USDA Food Safety and Inspection Service
Annual Sampling Summary Report
Fiscal Year 2023

U.S. Department of Agriculture
Food Safety and Inspection Service

Table of Contents

Introduction

The U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS) inspects meat, poultry, and egg products to ensure that the food produced is safe, wholesome, and properly labeled. Verification activities serve to protect the public from foodborne hazards. A key FSIS inspection verification activity is the sampling of product for microbiological contaminants or chemical residues.

Each new fiscal year (FY), FSIS develops its Annual Sampling Plan in alignment with the Agency's Strategic Plan goals, outcomes, objectives and measures, as well as the Agency's Annual Plan. The Annual Sampling Plan identifies changes planned to FSIS sampling programs and describes the Agency's overall strategy for directing its sampling resources. This report, the FY 2023 Annual Sampling Summary Report, summarizes the activities and provides an overview of results for the products the Agency sampled during FY 2023 (October 1, 2022 – September 30, 2023).

FSIS routinely evaluates sampling data, posts these data (including establishment-specific datasets) to the FSIS website, and shares data through quarterly letters directly with regulated establishments. These data include FSIS pathogen verification data, FSIS National Residue Program data, and import data. These data are used in a variety of ways, including monitoring the effectiveness of Hazard Analysis and Critical Control Points plans, informing Agency policymaking, estimating public health impact, and advising strategic and performance planning.

Summary of Sampling

Each sampling project has a unique description name and alphanumeric data system code; both are commonly used when discussing sampling projects and are included in this report. For microbiological analyses, FSIS analyzes sampling data and calculates either percent positive or prevalence. "Percent positive" is defined as the percentage of samples of a specific FSIS-regulated product where a specific pathogen is detected. "Prevalence" is defined as the estimated proportion, nationally, of a specific FSIS-regulated product with a specific pathogen. In FY 2023, microbiological sampling results include *Salmonella* isolates (the top three serotypes) that are associated with given FSIS-regulated products. Additionally, indicator organisms (Aerobic and Enterobacteriaceae) are summarized for applicable commodities in this report. More information on sampling definitions can be found on the FSIS website sampling results data dictionary.

This report separates sampling results into various sections: domestic microbiological sampling, domestic chemical residue sampling as conducted through the National Residue Program, import sampling, and all other sampling. FSIS continues to focus on its mission to protect public health and prevent foodborne illness in several different ways. Each section in the report below identifies any new sampling activities designed to further food safety and policy changes.

1. Domestic Microbiological Sampling

Raw Beef Products

FSIS collects raw beef samples from Federally inspected establishments and retail firms to verify that products are not adulterated and that establishments have systems in place to address pathogens. FSIS schedules sample collection monthly by randomly selecting establishments from the current population that produce eligible products (

Table 1) . The frequency of sampling at any establishment is based on the volume of eligible products (FSIS Directive 10,010.1). On February 1, 2023, the Agency expanded its routine verification testing for six Shiga toxin-producing *Escherichia coli* that are adulterants (non-O157 STEC; O26, O45, O103, O111, O121, or O145), in addition to the adulterant *Escherichia coli* (*E. coli*) O157:H7, to ground beef, bench trim, and other raw ground beef components in addition to raw beef manufacturing trimmings in official establishments (FRN FSIS-2010-0023). FSIS also began testing for these non-O157 STEC in ground beef samples that are collected at retail stores and collected imported raw beef products.

In FY 2023, changes in the Beef product sampling included:

- Expanding non-O157 STEC analysis to all raw beef products previously analyzed only for *E. coli* O157:H7,
- Discontinuing the beef manufactured trimmings cloth comparison study,
- Replacing the N60 excision sampling technique with the cloth sampling technique for routine verification sampling of domestic beef manufacturing trimmings and bench trim (FRN FSIS–2022–0019),
- Investigating options for enumeration of positive *Salmonella* samples, and
- Increasing allocations for exploratory beef carcass sampling (pre- and post-evisceration) samples due to additional establishment(s) operating under beef modernization waivers[1] .

Follow-up samples are a tool FSIS uses to verify whether the establishment has taken effective corrective action in response to an initial STEC positive detected through routine FSIS verification testing. FSIS collects raw beef follow-up samples in response to a STEC-positive finding from routine sampling. Raw beef follow-up samples (including samples collected from retail) are analyzed for all adulterant STEC and *Salmonella*. For ground beef product or bench trim samples that are positive for STEC, FSIS also collects follow-up samples from suppliers when suppliers provide source materials (**Table 4**).

For more information on source materials sampled, the sample project summary, sample method, and product sampled, see the FSIS Directive 10,010.1 Informational Dashboard and select the appropriate sample code for more information.

[1] Establishments currently participating in the *Salmonella* Initiative Program (SIP), a regulatory waiver program (https://www.fsis.usda.gov/sites/default/files/media_file/2022-06/SIP-waiver_table.pdf).

Table 1. FSIS' Raw Beef Verification Sampling

FSIS has five verification sampling codes and corresponding follow-up sampling codes.

Raw Beef Sampling Verification Code	Sample Project Description	Corresponding Follow-Up Sampling Code
MT43	Raw ground beef	MT53 or MT44[1]
MT60_C[2]	Beef manufacturing trimmings produced from cattle slaughtered onsite	MT53
MT64	Raw ground beef components other than trim, produced from cattle slaughtered onsite	MT53
MT65_C[2]	Bench trim produced from cattle not slaughtered onsite	MT52 or MT53
MT05	Raw ground beef in commerce	MT06

[1]FSIS also conducts MT44T_C follow-up sampling for positive samples not from FSIS verification sampling (e.g., traceback related to outbreaks).
[2]FSIS revised the project code to include "_C" in February 2023 for project which adopted the cloth sampling methodology.

Table 2. FY 2023 Summary of FSIS' Raw Beef Verification Sampling Programs

FY 2023 results for FSIS' five verification sampling codes for detecting *E. coli* O157:H7 and/or non-O157 STECs (including O26, O45, O103, O111, O121, and O145) and *Salmonella* (including the top 3 serotypes for each sampling project) in raw beef product samples.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Type of Calculation[2]	Prevalence or Percent Positive Calculation
Raw Ground Beef MT43	*E. coli* O157:H7	1,093	3,523	2	N/A	Prevalence	0.06%
	Salmonella spp.	1,292	11,147	108	Montevideo (19) 17.6% Muenchen (12) 11.1% Anatum (8) 7.41%	Prevalence	0.97%
	STEC[3]	1,241	7,624	21	N/A	Prevalence	0.28%
Beef Manufacturing Trim MT60_C[4]	*Salmonella* spp.	937	3,441	49	Dublin (7) 14.3% Montevideo (6) 12.2% Anatum (3) 6.12%	Prevalence	1.42%
	STEC	1,334	4,588	14	N/A	Prevalence	0.31%
Raw Ground Beef Components other than Trim MT64	*E. coli* O157:H7	62	443	1	N/A	Percent Positive	0.23%
	Salmonella spp.	116	1,314	62	Montevideo (12) 19.4% Anatum (10) 16.1% Muenchen (6) 9.68%	Percent Positive	4.72%
	STEC	111	871	6	N/A	Percent Positive	0.69%
Bench Trim MT65_C	*E. coli* O157:H7	269	477	0	N/A	Percent Positive	0.00%
	Salmonella spp.	699	1,408	8	Dublin (1) 12.5% Infantis (1) 12.5% Muenster (1) 12.5%	Percent Positive	0.57%
	STEC	430	931	6	N/A	Percent Positive	0.64%
Raw Ground Beef In-Commerce MT05	*E. coli* O157:H7	191	191	1	N/A	Percent Positive	0.52%
	Salmonella spp.	504	506	11	Montevideo (2) 18.2% Anatum (1) 9.1% Bareilly (1) 9.1%	Percent Positive	2.17%
	STEC	314	315	1	N/A	Percent Positive	0.32%

1 Percent of each serotype = (Number of isolates of the serotype/total number of *Salmonella* from the sampling project). The numerator is within parentheses.
2 Percent positive is 100*(the total number of positive samples divided by the total number of tested samples). Prevalence is a calculated percentage that takes into account establishment production volumes and the volume of contaminated product. See the sampling results data dictionary on the FSIS website for a detailed description of prevalence.
3 STEC (Shiga toxin-producing *Escherichia coli*) includes non-O157 STEC; O26, O45, O103, O111, O121, or O145.
4 FSIS revised the project code to include "_C" in February 2023 for the project, which adopted the cloth sampling methodology.
5 MT05 ground beef samples are collected from retail firms, not Federal establishments.

Table 3. FY 2023 Summary of FSIS' Beef Sanitary Indicator Organisms

FY 2023 results for FSIS' beef sanitary indicator organisms (Aerobic count MPN/ml) in raw beef product samples**.**

Product Name and Project Code	Number of Establishments Sampled	Number of Samples Analyzed	Number of Samples Detected	Mean Plate Count[1] (MPN/mL)	Percent Detection[2]
Beef Slaughter Waiver Sampling - Post-intervention/Pre-chill MT_PRECH	9	563	164	4.7×10^4	29.1%
Beef Slaughter Waiver Sampling - Pre-evisceration/Post-hide removal MT_PSTHR	9	564	553	3.9×10^4	98.0%

1 Mean of the results of every sample (greater than 10 MPN/ml) in countable range with +/- std).
2 Percent detection (% of samples greater than 10 MPN/ml detected over number of positive samples divided by the total number of tested samples).

Table 4. FY 2023 Summary of FSIS' Beef Follow-Up Sampling Programs

FY 2023 follow-up testing results in raw beef product samples in response to samples positive for either *E. coli* O157:H7 or non-O157 STEC in the verification sampling projects are shown.

Product Name and Project Code[1]	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Percent Positive Calculation
Raw Ground Beef MT44	*E. coli* O157:H7	2	27	0	0.00%
	Salmonella spp.	9	123	1	0.81%
	STEC	8	96	0	0.00%
Trim and Components MT52_C	*Salmonella* spp.	11	98	7	7.14%
	STEC	13	116	3	2.59%
MT44T_C	*Salmonella* spp.	1	16	0	0.00%
	STEC	2	16	0	0.00%
Beef Manufacturing Trim MT53_C	*Salmonella* spp.	44	469	16	3.41%
	STEC	64	613	4	0.65%

[1]No MT06 samples were collected in FY 2023.

Raw Pork Products

FSIS tests raw pork product samples for *Salmonella* and aerobic count indicator organisms. FSIS began sampling raw pork products in May 2015 (80 FR 3940) to test for pathogens of public health concern. FSIS collects samples from eligible establishments producing greater than 6,000 pounds of comminuted product and eligible establishments producing greater than 50,000 pounds per day of pork cuts, both intact and non-intact (**Table 5**). In FY 2023, no changes were made to pork product sampling for *Salmonella*. However, aerobic count testing was suspended in February 2023.

Table 5. FSIS' Raw Pork Sampling

FSIS has two raw pork sampling codes. FSIS does not conduct follow-up sampling for pork products.

Raw Pork Sampling Code	Sample Project Description
HC_PK_CUT01	Intact and Non-Intact Pork Cuts
HC_PK_COM01	Comminuted Pork

Table 6. FY 2023 Results for FSIS' Raw Pork Sampling Program

FY 2023 results for sampling in raw pork products to detect *Salmonella* are shown below.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Comminuted Pork HC_PK_COM01	*Salmonella* spp.	318	6,208	1,079	Anatum (129) 12.0% I 4,[5],12:i:- (96) 8.90% Infantis (78) 7.23%	17.4%
Intact and Non-Intact Pork Cuts HC_PK_CUT01	*Salmonella* spp.	106	2,347	170	I 4,[5],12:i:- (20) 11.8% Derby (17) 10.0% Infantis (17) 10.0%	7.24%

[1] Percent of each serotype = (Number of isolates of the serotype/total number of *Salmonella* from the sampling project). The numerator is within parentheses.

Table 7. FY 2023 Summary of FSIS' Raw Pork Indicator Organisms

FY 2023 results for FSIS' pork indicator organisms (Aerobic count MPN/g) in raw pork product samples**.**

Product Name and Project Code	Number of Establishments Sampled	Number of Samples Analyzed	Number of Samples Detected	Mean Plate Count[1] (MPN/g)	Percent Detection[2]
Comminuted Pork HC_PK_COM01	205	2, 031	2,031	1.4×10^4	100%
Intact and Non-Intact Pork Cuts HC_PK_CUT01	64	761	760	2.6×10^4	99.9%

1 Mean of the results of every sample (greater than 10 MPN/g) in countable range with +/- std).
2 Percent detection (% of samples greater than 10 MPN/g detected over number of positive samples divided by the total number of tested samples).

Raw Poultry Products

FSIS samples Federally inspected poultry establishments to verify whether eligible products meet applicable *Salmonella* performance standards (81 FR 7285).[2] Eligible products were scheduled for sampling 1 to 5 times per month throughout the year (based on the volume of product produced at establishments), thereby allowing FSIS to define a category[3] for each product, based on 10 to 60 sample results. All samples are tested for *Salmonella* and *Campylobacter* (**Table 8**). Other products (quarter or half chicken carcasses and mechanically separated chicken and turkey) were also sampled but at lower numbers per establishment (**Table 8**). These other products are under exploratory sampling and not under performance standards. In April and August 2022, issued new sampling instructions to the field (FSIS Notice 21-22, which was replaced by FSIS Notice 44-22). The notices added a new hot rehang sampling point to collect information on aerobic counts, *Salmonella* presence and enumeration for comparison with the existing post-chill sampling location.

[2] Product eligibility described at FSIS Establishment Eligibility Criteria for the Salmonella Verification Sampling Program and FSIS Scheduling Algorithm for the Salmonella Verification Sampling Program for Raw Meat and Poultry (usda.gov)
[3] Salmonella Verification Testing Program Monthly Posting | Food Safety and Inspection Service (usda.gov)

Table 8. FY 2023 Sampling Result Summary for FSIS' Raw Poultry Sampling Programs

FY 2023 sampling results for *Salmonella* and *Campylobacter* in raw poultry product samples are shown. Results do not include follow-up sample data.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Type of Calculation	Prevalence or Percent Positive Calculation
Chicken Whole Carcasses HC_CH_CARC01	*Salmonella* spp.	213	9,725	520	Kentucky (232) 44.6% Infantis (107) 20.6% Typhimurium (60) 11.5%	Prevalence	5.35%
	Campylobacter spp.	213	9,678	2,418	N/A	Prevalence	25.0%
Chicken Quarter or Half Carcasses EXP_CPT_QH01 [1]	*Salmonella* spp.	70	96	15	Kentucky (4) 26.7% Typhimurium (4) 26.7% Infantis (3) 20.0%	Percent Positive	15.6%
	Campylobacter spp.	69	95	46	N/A	Percent Positive	48.4%
Chicken Parts - Legs, Breasts, Wings HC_CPT_LBW01	*Salmonella* spp.	489	14,629	1,250	Infantis (398) 31.8% Kentucky (288) 23.0% Enteritidis (281) 22.5%	Prevalence	8.54%
	Campylobacter spp.	489	14,566	2,841	N/A	Prevalence	19.5%
Comminuted Chicken HC_CH_COM01	*Salmonella* spp.	73	1,869	530	Infantis (217) 40.9% Enteritidis (100) 18.9% Kentucky (87) 16.4%	Prevalence	28.4%
	Campylobacter spp.	73	1,856	144	N/A	Prevalence	7.76%
Mechanically Separated Chicken[2] EXP_CH_MSK01	*Salmonella* spp.	29	117	101	Infantis (62) 61.4% Kentucky (11) 10.9% Schwarzengrund (9) 8.91%	Percent Positive	86.3%
	Campylobacter spp.	29	117	77	N/A	Percent Positive	65.8%
Turkey Whole Carcasses HC_TU_CARC01	*Salmonella* spp.	43	1,564	5	Hadar (4) 80.0% Muenchen (1) 20%	Prevalence	0.32%
	Campylobacter spp.	43	1,562	10	N/A	Prevalence	0.64%

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Type of Calculation	Prevalence or Percent Positive Calculation
Comminuted Turkey HC_TU_COM01	*Salmonella spp.*	40	1,246	220	Hadar (48) 21.8% Infantis (25) 11.4% Agona (22) 10.0%	Prevalence	17.7%
	Campylobacter spp.	40	1,234	27	N/A	Prevalence	2.19%
Mechanically Separated Turkey[2]EXP_TU_ MSK01	*Salmonella spp.*	13	101	60	Schwarzengrund (11) 18.3% Uganda (10) 16.7% Agona (7) 11.7%	Percent Positive	59.4%
	Campylobacter spp.	13	101	24	N/A	Percent Positive	23.8%
Heavy Fowl Carcasses HC_HF_CARC01	*Salmonella spp.*	3	157	3	Enteritidis (2) 66.7% Hadar (1) 33.3%	Percent Positive	1.91%
	Campylobacter spp.	3	157	47	N/A	Percent Positive	29.9%
Exploratory Young Chicken Carcass Rehang Sampling[2] EX_CHCAR_RH1	*Salmonella spp.*	199	879	592	Kentucky (223) 37.7% Infantis (190) 32.1% Typhimurium (55) 9.30%	Percent Positive	67.4%

1 Percent of each serotype = (Number of isolates of the serotype/total number of *Salmonella* from the sampling project). The numerator is within parentheses.
2 Exploratory sampling projects.

Table 9. FY 2023 Summary of FSIS' Raw Poultry Sanitary Indicator Organisms

FY 2023 results for FSIS' poultry indicator organisms (Aerobic count MPN/ml) in raw poultry product samples**.**

Product Name and Project Code	Indicator	Number of Establishments Sampled	Number of Samples Analyzed	Number of Samples Detected	Mean Plate Count[1] (MPN/mL)	Percent Detection[2]
Chicken Whole Carcasses HC_CH_CARC01	Aerobic count	200	848	596	4.2×10^3	70.3%
	Enterobacteriaceae	200	836	155	1.1×10^3	18.5%
Exploratory Young Chicken Carcass Rehang Sampling EX_CHCAR_RH1	Aerobic count	199	833	832	9.4×10^4	99.9%
	Enterobacteriaceae	199	820	811	2.6×10^3	98.9%
Sampling for Ground and other Comminuted Chicken HC_CH_COM01	Aerobic count	66	1,101	1,099	2.9×10^5	99.8%
Follow-up sampling of Comminuted Chicken F_CH_COM01	Aerobic count	1	1	1	6.9×10^4	100%
Sampling for Chicken Parts HC_CPT_LBW01	Aerobic count	468	9,674	8,238	9.7×10^4	85.2%
Sampling for Ground and other Comminuted Turkey HC_TU_COM01	Aerobic count	39	618	616	3.1×10^5	99.7%

1 Mean of the results of every sample (greater than 10 MPN/ml) in countable range with +/- std).

2 Percent detection (% of samples greater than 10 MPN/ml detected over number of positive samples divided by the total number of tested samples).

Table 10. FY 2023 Follow-Up Sampling Result Summary for FSIS' Raw Poultry Sampling Programs

FY 2023 follow-up sampling results for *Salmonella* in raw poultry product samples are shown below. Follow-up sampling is assigned when an establishment does not meet a *Salmonella* performance standard (i.e., is in Category 3). FSIS *Salmonella* follow-up sampling results provide a snapshot of a specific establishment's performance based on intensified sample collection after the establishment implemented corrective actions, which can assist FSIS personnel during a Public Health Risk Evaluation or Food Safety Assessment. For this reason, the aggregated set of data reflects FSIS' efforts to collect follow-up samples but does not provide overall information about individual establishment performance.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Type of Calculation	Percent Positive Calculation
Chicken Whole Carcasses F_CH_CARC01	*Salmonella* spp.	30	425	71	Kentucky (39) 54.9% Infantis (12) 16.9% Typhimurium (7) 9.86%	Percent Positive	16.7%
Chicken Parts - Legs, Breasts, Wings F_CPT_LBW01	*Salmonella* spp.	67	1,063	187	Infantis (61) 32.6% Enteritidis (49) 26.2% Kentucky (35) 18.7%	Percent Positive	17.6%
Comminuted Chicken F_CH_COM01	*Salmonella* spp.	12	159	53	Infantis (23) 43.4% Kentucky (13) 24.5% Enteritidis (7) 13.2%	Percent Positive	33.3%
Turkey Whole Carcasses F_TU_CARC01	*Salmonella* spp.	1	4	0	N/A	Percent Positive	0.00%
Comminuted Turkey F_TU_COM01	*Salmonella* spp.	9	143	35	Hader (9) 25.7% Infantis (5) 14.3% Schwarzengrund (4) 11.4%	Percent Positive	24.5%

1 Percent of each serotype = (Number of isolates of the serotype/total number of *Salmonella* from the sampling project). The numerator is within parentheses.

Ready-to-Eat (RTE) Products

FSIS conducts microbiological testing of all RTE meat, poultry, and egg products for *Listeria monocytogenes* (*Lm)* and *Salmonella*, which are adulterants in these products. FSIS collects RTE product samples and environmental swab samples under various RTE sampling programs; see RTE Meat and Poultry Products Microbiological Sampling Programs.

Table 11. **FY 2023 Ready-to-Eat Product Sampling Results**

FY 2023 sampling results for FSIS RTE microbiological sampling programs are reported for *Listeria monocytogenes* (*Lm)* and *Salmonella*, if applicable.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Post-lethality exposed (PLE) and non-PLE products selected randomly RTEPROD_RAND	*Listeria monocytogenes (Lm)*	2,255	7,089	14	N/A	0.20%
	Salmonella spp.	2,255	7,086	2	Anatum (1) 50.0% I4,[5],12:i- (1) 50.0%	0.03%
PLE products selected by risk RTEPROD_RISK	*Listeria monocytogenes (Lm)*	1,739	7,916	14	N/A	0.18%
	Salmonella spp.	1,737	7,912	3	Anatum (1) 33.3% Muenster (1) 33.3% Uganda (1) 33.3%	0.04%
Intensified Verification Testing (IVT/for-cause) food contact surface samples INTCONT	*Listeria monocytogenes (Lm)*	41	874	16	N/A	1.83%
	Salmonella spp.	5	35	0	N/A	0.00%
IVT non-food contact environmental INTENV	*Listeria monocytogenes (Lm)*	41	445	24	N/A	5.39%
	Salmonella spp.	5	56	0	N/A	0.00%
IVT product INTPROD	*Listeria monocytogenes (Lm)*	41	415	6	N/A	1.45%

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top 3 *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
	Salmonella spp.	5	35	0	N/A	0.00%
Routine risk-based *Lm* (R*Lm*/risk-based) food contact surfaces RLMCONT	*Listeria monocytogenes (Lm)*	226	2,818	9	N/A	0.32%
R*Lm* non-food contact environmental (composite of 5-swabs) RLMENVC[2]	*Listeria monocytogenes (Lm)*	226	283	16	N/A	5.65%
R*Lm* product (composite of five 25-gram products from same lot) RLMPRODC	*Listeria monocytogenes (Lm)*	226	283	1	N/A	0.35%

1 Percent of each serotype = (Number of isolates of the serotype/total number of *Salmonella* from the sampling project). The numerator is within parentheses.

2 Includes two RLMENVR noncomposited brine samples that were negative.

Table 12. RTE Egg Products FY 2023 Sampling Results

FY 2023 microbiological sampling of liquid and dried pasteurized egg products tested for *Listeria monocytogenes* (*Lm)* and *Salmonella* are shown.

Product Name and Project Code	Pathogen	Number of Establishments with Samples Analyzed	Number of Samples Analyzed	Number Positive	Percent Positive Calculation
Egg Product Sampling - Dried Egg Products EGG_DY_MIC01	*Listeria monocytogenes (Lm)*	22	257	0	0.00%
	Salmonella spp.	22	257	0	0.00%
Egg Product Sampling - Liquid / Frozen Egg Products EGG_LQ_MIC01	*Listeria monocytogenes (Lm)*	48	1,232	1	0.08%
	Salmonella spp.	48	1,232	0	0.00%

2. Domestic Chemical Residue Sampling

National Residue Program

The U.S. National Residue Program (NRP) guides the sampling of domestic and imported meat, poultry, and egg product samples for chemical residue testing: see Residue Chemistry. Information about the sampling of imported product is below. The NRP includes surveillance sampling, inspector-generated sampling, and special project sampling in both Federal and State-inspected slaughter establishments.

In FY 2023, changes in the NRP include:

- Suspension of nitrofuran sampling and testing in domestic (whole chicken sampling) and imported poultry products,
- reduction of domestic Siluriformes sampling, and
- reduction of domestic young turkey sampling.

Additionally, per- and polyfluoroalkyl substances (PFAS) and metal residue datasets are being released quarterly. Datasets can be found by visiting the Chemical Residues and Contaminants page.

a. Surveillance Sampling Plan

Surveillance sampling is the scheduled sampling of specified slaughter subclasses at the time of slaughter after a carcass has passed antemortem inspection. In FY 2023, 8 analytical methods were used to screen for approximately 250 different veterinary drugs, pesticides, and environmental contaminants. In FY 2023, detected residue violations (30) consisted of the following residues: metolachlor (4), piperonyl butoxide (4), moxidectin (3), sulfamethazine (2), flunixin (2), and one instance each for acephate, carbadox, ciprofloxacin, florfenicol, gamithromycin, ivermectin, meloxicam, metronidazole, penicillin, prednisone, simazine, spectinomycin, sulfadimethoxine, sulfanilamide, and tildipirosin. In some cases, sample violations were associated with multiple residues in a single sample and multiple tissue types from a single animal.

Table 13. Summary of FY 2023 NRP Surveillance Sampling Residue Results

FY 2023 the summary of surveillance sampling results from FSIS inspector-collected muscle, kidney, and liver tissue from carcasses and parts is shown.

Animal Category	Animal Category	Number of Samples Analyzed by Animal Class			
		Total Samples	Number of Non-Detect Samples	Number of Non-Violative Positive Samples	Number of Violative Samples
Bovine	Beef Cows	886	877	5	4
	Bob Veal	391	373	10	8
	Dairy Cows	844	840	3	1
	Formula-Fed Veal	86	86	0	0
	Heifers	430	427	2	1
	Non-Formula-Fed Veal	57	57	0	0
	Steers	451	447	4	0
Porcine	Feral Swine	77	77	0	0
	Market Swine	907	901	5	1
	Roaster Swine	321	320	0	1
	Sows	846	840	5	1
Poultry	Young Chickens	441	438	3	0
	Young Turkeys	351	348	3	0
Other Species	Goats	301	298	0	3
	Lambs	93	92	0	1
	Mature Sheep	102	102	0	0
	Siluriformes (Catfish)	481	473	1	7
	Egg Products	189	186	3	0
Annual Total		**7,254**	**7,182**	**44**	**28**

Table 14. FY 2023 Number Collected NRP Surveillance Sampling Residues by Chemical Method

FY 2023 the number of 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	884	--	--	190	886	--	652	--	--
	Bob Veal	389	--	--	130	391	--	327	--	--
	Dairy Cows	843	--	--	169	844	--	608	--	--
	Formula-Fed Veal	86	--	--	1	86	--	41	--	--
	Heifers	429	--	--	139	430	--	328	--	--
	Non- Formula Fed Veal	57	--	--	--	57	--	18	--	--
	Steers	451	--	--	142	451	--	328	--	--
Porcine	Feral Swine	--	--	--	--	--	--	77	74	--
	Market Swine	905	--	--	188	906	--	695	194	--
	Roaster Swine	--	--	321	--	--	--	--	--	--
	Sows	844	--	--	150	845	--	650	199	--
Poultry	Young Chickens	440	--	--	188	441	5	253	245	--
	Young Turkeys	351	--	--	107	351	6	216	1	--
Other Species	Goats	300	--	--	--	301	--	75	--	--
	Lambs	93	--	--	--	93	--	78	--	--
	Mature Sheep	102	--	--	--	102	--	71	--	--
	Siluriformes (Catfish)	--	410	--	409	481	69	312	109	3
	Egg Products	--	--	--	--	185	--	177	--	--
Annual Total		**6,174**	**410**	**321**	**1,813**	**6,850**	**80**	**4,906**	**822**	**3**

[1] MRM: multiresidue method

[2] PFAS: polyfluoroalkyl substances.

Table 15. Summary FY 2023 Surveillance Sampling Residue Violations by Animal Class

List of FY 2023 surveillance sampling residue violations, including specific compound, concentration, tolerance, and regulatory citation by animal class is shown.

Animal Category	Tissue	Compound	Concentration	Units	Tolerance Level Value	Authority[1] (CFR Citation)
Beef Cow	Liver	Sulfamethazine	0.465	PPM	0.100	21 CFR 556.670
Beef Cow	Liver	Sulfamethazine	11.0	PPM	0.100	21 CFR 556.670
	Muscle	Sulfanilamide	*	PPM	0.050	40 CFR 180.360
Beef Cow	Liver	Florfenicol	5.63	PPM	3.70	21 CFR 556.283
	Muscle	Florfenicol	1.33	PPM	0.30	21 CFR 556.283
Beef Cow	Muscle	Piperonyl Butoxide	0.116	PPM	0.100	40 CFR 180.127
Bob Veal	Kidney	Spectinomycin	*	*	*	21 CFR 556.600
Bob Veal	Kidney	Penicillin	1.22	PPM	0.05	21 CFR 556.510
	Muscle	Penicillin	0.061	PPM	0,05	21 CFR 556.510
Bob Veal	Muscle	Gamithromycin	*	*	*	21 CFR 556.292
Bob Veal	Muscle	Prednisone	*	*	*	Not Approved[1]
Bob Veal	Muscle	Tildipirosin	*	*	*	21 CFR 556.733
Bob Veal	Muscle	Flunixin	*	*	*	21 CFR 556.286
Bob Veal	Muscle	Meloxicam	*	*	*	Not Approved[1]
Bob Veal	Muscle	Flunixin	*	*	*	21 CFR 556.733
Dairy Cow	Liver	Sulfadimethoxine	0.224	PPM	0.100	21 CFR 556.640
Goat	Muscle	Piperonyl Butoxide	0.228	PPM	0.100	40 CFR 180.127
Goat	Muscle	Moxidectin	*	*	*	21 CFR 556.426
Goat	Muscle	Ivermectin; Moxidectin	*	*	*	21 CFR 556.426
Heifer	Muscle	Piperonyl Butoxide	0.481	PPM	0.100	40 CFR 180.127
Lamb	Muscle	Moxidectin	110	PPB	50.0	21 CFR 556.426
Market Swine	Muscle	Piperonyl Butoxide	0.168	PPM	0.100	40 CFR 180.127
Roaster Swine	Liver	Carbadox	64.7	PPB	30.0	21 CFR 556.570
Siluriformes	Muscle	Metronidazole	*	*	*	Not Approved[1]
Siluriformes	Muscle	Metolachlor	*	*	*	40 CFR 180.368

Animal Category	Tissue	Compound	Concentration	Units	Tolerance Level Value	Authority[1] (CFR Citation)
Siluriformes	Muscle	Metolachlor	*	*	*	40 CFR 180.368
Siluriformes	Muscle	Acephate	*	*	*	40 CFR 180.108
Siluriformes	Muscle	Metolachlor	*	*	*	40 CFR 180.368
Siluriformes	Muscle	Metolachlor	*	*	*	40 CFR 180.368
Siluriformes	Muscle	Simazine	0.0134	PPM	*	40 CFR 180.213
Sow	Muscle	Ciprofloxacin	*	*	*	Not Approved[1]

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

[1] Reference to either Title 21 (veterinary drugs) or Title 40 (pesticides) of the Code of Federal Regulations (CFR). In cases, where the residue detected is not approved for the animal class, the violations is listed as "Not Approved"

PPB – parts per billion (µg/kg)

PPM – parts per million (mg/kg)

CFR – Code of Federal Regulations

b. Inspector-Generated Sampling Plan

FSIS inspectors collect samples for residue testing 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 Kidney Inhibition Swab (KIS™) test in livestock, the samples are sent directly to the laboratory for analysis. KIS tests are not performed in poultry, exotic animals slaughtered under voluntary inspection, or Siluriformes fish per FSIS Directive 10,800.2. If an inspector suspects the misuse of a drug in these slaughter classes, samples are sent directly to the laboratory for analysis. These samples are reported under the inspector-generated program (FSIS Directive 10,800.1).

In FY 2023, 115,853 Kidney Inhibition Swab (KIS™) tests were conducted on animals selected by FSIS (Table 16). Of these, 1,972 samples were submitted to FSIS field laboratories for further analysis, and 383 chemical residue violations were reported from 306 samples (multiple residue violations may be found in the same sample).

- Inspectors performed 100,444 in-plant KIS™ tests in bovine slaughter classes (beef cows, bob veal, bulls, dairy cows, formula-fed and non-formula-fed veal, and steers), resulting in 302 violative samples (0.3%).

- Dairy cows and bob veal account for 78% of the in-plant KIS™ test and 72% of the violations reported under the inspector-generated sampling plan.

- Desfuroylceftiofur (the primary metabolite of ceftiofur) and penicillin accounted for 48% and 16% of the violations reported in 190 dairy cows, respectively.

- Of the 46 bob veal violations, 50% of the violations were associated with neomycin.

- Inspectors performed 13,811 in-plant KIS™ tests in swine slaughter classes (market swine, sows, roaster swine, boar swine, and feral swine), resulting in four violative samples (0.03%).

- The predominant violative residues in the inspector-generated samples were ceftiofur (n=115), penicillin (44), and flunixin (41), which account for 30%, 11%, and 11% of total violative residues, respectively.

Table 16. Summary of FY 2023 Inspector-Generated Sampling (KIS™) Test and Confirmatory Tests

FY 2023 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	10,173	9,969	204	39
	Bison	4	4	0	0
	Bob Veal	9,428	9,324	104	46
	Buffalo	1	1	0	0
	Bulls	1,382	1,330	52	7
	Dairy Cows	68,771	67,603	1,168	170
	Formula-fed Veal	65	59	6	0
	Heavy Calves	150	146	4	1
	Heifers	3,374	3,275	99	9
	Non-Formula-fed Veal	488	448	40	15
	Steers	6,608	6,403	205	15
	Yak	1	1	0	0
Porcine	Boar/Stag Swine	63	63	0	0
	Market Swine	9,001	8,945	56	0
	Roaster Swine	1,435	1,430	5	1
	Sows	3,312	3,295	17	3
Other Species	Goats[1]	282	280	2	0
	Lambs	915	905	10	0
	Mature Sheep	400	400	0	0
Annual Total		**115,853**	**113,881**	**1,972**	**306**

[1] Includes both young and adult goats

Table 17. Summary of FY 2023 Inspector-Generated Sampling Residue Violation Results by Chemical Residue and Animal Class

FY 2023 summary of chemical residue violations reported within the inspector-generated sampling.

Chemical Residue	Animal Class											
	Beef Cows	Bob Veal	Bull/Stag	Dairy Cows	Heavy Calves	Heifers	Non-Formula-fed Veal	Market Swine	Roaster Swine	Sows	Steers	Total
Ampicillin	--	1	--	14	--	--	--	--	--	--	--	**15**
Ciprofloxacin	--	7	--	--	--	--	--	--	--	1	1	**9**
Desethylene Ciprofloxacin	--	1	--	--	--	--	--	--	--	--	--	**1**
Desfuroylceftiofur	10	1	1	91	--	4	--	--	--	1	7	**115**
Dihydrostreptomycin	--	--	--	1	--	--	--	--	--	--	--	**1**
Dimetridazole	1	--	--	--	--	--	--	--	--	--	--	**1**
Doramectin	5	--	--	--	--	--	--	--	--	--	--	**5**
Doxycycline	--	--	--	1	--	--	--	--	--	--	--	**1**
Enrofloxacin	--	5	--	--	--	--	--	--	--	--	--	**5**
Eprinomectin	--	1	--	--	--	--	--	1	--	--	--	**2**
Florfenicol	2	3	1	1	1	3	2	--	--	--	--	**13**
Florfenicol Amine	--	4	--	--	--	--	--	--	--	--	--	**4**
Flunixin	6	9	2	18	--		1		--	2	3	**41**
Gentamycin Sulfate	1	1	--	3	--	1	--	1	--	--	--	**7**
Meloxicam	--	--	--	4	--	--	--	--	--	--	1	**5**
Neomycin	--	23	--	--	--	--	--	--	--	--	--	**23**
Oxytetracycline	5	1	--	1	--	1	--	--	--	--	--	**8**
Penicillin	5	2	1	31	--	--	--	--	1	1	3	**44**
Phenylbutazone	--	--	1	--	--	--	--	--	--	--	--	**1**
Spectinomycin	--	6	--	--	--	--	--	--	--	--	--	**6**
Sulfadimethoxine	1	2	--	20	--	--	--	--	--	--	--	**23**
Sulfamethazine	3	4	2	4	1	--	--	--	--	--	--	**14**
Sulfamethoxazole	--	5	--	--	--	--	--	--	--	--	--	**5**

Chemical Residue	Animal Class											
	Beef Cows	**Bob Veal**	**Bull/Stag**	**Dairy Cows**	**Heavy Calves**	**Heifers**	**Non-Formula-fed Veal**	**Market Swine**	**Roaster Swine**	**Sows**	**Steers**	**Total**
Sulfathiazole	--	2	--	--	--	--	--	--	--	--	--	**2**
Tildipirosin	--	2	--	--	--	--	--	--	--	--	--	**2**
Tilmicosin	7	--	3	1	--	2	12	--	--	--	2	**27**
Tylosin	1	1	--	--	--	--	1	--	--	--	--	**3**
Annual Total	**47**	**81**	**11**	**190**	**2**	**11**	**16**	**2**	**1**	**5**	**17**	**383**

Table 18. Summary of FY 2023 Inspector-Generated Sampling

FY 2023 summary of suspect animal samples sent directly to any FSIS laboratory (inspector-generated sampling) for analysis.

Animal Category	Animal Class	Total Samples	Number of Non-Detect Samples	Number of Non-Violative Positives Samples	Number of Violative Samples
Bovine	Beef Cows	29	23	5	1
	Bob Veal	1	1	0	0
	Bull/Stag	9	9	0	0
	Dairy Cows	30	29	0	1
	Formula-fed Veal	1	0	1	0
	Heavy Calves	1	1	0	0
	Heifers	30	27	3	0
	Non-Formula-Fed Veal	1	1	0	0
	Steers	315	301	11	3
Porcine	Boar/Stag Swine	1	1	0	0
	Market Swine	228	217	10	1
	Roaster Swine	1	1	0	0
	Sow	1	1	0	0
Poultry	Young Chickens	1	1	0	0
Other Species	Goats	12	12	0	0
	Lamb	51	49	0	2
	Mature Sheep	4	3	1	0
Annual Total		**716**	**677**	**31**	**8**

3. Import Sampling

a. Import Microbiological Sampling

FSIS conducts point-of-entry reinspection of imported meat, poultry, and egg products. This activity is a reinspection of products that have already been inspected and passed by an equivalent foreign inspection system. Thus, imported product reinspection is a means of verifying the equivalence of a foreign country's inspection system on an ongoing basis.

On February 1, 2023, the Agency expanded its routine verification testing for six Shiga toxin-producing *Escherichia coli* (STEC) that are adulterants (non-O157 STEC; O26, O45, O103, O111, O121, or O145), in addition to the adulterant *Escherichia coli* (*E. coli*) O157:H7, to ground beef, bench trim, and other raw ground beef components in addition to raw beef manufacturing trimmings in official establishments (FRN FSIS-2010-0023). FSIS also began testing for these non-O157 STEC in applicable samples it collects of imported raw beef products.

In FY 2023, changes in import product sampling include:

- Expand non-O157 STEC analysis to all raw beef products previously analyzed only for *E. coli* O157:H7,
- Discontinue imported Siluriformes microbiological sampling,
- Suspend nitrofuran sampling and testing in imported poultry products, and
- Realign imported Siluriformes chemical residue sampling.

Table 19. Summary of FY 2023 Microbiology Sampling of Imported Products

FY 2023 microbiological sampling results for imported products by inspection level. The values shown here summarize results over all countries and do not reflect the percent positive for individual countries. Additionally, no direct comparisons should be made to domestic sampling because sampling for imported product varies based on the volume of shipments received by country and product.

Product Name and Project Code	Pathogen	Normal		Increased[1]		Intensified[2]		Annual Total
		Number of Samples Analyzed	Number Positive	Number of Samples Analyzed	Number Positive	Number of Samples Analyzed	Number Positive	
Imported Raw Beef Manufactured Trimmings or Components for use in Ground Beef or Beef Products MT51	*E. coli* O157:H7[3]	274	--	1	--	3	--	278
	STEC[3]	1,009	1	2	--	21	--	1,032
	Salmonella spp.	1,029	3	2	--	21	2	1,052
Imported Raw Ground or Comminuted Beef or Veal Product MT08	*E. coli* O157:H7[3]	18	--	--	--	--	--	18
	STEC[3]	36	--	--	--	--	--	36
	Salmonella spp.	54	--	--	--	--	--	54
Micro Pathogen Sampling of RTE Products IMVRTE	*Listeria monocytogenes*	2,643	3	7	--	154	1	2,804
	Salmonella spp.	2,642	2	7	--	154	1	2,803
Imported Egg Products EGGIMP	*Listeria monocytogenes*	90	--	10	--	--	--	100
	Salmonella spp.	90	--	10	--	--	--	100
Imported Raw and NRTE Poultry Products IMP_Poultry	*Salmonella* spp.	655	147	--	--	--	--	655
	Campylobacter	649	95	--	--	--	--	649
Imported Raw Pork Product IMP_Pork	*Salmonella* spp.	331	3	--	--	--	--	331

[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 or control product tested for adulterants by FSIS and is not to allow such product to enter commerce unless and until negative results are received.

[2]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.

[3]Starting February 1, 2023 all imported raw beef products are analyzed for all seven adulterant STEC serogroups, therefore reporting of Shiga Toxin-Producing *E. coli* and non-O157 STEC are combined as STEC see FRN FSIS-2010-0023.

b. Import Residue Sampling

Imported meat, poultry, and egg products are sampled through the point-of-entry Import Reinspection Sampling Plan, a chemical residue monitoring program that is conducted to verify whether foreign inspection systems in exporting countries are equivalent to U.S. standards. There were no import residue sampling violations during FY2023.

Table 20. Summary of FY 2023 Residue Sampling of Imported Products

Project Code	Analyte	Normal			Increased[1]	Intensified[2]			Annual Total
		Number of Samples Analyzed	Non-Violative Positives Samples	Violative Samples	Number of Samples Analyzed	Number of Samples Analyzed	Non-Violative Positives Samples	Violative Samples	
Imported Siluriformes Fish Products IMPFISH_CH[3]	Antifungal Dyes, Metals, MRM, Nitrofurans, Pesticides	142	--	--	--	--	--	--	**142**
Imported - Metals IMPMETALS	Metals	262	--	--	--	--	--	--	**262**
Nitrofurans IMPNITROFUR[4]	Nitrofurans	1	--	--	--	--	--	--	**1**
Imported - Pesticide IMPPESTICIDE	Pesticides	509	--	--	--	5	--	--	**514**
Imported Egg Products - Chemistry IMPRESEGG	Pesticides	37	--	--	10	--	--	--	**47**
Imported Fresh Products IMPRESFRESH	Aminoglycosides, MRM	775	2	--	1	--	--	--	**776**
Imported Processed Products	Avermectins	22	--	--	--	--	--	--	**22**

Project Code	Analyte	Normal			Increased[1]	Intensified[2]			Annual Total
		Number of Samples Analyzed	Non-Violative Positives Samples	Violative Samples	Number of Samples Analyzed	Number of Samples Analyzed	Non-Violative Positives Samples	Violative Samples	
- Residue Eastern Lab IMPRESPR_EL									
Imported Processed Products - Residue Midwestern Lab IMPRESPR_MWL	Sulfonamides	33	--	--	--	--	--	--	**33**
	Annual Total	**1,781**	**2**	**0**	**11**	**5**	**0**	**0**	**1,797**

[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. During FY 2023, there were no violative samples and no non-violative samples at increased level of inspection.

[2]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.

[3]As of October 1, 2022, IMPFISH_CH replaces IMPFISH_CH_E and IMPFISH_CH_W sampling projects.

[4]IMPNITROFUR is discontinued per FSIS Notice 64-22: Suspension of Young Chicken Carcass Sampling and Raw Poultry Products Testing for Nitrofuran Residues.

MRM: multiresidue method

4. Whole Genome Sequencing (WGS) Initiatives

WGS-related projects align with the goals and objectives of the FSIS Strategic Plan and other policies. FSIS engages with Federal partners to establish, advance, and apply whole genome sequencing (WGS) data to ensure and strengthen regulatory functions. FSIS laboratories perform WGS on all positive sample isolates for all pathogens from FSIS-regulated products. In FY 2023, this amounted to 16,193 bacterial isolate sequences uploaded to the National Center for Biotechnology Information (NCBI). To enhance transparency and use of the data, FSIS updated its publicly available establishment-specific datasets to include the FSIS number and date-stamped allele codes (FSIS Constituent Update, May 20, 2022). The FSIS Number provides a way to link FSIS sequence metadata to already publicly available sequence data on NCBI, and the allele codes provide a discrete reportable result to compare FSIS isolates to each other.

5. National Antimicrobial Resistance Monitoring System (NARMS)

The National Antimicrobial Resistance Monitoring System (NARMS) is an interagency collaborative partnership with State and local public health departments, the U.S. Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), and the U.S. Department of Agriculture (USDA). This national public health surveillance system tracks changes in antimicrobial susceptibility of select foodborne enteric bacteria found in ill people (CDC), retail meats (FDA), and food animals (USDA FSIS). The NARMS program at FSIS historically focused on two sampling points: samples collected from intestinal (cecal) content; and carcass, food commodity or product samples. Antimicrobial Susceptibility Tests (AST) are routinely conducted on all NARMS isolates, and WGS is conducted on a selected number of isolates. AST information provides phenotypic resistance information, determined using epidemiological cut-off values or clinical breakpoints to interpret data. WGS information provides genotypic resistance information, which is the presence of acquired genes and mutations known to enable a bacterium to grow in the presence of higher antimicrobial concentrations. These data may be accessed at the FDA NARMS Integrated Data Dashboards.

In FY 2023, changes in the NARMS Sampling plan includes:

- Suspension of NARMS veal [Bob Veal, Formula-Fed Veal, and Non-Formula-Fed Veal] expansion sampling based on data (480 samples),
- Suspension of NARMS sheep expansion sampling based on data (100 samples),
- Suspension of NARMS lamb expansion sampling based on data (100 samples), and
- Suspension of NARMS goat expansion sampling based on data (100 samples).

Table 21. Summary of FY 2023 NARMS Sampling Program

FY 2023 NARMS samples analyzed, isolates recovered, and further characterized.

Sampling Code	Samples Scheduled	Samples Analyzed	Total Isolates Retrieved	Isolates Characterized			
				Salmonella	***Campylobacter***	***E. coli***	***Enterococcus***
Cecal Sampling							
NARMS_BC Beef Cows	456	204	248	AST: 38	AST: 58	AST: 72	AST: 79
				WGS: 37	WGS: 58	WGS: 38	WGS: 16
NARMS_DC Dairy Cow	980	663	795	AST: 198	AST: 209	AST: 208	AST: 194
				WGS: 193	WGS: 202	WGS: 102	WGS: 36
NARMS_HF Heifer	456	296	349	AST: 49	AST: 83	AST: 87	AST: 87
				WGS: 49	WGS: 80	WGS: 53	WGS: 9
NARMS_ST Steer	1,368	347	369	AST: 118	AST: 169	AST: 55	AST: 53
				WGS: 113	WGS: 160	WGS: 28	WGS: 8
NARMS_MS Market Swine	860	568	715	AST: 217	AST: 133	AST: 220	AST: 196
				WGS: 214	WGS: 125	WGS: 151	WGS: 65
NARMS_SW Sow	410	405	692	AST: 218	AST: 63	AST: 207	AST: 192
				WGS: 212	WGS: 61	WGS: 139	WGS: 69
NARMS_YC Young Chicken	690	572	933	AST: 244	AST: 250	AST: 224	AST: 224
				WGS: 232	WGS: 239	WGS: 141	WGS: 81
NARMS_YT Young Turkey	435	385	662	AST: 49	AST: 134	AST: 207	AST: 202
				WGS: 49	WGS: 126	WGS: 159	WGS: 88

[1]Siluriformes NARMS samples are sourced from the Siluriformes microbiology sampling project, EXP_FI_MIC01, and not scheduled independently. See Table 5 for more information.

6. Other Sampling

FSIS conducts other sampling programs and special projects in response to investigations or other rapidly evolving events to protect consumers and ensure food safety on an as-needed basis (Table 22). Flexibility within FSIS laboratories provides the Agency with the ability to adapt and rapidly respond to emerging issues. These projects may include for-cause and inspector-generated sampling, such as:

- advanced meat recovery (AMR) sampling to verify that industry is preventing beef spinal cord material from entering the food supply and being misrepresented as meat;
- animal species identification sampling to verify species claims of meat, poultry, and egg products;
- food chemistry sampling to identify economic fraud or other chemical residues;
- compliance testing to evaluate products in commerce that are suspected to be adulterated or misbranded;
- abnormal container testing when inspection program personnel observe an abnormal container being used for thermally processed products;
- sampling in support of foodborne disease outbreaks or natural disaster investigations; and

- pathology testing to identify diseases, parasites, and related conditions in response to in-plant public health veterinarian findings from meat and poultry carcasses and parts.

FSIS also conducts some routine sampling to verify that products are properly labeled.

Table 22. Summary of FY 2023 Other Sampling

Project Name and Project Code	Samples Collected
Advanced Meat Recovery Product AMR01	59
Investigative Sampling COMPLIAN	48
Label Verification of Antibiotic Free EXP_LV_ABX	211
Label Verification of Hormone Free EXP_LV_HORM	1
Label Verification of Sodium and Fat Content EXP_LV_NUTR	106
Label Verification of Soy Free EXP_LV_SOY	14
Abnormal Container ABNCONT	3
Import – Abnormal Container IMPABNCONT	3
Import – Advanced Meat Recovery Product – Beef IMPAMRBEEF	3
Import – Species Identification IMPSPECIESID	240
Foodborne Illness and Outbreak Sampling OUTBREAK	459
Pathology – Collector Generated PATHOLOGY	2,816

Conclusion

In FY 2023, FSIS conducted meat, poultry, and egg products sampling verification to ensure that the food produced was safe, wholesome, and properly labeled to protect the public from foodborne hazards. FSIS, being a science-based agency, utilizes data to guide decision-making and foster ongoing improvements in food safety processes. FSIS evaluates these sampling data and shares the data, including analyses, on the FSIS website. Data sharing and transparency are critical steps to ensure public awareness of the food safety measures implemented.