Approved[1]

* Violative residue results were detected but not quantified.

[1]Not Approved: the residue detected is not approved for the animal class.

ppb – parts per billion (µg/kg)   ppm – parts per million (mg/kg)

CFR – Code of Federal Regulations

Inspector-Generated Sampling Plan

FSIS inspectors conduct inspector-generated sampling when they suspect that animals presented for slaughter may have violative levels of chemical residues. If an inspector suspects that there is misuse of drugs that cannot be detected by the KIS™ test, the samples are sent directly to the laboratory for appropriate analysis. These samples are reported under the Inspector-Generated program. If an inspector suspects that there is misuse of drugs that cannot be detected by the KIS™ test, the samples are sent directly to the laboratory for appropriate analysis. These samples are reported under the Collector-Generated program.

In FY 2022 Q1, of the 36,161 Kidney Inhibition Swab (KIS™) tests conducted on animals selected by FSIS (Table 4), 421 samples were submitted to FSIS field laboratories for further analysis. In total, 89 chemical residue violations were reported in 74 samples (Table 5). Due to multiple analyses per sample submitted, multiple residue violations may be found in the same sample. The predominant violative residues in the inspector-generated samples were ceftiofur (26) and penicillin (13) which account for 29% and 18% of total violative residues, respectively.

Table 4. Summary of FY 2022 Q1 Inspector-Generated Sampling (KIS^{TM}) Test and Confirmatory Tests

FY 2022 Q1 summary of KIS™ tests, number of in-plant screens with negative results, number of carcasses sent to FSIS laboratory for confirmation, and the number of carcasses (i.e., samples) with violations for each animal class.

Animal Category	Animal Class	KIS ™ Test			
		Total Number of In-plant Carcasses	Number of In-plant Negative Carcasses	Number of Samples Analyzed in FSIS Labs	Number of Samples with Confirmed Lab Violations
Bovine	Beef Cows	2,746	2,698	46	4
	Bob Veal	3,817	3,790	25	15
	Bulls	458	448	10	2
	Dairy Cows	21,154	20,865	287	46
	Formula-fed Veal	34	34	--	--
	Heavy Calves	44	43	1	1
	Heifers	829	817	10	1
	Non-Formula-fed Veal	43	41	2	2
	Steers	1,602	1,583	17	2
Porcine	Boar/Stag Swine	25	24	1	--
	Market Swine	3,246	3,232	12	--
	Roaster Swine	365	361	3	1
	Sows	1,423	1,418	5	--
Other Species	Goats	173	172	2	--
	Mature Sheep	92	92	--	--
	Lambs	90	90	--	--
	Annual Total	**36,141**	**35,708**	**421**	**74**

Table 5. FY 2022 Q1 Inspector-Generated Sampling Residue Violation Results by Chemical Residue and Animal Class
FY 2022 Q1 summary of chemical residue violations reported within the inspector-generated sampling.

Chemical Residue	Animal Class										
	Beef Cow	Bob Veal	Bulls	Dairy Cow	Heavy Calves	Heifer	Non-Formula-fed Veal	Steer	Roaster Swine	Goat	Annual Total
Ampicillin	--	--	--	4	--	--	--	--	--	--	4
Ciprofloxacin	--	1	--	1	--	1	--	--	--	--	3
Desethylene Ciprofloxacin	--	1	--	--	--	--	--	--	--	--	1
Desfuroylceftiofur	1	1	1	21	--	1	--	1	--	--	26
Enrofloxacin	--	1	--	--	--	--	--	--	--	--	1
Florfenicol	--	--	1	--	--	--	--	--	--	--	1
Flunixin	--	3	--	4	--	--	--	--	--	--	7
Gentamycin Sulfate	--	--	--	1	--	--	--	--	--	--	1
Ketoprofen	1	--	--	--	--	--	--	--	--	--	1
Meloxicam	1	--	--	2	--	--	--	--	--	--	3
Neomycin	--	4	--	--	--	--	2	--	--	--	6
Penicillin	--	1	--	10	1	--	--	--	1	--	13
Spectinomycin	--	--	--	--	--	--	--	--	--	1	1
Sulfadiazine	--	7	--	--	--	--	--	--	--	--	7
Sulfadimethoxine	--	--	--	3	--	--	--	--	--	--	3
Sulfadoxine	--	--	--	1	--	--	--	--	--	--	1
Sulfamethazine	--	--	--	4	--	--	--	1	--	--	5
Sulfamethoxazole	--	1	--	--	--	--	--	--	--	--	1
Sulfathiazole	--	1	--	--	--	--	--	--	--	--	1
Tetracycline	--	--	--	1	--	--	--	--	--	--	1
Tilmicosin	1	--	1	--	--	--	--	--	--	--	2
Annual Total	**4**	**21**	**3**	**52**	**1**	**2**	**2**	**2**	**1**	**1**	**89**

Table 6. Summary of FY 2022 Q1 Collected-Generated Sampling
FY 2022 Q1 summary of suspect animal samples sent directly to FSIS laboratory (collected-generated sampling) for appropriate analysis.

Animal Category	Animal Class	Total Samples	Number of Non-Detect Samples	Number of Non-Violative Positives Samples	Number of Violative Samples
Bovine	Beef Cow	2	2	--	--
	Bob Veal	1	--	1	--
	Bull	1	1	--	--
	Dairy Cow	5	5	--	--
	Heifer	2	2	--	--
	Steer	1	--	1	--
Porcine	Market Swine	1	1	--	--
Other Species	Lamb	9	--	--	--
Annual Total		**22**	**11**	**2**	**0**

In addition to the publication of the FY 2022 Sampling Summary NRP results, FSIS posts the details of each positive non-violative, and positive violative residue result associated with the NRP sampling program in a spreadsheet format on the FSIS website at:

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

This spreadsheet includes detailed information regarding samples collected and analyzed by FSIS under both the "scheduled" sampling and the "inspector-generated" sampling programs. Overall, these data indicate levels of metals in FSIS-regulated product, on average, are relatively low and are not likely to cause a human health concern. FSIS plans to update this spreadsheet on an ongoing basis so as to increase program transparency for all stakeholders. The spreadsheet includes the following data fields: sample collection and reviewed date, the project code, the animal class, tissue type, chemical residue name, concentration values, sample results (whether positive non-violative or positive violative), chemical concentration values (if any) and the CFR reference for each chemical listed.

Import Residue Sampling

Imported meat, poultry, and egg products are sampled through the point-of-entry Import Reinspection Sampling Plan. This verifies that foreign inspection systems in exporting countries are equivalent to U.S. standards. A total of 572 samples were analyzed under this program in FY 2022 Q1. During FY 2022 Q1, there were no violative import samples. The results are summarized in **Table 7**.

Table 7. Summary of FY 2022 Q1 Residue Sampling of Imported Products

FY 2022 Q1 import residue samples by inspection level and production type.

Product Name and Project Code	Analytical Method	Normal[1]		Annual Total
		Number of Samples Analyzed	Non-Violative Positives Samples	
Imported Fish Products-Eastern Laboratory IMPFISH_CH_E	Antifungal Dyes, Metals, MRM	143	--	**222**
Imported Fish Products-Western Laboratory IMPFISH_CH_W	Nitrofurans, Pesticides	144	--	**209**
Imported - Metals IMPMETALS	Metals	74	--	**132**
Imported - Pesticide IMPPESTICIDE	Pesticides	176	--	**162**
Imported Egg Products - Chemistry IMPRESEGG	Pesticides	9	--	**12**
Imported Processed Products - Residue Eastern Lab IMPRESPR_EL	Avermectins	11	--	**23**
Imported Processed Products - Residue Midwestern Lab IMPRESPR_MWL	Sulfonamides	15	--	**12**
Annual Total		**572**	**0**	**572**

/1/Increased is a level of reinspection above the normal level that is directed by a FSIS management decision. Under increased reinspection, FSIS may hold, on a case-by-case basis, lots of imported meat, poultry, or egg products pending receipt of a laboratory analysis. If FSIS does not place the product on hold, the importer of record is still required to hold product tested for adulterants by FSIS and is not to allow such product to enter commerce unless and until negative results are received. Intensified is a level of reinspection that is implemented automatically by the Public Health Information System (PHIS) when a Type of Inspection PHIS task is reported as "Fail." Under intensified reinspection, FSIS holds the sampled lot at the official import inspection establishment pending receipt of laboratory analysis. The sampled lot is not allowed to move off-site to be held. Intensified is a level of reinspection that is implemented automatically by the Public Health Information System (PHIS) when a Type of Inspection PHIS task is reported as "Fail." Under intensified reinspection, FSIS holds the sampled lot at the official import inspection establishment pending receipt of laboratory analysis. The sampled lot is not allowed to move off-site to be held.