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

2018 Residue Sampling Plans
October 1, 2017 to September 30, 2018

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

In Memoriam

Lynn Cruickshank, FSIS Eastern Laboratory, Athens, Georgia

Lynn Cruickshank served FSIS and the public for her entire federal career, most recently as Chemistry Branch Chief for residue analysis in the FSIS Eastern Laboratory in Athens, Georgia. With fierce determination and a steadfast commitment to the common good, Lynn oversaw the analysis of meat and poultry samples for chemical residues at Eastern Laboratory for many years. She was fastidious about all aspects of residue analysis, always insisting that results be produced of the highest caliber. She was a key contributor to the creation of this annual publication and an important resource for the National Residue Program for nearly three decades. Lynn lost her battle with cancer on December 7, 2017. Although she succumbed physically to the disease, she tenaciously loved life and never stopped fighting. Lynn will be sorely missed.

Table of Contents

Preface

Welcome to the 2018 “Blue Book”, the 2018 United States National Residue Program (NRP) that summarizes the process used by the United States Department of Agriculture’s (USDA) Food Safety and Inspection Service (FSIS), for sampling and testing of FSIS products for chemical compounds of public health concern. [For those reading this electronically, this document has been commonly known as the "Blue Book" because the covers of the printed versions were blue.] This document details the principles and methods used to plan and design the NRP sampling plans for veterinary drugs, pesticides, and environmental contaminants.

Contacts and Comments

Personnel from the Science Staff (SciS), Office of Public Health Science (OPHS), FSIS coordinated the effort to design and publish this book. Direct questions about the NRP to:

USDA/FSIS/OPHS
1400 Independence Avenue, SW
Washington, D.C. 20250-3700
Questions can be sent to askFSIS: http://askfsis.custhelp.com/app/utils/login_form/redirect/ask

Acknowledgements

The Food Safety and Inspection Service (FSIS) would like to acknowledge and thank all the members of the Surveillance Advisory Team (SAT) for their extensive contributions to the planning of the FY 2018 NRP.

Principal Authors (USDA/FSIS/OPHS)

Acronyms

AMDUCA – Animal Medicinal Drug Use Clarification Act
AMS – Agricultural Marketing Service
APHIS – Animal and Plant Health Inspection Service
ARS – Agricultural Research Service
CDC – Centers for Disease Control and Prevention
CHCs – Chlorinated Hydrocarbons
COPs – Chlorinated Organophosphates
FDA – Food and Drug Administration
FSIS – Food Safety and Inspection Service
EPA – Environmental Protection Agency
HACCP – Hazard Analysis and Critical Control Points
IPP – Inspection Program Personnel
IRSP – Import Reinspection Sampling Program
KIS™ test – Kidney Inhibition Swab Test
NASS – National Agricultural Statistics Service
NRP – U. S. National Residue Program (Domestic & Import)
NSAID – Non-Steroidal Anti-inflammatory Drug
OFO – Office of Field Operations
OPHS – Office of Public Health Science
PHIS – Public Health Information System
PHV – Public Health Veterinarian
SAT – Surveillance Advisory Team
TOI – Types of Inspection

Introduction

The U.S. National Residue Program (NRP) for Meat, Poultry, and Egg Products, is an interagency program designed to identify, rank, and analyze for chemical contaminants in meat, poultry, and egg products. The U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS) administers this program. FSIS publishes the NRP Residue Sampling Plans (traditionally known as the Blue Book) each year to provide information on the process of sampling meat, poultry, and egg products for chemical compounds of public health concern.

Background

FSIS administers this regulatory program under the Federal Meat Inspection Act (FMIA) (21 U.S.C. 601 et seq.), the Poultry Products Inspection Act (PPIA) (21 U.S.C. 453 et seq.), and the Egg Products Inspection Act (EPIA) (21 U.S.C. 1031 et seq.). The NRP is an important component of FSIS mission to protect the health and welfare of the consumers by regulating the meat, poultry, and egg products produced in federally inspected establishments and to prevent the distribution into commerce of any such products that are adulterated or misbranded.

The NRP requires the cooperation and collaboration of several agencies for its successful design and implementation. FSIS, along with the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA), are the primary Federal agencies managing this program. The FDA, under the Federal Food, Drug, and Cosmetic Act (FFDCA), establishes tolerances for veterinary drugs and action levels for food additives and environmental contaminants. The EPA, under the FFDCA, the Federal insecticide, Fungicide, and Rodenticide Act (FIFRA), and the Toxic Substances Control Act (TSCA), establishes tolerances for registered pesticides. Title 21 Code of Federal Regulations (CFR) includes tolerance levels established by FDA, and Title 40 CFR includes tolerance levels established by EPA.

The Surveillance Advisory Team (SAT) meets annually to evaluate chemical compounds for inclusion in the NRP scheduled sampling plans. The SAT includes representatives from FSIS, FDA, EPA, USDA's Agricultural Research Service (ARS), and the USDA's Agricultural Marketing Service (AMS), as well as HHS' Centers for Disease Control and Prevention (CDC). The SAT consists of experts in veterinary medicine, toxicology, chemistry, and public health who provide professional advice, as well as information on veterinary drug and pesticide use in animal husbandry. SAT discussions are used to decide which compounds represent a public health concern and warrant inclusion in the NRP scheduled sampling plans. In addition, the SAT may propose, based on professional judgment and reliable field information, the initiation of exploratory assessments for directed sampling on a production class or region of the country. These agencies work together to create the annual sampling plan, based on the following: prior NRP findings of chemical residues in meat, poultry, and egg products; FDA veterinary drug inventories completed during on-farm visits and investigation information; and pesticides and environmental contaminants of current importance to EPA.

Ultimately, FSIS publishes the completed sampling plan on the FSIS website. For 2018, SAT chose to employ techniques and principles from the field of risk assessment to rank pesticide and environmental contaminants based on relative public health concern, as described in Appendix V. This process enables FSIS to allocate resources to chemicals of high public health concern. FSIS is currently evaluating approaches to identify and prioritize veterinary drugs associated with FSIS-regulated products.

The range of chemical compounds evaluated for inclusion in the NRP are comprehensive in scope. It includes approved and unapproved pharmaceutical drugs and pesticides, and environmental contaminants known or suspected to be present in food animals in the U.S. and in countries exporting products to the U.S. The NRP is designed to: (1) provide a structured process for identifying and

evaluating chemical compounds used in food animals; (2) analyze chemical compounds of concern; (3) collect, analyze, and report results; and (4) identify the need for regulatory follow-up subsequent to the identification of violative levels of chemical residues.

Actions taken on violations

FSIS has administered the NRP by collecting and analyzing meat, poultry, and egg product samples for specific chemical compounds at FSIS laboratories since 1967 for meat and poultry, and beginning in 1995 for egg products. A violation occurs when an FSIS laboratory detects a chemical compound at level in excess of an established tolerance or action level as well as if the residue detected has no approved tolerance. Once the laboratory analysis is complete, FSIS enters the detailed residue violation information into the Residue Violation Information System (RVIS), an FSIS/FDA interagency database. FSIS provides establishment and the designated FSIS Inspection Program Personnel (IPP) with the analysis results and notifies the producer via certified letter. Under best practices, the establishment should also notify the producer that an animal from that business has been identified as having a residue violation. In addition, FSIS shares the violation data with EPA and FDA, where the latter Agency has on-farm jurisdiction. FDA and cooperating State agencies investigate producers linked to residue violations and, if conditions leading to residue violations are not corrected, can enforce legal action.

To notify the public and the industry of repeated residue violations by the same producer, FSIS posts a weekly Residue Repeat Violators List on its Web site that identifies producers with more than one violation on a rolling 12-month period. In addition, the list provides helpful information to the AMS-School Lunch Program processors and producers who are working to avoid illegal levels of residues, serves as a deterrent for violators, and enables FSIS and FDA to make better use of resources (list for processors and producers). Because FSIS updates are posted weekly, FDA may not have investigated each violation at the time of publication.

FSIS Laboratory Analytical Methods

In January 1997, FSIS implemented the Hazard Analysis and Critical Control Point (HACCP) inspection system in all federally inspected establishments. The HACCP regulation (HACCP GPO CFR) requires FSIS-inspected slaughter and processing establishments to identify all food safety hazards (including drug residues, chemical contaminants, and pesticides) that are reasonably likely to occur before, during, and after the food animal or product enters the slaughter establishment. The regulation also requires establishments to identify preventive measures to control these hazards. FSIS takes regulatory action against establishments that do not have an effective chemical residue control program in place. Minimizing food safety hazards from farm-to-fork protects consumers from the public health risks associated with chemical contaminants in food.

With greater public concern about the risks of chemical contaminants, focus has increased on strengthening the identification, prioritization, and testing for chemical hazards in meat, poultry, and egg products in the United States. The sampling plan for residues in FSIS-regulated products includes strengthening the focus of public health-based sampling. This approach includes broader screens for veterinary drugs, pesticides, and heavy metals, as well as conducting more analyses per sample.

FSIS uses analytical methods to detect, identify, and quantify residues that may be present in meat, poultry, and processed egg products. The Agency utilizes these methods for monitoring and for surveillance activities to determine product adulteration and for evaluations of human health risk. The Agency uses available methodologies to take appropriate regulatory action against adulterated products in a manner consistent with the reliability of the analytical data. The FSIS Analytical Chemistry Laboratory Guidebook lists the analytical methods used by the agency.

FSIS uses novel multi-residue methods for the detection and confirmation of veterinary drugs, pesticides, and environmental contaminants (see Appendix I). The veterinary drug method screens and confirms for over 80 analytes. The pesticide method screens and confirms for over 100 pesticides.

Overview of the Sampling Plans

The 2018 NRP is implemented on the United States Government fiscal year from October 1, 2017 to September 30, 2018. The NRP consists of three separate, but interrelated, chemical residue testing programs: scheduled sampling (Tier 1), targeted sampling at the production or compound class level (Tier 2), and targeted sampling at the herd/flock or compound class level (Tier 3). These testing programs provide FSIS data for the detection of chemical residues of public health concern and are modified annually in response to emerging chemical residue concerns and improved testing methodologies.

The 2018 NRP Residue Sampling Plan focuses on chemical residues in domestic meat, poultry, and egg products and the import reinspection of meat, poultry, and egg products. The domestic sampling plan includes scheduled sampling and inspector-generated sampling. The import reinspection sampling plan encompasses normal sampling, increased sampling, and intensified sampling. Directive 10,800.1, Rev 1 provides further detail on those sampling procedures.

On December 2, 2015, FSIS published the final rule, "Mandatory Inspection of Fish of the Order *Siluriforme*s and Products Derived From Such Fish." The 2008 Farm Bill amended the Federal Meat Inspection Act (FMIA) to make all fish of the order Siluriformes amendable to the FMIA and, therefore, subject to FSIS inspection.

FSIS will conduct periodic sampling and testing for chemical residues of domestic raw *Siluriforme*s fish at official fish establishments to ensure that the product is not adulterated. FSIS will conduct sampling on imported *Siluriforme*s fish products for chemical residues, at Official Import Inspection Establishments that have a Grant of Inspection (GOI) for *Siluriforme*s fish. More details about *Siluriforme*s can be found on the FSIS website

DOMESTIC SAMPLING PLAN

1. Tier 1

The Tier 1 sampling plan is the scheduled sampling of specified slaughter subclasses at the time of slaughter, after they have passed antemortem inspection. Carcasses are randomly selected for sampling. The number of samples scheduled each year is based on the probability of detecting at least one violation (Appendix II). Data collected from Tier 1 sampling serves as a baseline level for chemical residue exposure. Sampling tasks are assigned each month through the Public Health Information System (PHIS). The sampling task provides information to the Inspection Program Personnel (IPP) on when to collect the sample (collection window) and which production class to sample. The establishment holds or controls livestock carcasses selected for testing pending the results of analysis. For directed testing of poultry, the IPP recommends to the establishment that the establishment holds the specific poultry carcasses selected for residue testing pending the analysis results.

Tier 1 sampling results also can be used to identify producers or other entities marketing animals with violative levels of residues. Thus, the Tier 1 sampling plan not only gathers information, but also assists in deterring practices that lead to violative residues.

In 2018, the Tier 1 sampling plan will consist of random samples collected from each of the following production classes: beef cows, bob veal, dairy cows, steer, heifers, market swine, sows, goats, young chickens, and young turkeys. These production classes represent 95 percent of domestic meat and poultry consumption. Estimated consumption volume, per production class, can be found in Appendix III.

2. Tier 2

A. Inspector-Generated Sampling

FSIS inspection program personnel (IPP) conduct inspector-generated sampling when they suspect that animals may have violative levels of chemical residues. Currently, inspector-generated sampling targets individual suspect animals, suspect populations of animals, and animals condemned for specific pathologies listed in FSIS Directive 10,800.1, Rev 1. When Public Health Veterinarians (PHVs) detect evidence of a disease that may have been treated or suspect the administration of a drug, they retain the carcass and analyze samples from those carcasses using an in-plant method to screen for the presence of chemical residues. If the in-plant test is negative for antimicrobial residues included in the screen, the carcass is released to the establishment. If there are screen positive results, the carcass is held pending the results of laboratory testing. The PHV condemns carcasses of animals found to contain violative levels of residues in the muscle or if an unapproved drug is detected in any tissue.

In 2018, IPP will continue to complete in-plant residue screens using the Kidney Inhibition Swab test (KIS™ test). The screen-positive samples are submitted to the FSIS Midwestern Laboratory and analyzed by the laboratory to identify, quantify and confirm the contaminants.

i. Sampling of Individual Suspect Animals

Under the direction of the PHV, IPP conduct a KIS™ test on any carcass based on herd history or ante-mortem or post-mortem findings inspection findings may contain a violative drug residue. IPP follow the instructions provided in Directive 10,800.1, Rev 1, chapter three for circumstances warranting a KIS ™ test and chapter four for performing KIS™ tests and documenting the task in PHIS. The PHV selects a carcass for sampling based on the criteria outlined in FSIS Directive 10,800.1, Rev 1 (i.e., animal with disease signs and symptoms, producer history, or as a follow-up to results from random scheduled sampling). Usually, the sample is screened in the plant by the IPP and the screen-result verified when necessary by a PHV. Other samples are sent directly to the laboratory for analysis. For example, if the IPP suspects the misuse of a veterinary drug in an animal, she/he can perform the relevant in-plant screening analysis. If the result of a screening analysis is positive, the carcass is held (if it is not already condemned for other pathology or conditions that would make it unfit for human consumption), and the liver, kidney, and muscle samples from the carcass are then sent to an FSIS laboratory for analysis and confirmation.

ii. Sampling of Suspect Animal Populations

Sampling for suspect animal populations is directed by an FSIS regulation (9 CFR 310.21) and Directive 10,800.1, Rev 1. This is outlined for healthy-appearing bob veal calves and show animals.

B. Targeted Sampling

FSIS implements targeted sampling plans (exploratory assessments) in response to information (obtained by FDA and EPA and provided to FSIS) about misuse of animal drugs and/or exposure to environmental chemicals, as well as in response to Tier 1 analytical results. The duration of these sampling plans vary based on the situation. FSIS may conduct studies to develop information on the frequency and concentration at which some residues like trace metals and industrial components may be inadvertently present in animals. These sampling plans could be designed to distinguish components of meat, poultry and egg products in which residue problems exist, to measure the extent of problems, and to evaluate the impact of actions taken to reduce the occurrence of residues in the food animal population.

Sampling tasks are assigned through PHIS. The sampling task provides instructions to the IPP on when to collect the sample (collection window) and which slaughter production class to collect from. The establishment holds or controls livestock carcasses selected for testing pending the test results. For

directed residue testing of poultry, the IPP recommends to the establishment that the establishments hold the specific poultry carcasses selected for residue testing pending the test results.

In 2018, Ties 2 targeted sampling includes, sheep, and roaster swine as described in Table 3.

3. Tier 3

The Tier 3 sampling plan is similar in structure to the targeted sampling (exploratory assessment) program in Tier 2, with the exception that Tier 3 will encompass targeted testing at a herd or flock level. A targeted testing program designed for livestock or flocks originating from the same farm or geographic region may be necessary on occasion to determine the level of exposure to a chemical or chemicals. For instance, producers may administer some veterinary drugs to a herd or a flock (for example, growth promotants or antibiotics given in the feed) in a way that involves misuse. In addition, livestock and birds may be exposed unintentionally to an environmental contaminant. Therefore, a targeted testing program designed for livestock or flocks originating from the same farm or region may be necessary on occasion to determine the level of a chemical or chemicals to which the livestock or the birds in the flock have been exposed. Tier 3 will provide a vehicle for developing information that will support future policy development within the NRP.

In 2018, Tier 3 sampling includes feral swine analyses for pesticides

IMPORT REINSPECTION SAMPLING PLAN

Imported meat, poultry, and egg products are sampled through the port-of-entry Import Reinspection Sampling Plan, a chemical residue monitoring program conducted to verify the equivalence of inspection systems in exporting countries to United States standards. All imported products are subject to reinspection, and one or more Types of Inspection (TOI) are conducted on every lot[1] of product before it enters the U. S. Chemical residue sampling is included in the reinspection of imported products. The following three levels of chemical residue reinspection include:

- normal sampling: random sampling from a lot;
- increased sampling: above-normal sampling resulting from an Agency management decision;
- intensified sampling: additional samples taken when a previous sample for a TOI that failed to meet U.S. requirements.

The data obtained from laboratory analyses are entered into PHIS, an FSIS database designed to generate reinspection assignments, receive and store results, and compile histories for the performance of foreign establishments certified by the inspection system in the exporting country. The import reinspection sampling program is structured based on criteria's used to develop the domestic plan (Tier 1 and Tier 2). The estimated annual amount of product imported into the United States, listed in

[1] An import lot is a group of products defined statistically and/or scientifically by production segments and certified from one country, one establishment. A lot consists entirely of the same species, process category, and product standard of identity (sub-category). A single lot can contain shipping cartons with varying sizes of immediate containers.

Appendix IV, was used to assign the number of samples. FSIS intends to collect approximately 1,100 import samples, similar to FY 2017.

SUMMARY OF CHANGES FROM THE 2017 NRP

I. In order to enhance surveillance of formula-fed veal, non-formula fed veal, heavy calves, during FY 2018 the number of samples is increased from 33 to 75.

II. In previous sampling plans, FSIS only reported carbadox violations in roaster swine. Consequently, in 2018 roaster swine livers will be analyzed for carbadox only.

III. Metals have been analyzed in the Tier II plan since 2003. There have been no significant detections of metals; therefore, metals will not be included in the 2018 NRP.

IV. Based on the lab capacity the number of pesticide analyses have increased as follows:
   a. Four hundred samples each for beef cows, dairy cows, market swine, sows, young chicken, and young turkey. In 2017, 300 samples were planned for each of the production class
   b. Two hundred samples each for steers and heifers. In 2017, 110 samples were planned for each production class

V. Based on the lab capacity the number of samples for hormones have increased as follows:
   a. Four hundred samples each for beef cows and dairy cows. In 2017, 300 samples were planned for each of the production class

VI. On October 2016, FSIS added a new slaughter subclass for feral swine in the Animal Disposition Reporting (ADR) section of the Public Health Information System (PHIS). Therefore, feral swine are included in the Tier III sampling program. One hundred samples of feral swine will be analyzed for pesticides in 2018.

VII. The domestic turkey and chicken are tested for nitrofuran therefore SAT recommended that during 2018 imported raw chicken and raw turkey be analyzed for nitrofuran

VIII. In previous years only imported raw goat was analyzed for avermectins but the avermectins method is able to analyze both raw and processed goats, therefore the SAT recommended that during 2018 imported processed goats be analyzed for avermectins.

IX. FSIS is currently validating a multi-residue method for egg products and anticipate the sampling of egg products in the latter part of FY 2018.

POLICY AND PROCEDURES FOR HOLDING OR CONTROLLING PRODUCT UNDER NRP

As of February 2013, the Agency requires official establishments and importers of record to hold or maintain control of lots of product tested for adulterants until acceptable results become available. FSIS stated that the policy would apply to livestock carcasses subject to FSIS testing for residue on domestic products. FSIS explained that it will not hold poultry carcasses pending test results for residues due to historically low residue problems and large lot size. This was outlined in a published Federal Register Notice 76 FRN 19955. FSIS will not hold Siluiroformes carcasses pending test results for residues

The Hold and Test policy applies to normal and increased import reinspection sampling. Additionally, for intensified import sampling, the lot must be retained pending laboratory results.

ANIMAL PRODUCTION CLASSES

Production class nomenclature includes:

Bovine

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

Porcine

- Boars are mature swine showing male sexual characteristics.
- Market swine are usually marketed near 6 months of age and 200 to 300 pounds live weight.
- Roaster swine are animals of both sexes and any age that are marketed with the carcass unsplit and with the head on.
- Sows are mature, female swine, ordinarily having given birth to one or more litters.
- Stags are male swine castrated after they have reached sexual maturity.
- Feral Swine are domestic swine that escape captivity and reproduce in the wild Feral swine differ from their domestic counterparts in their physical appearance and in the manner in which they are raised and their method of capture. Typical characteristics of feral swine include color patterns (e.g., white stripes or spots), longer bristly haircoat, elongated snout with visible tusks, a "razorback" body shape, and wild boar males, which are uncastrated

Poultry

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

Other Livestock

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

- Other livestock include bison, deer, elk, etc.

Siluriformes

An order of bony fish that includes all catfish. All catfish have at least one pair of barbels ("feelers") on the upper jaw, with many possessing spines in front of the dorsal and pectoral fins. Most species inhabit raw water, but a few species are marine (salt-water). This includes the following:

ORDER	FAMILY	ACCEPTABLE COMMON OR USUAL NAMES	GENUS SPECIES
SILURIFORMES*	**Ictaluridae**	Blue Catfish or Catfish	*Ictalurus furcatus*
		Channel Catfish or Catfish	*Ictalurus punctatus*
		White Catfish or Catfish	*Ameiurus catus*
		Black Bullhead or Bullhead or Catfish	*Ameiurus melas*
		Yellow Bullhead or Bullhead or Catfish	*Ameiurus natalis*
		Brown Bullhead or Bullhead or Catfish	*Ameiurus nebulosus*
		Flat Bullhead or Bullhead or Catfish	*Ameiurus platycephalus*
	Clariidae	Whitespotted fish or Chinese fish	*Clarias fuscus*
		Sharptooth Clarias Fish	*Clarias gariepinus*
		Broadhead Clarias Fish	*Clarias macrocephalus*
		Walking Clarias Fish	*Clarias batrachus*
	Pangasius	Swai or Sutchi or Striped Pangasius or Tra	*Pangasianodon hypophthalmus or Pangasius hypophthalmus*
		Basa	*Pangasius bocourti*
		Mekong Giant Pangasius	*Pangasius gigas*
		Giant Pangasius	*Pangasius sanitwongsei*
	* This list is not all-inclusive. For other Siluriformes fish see the Integrated Taxonomic Information System (IT IS) at http://www.itis.gov and the Seafood List at http://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist.		

SUMMARY OF THE DOMESTIC AND IMPORT REINSPECTION SAMPLING PLANS

Summary Tables 1 and 2

Summary Tables 1 and 2 provide an overview of both domestic (Tier 1 and Tier 2) sampling organized by chemical compound class. Each table covers: Animal Medicinal Drug Use Clarification Act (AMDUCA)-prohibited drugs, veterinary drugs, pesticides, and environmental contaminants. The tables also identify the FSIS laboratory that would be conducting the analyses. Due to laboratory capacity, not every sample is analyzed for every compound class. Laboratory personnel make decisions on which samples to analyze. Some of the factors that are included in the decision are (1) the number of samples that can be analyzed per run, (2) the number of samples received that week, and (3) the total number of samples for that compound class/slaughter class pair. The factors behind these decisions can be found in the individual laboratory procedures.

Table 2 shows domestic Tier 2 sampling (formula-fed veal, non-formula-fed veal, heavy calf, bull, roaster swine, and sheep)

Summary Tables 3

Summary Tables 3 provide an overview of import sampling organized by animal production class. Each table includes the following: Animal Medicinal Drug Use Clarification Act (AMDUCA)-prohibited drugs, veterinary drugs, pesticides, and environmental contaminants.

Overview of the Program Design

The sampling plan design begins with a list of residues that may occur in meat, poultry, and egg products and are of concern to human health. FSIS coordinates an annual meeting of the SAT members to identify and prioritize chemical compounds of public health concern and assemble detailed information on each compound. FSIS combines this information with historical data on violation rates for each chemical compound to develop the domestic sampling and import reinspection plans. These sampling plans guide the allocation of FSIS laboratory, supply, and inspection resources.

Factors considered when developing the domestic and import scheduled sampling plans include:

- Qualitative public health risk associated with each chemical compound or compound class in meat, poultry, and egg products;
- The food animals affected by each chemical compound or compound class;
- The analytical methods that are available to identify the chemical compound or compound classes;
- FSIS laboratory capacity to analyze chemical compounds or compound classes; and
- The existence of a regulatory tolerance.

The import reinspection plan design is similar to the domestic plan, with two important exceptions. Raw product testing from samples collected at the U.S. port-of-entry is rare, because concerns about foreign animal diseases limit many countries to ship processed products only. When import of raw products is allowed, most shipped raw product consists of muscle tissue only. Exporting countries are required to identify the animal species in each product, but they are not required to identify the production class. Imported meat and poultry testing is categorized by species (e.g., poultry or porcine); egg products are distinguished as a separate category. There are different compound applications by importing countries: allowance in food animals that are not approved for such use in the United States and different use practices for compounds that are approved in the United States. For these reasons, the compounds selected for analysis in the import plan may not necessarily be the same as those in the U.S. domestic plan.

Summary Table 1: No. of Analyses per Production Class by Compound Class
2018 Domestic Scheduled Sampling: Tier 1

Methods	No. of Chemical Analyses per Production Class *										
	Number of Animals	Multi-residue (M,L,K)	Aminoglycosides (M,L,K)	Pesticides (M,L,K)	B-agonist (M,L)	Hormones (M,L)	Avermectins (M,L)	Arsenic (M,L)	Nitrofurans (M)	Metals (M)	Antifungal Dyes (M)
Beef cows	N= 800	800	800	400	400	300	400	200			
Bob veal	N= 400	400	400	200	200	200	200	100			
Dairy cows	N= 800	800	800	400	400	300	400	200			
Heifers	N= 400	400	400	200	200	200	200	100			
Steers	N= 400	400	400	200	200	200	200	100			
Market swine	N= 800	800	800	400	200		400	200			
Sows	N= 800	800	800	400	200		400	200			
Young chickens	N= 800	800	800	400				200	400		
Young turkeys	N= 800	800	800	400				200	400		
Goats	N= 300	300	300	150			150	75			
Siluriformes*	N= 650	650		325					325	325	325
Total		**6950**	**6300**	**3475**	**1800**	**1200**	**2350**	**1575**	**1125**	**325**	**325**

*Note: *N* denotes the number of samples collected/submitted for each production class (e.g., 800 total samples collected/submitted for beef cows and 400 total samples collected/submitted for heifers).
*Chemical analysis will be performed on tissue samples (M= muscle, L=liver, or K=kidney). Only muscle is analyzed for Siluriformes.

Summary Table 2: No. of Analyses per Production Class by Compound Class
2018 Domestic Scheduled Sampling: Tier 2

Methods	No. of Chemical Analyses per Production Class *						
	Number of Animals	Multi-residue (M,L,K)	Aminoglycosides (M,L,K)	Pesticides (M,L,K)	B-agonist (M,L)	Carbadox (L)	Avermectins (M,L)
Formula-fed Veal	N= 75	75	75		37		
Non-formula-fed Veal	N= 75	75	75		37		
Heavy Calf	N= 75	75	75		37		
Bull/stags	N= 100	100	100	50			50
Roaster swine	N= 300					300	
Sheep	N= 150	150	150	75			
Total		**475**	**475**	**125**	**111**	**300**	**50**

*Note: *N* denotes the number of samples collected/submitted for each production class (e.g., 150 total samples collected/submitted for sheep).
*Chemical analysis will be performed on tissue samples (M= muscle, L=liver, or K=kidney)

Tier 3
Feral swine (N=100) will be analyzed for pesticide residues.

Summary Table 3: No. of Analyses per Production Class by Compound Class
2018 Import Scheduled Sampling

Methods		No. of Chemical Analyses per Production Class *										
		Multi-residue	Aminoglycosides	Pesticides	B-agonist	Hormones	Avermectins	Arsenic	Nitrofurans	Sulfonamides	Metals	Antifungal drugs
Beef	Raw	150	150	100	75	100	75	75				
	Processed						75	75		25		
Chicken	Raw	75	75	75				75	75			
	Processed							50				
Turkey	Raw	40	40	25				15	75			
	Processed							15				
Veal	Raw	60	60	50	50		25	25		10		
	Processed						10	10				
Goat	Raw	25	25	25			15	15				
	Processed						5					
Lamb	Raw	20	20	20			15	15				
	Processed						5	5				
Mutton	Raw	5	5	5			10	5				
	Processed						5	5				
Pork	Raw	150	150	100	75		75	75		15		
	Processed						25	25				
Siluriformes	Raw	1800		900					900		900	900
Total		**2325**	**525**	**1300**	**200**	**100**	**340**	**485**	**1050**	**50**	**900**	**900**

Appendix I
List of Chemical Residues by Class/Method

1. Veterinary Drugs

For 2018 sampling, FSIS has scheduled the following classes of veterinary drug analytes:

a. Multi-residue method

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

b. Aminoglycoside Method

Amikacin	Gentamycin	Neomycin	Spectinomycin
Apramycin	Hygromycin B	Kanamycin	Streptomycin
Dihydrostreptomycin			

c. Hormones Method

Megestrol	Melengestrol Acetate	Hexestrol	Zeranol

d. Beta-Agonist Method

Cimaterol	Ractopamine	Zilpaterol
Clenbuterol	Salbutamol	

e. Avermectin Method

Doramectin	Ivermectin	Moxidectin

f. Nitrofuran Method

3-Amino-2-oxazolidinone (AOZ)	1-Aminohydantoin (AHD)	Semicarbazide (SEM)	3-Amino-5-morpholinomethyl-2-oxazolidinone (AMOZ)

g. Antifungal dyes

Malachite Green	Leucomalachite Green	Crystal Violet	Leucocrystal Violet

h. Carbadox Method

Quinoxaline-2-carboxylic acid

2. Pesticides and environmental contaminants

a. Pesticide Method

1-Naphthol	Coumaphos O	Fluroxypyr-1-Methylhepyl-Ester	Pentachlorobenzene (PCB)
3-Hydroxycarbofuran	Coumaphos S	Fluvalinate	Permethrin (cis&trans)
Acephate	DDD o,p’	Heptachlor	Piperonyl butoxide
Acetamiprid	DDD p,p’ + DDT, o,p'	Heptachlor epoxide (cis+ trans) or (B+A)	Pirimiphos methyl
Alachlor	DDE o,p’	Hexachlorobenzene (HCB)	Prallethrin
Aldicarb	DDE p,p’	Hexazinone	Profenofos
Aldicarb sulfone	DDT p,p’	Hexythiazox	Pronamide
Aldicarb sulfoxide	Deethylatrazine	Imazalil	Propachlor
Aldrin	Diazinon	Imidacloprid	Propanil
Atrazine	Dichlorvos (DDVP)	Indoxacarb	Propetamphos
Azinphos methyl	Dieldrin	Lindane (BHC gamma)	Propiconazole
Azoxystrobin	Difenoconazole	Linuron	Pyraclostrobin
Benoxacor	Diflubenzuron	Malathion	Pyrethrin I
Bifenthrin	Dimethoate	Metalaxyl	Pyrethrin II
Boscalid	Diuron	Methamidophos	Pyridaben
Buprofezin	Endosulfan I	Methomyl	Pyriproxyfen
Carbaryl	Endosulfan II	Methoxyfenozide	Resmethrin (cis&trans)
Carbofuran	Endosulfan sulfate	Metolachlor	Simazine
Carfentrazone ethyl	Ethion	Metribuzin	Sulprofos
Chlordane cis	Ethion monoxon	MGK-264 (isomers 1 & 2)	Tebufenozide
Chlordane trans	Ethofumesate	Myclobutanil	Tefluthrin
Chloroneb	Fenoxaprop ethyl	Nonachlor cis	Tetrachlorvinphos
Chlorothalonil	Fenpropathrin	Nonachlor trans	Tetraconazole
Chlorpropham	Fipronil	Norflurazon	Thiabendazole
Chlorpyrifos	Fipronil desulfinyl	Omethoate	Thiamethoxam
Chlorpyrifos methyl	Fipronil sulfide	Oxychlordane	Thiobencarb
Clothianidin	Fluridone	Pentachloroaniline (PCA)	Trifloxystrobin

b. Metals Method

Aluminum (Al)	Copper (Cu)	Selenium (Se)
Barium (Ba)	Iron (Fe)	Strontium (Sr)
Boron (B)	Lead (Pb)	Thallium (Tl)
Cadmium (Cd)	Manganese (Mn)	Vanadium (V)
Chromium (Cr)	Molybdenum (Mo)	Zinc (Zn)
Cobalt (Co)	Nickel (Ni)	

Appendix II
Statistical Table

Scheduled sampling is done to provide some assurance of detection of a violation that affects a given percentage of the sample population. Prior to FY 2012, FSIS tested 230 to 300 samples from each production class/residue compound class pairing to obtain results that were statistically meaningful. The testing sample sizes of 230 or 300 ensured FSIS a 90 percent or 95 percent probability, respectively, of detecting at least one chemical residue violation if the violation rate is equal to or greater than one percent in the population being sampled. Starting in FY 2012, FSIS stated in its residue sampling plan that the sample size selected/tested would increase to about 800 samples for each of the nine major production class tested under Tier 1.

The statistical table provides the calculated number of samples required to ensure detection of at least one violation that affects a given percentage of the sampled population. Statistically, for a binomial distribution with sample size "*n*" and violation rate "*v*" (in decimal), if *v* is the true violation rate in the population and *n* is the number of samples, the probability, *p*, of finding at least one violation among the *n* samples (assuming random sampling) is $p = 1 - (1 - v)^n$

For example, if the true violation rate is 1% the probability of detecting at least one violation with sample sizes of 230,300,390,460, and 800 are 90%, 95%, 98%, 99%,and 99.97% respectively.

In the table below the probability of detecting at least one violation with a sample size of 800 is italicized and bolded.

Statistical Table
2018 U.S. National Residue Program

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

The procedure to calculate the required sample size needed:

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

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

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

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

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

Appendix III
FY 2018 NRP: Estimated Amount of Domestically Produced Meat, Poultry, and Egg Products

Production Class	Number of Head Slaughtered /[1]	Pounds per Animal (dressed weight) /[2,3,4]	Total Pounds (dressed weight)	Percent Estimated Relative Consumption
Beef Cow	2,249,549	629.64	1,416,399,728	1.46
Bob Veal	193,062	39.29	7,585,943	0.01
Bull/Stag	487,093	887.81	432,448,125	0.45
Dairy Cow	2,424,661	660.19	1,600,735,581	1.65
Formula-fed Veal	208,627	263.47	54,967,558	0.06
Heavy Calf	12,973	275.10	3,568,896	0.004
Heifer	7,645,191	812.49	6,211,657,065	6.40
Non Formula-fed Veal	5,410	165.15	893,484	0.001
Steer	15,284,879	880.23	13,454,266,466	13.87
SUBTOTAL, CATTLE	**28,511,445**		**23,182,522,846**	**23.89**
Boar/Stag Swine	247,080	184.38	45,557,714	0.05
Feral Swine	23,103	49.24	1,137,588	0.001
Market Swine	114,595,934	202.05	23,153,584,939	23.86
Roaster Swine	602,539	68.99	41,568,429	0.04
Sow	2,126,523	291.30	619,447,832	0.64
SUBTOTAL, SWINE	**117,595,179**		**23,861,296,502**	**24.59**
Lamb	1,830,233	62.37	114,146,273	0.12
Goat	337,795	29.11	9,833,688	0.01
Mature Sheep	54,622	60.11	3,283,432	0.003
SUBTOTAL, OVINE	**2,222,650**		**127,263,393**	**0.13**
Deer/Reindeer	548	108.94	59,699	0.0001
Water Buffalo	85	572.11	48,629	0.0001
Bison	32,978	598.37	19,732,936	0.02
TOTAL, ALL LIVESTOCK\[3]	**148,362,885**		**47,190,924,005**	**48.64**
Capon	74,225	7.13	529,224	0.00
Duck	27,271,533	4.81	131,296,798	0.14
Emu	2,604	34.24	89,166	0.0001
Fryer/Roaster Turkey	12,102	9.89	119,685	0.0001
Goose	121,731	10.45	1,272,089	0.001
Guinea	145,157	2.98	432,568	0.0004
Heavy Fowl	77,568,801	6.01	466,188,494	0.48
Light Fowl	62,413,197	1.90	118,279,909	0.12
Old Breeder Turkey	1,793,919	21.91	39,313,231	0.04
Ostrich	903	109.06	98,477	0.00
Pheasant	232,215	1.94	450,497	0.0005
Quail	905,724	0.29	262,660	0.0003
Squab	876,467	1.24	1,086,819	0.00
Young Breeder Turkey	**1,783,786**	**22.65**	40,400,131	0.04
Young Chicken	9,013,864,007	4.45	40,077,826,985	41.31
Young Turkey	242,296,398	24.58	5,956,062,106	6.14
TOTAL POULTRY/[2]	**9,429,362,769**		**46,833,708,839**	**48.27**

Production Class	Number of Head Slaughtered /[1]	Pounds per Animal (dressed weight) /[2,3,4]	Total Pounds (dressed weight)	Percent Estimated Relative Consumption
Rabbit	299,811	3.59	1,076,321	0.001
Egg Products			2,997,935,602	3.09
Grand Total in Pounds, all Production Classes			**97,023,644,768**	**100.00**

[1] Source - Slaughter Volume Data from **July 1, 2016 to June 30, 2017** (Data Source: PHIS, July 20, 2017)
[2] Dressed weight calculated by applying dressing percentages to live weights. Live weight data was obtained from PHIS and dressing percentage from USDA AMS Report "Weekly Poultry Slaughtered Under Federal Inspection" https://search.ams.usda.gov/mnreports/nw_py017.txt
[3] All livestock = Calculated using PHIS
[4] Goose = PHIS Average Live Weight

Appendix IV

FY 2018 NRP: Estimated Annual Amount of Product Imported in the United States[1]

Product	Product Weight in Pounds	Product Imported Percent
Beef, Raw	2,037,376,984	51.35
Beef, Processed	189,291,286	4.77
Chicken, Raw	150,291,201	3.79
Chicken, Processed	104,307,980	2.63
Duck, Raw	2,153,876	0.05
Duck, Processed	1,536,563	0.04
Egg Products, Raw	13,858,895	0.35
Goat, Raw	45,330,398	1.14
Goat, Processed	200	0.00
Lamb, Raw	170,231,407	4.29
Lamb, Processed	38,920	0.001
Mutton, Raw	38,438,065	0.97
Mutton, Processed	191,833	0.005
Ostrich, Raw	44,923	0.001
Pork, Raw	973,043,815	24.53
Pork, Processed	160,250,054	4.04
Turkey, Raw	38,549,087	0.97
Turkey, Processed	4,496,915	0.11
Veal, Raw	37,824,238	0.95
Veal, Processed	112	2.8E-06
Grand Total	**3,967,256,752**	**100**

[1] Source - Slaughter Volume Data from **July 1, 2016 to June 30, 2017** (Data Source: PHIS, July 20, 2017)

Appendix V

Chemical Identification and Prioritization Framework for U.S. National Residue Program

FSIS chose to employ techniques and principles from the field of risk assessment to rank chemicals, based on relative public health concern. First, FSIS collated an exhaustive list of pesticides used domestically and internationally (from countries that are eligible to import to the US). FSIS then employed risk assessment techniques and principles to rank candidate pesticides, based on relative public health concern. The pesticides were ranked based on various factors as described below.

The categories of "Usage (S)," "Bioavailability (B)," "Frequency (F)," "Health-Based Guidance Value (H)," and "Carcinogenicity (C)" were employed as predictors of risk per unit of consumption from pesticides in animal products. The model uses a 6-point scale to give variability between overall score. For each chemical, the relative risk assessment can be summarized with the following equation.

$$\boldsymbol{Relative\ public\ health\ risk = Exposure\ \times\ Toxicity}$$

The variables **S**, **B,** and **F** represent pesticide exposure and variables **H** and **C** represent the pesticides toxicity. By multiplying weighted average exposure (**S, B,** and **F**) to the weighted average of toxicity (**H** and **C**), a rough estimate of the relative risk per unit of consumption represented by each pesticide or pesticide class is obtained.

$$\boldsymbol{Relative\ public\ health\ risk\ score} = \left(\frac{\boldsymbol{S+B+F}}{\boldsymbol{3}}\right)\ \times\ \left(\frac{\boldsymbol{H+C}}{\boldsymbol{2}}\right)$$

Many chemicals in the list below are not included in the FSIS analytical method. Therefore, to reduce the possibility for bias, FSIS decided to normalize the equation by adding a frequency adjustment for lack of testing (L) to the equation as described in the Frequency (F) section.

$$\boldsymbol{Relative\ public\ health\ risk\ score} = \left(\frac{\boldsymbol{S+B+F}}{\boldsymbol{3}}\right)\ \times\ \left(\frac{\boldsymbol{H+C}}{\boldsymbol{2}}\right) + \boldsymbol{L}$$

The calculated scores were used to rank pesticides by public health risk.

1. Usage (S)

The U.S. Geological Survey (USGS) publishes the annual county-level pesticide use survey. The survey estimated pesticide usage (in kilograms (kg)) in the US during 2008-2012. FSIS believes this data is important because the increase usage of pesticides increases the probability of the pesticide being present in the food supply, including FSIS-regulated products.

Categorical distribution of pesticide usage (in kg)

6	If usage is > 25,000 kg
5	If usage is > 20,000 and ≤ 25,000 kg
4	If usage is > 15,000 and ≤ 20,000 kg
3	If usage is > 10,000 and ≤ 15,000 kg
2	If usage is > 1,000 and ≤ 10,000 kg
1	If usage is ≤ 1,000 kg

2. Bioavailability (B)

The bioavailability (B) factor has been adopted from the previously published blue book ranking models. This is a measure of a chemical's relative affinity for fat, as measured by the octanol-water coefficient, log K_{ow}. The log K_{ow} is defined as the ratio of a compound's concentration in a known volume of *n*-

octanol to its concentration in a known volume of water after the octanol and water have reached equilibrium (Leo 1971). Compounds that have a high affinity for octanol tend to bioaccumulate in body fat and can easily cross the plasma membrane of cells. This is a concern, in that the chemical will stay in the fat of FSIS-regulated products. The log K_{ow} was calculated using EPA's EPISuite (v4.11) for chemicals lacking published log K_{ow}.

Categorical distribution of bioavailability

6 If log K_{ow} is > 5
5 If log K_{ow} is > 4 and ≤ 5
4 If log K_{ow} is > 3 and ≤ 4
3 If log K_{ow} is > 2 and ≤ 3
2 If log K_{ow} is > 1 and ≤ 2
1 If log K_{ow} is < 1

3. Frequency (F)

The frequency (F) of detecting a compound is based on annual sampling data. This includes the screening of FSIS-regulated products for 108 pesticide residues and their unreported positive residue levels, below published minimal limit of applicability (MLA), for the period ranging from 10/01/12 to 09/30/15.

Categorical distribution of the positive frequency (F)

6 If positive frequency is > 3.6%
5 If positive frequency is > 2.7 and ≤ 3.6%
4 If positive frequency is > 1.8 and ≤ 2.7%
3 If positive frequency is > 0.9 and ≤ 1.8%
2 If positive frequency is > 0 and ≤ 0.9%
1 If positive frequency is equal to 0%

Since this factor is only considering chemicals currently being screened by FSIS, the equation was normalized by adding a frequency adjustment **(L)** to the end of the final equation. This adjustment will address any bias. The frequency adjustment **(L)** factor is as follow:

a. Chemicals which have never been considered in the NRP were assigned 2 points.
b. Chemicals regularly screened but not detected were assigned a value of -1**.**

4. Health-Based Guideline Value (H)

Before pesticides are approved by EPA, each pesticide has to go through a rigorous testing process. It is at this stage that EPA determines if the pesticides have the potential to enter our food supply. Based on this possibility, dietary acute reference dose (aRFD) and chronic reference dose (cRFD) are determined.

The cRFD is an estimate (with uncertainty spanning an order of magnitude or greater) of a daily oral exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. The aRFD and cRFD are calculated by dividing the no-observed-adverse-effect-level (NOAEL) (i.e., the highest dose that gave no observable adverse effect) or the lowest-observed-adverse-effect-level (LOAEL) (i.e., the lowest dose at which an adverse effect was seen) by uncertainty factors (UF). UF's are used to account for differences between different humans (intraspecies variability) and for differences between the test animals and humans (interspecies extrapolation). If the LOAEL is used, an additional UF is required. These scores represent EPA's professional assessment of the extent to which the chronic dietary exposure to this compound may exceed EPA's level of concern. For each chemical, the level of regulatory concern was determined by the toxicological endpoint, chronic population adjusted dose (cPAD).

Categorical distribution of the cPAD

6	If HBGV is < 1E-6
5	If HBGV is < 1E-5 and ≥ 1E-6
4	If HBGV is < 1E-4 and ≥ 1E-5
3	If HBGV is < 1E-3 and ≥ 1E-4
2	If HBGV is < 1E-2 and ≥ 1E-3
1	If HBGV is ≥ 1E-2

5. Carcinogenic Potential (C)

The carcinogenic potential (C) factor is based on a report published by EPA's Office of Pesticide Programs, Chemicals Evaluated for Carcinogenic Potential (Dec 2015). The report lists the carcinogenicity hazard for pesticides, with no consideration of exposure information. The ranking is based on an EPA lettering system, designating the degree of carcinogenic potential. Similar to the previously mentioned variables, the carcinogenic potential will be classified based on the weight of evidence narrative in the cancer risk assessment.

Categorical distribution of the carcinogenic potential

4 or 6	Likely to Be Carcinogenic to Humans, Probable Carcinogenic to Humans
3	Suggestive Evidence of Carcinogenic Potential Possible Carcinogenic to Humans
2	Not Classifiable as to Human Carcinogenicity
1	Evidence of Non-carcinogenicity for Humans, Not Likely to Be Carcinogenic to Humans

For chemicals classified as 1) likely to be carcinogenic to humans and 2) probable carcinogenic to humans, the respective cancer slope factors (Q*) were used to determine the score. For Q* > 1, the chemical was given 6 points, and for Q*<1, the chemical was given 4 points.

Pesticide Ranking Based on Relative Public Health Impact

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
1	Dieldrin	Insecticide	1	6	2	4	6	0	17.5	Y	HH	In 2018 NRP
2	Aldrin	Insecticide	1	6	3	4	6	0	17.5	Y	H	In 2018 NRP
3	Mancozeb	Fungicide	6	2	1	3	4	2	16.0	N	--	
4	Tribufos (Def)	Herbicide	2	6	1	3	4	2	16.0	N	H	Pending
5	Chlordane Cis	Pesticide	1	6	2	3	6	0	15.8	Y	HH	In 2018 NRP
6	Chlordane Trans	Pesticide	1	6	2	3	6	0	15.8	Y	HH	In 2018 NRP
7	Heptachlor	Insecticide	1	6	2	3	6	0	15.8	Y	H	In 2018 NRP
8	Hexachlorobenzene (Hcb)	Fungicide	1	6	2	3	6	0	15.8	Y	HH	In 2018 NRP
9	Trifluralin	Herbicide	5	6	1	2	3	2	15.8	N	H	Pending
10	Alpha-Hexachlorocyclohexane	Insecticide	1	4	1	4	6	2	14.5	N	M	
11	Haloxyfop	Pesticide	1	4	1	4	6	2	14.5	N	--	
12	Triphenyltin Hydroxide	Pesticide	1	4	1	4	6	2	14.5	N	--	
13	Pendimethalin	Herbicide	6	6	1	1	3	2	14.0	N	--	
14	Lactofen	Herbicide	3	5	1	2	4	2	14.0	N	--	
15	Permethrin (Cis&Trans)	Insecticide	5	6	6	1	4	0	13.8	Y	HH	In 2018 NRP
16	Acetochlor	Herbicide	5	4	1	1	4	2	13.3	N	--	
17	Ethalfluralin	Herbicide	5	6	1	1	3	2	13.0	N	H	Pending
18	Mirex	Insecticide	1	6	2	3	3	2	12.5	N	H	Pending
19	Ethoprop	Insecticide	2	4	1	3	4	2	12.5	N	--	
20	Kresoxim-Methyl	Fungicide	2	4	1	3	4	2	12.5	N	--	
21	Bromadiolone	Pesticide	1	6	1	5	1	2	12.5	N	--	
22	Flocoumafen	Pesticide	1	6	1	5	1	2	12.5	N	--	
23	Quintozene (Pentachloronitrobenzene)	Fungicide	2	5	1	3	3	2	12.5	N	M	
24	Diclofop Methyl	Herbicide	2	5	1	2	4	2	12.5	N	--	
25	Tralkoxydim	Herbicide	2	5	1	2	4	2	12.5	N	--	
26	DDD P,P' + DDT O,P'	Insecticide	1	6	2	3	4	0	12.3	Y	HH	In 2018 NRP
27	DDE P,P'	Insecticide	1	6	3	3	4	0	12.3	Y	HH	In 2018 NRP
28	DDT	Insecticide	1	6	2	3	4	0	12.3	Y	HH	In 2018 NRP
29	DDT P,P'	Insecticide	1	6	2	3	4	0	12.3	Y	HH	In 2018 NRP
30	Dicofol (As Dichlorobenzophenone)	Insecticide	2	6	1	2	3	2	12.0	N	H	
31	Captan	Fungicide	5	3	1	1	4	2	12.0	N	L	
32	Propargite	Insecticide	2	6	1	1	4	2	12.0	N	H	Pending
33	Flumiclorac Pentyl	Pesticide	3	5	1	4	1	2	12.0	N	--	
34	Spirodiclofen	Insecticide	2	6	1	1	4	2	12.0	N	H	Pending Validation
35	Chlorothalonil	Fungicide	6	4	1	1	4	-1	11.5	Y	HH	In 2018 NRP
36	Carbaryl (1-Naphthol)	Insecticide	6	3	2	1	4	0	11.3	Y	HH	In 2018 NRP

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
37	DDD	Insecticide	1	6	1	3	4	-1	11.3	Y	H	In 2018 NRP
38	DDD O,P'	Insecticide	1	6	1	3	4	-1	11.3	Y	H	In 2018 NRP
39	DDE O,P'	Insecticide	1	6	1	3	4	-1	11.3	Y	H	In 2018 NRP
40	Bifenthrin	Insecticide	5	6	5	1	3	0	11.0	Y	HH	In 2018 NRP
41	Clodinafop-Propargyl	Herbicide	2	4	1	3	3	2	11.0	N	--	
42	Tembotrione	Herbicide	3	3	1	3	3	2	11.0	N	--	
43	Chlorpyrifos Oxon	Insecticide	6	3	1	3	1	2	11.0	N	--	
44	Tebuconazole	Fungicide	5	4	1	1	3	2	11.0	N	--	
45	Chlorpyrifos Methyl	Pesticide	6	5	2	3	1	0	11.0	Y	M	In 2018 NRP
46	Cyhalothrin- Lambda	Pyrethroids	6	6	1	2	1	2	11.0	N	--	
47	Diuron	Herbicide	5	3	1	2	4	-1	11.0	Y	L	In 2018 NRP
48	Disulfoton	Pesticide	2	5	1	4	1	2	10.8	N	--	
49	Beta-Hexachloro-Cyclohexane (B-Hch)	Insecticide	1	4	1	4	3	2	10.8	N	M	
50	Terbufos	Insecticide	2	5	1	4	1	2	10.8	N	--	
51	Endrin	Insecticide	1	6	1	3	2	2	10.8	N	H	Pending Validation
52	Amitraz	Insecticide	1	6	1	2	3	2	10.8	N	L	
53	Benfluralin	Herbicide	1	6	1	2	3	2	10.8	N	H	Pending Validation
54	Ethiprole	Pesticide	1	6	1	2	3	2	10.8	N	--	
55	Oxyfluorfen	Herbicide	2	5	1	2	3	2	10.8	N	M	
56	Triallate	Herbicide	2	5	1	2	3	2	10.8	N	--	
57	Tridiphane	Herbicide	1	6	1	2	3	2	10.8	N	H	
58	Pyraflufen	Herbicide	2	5	1	1	4	2	10.8	N	--	
59	Tetraconazole	Fungicide	2	5	2	2	4	0	10.5	Y	M	In 2018 NRP
60	Cypermethrin (All Isomers)	Insecticide	2	6	6	1	3	2	10.0	N	H	Pending
61	Phosmet	Insecticide	5	3	1	1	3	2	10.0	N	L	
62	Propiconazole	Fungicide	6	4	3	1	3	0	10.0	Y	M	In 2018 NRP
63	Pyrethrin I	Pyrethroids	2	6	2	1	3	2	10.0	N	HH	
64	Alachlor	Herbicide	4	4	3	1	4	0	10.0	Y	M	In 2018 NRP
65	Chlorpyrifos-Methyl Oxon	Insecticide	6	2	1	3	1	2	10.0	N	M	
66	Quizalofop Ethyl	Herbicide	3	5	1	2	2	2	10.0	N	M	
67	Cadusafos	Insecticide	1	4	1	5	1	2	9.5	N	--	
68	Etridiazole	Fungicide	1	4	1	2	4	2	9.5	N	L	
69	Fluthiacet-Methyl (Cga-248757)	Pesticide	2	3	1	2	4	2	9.5	N	--	
70	Oxythioquinox	Pesticide	1	4	1	2	4	2	9.5	N	M	
71	Epn (Ethyl P-Nitrophenyl Phenylphosphorothioate)	Pesticide	1	5	1	4	1	2	9.5	N	--	
72	Fenthion (Mpp)	Insecticide	1	5	1	4	1	2	9.5	N	M	
73	Isofenphos	Insecticide	1	5	1	4	1	2	9.5	N	M	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
74	Chlorfenapyr	Pesticide	1	5	1	2	3	2	9.5	N	--	
75	Oxadiazon	Herbicide	1	5	1	2	3	2	9.5	N	M	
76	Prochloraz	Fungicide	1	5	1	2	3	2	9.5	N	--	
77	Triadimenol	Fungicide	2	4	1	2	3	2	9.5	N	L	
78	Tribenuron Methyl	Pesticide	5	1	1	2	3	2	9.5	N	--	
79	Ziram	Fungicide	4	2	1	2	3	2	9.5	N	--	
80	Acifluorfen	Herbicide	2	4	1	1	4	2	9.5	N	--	
81	Chlorobenzilate	Pesticide	1	5	1	1	4	2	9.5	N	--	
82	Isoxaflutole	Herbicide	3	3	1	1	4	2	9.5	N	L	
83	Fludioxonil	Fungicide	5	5	1	1	2	2	9.5	N	--	
84	Methoxychlor	Insecticide	1	6	1	2	2	2	9.0	N	H	Pending Validation
85	Fipronil	Insecticide	2	4	2	3	3	0	9.0	Y	HH	In 2018 NRP
86	Fipronil Desulfinyl	Insecticide	1	5	2	3	3	0	9.0	Y	--	In 2018 NRP
87	Fipronil Sulfide	Insecticide	1	5	2	3	3	0	9.0	Y	--	In 2018 NRP
88	Lindane	Pesticide	2	4	2	3	3	0	9.0	Y	HH	In 2018 NRP
89	Parathion Methyl	Insecticide	1	3	1	4	3	2	9.0	N	M	
90	Carbophenothion	Insecticide	1	6	1	3	1	2	9.0	N	H	Pending Validation
91	Dinocap	Fungicide	1	6	1	3	1	2	9.0	N	--	
92	Mcpa (2-Methyl-4-Chlorophenoxyacetic Acid)	Herbicide	3	4	1	3	1	2	9.0	N	--	
93	Bromoxynil	Herbicide	3	4	1	1	3	2	9.0	N	--	
94	Fenbuconazole	Fungicide	3	4	1	1	3	2	9.0	N	L	
95	Difenoconazole	Fungicide	4	5	3	1	3	0	9.0	Y	M	In 2018 NRP
96	Pentachlorobenzene (Pcb)	Other	1	6	3	3	2	0	8.8	Y	H	In 2018 NRP
97	Linuron	Herbicide	3	4	2	2	3	0	8.8	Y	L	In 2018 NRP
98	Oxychlordane (Chlordane Byproduct)	Insecticide	1	6	2	4	1	0	8.8	Y	HH	In 2018 NRP
99	Resmethrin (Cis& Trans)	Insecticide	1	6	2	1	4	0	8.8	Y	H	In 2018 NRP
100	Atrazine-Desethyl	Herbicide	6	3	1	2	1	2	8.8	N	--	
101	Gamma-Cyhalothrin	Pyrethroids	3	6	1	2	1	2	8.8	N	--	
102	2,4-D	Herbicide	6	3	1	1	2	2	8.8	N	--	
103	Dicamba	Herbicide	6	3	1	1	2	2	8.8	N	--	
104	Iprodione	Fungicide	2	3	1	1	4	2	8.3	N	L	
105	Chlorpyrifos	Insecticide	6	5	2	2	1	0	8.3	Y	HH	In 2018 NRP
106	Dinoseb	Fungicide	1	4	1	2	3	2	8.3	N	--	
107	Molinate	Pesticide	1	4	1	2	3	2	8.3	N	--	
108	Parathion (Parathion-Ethyl)	Insecticide	1	4	1	2	3	2	8.3	N	M	
109	Terbutryn	Herbicide	1	4	1	2	3	2	8.3	N	--	
110	Cyproconazole	Fungicide	2	3	1	1	4	2	8.3	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
111	Epoxiconazole	Fungicide	1	4	1	1	4	2	8.3	N	--	
112	Iprovalicarb	Fungicide	1	4	1	1	4	2	8.3	N	--	
113	Nitrapyrin	Microbiocide	1	4	1	1	4	2	8.3	N	L	
114	Procymidone	Fungicide	1	4	1	1	4	2	8.3	N	--	
115	Tolyfluanid	Insecticide	1	4	1	1	4	2	8.3	N	--	
116	Clofentezine	Pesticide	2	4	2	1	3	2	8.0	N	L	
117	Dichlorprop-P	Herbicide	2	4	1	3	1	2	8.0	N	--	
118	Ethion Dioxon	Insecticide	1	5	1	3	1	2	8.0	Y	H	In 2018 NRP
119	Flufenacet	Herbicide	2	4	1	3	1	2	8.0	N	L	
120	Glufosinate-Ammonium	Herbicide	5	1	1	3	1	2	8.0	N	--	
121	Phorate (Thimet)	Insecticide	2	4	1	3	1	2	8.0	N	M	
122	Pirimiphos Ethyl	Pesticide	1	5	1	3	1	2	8.0	N	--	
123	Chlorthal Dimethyl	Pesticide	1	5	1	1	3	2	8.0	N	--	
124	Dimethenamid	Herbicide	3	3	1	1	3	2	8.0	N	--	
125	Fluazinam	Fungicide	2	4	1	1	3	2	8.0	N	--	
126	Metrafenone	Herbicide	1	5	1	1	3	2	8.0	N	--	
127	Penthiopyrad	Fungicide	1	5	1	1	3	2	8.0	N	--	
128	Pyrimethanil	Fungicide	2	4	1	1	3	2	8.0	N	--	
129	Tetramethrin	Insecticide	1	5	1	1	3	2	8.0	N	M	
130	Hexythiazox	Insecticide	2	6	3	1	3	0	8.0	Y	H	In 2018 NRP
131	Metolachlor	Herbicide	5	4	1	1	3	-1	8.0	Y	L	In 2018 NRP
132	2,4-Db	Herbicide	4	4	1	2	1	2	8.0	N	--	
133	Famoxadone	Fungicide	3	5	1	2	1	2	8.0	N	M	
134	Fluazifop-P-Butyl	Herbicide	3	5	1	2	1	2	8.0	N	M	
135	Flumethrin	Pyrethroids	2	6	1	2	1	2	8.0	N	--	
136	Cyfluthrin (All Isomers)	Insecticide	6	6	1	1	1	2	8.0	N	HH	Pending Validation
137	Esfenvalerate	Insecticide	6	6	1	1	1	2	8.0	N	H	Pending Validation
138	Imazalil	Fungicide	2	4	3	1	4	0	7.5	Y	M	In 2018 NRP
139	Profenofos	Insecticide	1	5	2	4	1	0	7.5	Y	M	In 2018 NRP
140	Propanil	Herbicide	2	4	3	2	3	0	7.5	Y	L	In 2018 NRP
141	Dodine	Pesticide	2	5	1	2	1	2	7.3	N	--	
142	Dicrotophos	Insecticide	2	1	1	4	3	2	7.3	N	--	
143	Fenvalerate	Insecticide	1	6	3	2	1	2	7.3	N	H	Pending
144	Dimoxystrobin	Fungicide	1	6	1	2	1	2	7.3	N	--	
145	Fomesafen	Herbicide	4	3	1	2	1	2	7.3	N	--	
146	Mesotrione	Pesticide	5	2	1	2	1	2	7.3	N	--	
147	Paraquat	Herbicide	6	1	1	2	1	2	7.3	N	--	
148	Phenothrin	Insecticide	1	6	1	2	1	2	7.3	N	H	Pending
149	Picolinafen	Pesticide	1	6	1	2	1	2	7.3	N	--	
150	Tolfenpyrad	Insecticide	1	6	1	2	1	2	7.3	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
151	Hydroprene	Insecticide	1	6	1	1	2	2	7.3	N	H	
152	Thifensulfuron-Methyl	Herbicide	5	2	1	1	2	2	7.3	N	--	
153	Triclopyr	Herbicide	4	3	1	1	2	2	7.3	N	--	
154	Dichlobenil	Pesticide	2	3	1	1	3	2	7.0	N	--	
155	Famphur	Pesticide	1	3	1	4	1	2	7.0	N	--	
156	Fenthion Sulfone	Insecticide	1	3	1	4	1	2	7.0	N	M	
157	Methidathion	Insecticide	1	3	1	2	3	2	7.0	N	L	
158	Triadimefon	Fungicide	1	3	1	2	3	2	7.0	N	L	
159	Folpet	Pesticide	1	3	1	1	4	2	7.0	N	--	
160	Metiram	Pesticide	3	1	1	1	4	2	7.0	N	--	
161	Thiacloprid	Insecticide	2	2	1	1	4	2	7.0	N	L	
162	Thiodicarb	Pesticide	2	2	1	1	4	2	7.0	N	--	
163	Abamectin (Avermectin B1)	Insecticide	4	1	1	3	1	2	7.0	N	--	
164	Chlorfenvinphos	Insecticide	1	4	1	3	1	2	7.0	N	M	
165	Endrin Ketone	Insecticide	1	4	1	3	1	2	7.0	N	--	
166	Fenamiphos	Insecticide	1	4	1	3	1	2	7.0	N	L	
167	Pyraclostrobin	Fungicide	6	4	2	1	1	2	7.0	N	M	
168	Terbuthylazine	Herbicide	1	4	1	2	2	2	7.0	N	--	
169	Fluometuron	Fungicide	2	3	1	1	3	2	7.0	N	--	
170	Hexaconazole	Fungicide	1	4	1	1	3	2	7.0	N	--	
171	Isoxaben	Herbicide	1	4	1	1	3	2	7.0	N	--	
172	Picoxystrobin	Fungicide	1	4	1	1	3	2	7.0	N	--	
173	Pyrasulfotole	Herbicide	2	3	1	1	3	2	7.0	N	--	
174	Sulfoxaflor	Insecticide	1	4	1	1	3	2	7.0	N	--	
175	Triflusulfuron-Methyl	Pesticide	1	4	1	1	3	2	7.0	N	--	
176	Vinclozolin	Fungicide	1	4	1	1	3	2	7.0	N	L	
177	Ethion	Insecticide	1	6	3	3	1	0	7.0	Y	H	In 2018 NRP
178	Nonachlor -Trans	Insecticide	1	6	2	3	1	0	7.0	Y	H	In 2018 NRP
179	Boscalid	Fungicide	4	3	2	1	3	0	7.0	Y	HH	In 2018 NRP
180	Buprofezin	Insecticide	2	5	3	1	3	0	7.0	Y	M	In 2018 NRP
181	Fenoxaprop Ethyl	Herbicide	2	5	2	1	3	0	7.0	Y	M	In 2018 NRP
182	Clethodim	Herbicide	5	5	1	1	1	2	7.0	N	M	
183	Ethion Monoxon	Insecticide	1	6	2	3	1	0	7.0	Y	HH	In 2018 NRP
184	Tefluthrin	Insecticide	3	6	2	2	1	0	6.8	Y	H	In 2018 NRP
185	Pirimicarb	Carbamate	1	2	1	2	4	2	6.5	N	--	
186	Cyhalothrin (All Isomers)	Insecticide	3	6	6	1	1	2	6.5	N	HH	Pending
187	Prometryn	Herbicide	2	4	1	2	1	2	6.5	N	--	
188	Bicyclopyrone	Herbicide	1	2	1	3	3	2	6.5	N	--	
189	Maneb	Pesticide	2	1	1	2	4	2	6.5	N	--	
190	Propoxur	Insecticide	1	2	1	2	4	2	6.5	N	--	
191	Pymetrozine	Insecticide	2	1	1	2	4	2	6.5	N	--	
192	Bitertanol	Fungicide	1	5	1	2	1	2	6.5	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
193	Diquat	Herbicide	3	3	1	2	1	2	6.5	N	--	
194	Fenarimol	Fungicide	2	4	1	2	1	2	6.5	N	M	
195	Flusilazole	Fungicide	2	4	1	2	1	2	6.5	N	--	
196	Furathiocarb	Pesticide	1	5	1	2	1	2	6.5	N	--	
197	Penconazole	Fungicide	1	5	1	2	1	2	6.5	N	--	
198	Phosalone	Insecticide	1	5	1	2	1	2	6.5	N	M	
199	Propaquizafop	Herbicide	1	5	1	2	1	2	6.5	N	--	
200	Propazine	Herbicide	2	4	1	2	1	2	6.5	N	--	
201	Prosulfocarb	Herbicide	1	5	1	2	1	2	6.5	N	--	
202	Triflumuron	Pesticide	1	5	1	2	1	2	6.5	N	--	
203	Naptalam	Herbicide	2	4	1	1	2	2	6.5	N	--	
204	Acephate	Insecticide	4	1	2	2	3	0	6.3	Y	HH	In 2018 NRP
205	Dimethoate	Insecticide	4	1	3	2	3	0	6.3	Y	L	In 2018 NRP
206	Tetrachlorvinphos	Insecticide	1	4	2	1	4	0	6.3	Y	M	In 2018 NRP
207	Piperonyl Butoxide	Synergist	1	5	6	1	3	0	6.0	Y	HH	In 2018 NRP
208	Malathion Oxon	Insecticide	3	1	1	1	3	2	6.0	N	L	
209	Diazinon	Insecticide	2	4	3	3	1	0	6.0	Y	HH	In 2018 NRP
210	Malathion	Insecticide	3	3	2	1	3	0	6.0	Y	L	In 2018 NRP
211	Fenbutatin Oxide	Insecticide	2	6	1	1	1	2	6.0	N	--	
212	Simazine	Herbicide	5	3	2	2	1	0	6.0	Y	L	In 2018 NRP
213	Etu (Ethylene Thiourea)	Pesticide	1	1	1	4	4	2	6.0	N	--	
214	Fentin Hydroxide	fungicide	3	1	1	3	1	2	6.0	N	--	
215	Phorate Oxon	Insecticide	2	2	1	3	1	2	6.0	N	M	
216	Phorate Sulfone	Insecticide	2	2	1	3	1	2	6.0	N	M	
217	Phorate Sulfoxide	Insecticide	2	2	1	3	1	2	6.0	N	M	
218	Ethephon	Herbicide	3	1	1	2	2	2	6.0	N	--	
219	Methiocarb	Insecticide	1	3	1	2	2	2	6.0	N	L	
220	Bromacil	Pesticide	1	3	1	1	3	2	6.0	N	--	
221	Triforin	Fungicide	1	3	1	1	3	2	6.0	N	--	
222	Etoxazole	Insecticide	2	6	1	1	1	2	6.0	N	--	
223	Fenpyroximate	Pesticide	2	6	1	1	1	2	6.0	N	H	Pending
224	Florasulam	Pesticide	2	6	1	1	1	2	6.0	N	--	
225	Flumioxazin	Herbicide	5	3	1	1	1	2	6.0	N	--	
226	Imazethapyr	Herbicide	5	3	1	1	1	2	6.0	N	--	
227	Novaluron	Herbicide	2	6	1	1	1	2	6.0	N	H	Pending
228	Pyridaben	Insecticide	2	6	2	2	1	0	6.0	Y	H	In 2018 NRP
229	Nonachlor -Cis	Insecticide	1	6	1	3	1	-1	6.0	Y	H	In 2018 NRP
230	Emamectin	Insecticide	2	1	1	4	1	2	5.8	N	--	
231	Sulfosulfuron	Herbicide	2	1	1	1	4	2	5.8	N	--	
232	Azinphos-Ethyl	Insecticide	1	4	1	2	1	2	5.8	N	L	
233	Chloroxuron	Herbicide	1	4	1	2	1	2	5.8	N	--	
234	Fenitrothion (Mep)	Insecticide	1	4	1	2	1	2	5.8	N	L	
235	Fluquinconazole	Fungicide	1	4	1	2	1	2	5.8	N	--	
236	Fpyriproxyfen	Fungicide	1	4	1	2	1	2	5.8	N	M	
237	Thiram	Pesticide	3	2	1	2	1	2	5.8	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
238	Aminopyralid	Herbicide	4	1	1	1	2	2	5.8	N	--	
239	Paclobutrazol	Fungicide	1	4	1	1	2	2	5.8	N	--	
240	Phenmedipham	Pesticide	1	4	1	1	2	2	5.8	N	--	
241	Quinclorac	Herbicide	2	3	1	1	2	2	5.8	N	--	
242	Eptc (S-Ethyl Dipropylthiocarbamate)	Herbicide	3	4	1	1	1	2	5.5	N	--	
243	Amitrole	Herbicide	1	1	1	3	4	2	5.5	N	--	
244	2,6-Diisopropylnaphthalene (2,6-Dipn)	Herbicide*	1	6	1	1	1	2	5.5	N	L	
245	Acequinocyl	Insecticide	1	6	1	1	1	2	5.5	N	--	
246	Bentazon	Herbicide	4	3	1	1	1	2	5.5	N	--	
247	Beta Cyfluthrin	Pesticide	1	6	1	1	1	2	5.5	N	--	
248	Bromophos	Insecticide	1	6	1	1	1	2	5.5	N	--	
249	Bromopropylate	Insecticide	1	6	1	1	1	2	5.5	N	--	
250	Butralin	Herbicide	2	5	1	1	1	2	5.5	N	--	
251	Carbosulfan	Carbamate	1	6	1	1	1	2	5.5	N	--	
252	Chlorantraniliprole	Insecticide	3	4	1	1	1	2	5.5	N	--	
253	Chlorimuron-Ethyl	Pesticide	4	3	1	1	1	2	5.5	N	--	
254	Clomazone	Herbicide	4	3	1	1	1	2	5.5	N	--	
255	Cloquintocet-Mexyl	Pesticide	1	6	1	1	1	2	5.5	N	--	
256	Cyhalofop-Butyl	Herbicide	2	5	1	1	1	2	5.5	N	--	
257	Cyhexatin	Pesticide	1	6	1	1	1	2	5.5	N	--	
258	Cyphenothrin	Insecticide	1	6	1	1	1	2	5.5	N	H	Pending
259	Cyprodinil	Fungicide	3	4	1	1	1	2	5.5	N	--	
260	Etofenprox	Insecticide	1	6	1	1	1	2	5.5	N	--	
261	Fenazaquin	Insecticide	1	6	1	1	1	2	5.5	N	--	
262	Flucythrinate	Pyrethroids	1	6	1	1	1	2	5.5	N	--	
263	Flufenoxuron	Insecticide	1	6	1	1	1	2	5.5	N	H	Pending
264	Fluopicolide	Fungicide	2	5	1	1	1	2	5.5	N	--	
265	Fluopyram	Fungicide	2	5	1	1	1	2	5.5	N	--	
266	Glyphosate	Herbicide	6	1	1	1	1	2	5.5	N	--	
267	Ipconazole	Fungicide	2	5	1	1	1	2	5.5	N	--	
268	Isoxadifen-Ethyl	Herbicide	1	6	1	1	1	2	5.5	N	--	
269	Methoprene	Insecticide	1	6	1	1	1	2	5.5	N	H	
270	Metsulfuron-Methyl	Herbicide	4	3	1	1	1	2	5.5	N	--	
271	Napropamide	Herbicide	3	4	1	1	1	2	5.5	N	--	
272	Prothioconazole	Fungicide	3	4	1	1	1	2	5.5	N	--	
273	Pyridate	Pesticide	1	6	1	1	1	2	5.5	N	--	
274	Quinoxyfen	Pesticide	2	5	1	1	1	2	5.5	N	--	
275	Sethoxydim	Herbicide	5	2	1	1	1	2	5.5	N	L	
276	S-Methoprene	Pesticide	1	6	1	1	1	2	5.5	N	--	
277	Spiromesifen	Insecticide	2	5	1	1	1	2	5.5	N	M	
278	Spiroxamine	Pesticide	1	6	1	1	1	2	5.5	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
279	Temephos	Insecticide	1	6	1	1	1	2	5.5	N	--	
280	Tridemorph	Fungicide	1	6	1	1	1	2	5.5	N	--	
281	Trifloxystrobin	Fungicide	6	5	2	1	1	0	5.5	Y	M	In 2018 NRP
282	Azinphos Methyl	Insecticide	4	3	5	2	1	0	5.3	Y	L	In 2018 NRP
283	Metribuzin	Herbicide	5	2	2	1	2	0	5.3	Y	L	In 2018 NRP
284	Sulprofos	Insecticide	1	6	2	2	1	0	5.3	Y	H	In 2018 NRP
285	Heptachlor Epoxide (Cis&Trans) Or (B+A)	Insecticide	1	1	3	4	6	0	5.0	Y	HH	In 2018 NRP
286	Deltamethrin	Insecticide	1	5	6	1	1	2	5.0	N	M	
287	Thiabendazole	Fungicide	1	3	3	1	4	0	5.0	Y	HH	In 2018 NRP
288	MGK-264 (Isomers 1&2)	Synergist	1	4	3	1	3	0	5.0	Y	HH	In 2018 NRP
289	Norflurazon	Herbicide	2	3	2	1	3	0	5.0	Y	L	In 2018 NRP
290	Oxydemeton Methyl	Insecticide	2	1	1	3	1	2	5.0	N	L	
291	Carbendazim	Fungicide	1	2	1	1	3	2	5.0	N	L	
292	Trichlorfon	Pesticide	1	1	1	3	3	2	5.0	N	--	
293	Propachlor	Herbicide	1	3	3	1	4	0	5.0	Y	L	In 2018 NRP
294	Propetamphos	Insecticide	1	4	3	3	1	0	5.0	Y	M	In 2018 NRP
295	Fenamiphos Sulfone	Insecticide	1	2	1	3	1	2	5.0	N	L	
296	Fenamiphos Sulfoxide	Insecticide	1	2	1	3	1	2	5.0	N	L	
297	Formetanate	Pesticide	2	1	1	3	1	2	5.0	N	--	
298	Formetanate Hydrochloride	Pesticide	1	2	1	3	1	2	5.0	N	--	
299	Fosthiazate	Nematocide	1	2	1	3	1	2	5.0	N	--	
300	Clofencet	Pesticide	1	2	1	1	3	2	5.0	N	--	
301	Flonicamid	Insecticide	2	1	1	1	3	2	5.0	N	L	
302	Pyrithiobac Sodium	Pesticide	2	1	1	1	3	2	5.0	N	--	
303	4-Chlorophenoxyacetic Acid (4-Cpa)	Pesticide	1	3	1	2	1	2	5.0	N	--	
304	Ametryn	Herbicide	1	3	1	2	1	2	5.0	N	--	
305	Cyclanilide	Herbicide	2	2	1	2	1	2	5.0	N	--	
306	Dichloran	Pesticide	1	3	1	2	1	2	5.0	N	--	
307	Fensulfothion	Insecticide	1	3	1	2	1	2	5.0	N	--	
308	Guazatine	Fungicide	1	3	1	2	1	2	5.0	N	--	
309	Topramezone	Herbicide	2	2	1	2	1	2	5.0	N	--	
310	Trifloxysulfuron	Herbicide	2	2	1	2	1	2	5.0	N	--	
311	Imazamethabenz-Methyl	Herbicide	2	2	1	1	2	2	5.0	N	--	
312	Tebuthiuron	Herbicide	2	2	1	1	2	2	5.0	N	L	
313	Bifenazate	Acaricide	2	4	1	1	1	2	5.0	N	L	
314	Clopyralid	Herbicide	4	2	1	1	1	2	5.0	N	--	
315	Diclosulam	Pesticide	2	4	1	1	1	2	5.0	N	--	
316	Didecyldimethylammonium Chloride	Pesticide	1	5	1	1	1	2	5.0	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
317	Diflufenican	Herbicide	1	5	1	1	1	2	5.0	N	--	
318	Diflufenzopyr	Herbicide	4	2	1	1	1	2	5.0	N	HH	
319	Fenhexamid	Fungicide	2	4	1	1	1	2	5.0	N	--	
320	Fenpropimorph	Pesticide	1	5	1	1	1	2	5.0	N	--	
321	Flubendiamide	Insecticide	2	4	1	1	1	2	5.0	N	--	
322	Fluroxypyr	Herbicide	3	3	1	1	1	2	5.0	N	L	
323	Flutolanil	Fungicide	2	4	1	1	1	2	5.0	N	M	
324	Iodosulfuron Methyl	Pesticide	2	4	1	1	1	2	5.0	N	--	
325	Mandipropamid	Fungicide	2	4	1	1	1	2	5.0	N	--	
326	Mcpb (4-(2-Methyl-4-Chlorophenoxy) Butyric Acid)	Herbicide	2	4	1	1	1	2	5.0	N	--	
327	Mefenpyr-Diethyl	Herbicide	1	5	1	1	1	2	5.0	N	--	
328	Metconazole	Fungicide	2	4	1	1	1	2	5.0	N	--	
329	Pinoxaden	Herbicide	2	4	1	1	1	2	5.0	N	--	
330	Prosulfuron	Herbicide	2	4	1	1	1	2	5.0	N	--	
331	Rimsulfuron	Herbicide	5	1	1	1	1	2	5.0	N	--	
332	Spirotetramat	Insecticide	2	4	1	1	1	2	5.0	N	--	
333	Tecnazene	Fungicide	1	5	1	1	1	2	5.0	N	--	
334	Tetradifon	Pesticide	1	5	1	1	1	2	5.0	N	--	
335	Tolclofos-Methyl	Fungicide	1	5	1	1	1	2	5.0	N	--	
336	Triticonazole	Fungicide	2	4	1	1	1	2	5.0	N	--	
337	Endosulfan	Pesticide	4	4	1	2	1	-1	5.0	Y	HH	In 2018 NRP
338	Dichlorvos (Ddvp)	Pesticide	1	2	3	3	3	0	4.5	Y	L	In 2018 NRP
339	Monocrotophos	Insecticide	1	1	1	4	1	2	4.5	N	--	
340	Diphenylamine (Dpa)	Fungicide	1	4	1	1	1	2	4.5	N	HH	Pending
341	O-Phenylphenol	Microbiocide	1	4	1	1	1	2	4.5	N	--	
342	Phosphine (Hydrogen Phosphide)	Pesticide	1	1	1	3	2	2	4.5	N	--	
343	Captan Epoxide	Pesticide	1	1	1	1	4	2	4.5	N	--	
344	Daminozide	Herbicide	1	1	1	1	4	2	4.5	N	--	
345	Propylene Oxide	Fungicide	1	1	1	1	4	2	4.5	N	--	
346	Propyzamide	Herbicide	1	4	3	1	1	2	4.5	N	--	
347	Acibenzolar-S-Methyl	Fungicide	1	4	1	1	1	2	4.5	N	--	
348	Benalaxyl	Pesticide	1	4	1	1	1	2	4.5	N	--	
349	Butafenacil	Herbicide	1	4	1	1	1	2	4.5	N	--	
350	Carboxin	Pesticide	2	3	1	1	1	2	4.5	N	L	
351	Chlorsulfuron	Herbicide	3	2	1	1	1	2	4.5	N	--	
352	Chlorsulfuron, 5-Hydroxy-	Pesticide	3	2	1	1	1	2	4.5	N	--	
353	Cyantraniliprole	Insecticide	1	4	1	1	1	2	4.5	N	--	
354	Cyazofamid	Fungicide	2	3	1	1	1	2	4.5	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
355	Desmedipham	Herbicide	1	4	1	1	1	2	4.5	N	--	
356	Dimethomorph	Pesticide	2	3	1	1	1	2	4.5	N	--	
357	Ethoxyquin	Fungicide	1	4	1	1	1	2	4.5	N	--	
358	Flucarbazone	Pesticide	2	3	1	1	1	2	4.5	N	--	
359	Flumetsulam	Herbicide	3	2	1	1	1	2	4.5	N	--	
360	Fluoxastrobin	Fungicide	2	3	1	1	1	2	4.5	N	L	
361	Flutriafol	Fungicide	2	3	1	1	1	2	4.5	N	--	
362	Fluxapyroxad	fungicide	1	4	1	1	1	2	4.5	N	--	
363	Halosulfuron-Methyl	Herbicide	4	1	1	1	1	2	4.5	N	--	
364	Imazapic-Ammonium	Herbicide	2	3	1	1	1	2	4.5	N	--	
365	Imazaquin	Herbicide	2	3	1	1	1	2	4.5	N	--	
366	Lenacil	Herbicide	1	4	1	1	1	2	4.5	N	--	
367	Nicosulfuron	Herbicide	4	1	1	1	1	2	4.5	N	--	
368	Picloram	Herbicide	4	1	1	1	1	2	4.5	N	--	
369	Propoxycarbazone	Herbicide	2	3	1	1	1	2	4.5	N	--	
370	Tepraloxydim	Herbicide	1	4	1	1	1	2	4.5	N	--	
371	Terbacil	Herbicide	3	2	1	1	1	2	4.5	N	L	
372	Triazophos	Pesticide	1	4	1	1	1	2	4.5	N	--	
373	Endosulfan I	Insecticide	1	5	2	2	1	0	4.5	Y	HH	In 2018 NRP
374	Azamethiphos	Pesticide	1	2	1	2	1	2	4.3	N	--	
375	Bendiocarb	Pesticide	1	2	1	2	1	2	4.3	N	--	
376	Endothall	Herbicide	1	2	1	2	1	2	4.3	N	--	
377	Imazapyr	Herbicide	2	1	1	2	1	2	4.3	N	--	
378	Naled	Pesticide	1	2	1	2	1	2	4.3	N	--	
379	Phosalone Oxon	Pesticide	1	2	1	2	1	2	4.3	N	--	
380	Pentachloroaniline (Pca)	Other	1	6	1	2	1	-1	4.3	Y	H	In 2018 NRP
381	Phosmet Oxon	Insecticide	1	1	1	1	3	2	4.0	N	--	
382	Oxamyl	Insecticide	3	1	1	1	1	2	4.0	N	--	
383	Demeton-S-Methyl Sulfone	Insecticide	1	1	1	3	1	2	4.0	N	L	
384	Asulam	Herbicide	1	1	1	1	3	2	4.0	N	--	
385	Bifenthrin, 4'-Hydroxy	Pesticide	1	1	1	1	3	2	4.0	N	--	
386	Dimethipin	Pesticide	1	1	1	1	3	2	4.0	N	--	
387	Ferbam	Pesticide	1	1	1	1	3	2	4.0	N	--	
388	Bupirimate	Fungicide	1	3	1	1	1	2	4.0	N	--	
389	Chloroneb, Hydroxy-	Pesticide	1	3	1	1	1	2	4.0	N	--	
390	Cloransulam-Methyl	Pesticide	1	3	1	1	1	2	4.0	N	--	
391	Cymoxanil	Fungicide	3	1	1	1	1	2	4.0	N	--	
392	Diphenamid	Herbicide	1	3	1	1	1	2	4.0	N	L	
393	Diphenamid, Desmethyl	Pesticide	1	3	1	1	1	2	4.0	N	--	
394	Ethoxysulfuron	Pesticide	1	3	1	1	1	2	4.0	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
395	Fenamidone	Fungicide	1	3	1	1	1	2	4.0	N	L	
396	Flucarbazone-Sodium	Herbicide	1	3	1	1	1	2	4.0	N	--	
397	Imazamox	Herbicide	3	1	1	1	1	2	4.0	N	--	
398	Imiprothrin	Insecticide	1	3	1	1	1	2	4.0	N	L	
399	Mesosulfuron Methyl	Herbicide	2	2	1	1	1	2	4.0	N	--	
400	Propamocarb	Fungicide	2	2	1	1	1	2	4.0	N	--	
401	Propamocarb Hydrochloride	Fungicide	2	2	1	1	1	2	4.0	N	--	
402	Propham	Herbicide	1	3	1	1	1	2	4.0	N	L	
403	Propoxycarbazone-Sodium	Herbicide	1	3	1	1	1	2	4.0	N	--	
404	Pyroxsulam	Herbicide	2	2	1	1	1	2	4.0	N	--	
405	Saflufenacil	Herbicide	3	1	1	1	1	2	4.0	N	--	
406	Thidiazuron	Herbicide	2	2	1	1	1	2	4.0	N	--	
407	Thiencarbazone-Methyl	Pesticide	2	2	1	1	1	2	4.0	N	--	
408	Triasulfuron	Herbicide	2	2	1	1	1	2	4.0	N	--	
409	Triflumazole	Fungicide	2	2	1	1	1	2	4.0	N	L	
410	Carfentrazone Ethyl	Herbicide	4	4	2	1	1	0	4.0	Y	L	In 2018 NRP
411	Fenpropathrin	Pyrethroids	2	6	3	1	1	0	4.0	Y	H	In 2018 NRP
412	Pyriproxyfen	Insecticide	2	6	2	1	1	0	4.0	Y	H	In 2018 NRP
413	Carbofuran	Insecticide	2	3	3	2	1	0	3.8	Y	L	In 2018 NRP
414	Endosulfan Ii	Insecticide	1	4	2	2	1	0	3.8	Y	HH	In 2018 NRP
415	Endosulfan Sulfate	Insecticide	1	4	2	2	1	0	3.8	Y	HH	In 2018 NRP
416	Ethofumesate	Herbicide	2	3	3	1	2	0	3.8	Y	L	In 2018 NRP
417	Cyromazine	Insecticide	1	1	1	2	1	2	3.5	N	--	
418	Diquat Dibromide	Herbicide	1	1	1	2	1	2	3.5	N	--	
419	Flupropanate	Pesticide	1	1	1	2	1	2	3.5	N	--	
420	Paraquat Dichloride	Herbicide	1	1	1	2	1	2	3.5	N	--	
421	Sulfuryl Fluoride	Pesticide	1	1	1	2	1	2	3.5	N	--	
422	Atrazine	Herbicide	6	3	1	1	1	-1	3.5	Y	L	In 2018 NRP
423	Amicarbazone	Herbicide	1	2	1	1	1	2	3.5	N	--	
424	Carbetamide	Pesticide	1	2	1	1	1	2	3.5	N	--	
425	Chloridazon	Herbicide	1	2	1	1	1	2	3.5	N	--	
426	Coumaphos	Insecticide	1	2	1	1	1	2	3.5	N	L	
427	Dinotefuran	Insecticide	2	1	1	1	1	2	3.5	N	L	
428	Ethametsulfuron Methyl	Herbicide	1	2	1	1	1	2	3.5	N	--	
429	Fosetyl	Fungicide	2	1	1	1	1	2	3.5	N	--	
430	Maleic Hydrazide	Pesticide	2	1	1	1	1	2	3.5	N	--	
431	Mepiquat	Herbicide	2	1	1	1	1	2	3.5	N	--	
432	Prohexadione Calcium	Fungicide	1	2	1	1	1	2	3.5	N	--	
433	Pyroxasulfone	Pesticide	1	2	1	1	1	2	3.5	N	--	
434	Spinetoram	Insecticide	2	1	1	1	1	2	3.5	N	--	

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
435	Trinexapac Ethyl	Herbicide	1	2	1	1	1	2	3.5	N	--	
436	Zineb	Fungicide	1	2	1	1	1	2	3.5	N	--	
437	Imidacloprid	Insecticide	6	1	3	1	1	0	3.5	Y	L	In 2018 NRP
438	Indoxacarb	Insecticide	2	5	2	1	1	0	3.5	Y	M	In 2018 NRP
439	Methoxyfenozide	Insecticide	3	4	2	1	1	0	3.5	Y	M	In 2018 NRP
440	Myclobutanil	Fungicide	4	3	2	1	1	0	3.5	Y	L	In 2018 NRP
441	Tebufenozide	Insecticide	2	5	2	1	1	0	3.5	Y	M	In 2018 NRP
442	Thiamethoxam	Insecticide	6	1	3	1	1	0	3.5	Y	L	In 2018 NRP
443	Thiobencarb	Herbicide	2	4	1	1	2	-1	3.5	Y	L	In 2018 NRP
444	Azoxystrobin	Fungicide	6	3	1	1	1	-1	3.5	Y	L	In 2018 NRP
445	Omethoate (Dimethoate Byproduct)	Insecticide	1	1	2	3	3	0	3.0	Y	L	In 2018 NRP
446	Diflubenzuron	Insecticide	2	4	2	1	1	0	3.0	Y	M	In 2018 NRP
447	Metalaxyl	Fungicide	4	2	2	1	1	0	3.0	Y	L	In 2018 NRP
448	Aldicarb	Carbamate	2	2	2	2	1	0	3.0	Y	L	In 2018 NRP
449	Benoxacor	Herbicide	1	3	2	2	1	0	3.0	Y	L	In 2018 NRP
450	Hexazinone	Herbicide	2	2	3	1	2	0	3.0	Y	L	In 2018 NRP
451	Azimsulfuron	Herbicide	1	1	1	1	1	2	3.0	N	--	
452	Azinphos-Methyl Oxon	Insecticide	1	1	1	1	1	2	3.0	N	L	
453	Chlormequat	Pesticide	1	1	1	1	1	2	3.0	N	--	
454	Dalapon (2,2-Dpa)	Herbicide	1	1	1	1	1	2	3.0	N	--	
455	Difenzoquat	Pesticide	1	1	1	1	1	2	3.0	N	--	
456	Fosetyl-Aluminum	Fungicide	1	1	1	1	1	2	3.0	N	--	
457	Glyphosate-Trimethylsulfonium	Pesticide	1	1	1	1	1	2	3.0	N	--	
458	Mepiquat Chloride	Herbicide	1	1	1	1	1	2	3.0	N	--	
459	Piperazine	Fungicide	1	1	1	1	1	2	3.0	N	--	
460	Spinosad	Insecticide	1	1	1	1	1	2	3.0	N	--	
461	Fluvalinate (T-Fluvalinate)	Insecticide	1	5	2	1	1	0	3.0	Y	M	In 2018 NRP
462	Pirimiphos Methyl	Insecticide	1	5	2	1	1	0	3.0	Y	M	In 2018 NRP
463	Methamidophos	Insecticide	2	1	1	4	1	-1	2.8	Y	L	In 2018 NRP
464	Prallethrin	Insecticide	1	4	1	1	2	-1	2.8	Y	M	In 2018 NRP
465	Chlorpropham	Herbicide	1	4	2	1	1	0	2.5	Y	L	In 2018 NRP
466	Methomyl	Insecticide	4	1	2	1	1	0	2.5	Y	L	In 2018 NRP
467	Chloroneb	Fungicide	1	4	3	1	1	0	2.5	Y	L	In 2018 NRP
468	Aldicarb Sulfoxide	Carbamate	1	2	2	2	1	0	2.3	Y	L	In 2018 NRP
469	Deethylatrazine	Herbicide	1	2	3	2	1	0	2.3	Y	--	In 2018 NRP
470	Aldicarb Sulfone	Carbamate	1	2	2	2	1	0	2.3	Y	L	In 2018 NRP
471	3-Hydroxycarbofuran	Insecticide	1	1	3	3	1	0	2.0	Y	L	In 2018 NRP
472	Acetamiprid	Insecticide	3	1	2	1	1	0	2.0	Y	L	In 2018 NRP
473	Fluroxypyr-1-Methylhepyl-Ester	Herbicide	1	3	3	1	1	0	2.0	Y	L	In 2018 NRP

Rank	Chemicals	Type	S	B	F	H	C	L	Score	FSIS Testing	EPA Rank	Current Status
474	Pronamide	Herbicide	1	4	1	1	1	-1	1.5	Y	L	In 2018 NRP
475	Coumaphos S	Pesticide	1	2	2	1	1	0	1.5	Y	L	In 2018 NRP
476	Fluridone	Herbicide	1	2	2	1	1	0	1.5	Y	L	In 2018 NRP
477	Clothianidin	Insecticide	1	1	3	1	1	0	1.0	Y	L	In 2018 NRP
478	Coumaphos O	Pesticide	1	1	2	1	1	0	1.0	Y	L	In 2018 NRP
479	Pyrazon	Herbicide	2	2	1	1	1	-1	1.0	Y	--	In 2018 NRP