USDA Food Safety and Inspection Service
Annual Sampling Summary Report
Fiscal Year 2024

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 and 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. 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 2024 Annual Sampling Summary Report, summarizes the activities and provides an overview of results for the products the Agency sampled during FY 2024 (October 1, 2023 – September 30, 2024).

FSIS routinely evaluates sampling data, posts these data (including establishment-specific datasets) to the FSIS website. 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 percent positive, volume weighted 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. "Volume weighted percent positive" for a specific product-pathogen pair is calculated by combining the production volumes for establishments with their sampling results. "Prevalence" is defined as the estimated proportion, nationally, of a specific FSIS-regulated product with a specific pathogen. In FY 2024, microbiological sampling results include *Salmonella* isolates (the top three serotypes) that are associated with given FSIS-regulated products. Additionally, indicator organisms (Aerobic Count 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

Routine Raw Beef Verification Sampling

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 selecting establishments that produce greater than an average of 250,000 lbs. of eligible products per day and randomly selecting from the establishments that

produce less than or equal to an average of 250,000 lbs. of eligible products per day (**Table 1).** Samples at retail firms producing raw ground beef products are scheduled randomly or on case-by-case basis as part of compliance investigations. The frequency of sampling at any establishment is based on the volume of eligible products (FSIS Directive 10,010.1). Raw beef samples from establishments and imported products and ground beef samples from retail stores, are analyzed for seven adulterant Shiga toxin-producing *Escherichia coli* (STEC) (O157:H7, O26, O45, O103, O111, O121, or O145) and *Salmonella*. Henceforth, these seven adulterants are referred to as STEC.

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.

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_C or MT44[1]
MT60_C[2]	Beef manufacturing trimmings produced from cattle slaughtered onsite	MT53_C
MT64	Raw ground beef components other than trim, produced from cattle slaughtered onsite	MT53_C
MT65_C[2]	Bench trim produced from cattle not slaughtered onsite	MT52_C or MT53_C
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 projects which adopted the cloth sampling methodology.

Table 2. FY 2024 Summary of FSIS' Raw Beef Verification Sampling Programs

FY 2024 results for FSIS' five verification sampling codes for detecting STEC and *Salmonella* (including the top three serotypes for each sampling project) in raw beef product samples.

Product Name and Project Code	Pathogen	Number of Establishments or Retail Firms Sampled	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[1]	Type of Calculation[2]	Prevalence or Percent Positive Calculation
Raw Ground Beef MT43	*Salmonella* spp.	1316	11561	140	Montevideo (24) 17.1% Muenchen (15) 10.7% Anatum/Cerro (9) 6.4%	Prevalence	1.21%
	STEC[3]	1316	11563	27	N/A	Prevalence	0.23%
Beef Manufacturing Trim MT60_C[4]	*Salmonella* spp.	583	3301	62	Anatum (7) 11.3% Dublin (7) 11.3% Cerro/Montevideo/ Muenchen (5) 8.1%	Prevalence	1.88%
	STEC	583	3301	11	N/A	Prevalence	0.33%
Raw Ground Beef Components other than Trim MT64	*Salmonella* spp.	171	1574	69	Anatum (16) 23.2% Montevideo (15) 21.7% Cerro/Muenchen (5) 7.2%	Percent Positive	4.38%
	STEC	171	1574	9	N/A	Percent Positive	0.57%
Bench Trim MT65_C	*Salmonella* spp.	551	1421	3	Dublin (2) 66.7% Muenster (1) 33.3%	Percent Positive	0.21%
	STEC	551	1421	2	N/A	Percent Positive	0.14%
Raw Ground Beef In-Commerce MT05	*Salmonella* spp.	489	489	6	Infantis (2) 33.3% Anatum/I 4,[5],12:i:-/Johannesburg/Montevideo (1) 16.7%	Percent Positive	1.23%
	STEC	489	489	0	N/A	Percent Positive	0%

1 Percent of each serotype is defined by (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 O157, O26, O45, O103, O111, O121, and 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.

Follow-up Raw Beef Sampling

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 *Salmonella* and all adulterant STEC . For ground beef product or bench trim samples that are positive for STEC, FSIS also collects follow-up samples from suppliers if suppliers have provided source materials (**Table 3**).

Table 3. FY 2024 Summary of FSIS' Beef Follow-Up Sampling Programs

FY 2024 follow-up testing results in raw beef product samples in response to samples positive for at least one adulterant STEC serogroup in the verification sampling projects are shown.

Product Name and Project Code[1]	Pathogen	Number of Establishments or Retail Firms Sampled	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Raw Ground Beef MT44	*Salmonella* spp.	15	170	2	Montevideo (1) 50% Anatum (1) 50%	1.18%
	STEC	15	170	2	N/A	1.18%
MT06	*Salmonella* spp.	1	1	0	N/A	0%
	STEC	1	1	0	N/A	0%
Trim and Components MT52_C	*Salmonella* spp.	12	95	3	Anatum (1) 33.3% Saintpaul (1) 33.3% Brandenburg (1) 33.3%	3.16%
	STEC	12	95	5	N/A	5.26%
Beef Manufacturing Trim MT53_C	*Salmonella* spp.	53	575	26	Montevideo (4) 15.4% Anatum (3) 11.5% Muenster/ IIIb 61:k:1,5,(7)/ I 4,[5],12:i:- (2) 7.7%	4.52%
	STEC	53	575	5	N/A	0.87%

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

Exploratory Beef Slaughter Waiver Carcass Sampling (pre- and post- evisceration)

FSIS collects samples from beef carcasses pre- and post- evisceration *i.e.,* before and after pathogen reduction interventions are applied in establishments that have requested a regulatory waiver as part of the *Salmonella* Initiative Program (SIP). Waivers are generally related to the presentation of carcasses for inspection. Carcasses samples are analyzed for aerobic count (Table 4) and *Salmonella* (Table 5).

Table 4. FY 2024 Summary of Beef Sanitary Indicator Organisms (Aerobic Count) in FSIS' Exploratory Beef Slaughter Waiver Carcass Sampling Programs

FY 2024 results for beef sanitary indicator organisms (Aerobic count MPN/mL) in FSIS' exploratory beef slaughter waiver carcass (pre- and post-evisceration) samples**.**

Product Name and Project Code	Number of Establishments Sampled [1]	Number of Samples Analyzed	Number of Samples Detected	Mean Plate Count[2] (MPN/mL)	Percent Detection[3]
Beef Slaughter Waiver Sampling - Pre-evisceration/Post-hide removal MT_PSTHR	12	606	600	5.4×10^4	99.0%
Beef Slaughter Waiver Sampling - Post-intervention/Pre-chill MT_PRECH	12	606	226	3.8×10^4	37.2%

1 FSIS gathers this data from existing waivers and approved inspection activities. Exploratory beef carcass (pre- and post- evisceration) sampling programs began in November 2020.

2 Mean of the results of every sample (greater than 10 MPN/mL) in countable range with positive/negative standard deviation).

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

Table 5. FY 2024 Summary of *Salmonella* in FSIS' Exploratory Beef Slaughter Waiver Carcass Sampling Program

FY 2024 results for *Salmonella* (including the top three serotypes for each sampling project) in FSIS' exploratory beef slaughter waiver carcass (pre- and post- evisceration) samples.

Product Name and Project Code	Number of Establishments Sampled [1]	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[2]	Percent Positive Calculation
Beef Slaughter Waiver Sampling - Pre-evisceration/Post-hide removal MT_PSTHR	12	606	174	Anatum (39) 22% Cerro (28) 16% Montevideo (27) 16%	28.7%
Beef Slaughter Waiver Sampling - Post-intervention/Pre-chill MT_PRECH	12	606	2	Muenchen (1) 50% Muenster (1) 50%	0.33%

[1]FSIS gathers this data from existing waivers and approved inspection activities. Exploratory beef carcass (pre- and post- evisceration) sampling programs began in November 2020.

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

Raw Pork Products

FSIS tests raw pork product samples for *Salmonella*. FSIS began sampling raw pork products in May, 2015 (80 FR 3940) to test for pathogens of public health concern. FSIS collects monthly 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 6**). In FY 2024, FSIS reduced comminuted pork and pork cut sampling to collect at a minimum 10 samples/establishment/year (a reduction of 6,940 samples to comminuted pork and 1,910 samples for pork cuts), as 10/year is the number required to estimate prevalence. FSIS also randomly collects samples from establishments producing greater than 1,000 pounds but less than 6,000 pounds of comminuted product or less than 50,000 pounds of pork cuts product in order to monitor the *Salmonella* population of small establishments. The annual totals for the small and very small pork establishment sampling program are 176 samples for comminuted pork and 50 samples for pork cuts.

Table 3. 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 4. FY 2024 Results for FSIS' Raw Pork Sampling Program

FY 2024 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 three *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Comminuted Pork HC_PK_COM01	*Salmonella* spp.	248	1742	328	Anatum (50) 15.2% I 4,[5],12:i:- (49) 14.9% Infantis (34) 10.4%	18.8%
Intact and Non-Intact Pork Cuts HC_PK_CUT01	*Salmonella* spp.	84	525	42	I 4,[5],12:i:- (10) 23.8% Anatum/Infantis/London (4) 9.5%	8.0%

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

Raw Poultry Products

FSIS samples Federally inspected poultry establishments to verify whether eligible products meet applicable *Salmonella* performance standards (81 FR 7285).[1] Eligible products were scheduled for sampling one to five times per month throughout the year (based on the volume of product produced at establishments), thereby allowing FSIS to define a category[2] for each product, based on 10 to 60 sample results. All samples are tested for *Salmonella,* and the minimum samples needed to estimate prevalence are also analyzed for *Campylobacter* (**Table 8**).

In FY 2024, changes in the Poultry product sampling included:

- Suspended the exploratory young chicken carcass at rehang sampling (-800 samples; implemented Nov. 2022).
- Suspended exploratory sampling of mechanically separated turkey and chicken products (-300 samples; implemented Oct., 2023), FSIS has collected adequate data from these products for analysis.
- Suspended exploratory sampling of chicken halves and quarters (-120 samples; implemented Oct., 2023), FSIS has collected adequate data from these products for analysis.
- Decreased *Campylobacter* analysis in all poultry products to the minimum samples needed to estimate prevalence (- 13,600 tests; implemented Oct., 2023) while FSIS considers next steps for *Campylobacter* policy.
- Decreased sample scheduling for comminuted chicken and turkey products by 50 percent to align with the routine sampling assignments for carcasses and parts (-2,000 samples; implemented Jan., 2024).
- Reduced turkey carcass sampling to the minimum samples needed to categorize most establishments (-1,042 samples; implemented Oct., 2023).

[1] 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)

[2] Salmonella Verification Testing Program Monthly Posting | Food Safety and Inspection Service (usda.gov)

Table 5. FY 2024 Sampling Result Summary for FSIS' Raw Poultry Sampling Programs

FY 2024 sampling results for *Salmonella* and *Campylobacter* in raw poultry product samples are shown. Results do not include *Salmonella* follow-up sample data.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[1]	Type of Calculation	Prevalence or Percent Positive Calculation
Chicken Whole Carcasses HC_CH_CARC01	*Salmonella* spp.	211	9638	475	Kentucky (207) 43.6% Infantis (114) 24.0% Enteritidis (56) 11.8%	Prevalence	4.9%
	Campylobacter spp.	205	4578	1171	N/A	Prevalence	25.6%
Chicken Parts - Legs, Breasts, Wings HC_CPT_LBW01	*Salmonella* spp.	493	14737	1225	Infantis (409) 33.4% Enteritidis (308) 25.1% Kentucky (258) 21.1%	Prevalence	8.3%
	Campylobacter spp.	477	7206	1465	N/A	Prevalence	20.3%
Comminuted Chicken HC_CH_COM01	*Salmonella* spp.	74	1072	336	Infantis (129) 38.4% Enteritidis (82) 24.4% Kentucky (47) 14.0%	Prevalence	31.3%
	Campylobacter spp.	74	1064	78	N/A	Prevalence	7.3%
Turkey Whole Carcasses HC_TU_CARC01	*Salmonella* spp.	41	640	2	Hadar (1) 50.0% I 4,[5],12:i:- (1) 50.0%	Prevalence	0.3%
	Campylobacter spp.	41	640	5	N/A	Prevalence	0.8%
Comminuted Turkey HC_TU_COM01	*Salmonella spp.*	47	913	155	Hadar (26) 16.8% Agona (25) 16.1% Schwarzengrund (18) 11.6%	Prevalence	17.0%
	Campylobacter spp.	47	908	15	N/A	Prevalence	1.6%
Heavy Fowl Carcasses HC_HF_CARC01	*Salmonella spp.*	3	168	8	Enteritidis (6) 75.0% Hadar (2) 25.0%	Percent Positive	4.8%
	Campylobacter spp.	3	167	55	N/A	Percent Positive	32.9%

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

Table 6. FY 2024 Summary of FSIS' Raw Poultry Sanitary Indicator Organisms

FY 2024 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]
Sampling for Ground and other Comminuted Chicken HC_CH_COM01	Aerobic count	43	99	98	4.4×10^5	99.0%
Sampling for Chicken Parts HC_CPT_LBW01	Aerobic count	390	811	697	8.4×10^4	85.9%
Sampling for Ground and other Comminuted Turkey HC_TU_COM01	Aerobic count	33	68	67	2.7×10^3	98.5%

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 7. FY 2024 Summary of FSIS' Raw Poultry *Salmonella* Quantification

FY 2024 results for FSIS' poultry *Salmonella* Quantification (Aerobic count MPN/mL) in raw poultry product samples.

Product Name and Project Code	Pathogen	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	*Salmonella* Quantification	157	460	68	92	14.8%
Sampling for Chicken Parts HC_CPT_LBW01	*Salmonella* Quantification	380	1175	182	93	15.5%
Sampling for Ground and other Comminuted Chicken HC_CH_COM01	*Salmonella* Quantification	63	324	19	61	5.9%
Sampling for Ground and other Comminuted Turkey HC_TU_COM01	*Salmonella* Quantification	32	152	5	35	3.3%

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 8. FY 2024 Follow-Up Sampling Result Summary for FSIS' Raw Poultry Sampling Programs

FY 2024 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 three *Salmonella* serotypes per sampling project[1]	Type of Calculation	Percent Positive Calculation
Chicken Whole Carcasses F_CH_CARC01	*Salmonella* spp.	30	393	42	Kentucky (21) 50.0% Infantis (9) 21.4% Enteritidis (5) 11.9%	Percent Positive	10.7%
Chicken Parts - Legs, Breasts, Wings F_CPT_LBW01	*Salmonella* spp.	69	1109	155	Infantis (45) 29.0% Enteritidis (43) 27.7% Kentucky (41) 26.5%	Percent Positive	14.0%
Comminuted Chicken F_CH_COM01	*Salmonella* spp.	16	221	62	Infantis (25) 40.3% Enteritidis (16) 25.8% Kentucky (10) 16.1%	Percent Positive	28.1%
Turkey Whole Carcasses F_TU_CARC01	*Salmonella* spp.	1	28	2	Hadar (1) 50.0% Muenchen (1) 50.0%	Percent Positive	7.1%
Comminuted Turkey F_TU_COM01	*Salmonella* spp.	11	154	22	Hader (5) 22.7% Orion (4) 18.2% Schwarzengrund (3) 13.6%	Percent Positive	14.3%

[1] Percent of each serotype is (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 Microbiological Testing Program for RTE Meat and Poultry and Pasteurized Egg Products.

Table 9. FY 2024 RTE Sampling Results

FY 2024 sampling results for FSIS RTE microbiological sampling programs are reported for *Lm* and *Salmonella*, if applicable.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Post-lethality exposed (PLE) and non-PLE products selected randomly RTEPROD_RAND	*Listeria monocytogenes*	2183	3589	8	N/A	0.22%
	Salmonella spp.	2183	3589	1	Javiana (1) 100.0%	0.03%
PLE products selected by risk RTEPROD_RISK	*Listeria monocytogenes*	1700	8214	30	N/A	0.37%
	Salmonella spp.	1700	8213	5	Enteritidis/Infantis (2) 40.0% Kentucky (1) 20.0%	0.06%
Routine risk-based *Lm* (R*Lm*/risk-based) food contact surfaces RLMCONT	*Listeria monocytogenes*	210	2640	5	N/A	0.19%
R*Lm* non-food contact environmental (composite of 5-swabs) RLMENVC[2]	*Listeria monocytogenes*	211	266	10	N/A	3.76%
R*Lm* product (composite of five 25-gram products from same lot) RLMPRODC	*Listeria monocytogenes*	211	265	3	N/A	1.13%

1 Percent of each serotype is (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 10. FY 2024 RTE Follow up Sampling Results

FSIS may conduct intensified verification testing (IVT) in response to positive Lm or *Salmonella* results in a RTE meat or poultry product or other for-cause reason related to RTE meat or poultry production. IVT is a sampling protocol under which FSIS tests RTE meat or poultry product, food contact surfaces, and non-food contact surfaces in the RTE environment for *Lm* or *Salmonella*.

Product Name and Project Code	Pathogen	Number of Establishments Sampled	Number of Samples Analyzed	Number Positive	Top three *Salmonella* serotypes per sampling project[1]	Percent Positive Calculation
Intensified Verification Testing (IVT/for-cause) food contact surface samples INTCONT	*Listeria monocytogenes*	55	1048	25	N/A	2.39%
	Salmonella spp.	5	50	0	N/A	0%
IVT non-food contact environmental INTENV	*Listeria monocytogenes*	55	525	25	N/A	4.76%
	Salmonella spp.	5	80	0	N/A	0%
IVT product INTPROD	*Listeria monocytogenes*	55	506	18	N/A	3.56%
	Salmonella spp.	5	50	0	N/A	0%

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 11. RTE Egg Products FY 2024 Sampling Results

FY 2024 microbiological sampling of liquid and dried pasteurized egg products tested for *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*	17	202	0	0.00%
	Salmonella spp.	17	202	0	0.00%
Egg Product Sampling - Liquid / Frozen Egg Products EGG_LQ_MIC01	*Listeria monocytogenes*	45	792	1	0.13%
	Salmonella spp.	45	792	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 Chemical Residues and Contaminants. 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 2024, changes in the NRP included:

- Reduced the number of egg samples from 250 to 100 samples (a reduction of 150 samples) due to a low number of positive samples in recent years.
- Suspended per- and polyfluoroalkyl substances (PFAS) testing in domestic pork and poultry products, as products shown to have very few positive samples. By suspending analysis in those two product classes, FSIS laboratories were able to devote time and resources towards expanding the analytical method to detect additional PFAS of concern (a reduction of 875 analyses).
- Suspended carbadox sampling in roaster pigs, which have been shown to have very few positive samples (a reduction of 300 samples).

Additionally, 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 2024, eight analytical methods were used to screen for approximately 250 different veterinary drugs, pesticides, and environmental contaminants. In FY 2024, FSIS detected the following 32 residue violations: ciprofloxacin (three), florfenicol (three), flunixin (three), meloxicam (three), moxidectin (three), enrofloxacin (two),

eprinomectin (two), piperonyl butoxide (two), sulfadimethoxine (two), sulfamethazine (two), and one instance each for diclofenac, doramectin, lasalocid, neomycin, oxytetracycline, tilmicosin, and tulathromycin. In some cases, sample violations were associated with multiple residues in a single sample and multiple tissue types from a single animal.

Table 12. Summary of FY 2024 NRP Surveillance Sampling Residue Results

FY 2024 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	824	812	10	2
	Bob Veal	318	310	2	6
	Dairy Cows	842	833	7	2
	Formula-Fed Veal	84	84	0	0
	Heifers	450	438	10	2
	Non-Formula-Fed Veal	47	43	3	1
	Steers	441	429	11	1
Porcine	Feral Swine	68	68	0	0
	Market Swine	832	827	3	2
	Sows	713	711	2	0
Poultry	Young Chickens	418	412	5	1
	Young Turkeys	346	344	2	0
Other Species	Goats	312	305	1	6
	Lambs	97	93	4	0
	Mature Sheep	97	94	1	2
	Siluriformes (Catfish)	211	207	4	0
	Egg Products	88	87	1	0
Annual Total		**6,188**	**6,097**	**66**	**25**

Table 13. FY 2024 Number Collected NRP Surveillance Sampling Residues by Chemical Method

FY 2024 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	Metals	MEGA[1]	MRM[2]	Nitrofurans	Pesticides	PFAS[3]
Bovine	Beef Cows	824	0	133	2	822	0	624	68[4]
	Bob Veal	318	0	124	1	317	0	249	22[4]
	Bulls	0	0	0	0	0	0	0	11[4]
	Dairy Cows	842	0	126	0	842	0	589	439[4]
	Heavy Calves	0	0	0	0	0	0	0	5[4]
	Formula-Fed Veal	84	0	0	0	84	0	29	0
	Heifers	450	0	125	1	449	0	344	54[4]
	Non- Formula Fed Veal	46	0	1	0	47	0	14	0
	Steers	441	0	130	0	441	0	335	108[4]
Porcine	Feral Swine	1	0	0	1	1	0	68	7
	Market Swine	831	0	128	3	829	0	634	0
	Sows	713	0	122	4	709	0	561	0
Poultry	Young Chickens	417	0	171	1	417	0	326	0
	Young Turkeys	345	0	154	2	344	0	281	0
Other Species	Goats	312	0	0	1	311	0	13	0
	Lambs	97	0	0	1	96	0	72	0
	Mature Sheep	97	0	0	1	96	0	74	0
	Siluriformes (Catfish)	0	183	177	0	211	24	136	103
	Egg Products	0	0	0	1	77	0	88	0
Annual Total		**5,818**	**183**	**1,391**	**19**	**6,093**	**24**	**4,437**	**817**

[1] MEGA: multiresidue method

[2] MRM: multiresidue method

[3] PFAS: per- and polyfluoroalkyl substances

[4] Bovine samples analyzed for PFAS were collected as inspector-generated samples. However, these samples can be considered surveillance samples as there is no reason to believe that these inspector-generated samples are more or less likely to contain PFAS than a randomly collected sample.

Table 14. Summary FY 2024 Surveillance Sampling Residue Violations by Animal Class

List of FY 2024 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	Tilmicosin	5.92	ppm	1.2 ppm	21 CFR 556.735
Beef Cow	Liver	Sulfadimethoxine	0.312	ppm	0.1 ppm	21 CFR 556.640
	Muscle	Sulfadimethoxine	0.163	ppm	0.1 ppm	21 CFR 556.640
Bob Veal	Muscle	Meloxicam	*	*	*	Not Approved[1]
Bob Veal	Kidney	Neomycin	383	ppm	7.2 ppm	21 CFR 556.430
	Muscle	Meloxicam	*	*	*	Not Approved[1]
Bob Veal	Muscle	Ciprofloxacin	*	*	*	Not Approved[1]
	Muscle	Enrofloxacin	*	*	*	Not Approved[1]
Bob Veal	Muscle	Flunixin	*	*	0.025 ppm	21 CFR 556.286
Bob Veal	Muscle	Ciprofloxacin	*	*	*	Not Approved[1]
	Muscle	Enrofloxacin	*	*	*	Not Approved[1]
Bob Veal	Muscle	Meloxicam	*	*	*	Not Approved[1]
Dairy Cow	Liver	Flunixin	1.95	ppm	0.125 ppm	21 CFR 556.286
Dairy Cow	Liver	Flunixin	0.534	ppm	0.125 ppm	21 CFR 556.286
Heifer	Liver	Florfenicol	5.21	ppm	3.7 ppm	21 CFR 556.283
	Liver	Sulfamethazine	3.52	ppm	0.1 ppm	21 CFR 556.670
	Muscle	Sulfamethazine	3.96	ppm	0.1 ppm	21 CFR 556.670
Heifer	Muscle	Piperonyl Butoxide	0.259	ppm	0.1 ppm	40 CFR 180.127
Non Formula-fed Veal	Liver	Florfenicol	8.47	ppm	3.7 ppm	21 CFR 556.283
	Muscle	Florfenicol	0.84	ppm	0.3 ppm	21 CFR 556.283
Steer	Muscle	Piperonyl Butoxide	0.149	ppm	0.1 ppm	40 CFR 180.127
Market Swine	Muscle	Ciprofloxacin	*	*	*	Not Approved[1]
Market Swine	Muscle	Lasalocid	*	*	*	Not Approved[1]
Young Chicken	Muscle	Diclofenac	*	*	*	Not Approved[1]

Animal Category	Tissue	Compound	Concentration	Units	Tolerance Level Value	Authority[1] (CFR Citation)
Goat	Muscle	Moxidectin	*	*	*	Not Approved[1]
Goat	Muscle	Eprinomectin	*	*	*	Not Approved[1]
Goat	Muscle	Moxidectin	*	*	*	Not Approved[1]
Goat	Muscle	Moxidectin	*	*	*	Not Approved[1]
Goat	Muscle	Eprinomectin	*	*	*	Not Approved[1]
Goat	Muscle	Tulathromycin	*	*	*	Not Approved[1]
Mature Sheep	Muscle	Doramectin	*	*	*	Not Approved[1]
Mature Sheep	Kidney	Oxytetracycline	90.0	ppm	12 ppm	21 CFR 556.500

***** Violative residue results were detected but not quantified. For more information, please see the CLG1.

[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

In addition to the scheduled NRP samples, 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 2024, 104,154 Kidney Inhibition Swab (KIS™) tests were conducted on animals selected by FSIS (**Table 18**). Of these tests, 1,573 samples were submitted to FSIS field laboratories for further analysis, and 368 chemical residue violations were reported from 276 samples (multiple residue violations may be found in the same sample).

- Inspectors performed 91,948 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 272 violative samples (0.3%).

- Dairy cows, beef cows, and bob veal account for 78% of the in-plant KIS™ tests and 74% of the violations reported under the inspector-generated sampling plan.

- Desfuroylceftiofur (the primary metabolite of ceftiofur) and penicillin accounted for 38% and 17% of the violations reported in 172 dairy cows, respectively.

- Of the 35 bob veal violations, 34% of the violations were associated with neomycin.

- Inspectors performed 10,866 in-plant KIS™ tests in swine slaughter classes (market swine, sows, roaster swine, boar swine, and feral swine), resulting in zero violative samples.

- The predominant violative residues in the inspector-generated samples were ceftiofur (n=97), penicillin (52), and flunixin (38), which account for 26%, 14%, and 10% of total violative residues, respectively.

Table 15. Summary of FY 2024 Inspector-Generated Sampling (KIS™) Test and Confirmatory Tests

FY 2024 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 Laboratories	Number of Samples with Confirmed Laboratory Violations
Bovine	Beef Cows	9665	9418	192	31
	Bob Veal	6380	6315	51	35
	Bulls	1188	1124	45	4
	Dairy Cows	64850	63473	939	172
	Formula-fed Veal	63	62	1	0
	Heavy Calves	208	196	6	1
	Heifers	3599	3493	90	12
	Non-Formula-fed Veal	84	73	6	2
	Steers	5911	5711	161	15
Porcine	Boar/Stag Swine	55	53	1	0
	Feral Swine	1	1	0	0
	Market Swine	6766	6713	34	0
	Roaster Swine	1145	1143	2	0
	Sows	2899	2852	26	0
Other Species	Goats[1]	293	280	8	1
	Lambs	655	642	8	3
	Mature Sheep	392	389	3	0
Annual Total		**104,154**	**101,938**	**1,573**	**276**

[1] Includes both young and adult goats

Table 16. Summary of FY 2024 Inspector-Generated Sampling Residue Violation Results by Chemical Residue and Animal Class

FY 2024 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	Lambs	Non-Formula-Fed Veal	Steer	Young Goat	Total
Ampicillin	2	-	-	12	-	-	-	-	-	-	**14**
Butorphanol	-	-	-	1	-	-	-	-	-	-	**1**
Cefazolin	1	-	-	-	-	-	-	-	-	-	**1**
Ciprofloxacin	1	3	-	-	-	1	-	-	6	-	**11**
Desethylene Ciprofloxacin	-	2	-	-	-	-	-	-	-	-	**2**
Desfuroylceftiofur	5	2	-	78	1	5	-	-	6	-	**97**
Dihydrostreptomycin	-	-	-	2	-	-	-	-	-	-	**2**
Doramectin	-	-	-	-	-	-	-	-	2	-	**2**
Doxycycline	-	1	-	1	-	-	-	-	-	-	**2**
Enrofloxacin	-	2	-	-	-	-	1	-	-	-	**3**
Florfenicol	4	-	-	4	2	2	-	2	3	-	**17**
Flunixin	4	5	1	25	-	1	-	-	2	-	**38**
Gamithromycin	-	-	-	-	-	-	2	-	-	-	**2**
Gentamycin Sulfate	1	1	-	-	-	1	-	-	-	-	**3**
Meloxicam	1	-	1	10	-	-	-	-	-	-	**12**
Neomycin	-	21	-	2	-	-	-	-	-	-	**23**
Oxytetracycline	5	-	-	4	-	-	1	-	-	-	**10**
Penicillin	11	1	2	34	-	2	-	1	1	-	**52**
Spectinomycin	-	2	-	-	-	-	-	-	-	-	**2**
Sulfadiazine	-	3	-	-	-	-	-	-	-	-	**3**
Sulfadimethoxine	-	-	-	26	-	4	-	-	-	-	**30**
Sulfadoxine	-	-	-	1	-	-	-	-	-	-	**1**

Chemical Residue	Animal Class										
	Beef Cows	Bob Veal	Bull/Stag	Dairy Cows	Heavy Calves	Heifers	Lambs	Non-Formula-Fed Veal	Steer	Young Goat	Total
Sulfamethazine	6	-	-	4	-	2	-	-	-	-	**12**
Sulfamethoxazole	-	6	-	1	-	-	-	-	-	-	**7**
Sulfanilamide	-	1	-	-	-	-	-	-	-	-	**1**
Sulfathiazole	-	10	-	-	-	-	-	-	-	-	**10**
Tilmicosin	4	-	1	-	-	-	-	-	3	-	**8**
Tulathromycin	-	-	-	-	-	-	-	-	-	1	**1**
Tylosin	-	1	-	-	-	-	-	-	-	-	**1**
Annual Total	**45**	**61**	**5**	**205**	**3**	**18**	**4**	**3**	**23**	**1**	**368**

Table 17. Summary of FY 2024 Inspector-Generated Sampling

FY 2024 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	24	20	2	2
	Bob Veal	1	0	1	0
	Bull/Stag	2	2	0	0
	Dairy Cows	46	40	1	5
	Heifers	17	15	2	0
	Non-Formula-Fed Veal	1	1	0	0
	Steers	248	237	10	1
Porcine	Market Swine	264	257	6	1
	Sows	3	3	0	0
Other Species	Goats[1]	33	33	0	0
	Lamb	71	69	1	1
	Mature Sheep	5	5	0	0
Annual Total		**715**	**682**	**23**	**10**

[1] Includes both young and adult goats

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. In FY 2024 there were no changes made to import product sampling.

Table 18. Summary of FY 2024 Microbiology Sampling of Imported Products

FY 2024 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	STEC[3]	1,231	3	21	--	105	1	1,357
	Salmonella spp.	1,231	6	21	--	105	--	1,357
Imported Raw Ground or Comminuted Beef or Veal Product MT08	STEC[3]	25	--	--	--	--	--	25
	Salmonella spp.	25	--	--	--	--	--	25
Micro Pathogen Sampling of RTE Products IMVRTE	*Listeria monocytogenes*	2,952	7	9	--	81	1	3,042
	Salmonella spp.	2,951	--	9	--	81	--	3,041
Imported Egg Products EGGIMP	*Listeria monocytogenes*	80	--	--	--	--	--	80
	Salmonella spp.	80	--	--	--	--	--	80
Imported Raw and NRTE Poultry Products IMP_Poultry	*Salmonella* spp.	676	142	--	--	--	--	818
	Campylobacter	671	107	--	--	--	--	778
Imported Raw Pork Product IMP_Pork	*Salmonella* spp.	424	15	--	--	2	--	426

[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, 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. In FY 2024 there were five residue violations: four penicillin positives in raw, non-intact beef and one sulfadiazine positive in raw intact pork.

Table 19. Summary of FY 2024 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	177	--	--	--	--	--	--	**177**
Imported - Metals IMPMETALS	Metals	361	--	--	--	--	--	--	**361**
Imported - Pesticide IMPPESTICIDE	Pesticides	592	2	--	15	1	--	--	**608**
Imported Egg Products - Chemistry IMPRESEGG	Pesticides	23	--	--	--	--	--	--	**23**
Imported Fresh Products IMPRESFRESH	Aminoglycosides, MRM	897	5	2	16	52	2	3	**965**
Imported Processed Products - Residue Eastern	Avermectins	15	--	--	7	--	--	--	**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	
Laboratory IMPRESPR_EL									
Imported Processed Products - Residue Midwestern Laboratory IMPRESPR_MWL	Sulfonamides	41	--	--	8	--	--	--	**49**
	Annual Total	**2,106**	**7**	**2**	**46**	**53**	**2**	**3**	**2,205**

[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.

[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]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

Table 20. Summary of FY 2024 Residue Sampling of Imported Products

List of FY 2024 import residue sampling violations (foreign country, specific compound, concentration, tolerance, and regulatory citation) by animal class. FSIS detected penicillin and sulfadiazine residues in imported products.

Foreign Country	Animal Class	Compound	Concentrations	Units	Tolerance Level Value	Authority (CFR Citations)
Canada	Beef	Penicillin	0.122	ppm	0.05 ppm	21 CFR 556.510
Canada	Beef	Penicillin	0.182	ppm	0.05 ppm	21 CFR 556.510
Canada	Beef	Penicillin	0.0590	ppm	0.05 ppm	21 CFR 556.510
Canada	Beef	Penicillin	0.104	ppm	0.05 ppm	21 CFR 556.510
Netherlands	Pork	Sulfadiazine	*	*	*	Not Approved[1]

***** Violative residue results were detected but not quantified. For more information, please see the CLG1.

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

PPM – parts per million (mg/kg)

CFR – Code of Federal Regulations

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 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 2024, this amounted to 10,279 bacterial isolate sequences uploaded to the National Center for Biotechnology Information (NCBI). Additionally, in FY 2024 FSIS expanded WGS usage to predict antimicrobial resistance (AMR) profiles and replaced phenotypic antimicrobial susceptibility testing (AST) with WGS based predicted AMR for most non-cecal samples. These results are publicly available as they have been added to the establishment-specific laboratory sampling datasets (Constituent Update - February 2, 2024 | Food Safety and Inspection Service).

5. National Antimicrobial Resistance Monitoring System (NARMS)

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 at slaughter and animal-derived food products (USDA FSIS). The FSIS NARMS program focuses on two sampling points: samples collected from the intestines (cecal content); and those from the carcass (products). NARMS isolates are subject to antimicrobial sensitivity testing (AST) and/or whole genome sequencing (WGS). All the NARMS *Salmonella* and *Campylobacter* are subject to WGS with predictive AMR reported. Only a proportion of *Salmonella* and *Campylobacter* isolates are subject to AST. For NARMS indicator bacteria (*E. Coli* and *Enterococcus* spp.), the proportions of isolates subject to WGS and/or AST can vary from year to year. AST provides phenotypic resistance information, which is interpreted by using epidemiological cut-off values or clinical breakpoints. WGS information provides genotypic information related to acquired genes and mutations which lead to phenotypic antimicrobial resistance. These data may be accessed from FDA NARMS Integrated Data Dashboards.

In FY 2024, changes in the NARMS Sampling plan included:

- Resumption of NARMS sheep expansion sampling (180 samples).
- Resumption of NARMS lamb expansion sampling (420 samples).

Table 21. Summary of FY 2024 NARMS Sampling Program

FY 2024 NARMS samples analyzed, isolates recovered and further characterized.

Sampling Code	Samples Scheduled	Samples Analyzed[1]	Total Isolates Retrieved (*Salmonella*, *Campylobacter*, *E. coli* and *Enterococcus*)	Isolates Characterized[2,3]			
				Salmonella	***Campylobacter***	***E. coli***	***Enterococcus***
Cecal Sampling							
NARMS_BC Beef Cows	456	492	267	AST: 52	AST: 36	AST: 86	AST: 93
				WGS: 52	WGS: 35	WGS: 56	WGS: 39
NARMS_DC Dairy Cow	690	735	752	AST: 168	AST: 167	AST: 220	AST: 197
				WGS: 168	WGS: 157	WGS: 146	WGS: 76
NARMS_HF Heifer	430	469	310	AST: 57	AST: 68	AST: 89	AST: 96
				WGS: 57	WGS: 67	WGS: 60	WGS: 37
NARMS_ST Steer	972	1043	274	AST: 89	AST: 92	AST: 46	AST: 47
				WGS: 88	WGS: 90	WGS: 13	WGS: 17
NARMS_MS Market Swine	442	451	598	AST: 122	AST: 94	AST: 197	AST:185
				WGS: 122	WGS: 86	WGS: 139	WGS: 71
NARMS_SW Sow	300	295	594	AST: 141	AST: 75	AST: 190	AST: 188
				WGS: 140	WGS: 60	WGS: 49	WGS: 74
NARMS_YC Young Chicken	690	743	903	AST: 217	AST: 260	AST: 209	AST: 217
				WGS: 217	WGS: 238	WGS: 150	WGS: 84
NARMS_YT Young Turkey	510	524	685	AST: 69	AST: 194	AST: 211	AST: 211
				WGS: 69	WGS: 183	WGS: 150	WGS: 83
NARMS_LB Lamb	420	514	435	AST: 67	AST: 121	AST: 247	N/A*
				WGS: 67	WGS: 121	WGS: 228	N/A*
NARMS_SH Sheep	180	214	326	AST: 80	AST: 66	AST: 180	N/A*
				WGS: 80	WGS: 66	WGS: 176	N/A*

[1]The number of Samples Scheduled verses Samples Analyzed may vary based on number of tests performed on each sample
[2]WGS = Whole Genome Sequencing; AST = Antimicrobial Susceptibility Testing
[3]All *Salmonella* and *Campylobacter* are subject to WGS; different proportions of *E. coli* and *Enterococcus* spp. are subject to WGS and/or AST
*Sheep and lamb samples not tested for *Enterococcus*

6. Highly Pathogenic Avian Influenza A (HPAI) H5N1 Sampling

To verify the safety of the meat supply in the context of H5N1, FSIS began testing for H5N1 in asymptomatic dairy cows under the National Residue Program in Sept. 2024. Over the next year approximately 800 muscle tissue samples will be collected. No positives were detected in the first weeks of testing and FSIS intended to post the complete results in next years report.Additionally, FSIS, APHIS, and USDA's Agricultural Research Service (ARS) have completed three separate beef safety studies related to avian influenza in meat from dairy cattle.

Beef Muscle Sampling of Cull Dairy Cows

- In May 2024, FSIS announced the final results of its beef muscle sampling of cull dairy cows condemned at select FSIS-inspected slaughter facilities. **No meat from these dairy cattle entered the food supply.** In May 2024, testing was completed on all 109 muscle samples that were collected. The samples were analyzed by APHIS using polymerase chain reaction (PCR) to determine presence of viral particles. No viral particles were detected in 108 out of 109 muscle samples.
- Viral particles were detected in tissue samples, including diaphragm muscle, from one cow. FSIS and APHIS worked together to conduct traceback, including notification to the producer to gather further information.

Samples of Ground Beef Obtained at Retail in the Affected States

- Final results were posted May 2024. Samples were collected at retail outlets in the States in which, at the time, dairy cattle herds have tested positive for H5N1 influenza virus. The samples were analyzed by APHIS using PCR to indicate whether any viral particles were present. **No virus particles were found to be present**.

7. 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 25**). 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.
- 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.
- In Sept. 2024, FSIS implemented a new allergen verification sampling program at establishments that produce ready-to-eat (RTE) products with labeling that claims the absence of at least one of the 14 food allergens (e.g. “no peanuts”). FSIS has implemented this program to expand its verification of industry compliance with labeling regulations.

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

Table 22. Summary of FY 2024 Other Sampling

Project Name and Project Code	Samples Collected
Advanced Meat Recovery Product AMR01	51
Investigative Sampling COMPLIAN	58
Label Verification of Antibiotic Free EXP_LV_ABX	144
Label Verification of Hormone Free EXP_LV_HORM	5
Label Verification of Sodium and Fat Content EXP_LV_NUTR	139
Label Verification of Soy Free EXP_LV_SOY	28
Import – Abnormal Container IMPABNCONT	18
Import – Advanced Meat Recovery Product – Beef IMPAMRBEEF	2
Import – Species Identification IMPSPECIESID	299
Foodborne Illness and Outbreak Sampling OUTBREAK	495
Pathology – Collector Generated PATHOLOGY	2,416
Allergens Sampling LV_ALG	37

Conclusion

In FY 2024, 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.