FOOD SAFETY AND INSPECTION SERVICE

2001 FSIS NATIONAL RESIDUE PROGRAM

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PREFACE

Welcome to the 2001 "Blue Book." This book presents the 2001 Food Safety and Inspection Service (FSIS) National Residue Program (NRP). [For those reading this electronically, this document has been commonly known as the "Blue Book" because the covers of the printed versions are blue.]

This text presents a comprehensive explanation of the process used to plan the NRP for 2001. In 1999, the NRP was modified to move towards a system of residue evaluation more consistent with modern risk assessment principles. The methodologies employed in the planning of the 2001 NRP, as described in this document, reflect these changes. Following the explanation of the planning process, this text provides a detailed description of the completed Domestic Monitoring Plan and Special Projects and Import Residue Plan for the 2001 FSIS NRP.

In addition to a description of the annual NRP, this Blue Book contains updated versions of four tables that our readers have found very useful: a list of the type and amounts of tissue collected for each analysis conducted in the FSIS NRP; a list of all established tolerances and action levels for drugs and food additives in food animal tissues; a list of all established tolerances and action levels for pesticides and environmental contaminants in food animal tissues; and a list that provides the performance characteristics and analytical methodologies of the FSIS Official Methods used in the NRP. These tables appear as Appendices I through IV, respectively, at the end of this publication.

The staff of the Residue Branch, Food Animal Sciences Division, Office of Public Health and Science, FSIS, hope that you will find this *2001 National Residue Program* to be every bit as useful and informative as it has been in past years. We would like to thank all of our predecessors for providing us with tables and information that they developed and that we continue to use.

CONTACTS AND COMMENTS

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A complete copy of this document is posted on the FSIS website at http://www.fsis.usda.gov/oa/pubs/techpubs.htm. While supplies last, hard copies can be obtained by contacting Joyce Edwards, Printing and Management Section, Administrative Services Division, FSIS, USDA, Room 0143 South Building, 1400 Independence Ave., SW, Washington, DC 20250-3700, phone (202) 690-4662, fax (202) 720-5400.

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SECTION 1. INTRODUCTION TO THE FSIS NATIONAL RESIDUE PROGRAM

An essential aspect of food safety in is the control of residues that may result from the use of animals drugs and pesticides, or from incidents involving environmental contaminants. The United States has a complex residue control system, with rigorous processes for approval, sampling and testing, and enforcement. Three principal agencies are involved in the control of residues in meat, poultry, and egg products: the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA) and the Food Safety Inspection Service (FSIS) of the United States Department of Agriculture (USDA). FDA and EPA establish tolerances (maximum permissible levels) for chemical residues in foods, and FSIS enforces these tolerances through its various residue control programs.

FDA establishes tolerances for veterinary drugs and food additives, under the statutory authority of the Federal Food, Drug, and Cosmetic Act (FFDCA). These tolerances are published in Title 21 of the Code of Federal Regulations (21 CFR). EPA establishes tolerances for registered pesticides under the statutory authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and FFDCA, as modified by the Food Quality Protection Act (FQPA). These are published in 40 CFR. Maximum permissible levels have also been established for residues that are the result of environmental contamination, such as cancelled pesticides that are no longer approved for use but persist in the environment (e.g., DDT), industrial chemicals (e.g., PCBs), and heavy metals. Tolerances for industrial chemicals and heavy metals are established by FDA and published in 21 CFR. For cancelled pesticides, action levels (similar to tolerances, but less formal), are established by FDA or FSIS, based on recommendations that EPA has published in the Federal Register.

Under the Federal Meat Inspection Act (FMIA), the Poultry Products Inspection Act (PPIA), and the Egg Products Inspection Act (EPIA), FSIS acts to ensure that USDA-inspected meat, poultry and egg products do not contain illegal levels of chemical residues. The cornerstone of FSIS residue prevention activities is the FSIS National Residue Program (NRP), a multi-component analytical testing program for residues in domestic and imported meat, poultry, and egg products. The FSIS NRP, which has been in effect since 1967, provides a variety of sampling plans to prevent violative residues from entering the food supply, and develops national data on the occurrence of chemical residues to support risk assessment, enforcement and educational activities. The range of chemical compounds evaluated for inclusion in the various NRP testing programs is comprehensive in scope. It includes approved and unapproved pharmaceutical drugs and pesticides known or suspected to be present in food animals in the U.S. and in countries exporting products to the U.S. It also includes any other xenobiotic or naturally occurring compounds that may appear in meat, poultry, and egg products and that may pose a potential human health hazard.

The NRP is designed to provide: (1) a structured process for identifying and evaluating compounds of concern by production class; (2) the capability to analyze for compounds of concern; (3) appropriate regulatory follow-up of reports of violative tissue residues; and (4) collection, statistical analysis, and reporting of the results of these activities.

When violative residues are detected in food-producing animals submitted for slaughter, FSIS notifies the producer and other parties involved in offering these animals for sale. Product found to contain violative levels of residues is considered adulterated and is subject to condemnation. If the product has been distributed into commerce, it may be subject to market recall. In addition, FDA and cooperating state agencies may make on-site visits to these firms. Typically, an educational visit by the state is the first step in attempting to correct a residue problem. If the problem is not corrected, subsequent visits, made

by FDA, could result in enforcement action, including prosecution. Until September 4, 2001, FSIS also subjected these parties to follow-up enforcement testing until compliance was demonstrated. Beginning on September 5, 2001, this policy was discontinued and a new policy was implemented, in which FSIS will post, on its website, the names and addresses of parties who the Food and Drug Administration has determined are responsible for the repeated sale of livestock or poultry containing violative levels of chemical residues. FSIS believes that this new policy will act as a more effective deterrent against residue violations, while also enabling the Agency to make better use of its residue testing resources.

An additional function of the FSIS NRP is to provide verification of residue control in Hazard Analysis and Critical Control Point (HACCP) systems. Under FMIA, and PPIA, the ultimate responsibility for ensuring that product is not adulterated when it enters commerce rests with the slaughter and processing establishments that produced the product. To define and formalize this responsibility, on July 25, 1996 USDA published the *Final Rule on Pathogen Reduction; Hazard Analysis and Critical Control Point Systems*. The principal focus of this rule is to reduce the incidence of foodborne illness associated with meat and poultry. Part 417 of the HACCP regulation requires meat and poultry establishments to develop and implement a system of preventive measures designed to ensure the safety of their products. In developing their HACCP plans, slaughter establishments must address all chemical, physical, and biological hazards that are reasonably likely to occur in the animals that enter their plants. Therefore, as part of the HACCP regulation, slaughter and production establishments are required to identify all chemical residue hazards that are reasonably likely to occur, and develop systems to guard against them. A vigilant chemical residue prevention program is essential to foster the prudent use of drugs and pesticides in animals that enter the human food supply. The requirement that slaughter establishments implement HACCP systems is a significant step in this evolutionary process.

The goals of the NRP can be summarized as follows:

- Enforce Federal laws and regulations;
- Maintain consumer confidence by ensuring that meat, poultry, and egg products are not adulterated;
- Act as a deterrent against the slaughter of adulterated animals and the processing of adulterated eggs;
- Identify violative product and prevent its entry into the food supply;
- Assess and communicate human exposure to chemical residues; and
- Provide verification of residue control in HACCP systems.

SECTION 2. COMPONENTS OF THE FSIS NATIONAL RESIDUE PROGRAM

DOMESTIC RESIDUE SAMPLING PROGRAM

The Food Safety and Inspection service (FSIS) National Residue Program (NRP) provides a variety of sampling plans to verify and enforce that slaughter establishments are fulfilling their responsibilities under the Hazard Analysis and Critical Control Point (HACCP) regulation, and in accordance with Food and Drug Administration (FDA) and Environmental Protection Agency (EPA) regulations, to prevent the occurrence of violative residues. The NRP also collects and uses national data on chemical residues to support risk assessment, enforcement, and educational activities. All residue data is collected and stored in the Microbiological and Residue Computer Information System (MARCIS). Detailed information on violations is immediately transferred to the Residue Violation Information System (RVIS), which facilitates regulatory follow-up on violations and tracking of residue violators by both FSIS and FDA.

Components of the NRP for domestically produced products include:

- Monitoring Plan– the random sampling of specified animal populations at time of slaughter to provide information about the occurrence of residue violations on an annual, national basis. Monitoring information is obtained through a statistically based random selection of specimens from animals that that have passed inspection and therefore been permitted entry into the food supply. Generally, production classes are sampled at one of four levels (460 samples/year, 300 samples/year, 230 samples/year, or 90 samples/year). The probability of detecting a violation varies positively with the number of samples analyzed and the true violation rate of the production class being tested. The results are also used to identify producers or other entities marketing animals with violative concentrations of residues. When such producers subsequently offer animals for slaughter, the animals may be subjected to Enforcement Testing until compliance is demonstrated. The carcass is not retained after the sample is taken

- Special Projects – information-gathering studies that do not meet the criteria for inclusion in the Monitoring Plan, e.g., when sampling will not be conducted over a full 12-month period, or when there is a lack of precise slaughter volume data on the production classes to be sampled. This designation is also used when it is not possible to determine a "violation rate" for a compound because the violative level has not been defined. Many chemicals, such as heavy metals, industrial chemicals, and mycotoxins, may be inadvertently present in animals. Their presence in edible tissues, and the resulting need for limits to protect public health, has not been established. FSIS may conduct studies to develop information on the frequency and concentration at which such residues occur. With the exception of certain types of Surveillance Sampling, Special Projects generally sample animals that have passed USDA inspection.

    - Surveillance Sampling – considered a subset of Special Projects except that, unlike Special Projects, Surveillance Sampling sometimes employs on-site rapid screening tests. Surveillance consists of targeted sampling designed to distinguish components of livestock, poultry, and egg products in which residue problems exist, measure the extent of problems, and evaluate the impact of actions taken to reduce the occurrence of residues.

- Enforcement Testing – the analysis of specimens collected from individual animals or lots that appear suspicious to FSIS in-plant inspectors, based on herd history or antemortem or postmortem inspection. Enforcement Testing is performed to detect individual animals with violative concentrations of residues. This testing is emphasized in problem populations (those with a high prevalence of residue violations) and used as a tool to prevent carcasses with violative residues from entering the food supply. It is also used to follow up on producers and others who have marketed animals with violative concentrations of residues to determine if the non-compliance has been corrected, or to verify the performance of an establishment's Hazard Analysis and Critical Control Point (HACCP) system in controlling violative residues.

It is important to emphasize the differences between the types of samples collected under the Monitoring Plan and Special Projects, as compared with those collected under Enforcement Testing. Since the former plans are designed to collect information upon the prevalence of residue violations in the U.S. food supply, these plans collect samples only from animals that appear normal and healthy at time of slaughter and thus pass USDA inspection and are permitted entry into the food supply. By contrast, since Enforcement Testing is designed to prevent violative product from entering the food supply, it is targeted towards animals that do not appear to be normal or healthy, or which show abnormal postmortem signs, or which are suspicious based on herd history. Enforcement Testing occasionally also includes samples from animals that have already been condemned based on postmortem inspection.

Further, because carcasses sampled under Enforcement Testing are by definition "suspect," and because a principal goal of Enforcement Testing is to prevent adulterated meat, poultry, and egg products from entering the food supply, all carcasses sampled under Enforcement Testing are held pending the results of official laboratory testing (unless on-site screening tests, described below, show them to be negative, or unless they have already been condemned by the inspector for other reasons). Carcasses found to contain violative concentrations of residues are considered adulterated and are condemned. By contrast, carcasses sampled under the Monitoring Plan and Special Projects are not held pending the results of testing. This is because the primary purpose of these sampling plans is information gathering (and identification of emerging residue problems), rather than direct removal of violative product from the food supply. Additionally, carcasses tested under the Monitoring Plan and Special Projects are unlikely to be violative; violations for most combinations of compound classes and production classes are below 0.3%.

Finally, all samples collected under the Monitoring Plan and Special Projects are submitted directly to an FSIS laboratory for testing. By contrast, Enforcement Testing makes extensive use of rapid on-site screening tests. Because FSIS in-plant inspectors are required to subject all carcasses for which there is a suspicion of a residue violation to Enforcement Testing, many such tests are performed, typically between 100,000 and 200,000 annually. However, it is not practical for FSIS to carry out expensive and time-consuming laboratory tests on this number of Enforcement samples each year. Therefore, to perform such a large number of tests efficiently, carcasses are first pre-screened on-site by FSIS inspectors using rapid screening tests, where such tests are available. In this way, only those samples that test positive by a screening test (again, where such tests are available) are sent to an official laboratory for follow-up testing. If an FSIS inspector suspects that a carcass may contain a violative level of a residue not detected by an official FSIS screening method (see below), a sample taken from that carcass is sent directly to an official laboratory for testing.

As explained above, the use of on-site rapid screening tests also facilitates rapid decisions on carcass disposition. A carcass that registers a positive result on the screening test is held pending the outcome of laboratory testing, while one that registers a negative result is permitted to enter the food supply (unless the FSIS inspector has condemned it for some other reason).

FSIS currently employs the following on-site rapid screening tests (as of this year, CAST, or Calf Antibiotic and Sulfonamide Test, which had been used for several years to test bob veal calves, has been replaced by FAST, because of the latter's superior speed and sensitivity):

- SOS, for Sulfa-On-Site, was implemented in April 1988 to test swine urine for sulfonamide residues. SOS is used in many of the largest swine slaughtering facilities.

- STOP, for Swab Test on Premises, was implemented in 1979 to detect the presence of antibiotic residues in kidney tissues. Originally developed for testing dairy cows, STOP is now approved for use in all species. While STOP is not designed to detect sulfonamides, it can register a positive at high concentrations. Additionally, producers will often use antibiotics in combination with sulfonamides. For these two reasons, the FSIS laboratory tests STOP positive samples for sulfonamides as well as antibiotics.
- FAST**,** for Fast Antimicrobial Screen Test, quickly detects both antibiotic and sulfonamide drug residues in kidneys and livers. At this time, it has been approved for use in bovine animals only. It has proved to be a suitable replacement for CAST and STOP in this species, as it is both quicker and more sensitive. Though also capable of detecting sulfonamides, FAST is significantly less sensitive than the SOS test. FAST was implemented in bovine pilot plants in 1995. Its use was extended to approximately 50 of the largest cow and bob veal slaughtering plants in 1996, and it is currently employed in almost all plants that slaughter.

Contamination Response System

The Contamination Response System (CRS) is not a testing plan, but rather an emergency response management system for FSIS, FDA, and EPA. There are certain pesticides and environmental contaminants whose detection may suggest the occurrence of a potential risk to consumers. To ensure against this, detection of these residues immediately initiates a rapid follow-up investigation to characterize and address the residue problem. Actions taken may include investigation of any entity from the producer to the retailer and, if needed, withdrawal of the product from the market. This system is also triggered following the detection of banned veterinary drugs.

IMPORT RESIDUE SAMPLING PROGRAM

The Federal Meat Inspection Act (FMIA), Poultry Products Inspection Act (PPIA), and Egg Products Inspection Act (EPIA) require foreign countries that export meat, poultry, or egg products to the U.S. to establish and maintain inspection systems that are equivalent to those of the U.S. Countries must undergo a rigorous review process before they can become eligible to export meat, poultry and egg products to the U.S.

Residue control is a major feature of an inspection system that must be judged equivalent to the U.S. system before a country becomes eligible to export to the U.S. Foreign countries exporting to the U.S. are required to have protection from foodborne hazards equivalent to that of the U.S. These may include the following: random sampling of animals at slaughter; use of approved testing methods; testing appropriate target tissues, even though such tissue may not be exported to the U.S.; testing for compounds identified as potential contaminants of meat exported to the U.S.; and random sampling of eggs presented for processing.

After a foreign country is determined to have an equivalent system of inspection and becomes eligible to export product to the U.S., FSIS relies on the country's national inspection authorities to certify that establishments meet all applicable standards and are authorized to export to the U.S. FSIS performs periodic audits of the foreign inspection systems. The frequency and extent of audits depend on the

country's performance history, including the results from previous plant reviews and product reinspection at the port-of-entry. If a country does not maintain an inspection system equivalent to the U.S. system, it is not permitted to export product to the U.S.

As a further check on the effectiveness of the foreign inspection system, FSIS randomly samples meat, poultry, and egg products for residues at the U.S. port-of-entry. Sampling at the port-of-entry is based on the Import Residue Plan, which is designed annually by FSIS. Components of FSIS import residue sampling include Monitoring, Increased Monitoring, Surveillance, and Exploratory Testing. These are described below.

- Monitoring involves the sampling of specified raw or processed products to provide information about the occurrence of residue violations on an annual, international basis. Monitoring information is obtained through a statistically based random selection of products that have passed inspection from the foreign country. The probability of detecting a violation varies positively with the number of samples analyzed and the true violation rate of the product being tested. The results are used to identify countries whose product contains violative concentrations of residues. When a violation is found in a product, the foreign country is subjected to increased testing until compliance is demonstrated. The product is not retained after the sample is taken.

- Increased Monitoring occurs when FSIS finds a violation in a sample from a foreign country.

- Surveillance Testing occurs when FSIS suspects that product from a specific country may likely to have violative concentrations of a residue. Surveillance is designed to measure the extent of problems, and to evaluate the impact of actions taken to reduce the occurrence of residues in imported products.

- Exploratory Testing occurs when FSIS determines a need to study a specific product or compound that is being imported from one or more countries.

Residue sampling of meat and poultry is directed by the Automated Import Information System (AIIS), which stores results from all port-of-entry samples for each country and for each plant. All shipments are inspected for transportation damage, labeling, proper certification, general condition, and accurate count. AIIS assigns a variety of types of inspections, which may include analysis for chemical residues. Residue analyses are not limited to those compounds included in the domestic residue program. FSIS can initiate a special sampling plan when there is a need to monitor a country for residues of a specific compound, based on detection of violative residues at port of entry, or other information concerning risk to human health. Decisions about product acceptability are based on U.S. tolerances or action levels.

The first ten shipments of egg products from individual foreign establishments are subjected to 100 percent reinspection, to establish a history of compliance for each product category. This level is reduced a random selection of one reinspection out of eight shipments, which continues as long as the product is in compliance. If a positive result is found in an egg product, import requests would be denied until foreign officials and FSIS determined that egg products originating from that country are safe for human consumption.

Shipments that are sampled during routine monitoring are eligible to be stamped with the U.S. mark of inspection and allowed to enter commerce prior to receipt of the results of the analysis. If violative results are subsequently reported, imported product bearing the U.S. mark of inspection cannot be used as human food; the importer does not have the option of recalling the product and exporting it from the U.S. It must either be destroyed or, if approved by FDA, converted to animal food. By contrast, if the importer chooses to voluntarily hold the shipment until the results are received, and the results are found to be violative, the shipment is refused entry as human food, and is either exported from the United States, destroyed or, if approved by FDA, allowed entry to the U.S. as animal food.

SECTION 3. PLANNING THE 2001 FSIS NATIONAL RESIDUE PROGRAM: INTRODUCTION

The Food Safety and Inspection Service (FSIS) has focused special attention on the design of the Monitoring Plan and Special Projects for domestic products, and of the Import Residue Plan for imported products, since these are the Agency's principal sources of information on the occurrence of residues in meat, poultry, and egg products. The remainder of this document will explain how FSIS designed the 2001 FSIS National Residue Program (NRP) Domestic Monitoring Plan and Special Projects, and Import Residue Plan, and will provide a complete listing of the residues and production classes that are sampled under these programs.

The first step in the design of these sampling plans is to generate a comprehensive list of residues of concern in meat, poultry and egg products. To accomplish this, FSIS coordinates annual meetings of the Surveillance Advisory Team (SAT)[1], which is comprised of members from the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), the Animal and Plant Health Inspection Service (APHIS), the Agricultural Marketing Service (AMS), the Agricultural Research Service (ARS), and FSIS. This interagency committee identifies the priority public health compounds of concern, and provides FSIS with detailed information about each compound. FSIS then combines this information with its historical data on compound violation rates to develop the domestic Monitoring Plan and Special Projects, and the Import Residue Plan. These sampling plans guide the allocation of FSIS laboratory and inspection resources.

Factors taken into consideration in developing the domestic Monitoring Plan and Special Projects, and the Import Residue Plan, are:

- The overall estimated relative public health concern associated with each compound or compound class in meat, poultry, and egg products;
- The production or product classes in which each compound or compound class is likely to be of concern;
- The availability of analytical methods, which determines which compounds or compound classes can be analyzed; and
- The analytical capacity of the FSIS laboratories, which determines how many analyses of each compound or compound class can be performed.

Thus, the final form of the scheduled sampling plans are determined not only by the estimated relative public health risk represented by each combination of residue and production class, but also the availability of methods and resources to sample for these residues. FSIS attaches a high priority to obtaining new or improved methods for highly ranked residues.

The selection process used to design the Import Residue Plan is similar to that of the domestic plans, with two important exceptions. First, since many countries ship processed products only, it is often not possible to test raw product at the U.S. port-of-entry. Further, even when raw product is shipped, it often consists of muscle tissue only. By contrast, domestic residue testing often is targeted towards organ tissues (typically kidney and liver). This is because many residues concentrate in organs, which makes them easier to detect. Because of this concentration effect, FDA often bases its tolerances for veterinary drugs upon the levels found in kidney or liver. Second, while countries are required to identify the animal species used in each product, they are not required to identify the production class. Testing on imported meat and poultry is subdivided by animal species (e.g., chicken vs. pig), and cannot be further subdivided

[1]A detailed list of SAT participants is provided at the end of this section.

within a species (e.g., steer vs. heifer vs. dairy cow. vs. formula-fed veal). Egg products, however, can be distinguished as a separate category.

Finally, because different countries have different approved compounds and different use practices, the compounds analyzed in the Import Residue Plan may not necessarily the same those in the Domestic Monitoring Plan and Special Projects.

SURVEILLANCE ADVISORY TEAM (SAT)

PURPOSE

The SAT participants identify:

- The "universe" of compounds,
- Specific residues of public health concern,
- Analytical residue method development needs
- Emerging issues for chemical hazards

CHAIR

- Director, Food Animal Sciences Division, Office of Public Health and Science (OPHS), FSIS, USDA

PARTICIPANTS

EPA
- Office of Pesticides, Prevention, and Toxic Substances

HHS (Department of Health and Human Services)
- FDA, Center for Food Safety and Applied Nutrition
- FDA, Center for Veterinary Medicine
- Centers for Disease Control and Prevention

USDA
- Agricultural Marketing Service
- Agricultural Research Service
- Animal and Plant Health Inspection Service
- Food Safety and Inspection Service

SECTION 4. PLANNING THE 2001 FSIS DOMESTIC MONITORING PLAN AND SPECIAL PROJECTS: VETERINARY DRUGS

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate veterinary drugs of concern selected by members of the Surveillance Advisory Team (SAT) are presented below. Since the Food Safety and Inspection Service (FSIS) wishes to prioritize which *analyses* should be conducted, compounds that are, or are likely to be, detected by the same analytical methodology have been grouped together:

--*Antibiotics:*[1]

- Those antibiotics quantitated by the FSIS Bioassay multiresidue method (MRM) and associated follow-up methodologies[2] [tetracycline, oxytetracycline, chlortetracycline, beta-lactams (penicillins and cephalosporins; not differentiated within this category), gentamicin, spectinomycin/streptomycin (not differentiated), erythromycin, tilmicosin, tylosin, neomycin, flavomycin, bacitracin, hygromycin, novobiocin, lincomycin*, pirlimycin*, clindamycin*, spiramycin*, oleandomycin*] *identification by mass spectrometry; not quantitated
- Amikacin (aminoglycoside)
- Apramycin (aminoglycoside)
- Kanamycin (aminoglycoside)
- Spectinomycin (aminoglycoside)
- Streptomycin (aminoglycoside)
- Ampicillin (beta-lactam)

[1] It can be seen that many of the compounds detected by the FSIS Bioassay (see footnote 2) are also listed separately. This was done because, even though these compounds could be detected by the Bioassay, FSIS also wished to consider the merits of implementing individual chemical methodologies (generally High Performance Liquid Chromatography [HPLC]) for their analysis. Compounds were considered for chemical analysis either because: (1) they could be detected by the Bioassay, but not distinguished from other compounds (e.g., spectinomycin and streptomycin); or (2) they could be detected by the Bioassay, but the chemical method offered a significantly and usefully lower Limit of Quantitation (LOQ) (e.g., tilmicosin). [In this document, LOQ refers to the lowest level at which the residue can be quantitated. A lower LOQ results in more detailed low-level data on residue occurrences. Data on low-level residue occurrences is needed when generating exposure estimates for risk assessment, and is useful in planning future residue programs.]

[2] FSIS quantitates most antibiotics using a 7-plate Bioassay that measures microbial inhibition. The pattern of inhibition (i.e., the combination of plates showing inhibition) is used to identify the antibiotic. There are some antibiotics, however, that share the same pattern of inhibition. In these cases, it is necessary to undertake follow-up testing (High Performance Liquid Chromatography [HPLC] or mass spectrometry) to identify the compound, where such follow-up methodologies are available. The compounds that share patterns of inhibition, and which are individually identified through follow-up testing, are:

tetracycline/oxytetracycline/chlortetracycline - compounds individually identified by follow-up with HPLC method for tetracyclines

tilmicosin/tylosin - differentiated by mass spectrometry

- Amoxicillin (beta-lactam)
- Cloxacillin (beta-lactam)
- Hetacillin (beta-lactam)
- Ticarcillin (beta-lactam)
- Ceftiofur (cefalosporin)
- Cefazolin (synthetic cefalosporin)
- Chloramphenicol
- Florfenicol (chloramphenicol derivative)
- Thiamphenicol (chloramphenicol derivative)
- Fluoroquinolones in FSIS MRM (ciprofloxacin, desethyleneciprofloxacin, danofloxacin, difloxacin, enrofloxacin, marbofloxacin, orbifloxacin, and sarafloxacin)
- Avoparcin (glycopeptide)
- Vancomycin (glycopeptide)
- Clindamycin (lincosamide)
- Lincomycin (lincosamide)
- Pirlimycin (lincosamide)
- Oleandomycin (macrolide)
- Spiramycin (macrolide)
- Tilmicosin (macrolide)
- Tylosin (macrolide)
- Colistin (polypeptide antibiotic)
- Virginiamycin

--*Other Veterinary Drugs:*
- Amprolium (coccidiostat)
- Arsenicals (detected as elemental arsenic)
- Avermectins in FSIS MRM (doramectin, ivermectin, and moxidectin) (antiparasitics)
- Eprinomectin (avermectin)
- Benzimidazoles (anthelmintic)
- Berenil (antiprotozoal)
- Carbadox (antimicrobial)
- Clenbuterol and other unapproved beta agonists (growth promotants)[3]
- Ractopamine (beta agonist)
- Clorsulon (anthelmintic)
- Dexamethasone (glucocorticoid)
- Methyl prednisone (glucocorticoid)
- Prednisone (glucocorticoid)
- Halofuginone (antiprotozoal, coccidiostat)
- Hormones, naturally-occurring (17-β estradiol, progesterone, testosterone)
- DES (hormone, synthetic)
- MGA (hormone, synthetic)
- Trenbolone (hormone, synthetic)
- Zeranol (hormone, synthetic)
- Lasalocid (coccidiostat)

[3]The screening test used by FSIS has been officially validated for clenbuterol only, but has also demonstrated the ability to detect other beta agonists, including fenoterol and cimaterol. The follow-up confirmatory method detects eight unapproved beta agonists (clenbuterol, cimaterol, fenoterol, mabuterol, salbutamol, brombuterol, and terbutaline).

- Levamisole (anthelmintic)
- Morantel and pyrantel (anthelmintic)
- Nicarbazin (coccidiostat)
- Nitrofurans (incl. furazolidone, nitrofurazone) (antimicrobial)
- Nitromidazoles in FSIS MRM (dimetridazole, ipronidazole) (antiprotozoals)
- Ronidazole (nitroimidazole) (antimicrobial)
- Etodolac (nonsteroidal anti-inflammatory drug [NSAID])
- Flunixin (NSAID)
- Phenylbutazone (NSAID)
- Dipyrone (NSAID)
- Sulfonamides in FSIS MRM (incl. sulfapyridine, sulfadiazine, sulfathiazole, sulfamerazine, sulfamethazine, sulfachloropyridazine, sulfadoxine, sulfamethoxypyridazine, sulfaquinoxaline, sulfadimethoxine, sulfisoxazole, sulfacetamide, sulfamethoxazole, sulfamethizole, sulfanilamide, sulfaguanidine, sulfabromomethazine, sulfasalazine, sulfaethoxypyridazine, sulfaphenazole, and sulfatroxazole) (antimicrobials, some are coccidiostats)
- Sulfanitran (antibacterial, coccidiostat)
- Thyreostats (incl. thiouracil)
- Veterinary tranquilizers in FSIS MRM (azaperone and its metabolite azaperol, xylazine, haloperidol, acetopromazine, propionylpromazine, and chlorpromazine)

RANKING OF CANDIDATE COMPOUNDS

COMPOUND SCORING

Using a simple 4-point scale (4 = high; 3 = moderate; 2 = low; 1 = none), the SAT scored each of the above veterinary drugs or drug classes in each of the following categories:

C FSIS Historical Testing Information on Violations
C Regulatory Concern
C Lack of FSIS Testing Information on Violations
C Withdrawal Time
C Impact on New and Existing Human Disease
C Relative Number of Animals Treated
C Acute or Chronic Toxicity Concerns

Definitions of each of these categories, and the criteria used for scoring, appear at the end of this section is the "*Scoring Key for Veterinary Drugs, 2001 Domestic Residue Program*."

The results of the compound scoring process are presented in Table 4.1, *Scoring Table for Veterinary Drugs*.

COMPOUND RANKING

Background

As stated above, FSIS chose to employ techniques and principles from the field of risk assessment to obtain a ranking of the relative public health concern represented by each of the above candidate compounds or compound classes.

If FSIS were in possession of detailed historical data on the distribution of levels of each of the candidate compounds or compound classes in meat, poultry, and egg products, then that information could be combined with consumption data to estimate exposure. By combining these exposure data with toxicity information, risk estimates for each compound or compound class could be generated:

Risk = Exposure x Toxicity (4.1)
= Consumption x Residue Levels x Toxicity
= Consumption x "Risk Per Unit of Consumption"

Given the limited resources available for this priority-setting effort, FSIS did not attempt to associate different degrees of risk with different amounts or percentages by which the tolerance or action level was exceeded. FSIS instead determined that the best available method for the measurement of relative toxicity is associated with the tolerance or action level. *Specifically, the frequency of violation of the tolerance or action level was used as an indicator of the risk per unit of consumption of a product.*

The first criterion evaluated in Table 4.1, "FSIS Historical Testing Information on Violations," is based on the percent of tested carcasses found to have residues in excess of the tolerance or action level, from FSIS random sampling programs of animals entering the food supply. Specifically, compounds were scored by two methods: (a) the maximum violation rate seen in any production class (averaged over 1990 - 1999); and (b) the maximum, for any class, of the violation rate (again, averaged over 1990 - 1999), but weighted by the size of the production class. The final score for each drug was assigned based on the highest of these two scores.[4] Therefore, it can be seen from Equation (4.1) that the violation rate scores assigned in Table 4.1 represent a rough overall estimate of *relative* risk per unit of consumption.[5] However, for the many candidate compounds or compound classes of concern that have never been included in the FSIS NRP, data on violation rates is not available. It was therefore necessary to generate an estimate of the overall violation rate for each these untested compounds and compound classes.

Estimating the Violation Rate

"Regulatory Concern," "Withdrawal Time," and "Relative Number of Animals Treated" were chosen as scoring categories because it was expected that each of these would be positively correlated with the violation rate. Therefore, they might serve as predictors of violations in those compounds or compound classes for which no reliable historical testing information was available. As indicated in the *Scoring Key for Veterinary Drugs*, the "Regulatory Concern" category was designed to predict the "likelihood of occurrence of violations, based on regulatory intelligence information about possible misuse." "Withdrawal Time" is expected to correlate with "FSIS Historical Testing Information on Violations" because a longer withdrawal time is less likely to be properly observed. When the withdrawal time is not observed prior to slaughter, the carcass may contain violative levels of residues, since the time necessary for sufficient metabolism and/or elimination of the drug would not have passed. "Relative Number of Animals Treated" is expected to correlate with "FSIS Historical Testing Information on Violations" simply because heavy compound use increases the likelihood of violations.

[4] For a more detailed explanation, refer the *Scoring Key for Veterinary Drugs*.

[5] While some consideration was given to the size of the production class in scoring "FSIS Historical Testing Information on Violations," no systematic weighting was applied to the scores in this category based upon consumption. Hence, the scores assigned to this category represent relative risk *per unit of consumption*, rather than relative risk. To obtain values for relative risk, the scores in this category must be multiplied by the consumption data for each individual production class. This calculation is implemented subsequently, in Phase IV, Equation (4.6).

Recall that violation rate data are available for selected compounds and compound classes. Using the scores assigned to these compounds and compound classes, it was possible to evaluate how well the above criteria were correlated. In an effort to impute values for the missing data, a linear regression model was applied. The dependent variable in this model was the category “FSIS Historical Testing Information on Violations," while the only significant independent variable was the product of the “Regulatory Concern” and “Relative Number of Animals Treated.”

Table 4.1 lists 9 compounds or compound classes for which current, reliable data were available to score the category "FSIS Historical Testing Information on Violations," and 53 compounds or compound classes for which they were not. A least squares linear regression model, using the independent variable from the 9 scored compounds or compound classes, was used to predict scores in the category "FSIS Historical Testing Information on Violations" for remaining 53. The following equation was derived:

$$Vp = 0.19(R*N) + 0.85 \qquad (4.2)$$

where Vp= Predicted score for "FSIS Historical Testing Information on Violations"
R = score for "Regulatory Concern"
N = score for "Relative Number of Animals Treated"
R*N = product of R and N.

This model is the result of using a stepwise regression with several possible independent variables. The independent variables available for the stepwise regression were:

1. A score for Regulatory Concern (R)
2. A score for Withdrawal Time (W)
3. A score for Relative Number of Animals Treated (N)
4. R^2
5. W^2
6. N^2
7. The product of R and W
8. The product of R and N
9. The product of W and N.

No terms involving the withdrawal time were included in the final equation since none were found to be significant factors in the regression model.

The model represented by Equation (4.2) was significant, with an overall model p-value of 0.0001, and an R^2 value of 0.94, accounting for 94 percent of the variability in the data.

Where current, reliable historical testing data were available for a compound or compound class, FSIS used the score assigned in Table 4.1. Where current, reliable historical data were not available, FSIS used the predicted score generated by Equation (4.2).

Rating the Veterinary Drugs According to Relative Public Health Concern

As indicated above, the score for "FSIS Historical Testing Information on Violations," combines information on residue levels and toxicity, and thus represents a rough overall estimate of the relative risk per unit of consumption for each drug or drug class. Although this score, once multiplied by relative consumption data for each production class, would conform most closely to a purely risk-based ranking, FSIS believes that additional attributes should also be considered in the ranking. Thus, the ranking

according to relative public health concern incorporates, as modifiers, the remaining scoring categories presented in Table 4.1:

Relative Public Health Concern = *Predicted* or *Actual* score for (4.3)
"FSIS Historical Testing Information on Violations" (Estimate of Relative Hazard)
x *modifier for* "Acute or Chronic Toxicity Concerns"
x *modifier for* "Impact on New and Existing Human Disease"
x *modifier for* "Lack of FSIS Testing Information on Violations"

The finding of a violation means that a compound was found at a level where the likelihood of a toxic effect exceeds the Food and Drug Administration's (FDA's) standards. However, this does not address the *severity* of the effect associated with the toxic endpoint. To capture this concern FSIS has added a modifier for "Acute or Chronic Toxicity Concerns." Thus, compounds whose toxic effect can be severe (such as chloramphenicol, exposure to which has been associated with aplastic anemia) are given a maximum score in this category.

A modifier has also been added for "Impact on New and Existing Human Disease." This represents the extent to which the use or misuse of this compound will contribute to new and existing human disease. For example, there is a possibility that the creation of antibiotic-resistant human pathogens may result from the use of antibiotics in animals. This represents a potential public health concern that is not captured by the violation rate.

Finally, the modifier for "Lack of FSIS Testing Information on Violations" has been incorporated because sparse or dated data, or a lack of data altogether, increase the relative public health need to obtain information on residue violations for a compound or compound class. In other words, consider two hypothetical compounds, A and B. Suppose FSIS has sampled extensively for compound A, and that A's violation rate earns it a score of "3" in that category. Further suppose that FSIS has never sampled for compound B but that, based on its scores in the “Regulatory Concern,” “Withdrawal Time,” and “Number of animals treated” categories, B has a *predicted* violation rate score of "3." Also assume that A and B have been assigned identical scores in all other categories. FSIS believes there is greater need to sample for B than for A, because FSIS has extensive information on A, but none on B.

The use of modifiers presents an element of arbitrariness, as there are no fundamentally "correct" assumptions for the appropriate weight that should be given to each. The approach of FSIS was to consider several alternative sets of weighting factors, and assess the robustness of the final ranking. In Table 4.1, the drugs are rated for relative public health concern by combining the scoring categories presented in Equation (4.3), above, using the weighting formula shown in the last column. In this formula, the score for "FSIS Historical Testing Information on Violations" has been multiplied by a weighted average of the modifiers for "Acute or Chronic Toxicity Concerns" and "Impact on New and Existing Human Disease.” These last two categories were combined because they both represent the negative potential public health effects associated with the use of a compound or compound class. The product of the above categories was then multiplied by a modifier for "Lack of FSIS Testing Information on Violations." Note that various formulas were considered, differing principally in the relative weights given to "Acute or Chronic Toxicity Concerns" versus "Impact on New and Existing Human Disease," and in the magnitude of the modifier for "Lack of FSIS Testing Information on Violations." FSIS chose the selected formula, based on a consensus about the relative importance of each modifier, and of how much each modifier should be allowed to alter the underlying risk-based score, "V," in Equation (4.4), below. The value of the selected mathematical formula is that it formalizes the basis of FSIS's judgement. This enables others to observe and understand the adjustments that were made, and it ensures consistency in how these adjustments were applied across a wide range of compounds. Equation (4.4) summarizes the way final adjustments were made.

Relative public health concern rating, veterinary drugs (4.4)
= V*((D+3*T)/4) *{1+[(L-1)*0.05]}

Where: V = *Predicted* or *Actual* score for “FSIS Historical Testing Information on Violations "
D = score for "Impact on New and Existing Human Disease"
T = score for "Acute or Chronic Toxicity Concerns"
L = score for "Lack of FSIS Testing Information on Violations

In this formula, the category of "Acute or Chronic Toxicity Concerns" was given three times the weight of "Impact on New and Existing Human Disease," because the former represents known direct health effects, while the latter represents possible indirect health effects. Further, in this formula, the final ratings of compounds or compound classes receiving scores of 4, 3, 2, and 1 in "Lack of FSIS Testing Information on Violations" would be increased by 15%, 10%, 5%, and 0% respectively. In other words, the rating of a compound or compound class that had never been tested by FSIS (in the production classes and matrices of concern) would be increased by 15%, while the rating of one that had been recently tested by FSIS (again, in the production classes and matrices of concern) would remain unchanged.

The formula used here for the veterinary drugs, and below for the pesticides, has been normalized. Because the formulas for the pesticides use different terms (i.e., scoring categories) from those for the veterinary drugs, their scores are not precisely comparable. However, as a result of the normalization the scores for the pesticides and veterinary drugs are comparable in magnitude, thus enabling at least a rough comparison to be made across these two very different categories of compounds.

In Table 4.2, *Rank and Status for Veterinary Drugs*, the drugs are ranked by their rating scores, as generated using the above weighting formula. The scores presented in Table 4.2 enable FSIS to bring consistency, grounded in formal risk-based considerations, to its efforts to differentiate among a very diverse range of drugs and drug classes in a situation that is marked by minimal data on relative exposures**.** These rankings do not account for differences in exposure due to differences in overall consumption.[6] Data on relative consumption are applied subsequently, in Phase IV, when relative exposure values for each compound/production class (C/PC) pair are estimated.

PHASE II - SELECTING DRUGS FOR INCLUSION IN THE 2001 NRP

Following the completion of the ranking of the veterinary drugs, FSIS (1) used these rankings to select those compounds and compound classes that should be included in the 2001 NRP, based purely on their relative public health concern and (2) determined which of these compounds and compound classes actually could be included in the 2001 NRP, based on the availability of laboratory resources.

The consensus of FSIS and FDA was that those compounds and compound classes ranked 34th or higher (out of a total of 62) represented a potential public health concern sufficient to justify their inclusion in the 2001 NRP. In addition, FDA expressed an interest in having FSIS perform limited testing on one compound that did not fall within this group of 34 (veterinary tranquilizers, ranked 56th, in market hogs).

Once the high-priority compounds and compound classes had been identified, it was necessary for FSIS to apply considerations beyond those related to public health to determine the compounds for which the

[6] See footnote 5.

Agency would sample. The principal consideration not related to public health was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Based on these considerations, FSIS plans to include the following veterinary drugs in the 2001 Monitoring Plan and Special Projects:

--*Antibiotics:*

- Those antibiotics quantitated by the FSIS Bioassay MRM and associated follow-up methodologies[7] [tetracycline, oxytetracycline, chlortetracycline, beta-lactams (penicillins and cephalosporins; not differentiated within this category), gentamicin, spectinomycin/streptomycin (not differentiated), erythromycin, tilmicosin, tylosin, neomycin, flavomycin, bacitracin, hygromycin, novobiocin, lincomycin*, pirlimycin*, clindamycin*, spiramycin*, oleandomycin*] *identification by mass spectrometry; not quantitated
- Chloramphenicol
- Fluoroquinolones in FSIS MRM (ciprofloxacin, desethyleneciprofloxacin, danofloxacin, difloxacin, enrofloxacin, marbofloxacin, orbifloxacin, and sarafloxacin)

--*Other Veterinary Drugs:*

- Arsenicals (detected as elemental arsenic)
- Avermectins in FSIS MRM (incl. doramectin, ivermectin, moxidectin) (antiparasitics)
- Carbadox (antimicrobial)
- Clenbuterol and other unapproved beta agonists (growth promotants)[8]
- Ractopamine (beta agonist)
- DES/zeranol/trenbolone (hormones, synthetic) (inclusion of trenbolone is tentative, pending completion of method extension)
- MGA (hormone, synthetic)
- Phenylbutazone (NSAID)
- Sulfonamides in FSIS MRM (incl. sulfapyridine, sulfadiazine, sulfathiazole, sulfamerazine, sulfamethazine, sulfachloropyridazine, sulfadoxine, sulfamethoxypyridazine, sulfaquinoxaline, sulfadimethoxine, sulfisoxazole, sulfacetamide, sulfamethoxazole, sulfamethizole, sulfanilamide, sulfaguanidine, sulfabromomethazine, sulfasalazine, sulfaethoxypyridazine, sulfaphenazole, and sulfatroxazole) (antimicrobials, some are coccidiostats)

Thus, in the 2001 NRP, FSIS plans to employ 12 methodologies that analyze for veterinary drugs. Five of the 12 are single-compound methodologies, and six are MRM's (phenylbutazone is detected by the FSIS MRM for chlorinated hydrocarbon and chlorinated organophosphate compounds). Together, these methodologies encompass approximately 60 different compounds (groups of individual drugs that are not differentiated have been counted as only a single compound).

Table 4.2 lists all of the original candidate veterinary drugs in rank order. This table specifies whether each compound or compound class will be sampled under the 2001 Monitoring Plan or Special Projects, or will not be included in the 2001 NRP. For each highly ranked compound or compound class that was not included in the 2001 NRP, a brief explanation of the reason for its exclusion is provided. This table will be used to identify future method development needs for veterinary drugs for the FSIS NRP.

[7]See footnote 2.

[8]See footnote 3.

PHASE III - IDENTIFYING THE COMPOUND/PRODUCTION CLASS (C/PC) PAIRS

The SAT participants (principally those from FDA) identified the production classes of concern for each of the drugs and drug classes to be included in the 2001 NRP. These determinations were based upon professional judgment of the likelihood of finding violations within each production class (information examined included use approvals, extent of use, evidence of misuse and, if available, past violation history), combined with the proportion of total domestic meat consumption each production class represented. The results are presented in Table 4.3, *Production Classes Considered for Each Veterinary Drug/Drug Class*. C/PC pairs included in the 2001 NRP are designated by a "✯." Those C/PC pairs that are of regulatory concern, but that could not be included in the 2001 NRP because of laboratory resource constraints, are marked with a "✍." Since all production classes will be sampled by the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP) method (see Section 6), and since this method also detects phenylbutazone, the latter will, by default, likewise be sampled in all production classes. However, phenylbutazone is not of regulatory concern in all production classes. Those production classes in which phenylbutazone will be sampled, but where it is not of regulatory concern, are designated by a "☜" (i.e., these production classes will be sampled for phenylbutazone, but only because it is automatically detected through the CHC/COP methodology).

NOMENCLATURE

This edition follows the usage of the 1989 and later editions of the NRP. "Fancy calves" in the 1988 edition became "Formula-fed calves" in 1989; "Western calves" in the 1988 edition became "Heavy calves" in 1989.

Production classes are defined as follows:

- Bulls are mature, sexually intact male cattle
- Beef cows are sexually mature female cattle of beef type, ordinarily having given birth to one or more calves
- Dairy cows are sexually mature female cattle of dairy type, ordinarily having given birth to one or more calves
- Heifers are young, female cattle that have not yet given birth to a calf
- Steers are male cattle castrated before sexual maturity
- Bob calves are calves up to three weeks of age or 150 pounds
- Formula-fed calves are confinement-raised calves fed on a liquid milk replacer diet and weighing more than 150 pounds
- Non-formula fed calves are calves fed a diet that includes solid feeds such as grass and grains requiring a functional rumen and weighing between 150 and 400 pounds
- Heavy calves are non-formula fed calves weighing greater than 400 pounds with the physical characteristics of a calf
- Market hogs are swine usually marketed near six months of age and 200 to 300 pounds live weight
- Boars are mature swine showing male sexual characteristics
- Stags are male swine castrated after they have reached sexual maturity
- Sows are mature female swine
- Sheep include mature sheep with no distinction by gender
- Lambs include young sheep less than one-year old and yearlings, which are sheep one to two years old
- Goats are of either sex and any age

- Horses are of either sex and any age
- Other livestock include bison, deer, elk, reindeer, etc.
- Young chickens include broilers/fryers that are usually less than 10 weeks of age, roasting chickens that are young chickens of either sex usually less than 12 weeks of age, and capons, which are surgically neutered male chickens usually less than 4 months of age
- Mature chickens are adult female chickens usually more than 10 months of age
- Young turkeys include fryer turkeys that are either male or female and usually less than 12 weeks of age, and roaster turkeys that are either male or female usually less than 6 months of age
- Mature turkeys are of either sex and usually more than 15 months of age
- Ducks are of either sex and any age
- Geese are of either sex and any age
- Other fowl include ratites (typically ostriches, emus, and rheas), guineas, squabs (young, fledgling pigeons), adult pigeons, pheasants, grouse, partridges, quail, etc.
- Rabbits are any of several lagomorph mammals
- Egg products are dried, frozen, or liquid eggs

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

"FULL-RESOURCE" SAMPLING

Table 4.3 lists the estimated consumption of each production class as a percentage of the total consumption of all the production classes in the table. To obtain these estimates, production data were employed as a surrogate for consumption. The production data used was that collected by FSIS, and collated and reported by the National Agricultural Statistical Service, on animals (and egg products) presented for slaughter (or processing) in federally inspected establishments, during calendar year 1999. As shown in Equation (4.5), the estimated relative percent of consumption represented by each production class was obtained by dividing the estimated total annual U.S. domestic production (pounds dressed weight) for that class by the total poundage for all production classes that are listed in Table 4.3:

$$(\text{Est. rel. \% domestic consumption})_{PC} = \frac{(\text{Annual production, pounds dressed wt.})_{PC}}{\text{Total annual production, all production classes}} \quad (4.5)$$

All calculations and results are presented in Table 4.4, *Estimated Relative Consumption, Domestic Meat, Poultry, and Egg Products.*

Note that individual data were not available for ratites and squab (which fall under the "other fowl" category), or for bison (which are counted under the "other livestock" category). Ratites and bison are major components of the other fowl and other livestock categories, respectively. Thus, for simplicity, the values for other fowl and other livestock were used to represent the values for ratites and bison in Table 4.3.

FSIS has sufficient analytical capability to consider sampling all production classes of concern for the following compound classes: antibiotics (by Bioassay); arsenicals; avermectins; sulfonamides; and phenylbutazone (via the CHC/COP methodology). To establish a relative sampling priority for each C/PC pair, the ranking score for each compound class (as calculated in Table 4.1) was multiplied by the estimated relative percent of domestic consumption for each production class (as calculated in Table 4.4 and as presented in Table 4.3). This is shown in Equation (4.6):

$$(\text{Relative sampling priority})_{C/PC} = (\text{Ranking score})_{C} \times (\text{Rel. \% domestic consumption})_{PC} \quad (4.6)$$

Equation (4.6) is analogous to the equation used to estimate risk (Equation (4.1)), in which risk per unit of consumption is multiplied by consumption. While the results of Equation (4.6) do not constitute an estimate of risk, they provide a numerical representation of the relative public health concern represented by each C/PC pair, and thus can be used to prioritize FSIS analytical sampling resources according to the latter. Note that the risk ranking provided by Equation (4.6) is based upon average consumption across the entire U.S. population, rather than upon maximally exposed individuals.

In Table 4.5, *Veterinary Drug Compound/Production Class Pairs, Sorted by Sampling Priority Score, "Full Resource" Sampling*, the calculation shown in Equation (4.6) has been carried out for the antibiotics, arsenicals, avermectins, and sulfonamides, for each production class in which the specified drug might appear (as indicated in Table 4.6). The C/PC pairs were sorted by their sampling priority scores, and roughly divided into quartiles. Initially, C/PC pairs in the first though fourth quartiles were assigned sampling numbers of 460, 300, 230, and 90, respectively. The cutoff scores for Relative Public Health Concern corresponding to each sampling level were as follows: >29 = 460 samples; 2.3 - 29 = 300 samples; 0.14 - 2.2 = 230 samples; < 0.14 = 90 samples. These priority scores were combined with historical violation rate information for each individual C/PC pair, and information on laboratory sampling capacity to select, for each pairing, from among four different sampling options: very high regulatory concern (460 analyses/year); high regulatory concern (300 analyses/year); moderate regulatory concern (230 samples/year); low regulatory concern (90 samples/year).[9] For antibiotics, because of available laboratory capacity, it was possible to increase sampling of those production classes having the highest regulatory concern to 690 analyses/year. These sampling levels provide varying probabilities of detecting residue violations. Thus the larger sample sizes, which provide the greater chance of detecting violations, are directed towards those C/PC pairs that have been identified as representing higher levels of relative public health concern. Statistically, if the true violation rate is 1%, the probabilities of detecting at least one violation with sampling levels of 690, 460, 300, 230, and 90 are 99.9%, 99%, 95%, 90%, and 60% (85% at a 2% violation rate), respectively.

Because the numbers of squab produced and consumed are very limited, and because quantitative data on squab production were not available, squab were not included in the above determination, and were instead assigned, for each analysis performed, a sampling frequency of 45 animals. This number was judged to be appropriate relative to the estimated annual U.S. production of squab.

ADJUSTING RELATIVE SAMPLING NUMBERS

Adjusting for historical data on violation rates of individual C/PC pairs

As described above, FSIS used "FSIS Historical Testing Information on Violations" as a critical factor in ranking the various drugs and drug classes according to their relative public health concern. Because this information is available for each production class individually, it can also be used to further refine the relative priority of sampling each C/PC pair. Table 4.6, *Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling*, lists the number of analyses assigned to each C/PC pair in Table 4.5. It also lists, for the period 1/1/90 - 12/31/99, the total number of samples analyzed by FSIS under its Monitoring Plan and Special Projects (i.e., random sampling only) for each C/PC pair, and the percent of samples found to be violative (i.e., present at a level in excess of the action level or regulatory tolerance; or, for those compounds that are prohibited, present at any detectable level). Using this data, the following rules were applied to adjust the sampling numbers:

[9]For reasons explained below, arsenicals in young chickens were scheduled to be sampled at a still higher level of 1200/analyses per year.

1. C/PC pair never tested: +1 level (i.e., increase by one sampling level, e.g., from 230 samples to 300 samples)
2. At least 300 samples tested, violation rate $\geq$ 0.50%, but < 0.70%: +1 level
3. At least 300 samples tested, violation rate $\geq$ 0.70%: +2 levels
4. At least 300 samples tested, violation rate = 0.00%: -1 level
5. The maximum number of samples to be scheduled for testing is 460.

The three exceptions to this are:

1. Geese are not scheduled for more than 90 samples. Sampling destroys the entire goose carcass. Because very few geese are produced, and because virtually all geese are slaughtered by a very limited number of establishments, collecting a larger number of samples would present an unfair burden to these establishments.
2. As explained above, squab are automatically assigned 45 samples for each analysis performed.
3. Sampling for antibiotics in certain production classes was permitted to rise to a fifth sampling level, 690 analyses/year, to take advantage of additional sampling capacity for this compound class, and thereby increase the quality of FSIS's information on antibiotic occurrence.

All of the above adjustments were applied, and the sampling numbers obtained following these adjustments are listed in Table 4.6 under the heading "INITIAL ADJ. #" (initial adjusted number of samples).

Adjusting for laboratory capacity

Following this, it was necessary to make a final set of adjustments to match the total sampling numbers for each compound class with the analytical capabilities of the FSIS laboratories. No adjustments were necessary for the avermectins, since there was a close correspondence between the proposed number of samples listed in Table 4.6 and FSIS laboratory capacity.

For the antibiotics, FSIS laboratory capacity slightly exceeded the proposed number of samples. FSIS decided to use this excess capacity to improve the quality of information collected, by setting a 230-sample minimum for all production classes (except geese, as explained above). This additional laboratory capacity also explains why sampling for antibiotics was not restricted to a maximum of 460 samples per C/PC pair.

For sulfonamides, FSIS laboratory capacity was less than the proposed number of samples. To accommodate this discrepancy, a ceiling of 300 samples was established for all production classes. This enabled FSIS to avoid eliminating any production classes of concern from sulfonamide sampling, while maintaining an adequate level of data quality for the most important production classes.

For the arsenicals, a decision was made to increase the number of analyses in young chickens from 460 to 1200, to obtain a more accurate characterization of arsenical violations in this production class. The basis for this decision was that: (a) the violation rate for arsenicals in young chickens between 1990-1999 has averaged 0.42%, which is relatively high; (b) young chickens are the largest production class (constituting an estimated 36%, by weight, of total domestic consumption of meat, poultry and egg products), and violations in young chickens thus represent a relatively larger public exposure than violations in smaller production classes; and (c) laboratory capacity for this increased sampling was available.

The sample numbers obtained following all needed adjustments for laboratory capacity are listed in the last column of Table 4.6, under the heading "FINAL ADJ. #" (final adjusted number of samples).

"LIMITED RESOURCE" SAMPLING

The 2001 NRP includes a number of compounds never before sampled by FSIS. In sampling these compounds, FSIS was most concerned with obtaining information on their occurrence in particular production classes where it was suspected they might be of concern. To enable FSIS to sample this entire range of compounds, it was necessary to limit the number of samples taken per compound. In apportioning this "limited resource" sampling among the production classes of concern, it was particularly important to ensure that a sufficient number of samples was taken from each production class analyzed. If too few samples were taken from a production class, and no violations were detected, it would be difficult to interpret such a result (the interpretation could not be informed by data from earlier sampling, because no such sampling exists). With a small number of samples, the lack of a detected violation might mean that the true violation rate was very low, or it might mean that the true violation rate was high but that too few samples were taken to detect a violation. Thus, where possible, a minimum of 300 analyses was to be carried out in each production class sampled. This yields a 95% chance of detecting a violation, if the true violation rate were 1%. However, because of laboratory resource limitations, it was not always possible to sample at this level.

Selection of production classes for the limited resource compounds was made as follows:

Beta agonists are of concern in steers, formula-fed veal, and market hogs. The analytical capacity for beta agonists in 2001 is 900 samples. FSIS will work with FDA to conduct 300 analyses for beta agonists in each of these three production classes.

Carbadox is of concern in market hogs, roaster pigs, boars/stags, and sows. The analytical capacity for domestic sampling of carbadox in 2001 is 230 samples, and the top priority production class is roaster pigs. Thus, FSIS will conduct 230 analyses for carbadox in roaster pigs.

Chloramphenicol is of concern in dairy cows, formula-fed veal, non-formula-fed veal, and ratites. The analytical capacity for chloramphenicol in 2001 is 900 samples, and the FSIS method for chloramphenicol does not work in ratites tissue. FSIS will thus conduct 300 analyses for beta agonists in each of the three bovine production classes.

DES and zeranol are detected by a single analytical methodology. Trenbolone may also be detectable by this methodology, contingent upon successful extension of the method. DES is of concern in heifers, steers, and formula-fed veal; zeranol is of concern in formula-fed veal and non-formula-fed veal; and trenbolone is of concern in formula-fed veal, non-formula-fed veal, and lambs. The top priority production class for all of these compounds is formula-fed veal. The analytical capacity for this methodology in 2001 is 250 samples. FSIS will thus conduct 250 analyses for DES/zeranol/trenbolone (trenbolone tentative) in formula-fed veal.

Fluoroquinolones are of concern in seven different production classes. The analytical capacity for domestic sampling of fluoroquinolones in 2001 is 690 analyses, and the top two priority production classes are dairy cows and young chickens. FSIS will conduct 460 and 230 analyses for fluoroquinolones in these two production classes, respectively.

MGA is of concern in heifers, steers, formula-fed veal, and non-formula fed veal. The analytical capacity for MGA in 2001 is 230 samples, and the top priority production class is heifers. FSIS will thus conduct 230 analyses for MGA in heifers.

Ractopamine is of concern in heifers, steers, market hogs, roaster pigs, and young turkeys. The analytical capacity for domestic sampling of ractopamine in 2001 is 350 samples, and the two top priority production classes are market hogs and steers. FSIS will conduct 230 and 120 analyses for ractopamine in these two production classes, respectively. [10]

The above information is presented in tabular format at the end of Section 9 in Table 9.1, *Detailed Sampling Plan*, Table 9.2, *Summary*; and in Table 9.4, *Summary, 2001 FSIS National Residue Program, Domestic Monitoring Plan and Special Projects and Import Residue Plan*.

NOTE ON SEASONALITY

Many of the residues sampled under the limited-resource category will be analyzed over a period of three to four months, rather than over an entire year. This was done because, to cover such a wide range of residues, it was necessary for FSIS to maximize laboratory efficiency. It is more efficient to dedicate instrumentation and analysts to a small number of compounds, finish those analyses, and then change to a new set of analyses, rather than attempting to maintain analytical capacity for all of the above analytes simultaneously.

For those compounds where sampling was limited to a few months, and where usage was judged to be seasonal, sampling was scheduled to coincide with the period of greatest suspected usage.

[10] FSIS will analyze 120 steer samples, rather than the standard 90, to take advantage of the small additional availability of laboratory capacity. With 120 samples, the quality of information will be slightly higher than it would be with 90.

SCORING KEY FOR VETERINARY DRUGS
2001 FSIS DOMESTIC RESIDUE PROGRAM

FSIS Historical Testing Information on Violations (1/1/90 - 12/31/99)

Violation rate scores were calculated by two different methods, A and B, using violation rate data from FSIS random sampling of animals entering the food supply:

Method A: Maximum Violation Rate. Identify the production class exhibiting the highest average violation rate (the number of violations over the period from 1990 - 1999, divided by the total number of samples analyzed). Score as follows:

4 = > 1.0%
3 = 0.50% - 1.0 %
2 = 0.15% - 0.49%
1 = < 0.15%
NT = Not tested by FSIS
NA = Tested by FSIS, but violation information does not apply

Method B: Violation Rate Weighted by Size of Production Class. For each production class analyzed, multiply the average violation rate (defined above) by the relative consumption value for that class (weighted annual U.S. production for that class, divided by total production for all classes for which FSIS has regulatory responsibility). Add together the values for all production classes. Score as follows:

4 = > 0.15%
3 = 0.076% - 0.15%
2 = 0.01% - 0.075%
1 = < 0.01%
NT = Not tested by FSIS
NA = Tested by FSIS, but violation information does not apply

Final score is determined by assigning, to each drug or drug class, the greater of the scores from Method A and Method B.

It can be seen that Method A identifies those drugs that are of regulatory concern because they exhibit high violation rates, independent of the relative consumption value of the production class in which the violations have occurred. Method B identifies those drugs that may not have the highest violation rates, but would nevertheless be of concern because they exhibit moderate violation rates in a relatively large proportion of the U.S. meat supply. By employing Methods A and B together, and assigning a final score based on the highest score received from each, both of the above concerns are captured.

Regulatory Concern

This consists of professional judgments made about the likelihood of occurrence of violations, based on regulatory intelligence information about possible misuse. Due to the public health significance of drug residue violations, surveillance data pertaining to a compound must meet only one of the requirements listed under each number below to receive that numerical ranking.

4 = Well-documented intelligence information gathered from a variety of reliable sources indicates possible widespread misuse of the compound, and/or this compound is banned, or is on the list of compounds prohibited from use in food animals under the Animal Medicinal Drug Use Clarification Act (AMDUCA), or is not approved for use in the U.S.

3 = Intelligence information gathered through a variety of sources indicates only occasional misuse of this compound. The dosage form/packaging of this compound has potential for misuse.

2 = Intelligence information rarely indicates misuse of this compound.

1 = Intelligence information has never indicated misuse of this compound.

Lack of FSIS Testing Information on Violations

This represents the extent to which FSIS analytical testing information on a residue is limited, absent or obsolete.

4 = FSIS has not included this compound in its sampling program within the past 10 years (1/1/90 - 12/31/99); or FSIS has included this compound within its program only between 6 and 10 years ago (1/1/90 - 12/31/94), but the sampling does not meet the criteria specified for a "3;" or FSIS has included this compound in its sampling program, but the information is not at all useful in predicting future violation rates, because of subsequent significant changes in the conditions of use of the compound (e.g., the reduction in withdrawal time for carbadox), or because regulatory intelligence information indicates that the situation has changed significantly since the last time the compound was sampled; or because the compound is of concern in several production classes of interest, but testing has been carried out in only one.

3 = FSIS has tested within the past 5 years (1/1/95 - 12/31/99), but in fewer than 75% of the production classes of interest; or the only testing was between 6 and 10 years ago, where FSIS has analyzed at least 75% of production classes of interest for at least 2 of these 5 years, with a total of at least 500 samples per production class during this 5-year period and, in the case of a multiresidue method (MRM), the method used covers all compounds of interest with the compound class; or, the compound would normally have qualified for a "1" or "2," but the method used was not sufficiently sensitive to permit accurate determination of the true violation rate.

2 = FSIS has included this compound in its sampling program within the past 5 years in at least 75%, but less than 100% of the production classes of interest; or 100% of the production classes of interest have been sampled, but the amount and duration of sampling has been insufficient to qualify for a "1."

1 = FSIS has included this compound in its sampling program within the past 5 years, and has analyzed each production class of interest for at least 2 of these 5 years, with a total of at least 500 samples per production class during this 5-year period, and in the case of an MRM, the method used covers all compounds of interest with the compound class.

Withdrawal Time

Producers using approved animal drugs are required to follow approved "conditions of use." For each drug, in each production class in which it is approved, the conditions of use specify the dosing regimen and the withdrawal time. The withdrawal time is the number of days that must pass between completion

of the dosing regimen and the time of slaughter. This allows sufficient time for the concentration of drug in the animal to decrease below the tolerance. For approved drugs, the following scores were used. For unapproved drugs, scores in this category were assigned based on estimates of their half-lives.

4 = Withdrawal time greater than 14 days

3 = Withdrawal time between 8 and 14 days

2 = Withdrawal time between 1 and 7 days

1 = Zero-day withdrawal time

Impact on New and Existing Human Disease

This represents the extent to which the use or misuse of this compound may contribute to new and existing human disease. Examples could include the possible creation of antibiotic-resistant human pathogens from the use of antibiotics in animals, or the potentiation of new zoonotic diseases (which might subsequently be altered and transferred to humans) following pesticide-induced immunosuppression.

4= Scientific information gathered from a variety of reliable sources indicate that possible widespread use of this compound might significantly modify drug resistance patterns of human pathogenic organisms.

3 = Limited scientific information is available to suggest or document public health risk but compound has the potential to affect microflora.

2 = No scientific information available to suggest or document public health risk.

1 = Current scientific information available suggests no public health risk.

Relative Number of Animals Treated

These scores are based on surveys of treatment practices in animal populations that are representative of national feedlot, dairy, and swine production.

4 = Products containing this drug fall within the top third of those administered to animals treated within a particular category and dosage form of active ingredient.

3 = Products containing this drug fall within the middle third of those administered to animals treated within a particular category and dosage form of active ingredient.

2 = Products containing this drug fall within the bottom third of those administered to animals treated within a particular category and dosage form of active ingredient (but have more usage than products given a score of "1," as defined below).

1 = Products containing this drug are estimated to have extremely limited usage. This category includes all drugs banned under AMDUCA.

Note: Where data were unavailable, scores were estimated, based on comparison to related drugs with known usage levels. Numbers estimated in this way are contained within parentheses.

Acute or Chronic Toxicity Concerns

This represents a combination of the toxicity of the compound and the severity associated with the compound's toxic endpoint

4 = Compound is a carcinogen, or potentially life threatening, or has significant acute effects including the anaphylactic response to an allergen.

3 = Systemic No Observed Effect Levels (NOEL's) seen at intermediate to low doses in laboratory test animals. Antimicrobial effects with a high potential to alter intestinal microflora.

2 = Systemic NOEL's seen at high oral doses in laboratory test animals. Antimicrobial effects with a moderate potential to alter intestinal microflora.

1 = Compound generally shows no toxicity in laboratory test animals even at doses much higher than present in edible tissues at zero-day withdrawal.

Table 4.1
Scoring Table for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regula-tory Concern (CVM) (R)	With-drawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Con-cerns (CVM) (T)	Lack of Testing Info. on Viola-tions (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Those antibiotics quantitated by the FSIS Bioassay MRM	4	4	4	4	3.956	4.000	3	4	1	***15.0***
Amikacin (aminoglycoside)	NT	3	4	2	2.012	2.013	3	2	4	***5.2***
Apramycin (aminoglycoside)	NT	4	4	2	2.401	2.401	3	2	4	***6.2***
Kanamycin (aminoglycoside)	NT	3	4	2	2.012	2.013	3	2	4	***5.2***
Spectinomycin (aminoglycoside)	NA-D, M	4	4	3	3.179	3.179	3	2	4	***8.2***
Streptomycin (aminoglycoside)	NA-D	4	4	3	3.179	3.179	3	2	4	***8.2***
Amoxicillin (beta-lactam)	NT	3	2	2	2.012	2.013	3	4	4	***8.7***
Ampicillin (beta-lactam)	NT	3	2	2	2.012	2.013	3	4	4	***8.7***
Cloxacillin (beta-lactam)	NT	3	2	2	2.012	2.013	3	4	4	***8.7***
Hetacillin (beta-lactam)	NT	2	2	2	1.624	1.624	3	4	4	***7.0***
Ticarcillin (beta-lactam)	NT	2	2	2	1.624	1.624	3	4	4	***7.0***
Ceftiofur (cefalosporin)	NT	3	2	3	2.596	2.596	4	2	4	***7.5***
Cefazolin (synthetic cefalosporin)	NT	3	2	2	2.012	2.013	3	2	4	***5.2***
Chloramphenicol	NA-N	4	2	1	1.624	1.624	4	4	4	***7.5***
Florfenicol (chloramphen. deriv.)	NT	3	4	4	3.179	3.179	3	3	4	***11.0***
Thiamphenicol (chloramphen. deriv.)	NT	3	2	1	1.429	1.429	3	3	4	***4.9***
Fluoroquinolones	NA-O [NT]	4	3	3	3.179	3.179	4	2	3	***8.7***
Avoparcin (glycopeptide)	NT	4	2	1	1.624	1.624	4	2	4	***4.7***
Vancomycin (glycopeptide)	NT	4	2	1	1.624	1.624	4	2	4	***4.7***
Clindamycin (lincosamide)	NA-Q	2	2	2	1.624	1.624	3	3	4	***5.6***
Lincomycin (lincosamide)	NA-Q	2	2	2	1.624	1.624	3	3	4	***5.6***
Pirlimycin (lincosamide)	NA-Q	3	4	3	2.596	2.596	4	2	4	***7.5***
Oleandomycin (macrolide)	NA-Q	2	2	2	1.624	1.624	3	3	4	***5.6***
Spiramycin (macrolide)	NA-Q	2	3	2	1.624	1.624	3	2	4	***4.2***
Tilmicosin (macrolide)	NA-O [NA-D]	4	4 [2]	3	3.179	3.179	3	3	3	***10.5***
Tylosin (macrolide)	NA-D	3	3	2	2.012	2.013	3	2	1	***4.5***
Colistin (polypeptide antibiotic)	NT	1 [2]	1	2	1.235	1.235	1	3 [2]	4	***3.6***
Virginiamycin	NT	1	1	3	1.429	1.429	3	1	4	***2.5***

Table 4.1 - *Continued*
Scoring Table for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regulatory Concern (CVM) (R)	Withdrawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Concerns (CVM) (T)	Lack of Testing Info. on Violations (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Amprolium (coccidiostat)	NT	4	2	2	2.401	2.401	3	2	4	***6.2***
Arsenicals (detected as As)	4	4	2	4	3.956	4.000	3	2	1	***9.0***
Avermectins in FSIS MRM (incl. doramectin, ivermectin, moxidectin) (antiparasitics)	3*	3	4	4	3.179	3.000	2	3	3	***9.1***
Eprinomectin (avermectin)	NT	2	2	3	2.012	2.013	2	2	4	***4.6***
Benzimidazoles (anthelmintic)	1	1	3	2	1.235	1.000	1	2	3	***1.9***
Berenil (antiprotozoal, Histomonas)	NA-G, Mx	4	4	1	1.624	1.624	2	3	4	***5.1***
Carbadox (antimicrobial)	NA-O [NA-W]	4	4	3	3.179	3.179	3	4	3	***13.1***
Clenbuterol and other unapproved beta agonists (growth promotants)	NA-O [NA-C]	4	2	1	1.624	1.624	3 [1]	4	3	***6.7***
Ractopamine (beta agonist)	NT	4	2	3	3.179	3.179	2	4	4	***12.8***
Clorsulon (anthelmintic, Trematodes)	NT [1]	2	3	2	1.624	1.624	2	2	4	***3.7***
Dexamethasone (glucocorticoid)	NA-O [NT]	4	2	2	2.401	2.401	1	3	3	***6.6***
Methyl prednisone (glucocorticoid)	NT	4	2	2	2.401	2.401	1	3	4	***6.9***
Prednisone (glucocorticoid)	NT	2	2	1	1.235	1.235	1	3	4	***3.6***
Halofuginone (antiprotozoal, coccidiostat)	2	1	2	2	1.235	2.000	2	2	1	***4.0***
Hormones, naturally-occurring	NT	2	1	4	2.401	2.401	2	2	4	***5.5***
DES (hormone, synthetic)	NA-N	4	4	1	1.624	1.624	3 [2]	4	4	***7.0***
MGA (hormone, synthetic)	NA-N	3	1	4	3.179	3.179	3 [2]	3	4	***11.0***
Trenbolone (hormone, synthetic)	NT	4 [3]	1 [3]	3	3.179	3.179	3 [2]	3	4	***11.0***
Zeranol (hormone, synthetic)	NT [NA-N]	3	1	3	2.596	2.596	3 [2]	3	4	***9.0***
Lasalocid (coccidiostat)	NT	2	1	3	2.012	2.013	3	2	4	***5.2***
Levamisole (anthelmintic, Nematodes)	2	3	3	2	2.012	2.000	1	1	1	***2.0***
Morantel and pyrantel (anthelmintic)	1	1	1	2	1.235	1.000	2	1	3	***1.4***
Nicarbazin (coccidiostat)	1	2	2	1	1.235	1.000	2	1	3	***1.4***
Nitrofurans (incl. furazolidone, nitrofurazone) (antimicrobial)	NT	4	2	1	1.624	1.624	3	4	4	***7.0***
Nitromidazoles in FSIS MRM (dimetridazole, ipronidazole) (antiprotozoals, Histomonas)	NA-O [NA-N]	4	2	1	1.624	1.624	3 [1]	4	3	***6.7***

Table 4.1 - *Continued*
Scoring Table for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regulatory Concern (CVM) (R)	Withdrawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Concerns (CVM) (T)	Lack of Testing Info. on Violations (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Ronidazole (nitroimidazole) (antimicrobial)	NT	2	2	1	1.235	1.235	3 [1]	4	4	***5.3***
Etodolac (NSAID)	NT	3	2	1	1.429	1.429	1	3	4	***4.1***
Flunixin (NSAID)	NA-O [NT]	4 [3]	2	3	3.179	3.179	1	3	2	***8.3***
Phenylbutazone (NSAID)	NA-O [NT]	4	3	2	2.401	2.401	1	4 [3]	2	***8.2***
Dipyrone (NSAID)	NT	3	3	1	1.429	1.429	1	3	4	***4.1***
Sulfonamides (antimicrobials, some are coccidiostats)	4	4	3	4	3.956	4.000	3	3	1	***12.0***
Sulfanitran (antibacterial, coccidiostat)	NT	4	3	4	3.956	3.956	3	3	4	***13.6***
Thyreostats (incl. thiouracil)	NT	4	3	1	1.624	1.624	2	4	4	***6.5***
Veterinary tranquilizers	NT	4	2	2	2.401	2.401	1	1	4	***2.8***

*Scoring based on ivermectin violations only; method not extended to other avermectin compounds until after 1998

Key:

MRM = Multiresidue method

NT = Not Tested by FSIS (1990-1999):

NA = Compound has been tested by FSIS (1990-1999), but the information is Not Applicable

NA-C = compound is of concern in several production classes, but testing has been carried out in only one

NA-D = detected and quantitated, but not uniquely identified, i.e., method cannot distinguish between this compound and one or more other compounds

NA-G = testing carried out in limited geographical area only, and thus does not necessarily represent overall national violation rate, e.g., sampling for berenil in Puerto Rico

NA-M = problem with analytical methodology

NA-Mx = new information indicates that testing was not carried out in the correct matrix, e.g., berenil testing carried out in plasma rather than serum)

NA-N = new information since previous testing, suggesting that the results of this testing may not be representative of the current situation

NA-Q = detected but not quantitated by method

NA-W = withdrawal time for drug has changed

NA-O = data is preliminary, because useable data on this compound (i.e., data not subject to any of the various problems listed immediately above) has been collected for only one year

FSIS = Scores in this column supplied by FSIS

CVM = Scores in this column supplied by CVM

CDC = Scores in this column supplied by CDC

Numbers in parentheses are estimates.

[Where scores have been changed from the 2000 NRP, those from year 2000 are shown in square brackets.]

Table 4.2
Rank and Status for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

Rank	DRUG	SCORE	STATUS IN 2001 NRP
1	**Antibiotics in FSIS Bioassay MRM** (tetracycline, oxytetracycline, chlortetracycline, beta-lactams (penicillins and cephalosporins; not differentiated within this category), streptomycin/spectinomycin (not differentiated), gentamicin, erythromycin, tilmicosin, tylosin, neomycin, flavomycin, bacitracin, hygromycin, novobiocin, lincomycin*, pirlimycin*, clindamycin*, spiramycin*, oleandomycin*] *identification by follow-up with mass spectrometry; not quantitated	**15.0**	Monitoring Plan, all domestic production classes except egg products; and all import product classes.
2	Sulfanitran (antibacterial, coccidiostat)	**13.6**	NIP, no method - need to add to sulfonamide MRM, or find new method.
3	Carbadox (antimicrobial)	**13.1**	Special Project, roaster pigs and imported fresh pork
4	Ractopamine (beta agonist)	**12.8**	Special Project, market hogs and steers.
5	**Sulfonamides in FSIS MRM** (sulfapyridine, sulfadiazine, sulfathiazole, sulfamerazine, sulfamethazine, sulfachloropyridazine, sulfadoxine, sulfamethoxypyridazine, sulfaquinoxaline, sulfadimethoxine, sulfisoxazole, sulfacetamide, sulfamethoxazole, sulfamethizole, sulfanilamide, sulfaguanidine, sulfabromomethazine, sulfasalazine, sulfaethoxypyridazine, sulfaphenazole, and sulfatroxazole) (antimicrobials, some are coccidiostats)	**12.0**	Monitoring Plan, MRM, all domestic production classes except sheep and rabbits, and all import product classes.
6	Florfenicol (chloramphenicol derivative)	**11.0**	NIP, no method.F DA is currently working on an MRM for chloramphenicol, florfenicol, and thiamphenicol.
7	MGA (hormone, synthetic)	**11.0**	Special Project, heifers. Should also be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
8	Trenbolone (hormone, synthetic)	**11.0**	Special Project, formula fed veal, *contingent upon successful extension, to trenbolone, of FSIS MRM for DES and zeranol.*
9	Tilmicosin (macrolide)	**10.5**	NIP, laboratory resources not available.
10	**Avermectins in FSIS MRM** (doramectin, ivermectin, and moxidectin) (antiparasitic)	**9.1**	Monitoring Plan, MRM, ratites and all non-avian domestic production classes; and all non-avian fresh import product classes.
11	Arsenicals (detected as As)	**9.0**	Monitoring Plan, beef cows, goats, all porcine production classes, and all avian production classes (including egg products) except ratites and squab; and imported fresh and processed poultry and pork
12	Zeranol (hormone, synthetic)	**9.0**	Special Project, formula fed veal, using FSIS MRM for DES and zeranol.
13	Amoxicillin (beta-lactam)	**8.7**	NIP, no method - need MRM for beta-lactams.
14	Ampicillin (beta-lactam)	**8.7**	NIP, no method - need MRM for beta-lactams.
15	Cloxacillin (beta-lactam)	**8.7**	NIP, no method - need MRM for beta-lactams.
16	**Fluoroquinolones in FSIS MRM** (ciprofloxacin, desethyleneciprofloxacin, danofloxacin, difloxacin, enrofloxacin, marbofloxacin, orbifloxacin, sarafloxacin)	**8.7**	Special Project, MRM, dairy cows, and young chickens, and imported fresh poultry.

Table 4.2 - *Continued*
Rank and Status for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

Rank	DRUG	SCORE	STATUS IN 2001 NRP
17	Flunixin (NSAID)	**8.3**	NIP, laboratory resources not available.
18	Phenylbutazone (NSAID)	**8.2**	Monitoring Plan, all domestic production classes except roaster pigs, and all import product classes, as part of the CHC/COP method.
19	Spectinomycin (aminoglycoside)	**8.2**	NIP, method not operational - ultimately need MRM for aminoglycosides.
20	Streptomycin (aminoglycoside)	**8.2**	NIP, no method - need MRM for aminoglycosides; will need bridging data to use chemical method on streptomycin.
21	Ceftiofur (cefalosporin)	**7.5**	NIP, no method - need MRM for beta-lactams.
22	Chloramphenicol	**7.5**	Monitoring Plan, dairy cattle, formula-fed veal, and non-formula fed veal; and imported fresh beef and veal. FDA is currently working on an MRM for chloramphenicol, florfenicol, and thiamphenicol.
23	Pirlimycin (lincosamide)	**7.5**	NIP, method needs improvement.
24	DES (hormone, synthetic)	**7.0**	Special Project, formula fed veal, using FSIS MRM for DES and zeranol.
25	Hetacillin (beta-lactam)	**7.0**	NIP, no method - need MRM for beta-lactams.
26	**Nitrofurans** (incl. furazolidone and nitrofurazone) (antimicrobial)	**7.0**	NIP, no viable method available.
27	Ticarcillin (beta-lactam)	**7.0**	NIP, no method - need MRM for beta-lactams.
28	Methyl prednisone (glucocorticoid)	**6.9**	NIP, no method, but should be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
29	**Clenbuterol and other unapproved beta agonists** (growth promotants)*****	**6.7**	Special Project, market hogs, steers, and formula-fed veal, by eyeball screen followed by confirmatory method performed by FDA-NCTR; need to test eyeball screen to officially extend to other beta agonists, and install NCTR confirmatory MRM for beta agonists.
30	**Nitromidazoles in FSIS MRM** (dimetridazole and ipronidazole) (antiprotozoal)	**6.7**	NIP, laboratory resources not available.
31	Dexamethasone (glucocorticoid)	**6.6**	NIP, laboratory resources not available.
32	Thyreostats (incl. thiouracil)	**6.5**	NIP, laboratory resources not available.
33	Amprolium (coccidiostat)	**6.2**	NIP, laboratory resources not available.
34	Apramycin (aminoglycoside)	**6.2**	NIP, no method - need MRM for aminoglycosides.
BASED ON CONSULTATION WITH FDA, CDC, AND OTHER AGENCIES, COMPOUNDS BELOW THIS POINT WERE NOT CONSIDERED TO REPRESENT A BROAD POTENTIAL PUBLIC HEALTH RISK. HOWEVER, SOME OF THESE MAY BE SAMPLED ON A SPECIFIC, AS-NEEDED BASIS. NONE OF THE COMPOUNDS ON THE FOLLOWING PAGE WAS SELECTED FOR INCLUSION INTO THE 2001 FSIS NATIONAL RESIDUE PROGRAM (NRP).			
35	Clindamycin (lincosamide)	**5.6**	NIP, no method, low priority.
36	Lincomycin (lincosamide)	**5.6**	NIP, no method, low priority.
37	Oleandomycin (macrolide)	**5.6**	NIP, no method, low priority.
38	**Hormones, naturally-occurring** (17-estradiol, testosterone, and progesterone)	**5.5**	NIP, no method, low priority, but should be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
39	Ronidazole (nitroimidazole) (antimicrobial)	**5.3**	NIP - may be able to extend MRM for nitroimidazoles to capture this compound.
40	Amikacin (aminoglycoside)	**5.2**	NIP, no method - need MRM for aminoglycosides.

Table 4.2 - *Continued*
Rank and Status for Veterinary Drugs
2001 FSIS NRP, Monitoring Plan and Special Projects

Rank	DRUG	SCORE	STATUS IN 2001 NRP
41	Cefazolin (synthetic cefalosporin)	**5.2**	NIP, no method - need MRM for beta-lactams.
42	Kanamycin (aminoglycoside)	**5.2**	NIP, no method - need MRM for aminoglycosides.
43	Lasalocid (coccidiostat)	**5.2**	NIP, Official FSIS Method available, low priority.
44	Berenil (antiprotozoal)	**5.1**	NIP, scored as low priority, but priority may increase because of recent FDA concerns about misuse in dairy cattle. FSIS method available, but for plasma only. Need to review NADA method for liver.
45	Thiamphenicol (chloramphenicol derivative)	**4.9**	NIP, no method.F DA is currently working on an MRM for chloramphenicol, florfenicol, and thiamphenicol..
46	Avoparcin (glycopeptide)	**4.7**	NIP, no method, low priority.
47	Vancomycin (glycopeptide)	**4.7**	NIP, no method, low priority.
48	Eprinomectin (avermectin)	**4.6**	NIP, no method, low priority.
49	Tylosin (macrolide)	**4.5**	NIP, no method, low priority.
50	Spiramycin (macrolide)	**4.2**	NIP, low priority.
51	Dipyrone (NSAID)	**4.1**	NIP, no method, low priority, but MRM for all NSAID's may be desirable.
52	Etodolac (NSAID)	**4.1**	NIP, no method, low priority, but MRM for all NSAID's may be desirable.
53	Halofuginone (antiprotozoal, coccidiostat)	**4.0**	NIP, Official FSIS Method available, low priority.
54	Clorsulon (anthelmintic)	**3.7**	NIP, Official FSIS Method available, low priority.
55	Colistin (polypeptide antibiotic)	**3.6**	NIP, no method, low priority.
56	Prednisone (glucocorticoid)	**3.6**	NIP, no method, low priority, but should be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
57	**Veterinary tranquilizers in FSIS MRM** (azaperone and its metabolite azaperol, xylazine, haloperidol, acetopromazine, propionylpromazine, and chlorpromazine)	**2.8**	NIP. Screening method available. Low score, but FDA indicates interest in applying this method to dairy cows, market hogs, and ratites.
58	Virginiamycin	**2.5**	NIP, no method, low priority.
59	Levamisole (anthelmintic)	**2.0**	NIP, Official FSIS Method available, low priority.
60	Benzimidazoles (anthelmintic)	**1.9**	NIP, Official FSIS Method available, low priority.
61	Morantel and pyrantel (anthelmintic)	**1.4**	NIP, Official FSIS Method available, low priority.
62	Nicarbazin (coccidiostat)	**1.4**	NIP, no method, low priority.

*The clenbuterol methodology employs a screen that has been officially validated for clenbuterol only, but has also demonstrated the ability to detect other beta agonists (including fenoterol and cimaterol).This is followed by a confirmatory method that detects eight unapproved beta agonists (clenbuterol, cimaterol, fenoterol, mabuterol, salbutamol, brombuterol, and terbutaline).

Key:

CHC/COP = Chlorinated hydrocarbon/chlorinated organophosphate

MRM = Multiresidue method

NIP = Not included in 2001 FSIS National Residue Program (NRP)

NSAID = Non-steroidal anti-inflammatory drug

In the second column, where multiple compounds have been grouped together for analysis or potential analysis by a single MRM, the title of that group has been bolded (e.g., "Antibiotics in FSIS Bioassay MRM").

Table 4.3
Production Classes to be Considered for Each Veterinary Drug/Drug Class
2001 FSIS NRP, Monitoring Plan and Special Projects

Est. Rel. % Dom. Cons.	DRUG->	Anti-biotics	Car-badox	Racto-pamine	Sulfon-amides	MGA	Tren-bolone	Aver-mecs.	Arsen-icals	Zer-anol	Fluoro quins.	Pheny-lbute.	Chlor-fenicol.	DES	Clen-buterol
	DRUG SCORE->	15.0	13.1	12.8	12.0	11.0	11.0	9.1	9.0	9.0	8.7	8.2	7.5	7.0	6.7
0.038	Horses	★			★			★				★			
0.664	Bulls	★			★			★				★			
1.857	Beef cows	★			★			★	★			★			
1.886	Dairy cows	★			★			★			★	★	★		
10.175	Heifers	★		▩	★	★		★				★		▩	
16.777	Steers	★		★	★	▩		★				★		▩	★
0.048	Bob veal calves	★			★			★				▤	▩		
0.196	Formula-fed veal	★			★	▩	★	★		★		▤	★	★	★
0.008	Non-formula-fed veal	★			★	▩	▩	★		▩		▤	★		
0.020	Heavy calves	★			★			★				★			
0.013	Sheep	★						★				▤			
0.271	Lambs	★			★		▩	★				▤			
0.030	Goats	★			★			★	★			▤			
21.534	Market hogs	★	▩	★	★			★	★		▩	▤			★
0.013	Roaster pigs	★	★	▩	★			★	★						
0.144	Boars/Stags	★	▩		★			★	★			★			
0.749	Sows	★	▩		★			★	★			★			
35.735	Young chickens	★			★				★		★	▤			
0.664	Mature chickens	★			★				★		▩	▤			
6.317	Young turkeys	★		▩	★				★		▩	▤			
0.047	Mature turkeys	★			★				★		▩	▤			
0.130	Ducks	★			★				★			▤			
0.002	Geese	★			★				★			▤			
0.010	Other fowl - ratites	★			★			★				▤			
>>0.010	Squab	★			★							▤			
0.001	Rabbits	★						★				▤			
0.006	Other livestock - bison	★			★			★				▤			
2.659	Egg products	▩			★				★		▩	▤			

Key:

Est. Rel. % Dom. Cons. = Estimated relative percent of domestic consumption, calendar year 1999. This was derived by estimating the total annual U.S. domestic production (pounds dressed weight) for each production class, and dividing by the total poundage for all production classes on this list (see Table 4.4). See explanation in text, Section 4, for values used for ratites, bison, and squab.

★ = Scheduled for sampling under the 2001 FSIS NRP.

▩ = Of potential regulatory concern, but could not be sampled under the 2001 FSIS NRP because of laboratory resource constraints.

▤ = Not of regulatory concern, but sampled anyway because comes through during CHC/COP method.

Table 4.4
Estimated Relative Consumption, Domestically Produced Meat, Poultry, and Egg Products
2001 FSIS NRP, Monitoring Plan and Special Projects

PRODUCTION CLASS	NUMBER HEAD SLAUGHTERED	LBS./ ANIMAL, DRESSED WT.	TOTAL LBS., DRESSED WT.	EST. RELATIVE CONSUMPTION
Bulls	627,000	881	552,387,000	0.664
Beef cows	3,030,000	510	1,545,300,000	1.857
Dairy cows	2,573,000	610	1,569,530,000	1.886
Heifers	11,648,000	727	8,468,096,000	10.175
Steers	17,608,000	793	13,963,144,000	16.778
Bob calves	533,086	[75]	39,981,450	0.048
Formula-fed veal calves	664,191	[245]	162,726,795	0.196
Non-formula-fed veal calves	18,386	[350]	6,435,100	0.008
Heavy calves	41,120	[400]	16,448,000	0.020
SUBTOTAL, CATTLE	**36,742,783**		**26,324,048,345**	**31.632**
Market hogs	95,840,000	187	17,922,080,000	21.535
Roaster pigs	160,000	70	11,200,000	0.013
Boars/Stags	404,000	296	119,584,000	0.144
Sows	3,335,000	187	623,645,000	0.749
SUBTOTAL, SWINE	**99,739,000**		**18,676,509,000**	**22.441**
Sheep	188,000	59	11,092,000	0.013
Lambs	3,369,000	67	225,723,000	0.271
SUBTOTAL, OVINE	**4,049,608**		**261,445,400**	**0.314**
Goats	492,608	[50]	24,630,400	0.030
Horses	62,813	[500]	31,406,500	0.038
Other livestock (includes bison)	17,956	[300]	5,386,800	0.006
TOTAL,ALL LIVESTOCK	**140,612,160**		**45,298,796,045**	**54.431**
Young chickens			29,741,380,000	35.738
Mature chickens			552,341,000	0.664
Young turkeys			5,257,801,000	6.318
Mature turkeys			38,715,000	0.047
Ducks			108,148,000	0.130
Geese			1,674,665	0.002
Other fowl (includes ratites)			8,182,000	0.010
SUBTOTAL, POULTRY			**35,708,241,665**	**42.909**
Rabbits	401,718		1,017,856	0.001
Egg products			2,213,090,000	2.659
GRAND TOTAL, ALL PRODUCTION CLASSES			**83,221,145,566**	**100.000**

Notes on Table --- Source of data: The numbers in this table were derived from National Agricultural Statistical Service (NASS) data on animals (and egg products) presented for slaughter (or processing) in federally inspected establishments, for calendar year 1999. **Purpose:** The purpose of this table is to estimate, for each individual production class for which FSIS has regulatory responsibility, the amount of domestically-produced product consumed relative to the total for all of these production classes (this will in turn be used to estimate relative exposures to chemical residues). This was estimated by assuming that the relative amount of each production class consumed would be approximately proportional to the total poundage (based on dressed weight) of each production class presented for slaughter/processing in federally inspected establishments. Dressed weight, which represents the weight of the carcass after hide, hoof and hair have been removed, was used instead of live weight, because the former was thought to be more closely representative of total pounds consumed. *Note: this table estimates the amount of domestically produced product that is consumed, regardless of who consumes it (i.e., no distinction is made between domestically produced product consumed domestically, vs. that which is exported).* **Poultry, rabbits, and egg products:** For these production classes, figures for total pounds dressed weight, CY'99, were available directly from NASS. **Livestock:** For livestock, NASS does not provide figures for total pounds dressed weight. Therefore, CY'99 NASS figures for number of head slaughtered were multiplied by CY'99 NASS values for average pounds dressed weight per animal (where indicated by square brackets, the latter was unavailable and estimates were used instead), to calculate total pounds dressed weight.

Table 4.5
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	# SAMPLES
1	Antibiotics	15.00	Young chickens	35.738	536.07	460
2	Sulfonamides	12.00	Young chickens	35.738	428.85	460
3	Antibiotics	15.00	Market hogs	21.535	323.03	460
4	Arsenicals	9.00	Young chickens	35.738	321.64	460
5	Sulfonamides	12.00	Market hogs	21.535	258.43	460
6	Antibiotics	15.00	Steers	16.778	251.68	460
7	Sulfonamides	12.00	Steers	16.778	201.34	460
8	Avermectins	9.08	Market hogs	21.535	195.43	460
9	Arsenicals	9.00	Market hogs	21.535	193.82	460
10	Antibiotics	15.00	Heifers	10.175	152.63	460
11	Avermectins	9.08	Steers	16.778	152.26	460
12	Sulfonamides	12.00	Heifers	10.175	122.10	460
13	Antibiotics	15.00	Young turkeys	6.318	94.77	460
14	Avermectins	9.08	Heifers	10.175	92.34	460
15	Sulfonamides	12.00	Young turkeys	6.318	75.81	460
16	Arsenicals	9.00	Young turkeys	6.318	56.86	460
17	Sulfonamides	12.00	Egg products	2.659	31.91	460
18	Antibiotics	15.00	Dairy cows	1.886	28.29	300
19	Antibiotics	15.00	Beef cows	1.857	27.85	300
20	Arsenicals	9.00	Egg products	2.659	23.93	300
21	Sulfonamides	12.00	Dairy cows	1.886	22.63	300
22	Sulfonamides	12.00	Beef cows	1.857	22.28	300
23	Avermectins	9.08	Dairy cows	1.886	17.12	300
24	Avermectins	9.08	Beef cows	1.857	16.85	300
25	Arsenicals	9.00	Beef cows	1.857	16.71	300
26	Antibiotics	15.00	Sows	0.749	11.24	300
27	Antibiotics	15.00	Bulls	0.664	9.96	300
28	Antibiotics	15.00	Mature chickens	0.664	9.96	300
29	Sulfonamides	12.00	Sows	0.749	8.99	300
30	Sulfonamides	12.00	Bulls	0.664	7.97	300
31	Sulfonamides	12.00	Mature chickens	0.664	7.96	300
32	Avermectins	9.08	Sows	0.749	6.80	300
33	Arsenicals	9.00	Sows	0.749	6.74	300
34	Avermectins	9.08	Bulls	0.664	6.02	300
35	Arsenicals	9.00	Mature chickens	0.664	5.97	300
36	Antibiotics	15.00	Lambs	0.271	4.07	300
37	Sulfonamides	12.00	Lambs	0.271	3.25	300
38	Antibiotics	15.00	Formula-fed	0.196	2.93	300
39	Avermectins	9.08	Lambs	0.271	2.46	300
40	Sulfonamides	12.00	Formula-fed	0.196	2.35	300

Table 4.5 - *Continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2000 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	# SAMPLES
41	Antibiotics	15.00	Boars/Stags	0.144	2.16	230
42	Antibiotics	15.00	Ducks	0.130	1.95	230
43	Avermectins	9.08	Formula-fed	0.196	1.77	230
44	Sulfonamides	12.00	Boars/Stags	0.144	1.72	230
45	Sulfonamides	12.00	Ducks	0.130	1.56	230
46	Avermectins	9.08	Boars/Stags	0.144	1.30	230
47	Arsenicals	9.00	Boars/Stags	0.144	1.29	230
48	Arsenicals	9.00	Ducks	0.130	1.17	230
49	Antibiotics	15.00	Bob calves	0.048	0.72	230
50	Antibiotics	15.00	Mature turkeys	0.047	0.70	230
51	Sulfonamides	12.00	Bob calves	0.048	0.58	230
52	Antibiotics	15.00	Horses	0.038	0.57	230
53	Sulfonamides	12.00	Mature turkeys	0.047	0.56	230
54	Sulfonamides	12.00	Horses	0.038	0.45	230
55	Antibiotics	15.00	Goats	0.030	0.44	230
56	Avermectins	9.08	Bob calves	0.048	0.44	230
57	Arsenicals	9.00	Mature turkeys	0.047	0.42	230
58	Sulfonamides	12.00	Goats	0.030	0.36	230
59	Avermectins	9.08	Horses	0.038	0.34	230
60	Antibiotics	15.00	Heavy calves	0.020	0.30	230
61	Avermectins	9.08	Goats	0.030	0.27	230
62	Arsenicals	9.00	Goats	0.030	0.27	230
63	Sulfonamides	12.00	Heavy calves	0.020	0.24	230
64	Antibiotics	15.00	Roaster pigs	0.013	0.20	230
65	Antibiotics	15.00	Sheep	0.013	0.20	230
66	Avermectins	9.08	Heavy calves	0.020	0.18	230
67	Sulfonamides	12.00	Roaster pigs	0.013	0.16	230
68	Antibiotics	15.00	Other fowl	0.010	0.15	230
69	Avermectins	9.08	Roaster pigs	0.013	0.12	90
70	Arsenicals	9.00	Roaster pigs	0.013	0.12	90
71	Avermectins	9.08	Sheep	0.013	0.12	90
72	Sulfonamides	12.00	Other fowl	0.010	0.12	90
73	Antibiotics	15.00	Non-formula	0.008	0.12	90
74	Antibiotics	15.00	Other livestock	0.006	0.10	90
75	Sulfonamides	12.00	Non-formula	0.008	0.09	90
76	Avermectins	9.08	Other fowl	0.010	0.09	90
77	Sulfonamides	12.00	Other livestock	0.006	0.08	90
78	Avermectins	9.08	Non-formula	0.008	0.07	90
79	Avermectins	9.08	Other livestock	0.006	0.06	90
80	Antibiotics	15.00	Geese	0.002	0.03	90

Table 4.5 - *Continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2000 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	# SAMPLES
81	Sulfonamides	12.00	Geese	0.002	0.02	90
82	Antibiotics	15.00	Rabbits	0.001	0.02	90
83	Arsenicals	9.00	Geese	0.002	0.02	90
84	Avermectins	9.08	Rabbits	0.001	0.01	90

Table 4.6
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2001 FSIS NRP Monitoring Plan and Special Projects

COMPOUND CLASS	PRODUCTION CLASS	SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Antibiotics	Young chickens	536.067	3816	0.05	460		460		**460**
Antibiotics	Market hogs	323.032	3991	0.58	460	+1	690		**690**
Antibiotics	Steers	251.675	3063	0.07	460		460		**460**
Antibiotics	Heifers	152.631	2548	0.04	460		460		**460**
Antibiotics	Young turkeys	94.768	3952	0.23	460		460		**460**
Antibiotics	Egg products	39.889	304	0.66	460	+2	690	No method	**0**
Antibiotics	Dairy cows	28.290	4676	0.79	300	+2	690		**690**
Antibiotics	Beef cows	27.853	4164	0.22	300		300		**300**
Antibiotics	Sows	11.241	4070	0.27	300		300		**300**
Antibiotics	Bulls	9.956	2100	0.00	300	-1	230		**230**
Antibiotics	Mature chickens	9.956	3532	0.00	300	-1	230		**230**
Antibiotics	Lambs	4.068	3835	0.23	300		300		**300**
Antibiotics	Formula-fed	2.933	6361	0.71	300	+2	690		**690**
Antibiotics	Boars/Stags	2.155	2688	0.26	230		230		**230**
Antibiotics	Ducks	1.949	3058	0.13	230		230		**230**
Antibiotics	Bob calves	0.721	4347	1.29	230	+2	460		**460**
Antibiotics	Mature turkeys	0.698	2143	0.14	230		230		**230**
Antibiotics	Horses	0.566	2097	5.58	230	+2	460		**460**
Antibiotics	Goats	0.444	2913	0.17	230		230		**230**
Antibiotics	Heavy calves	0.296	3358	0.42	230		230		**230**
Antibiotics	Roaster pigs	0.202	197	1.02	230	+1	300		**300**
Antibiotics	Sheep	0.200	2277	0.04	230		230		**230**
Antibiotics	Other fowl - ratites	0.147	NT	NT	230	+1	300		**300**
Antibiotics	Non-formula	0.116	3051	0.59	90	+1	230		**230**
Antibiotics	Other livestock - bison	0.097	NT	NT	90	+1	230		**230**
Antibiotics	Geese	0.030	601	0.00	90	NO ADJ	90		**90**
Antibiotics	Rabbits	0.018	1014	2.56	90	+2	300		**300**
Antibiotics	Squab		NT		45		45		45
TOTAL # SAMPLES					**7565**		**9755**		**9065**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2000 FSIS NRP Monitoring Plan and Special Projects

COMPOUND CLASS	PRODUCTION CLASS	SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Avermectins	Market hogs	195.435	2699	0.00	460	-1	300		**300**
Avermectins	Steers	152.264	3197	0.03	460		460		**460**
Avermectins	Heifers	92.342	2197	0.00	460	-1	300		**300**
Avermectins	Dairy cows	17.115	2855	0.14	300		300		**300**
Avermectins	Beef cows	16.851	3177	0.22	300		300		**300**
Avermectins	Sows	6.801	2179	0.00	300	-1	230		**230**
Avermectins	Bulls	6.024	1612	0.31	300		300		**300**
Avermectins	Lambs	2.461	2608	0.08	300		300		**300**
Avermectins	Formula-fed	1.774	2940	0.14	230		230		**230**
Avermectins	Boars/Stags	1.304	1324	0.00	230	-1	90		**90**
Avermectins	Bob calves	0.436	157	0.00	230		230		**230**
Avermectins	Horses	0.342	1290	0.78	230	+2	460		**460**
Avermectins	Goats	0.269	2812	0.68	230	+1	300		**300**
Avermectins	Heavy calves	0.179	2895	0.45	230		230		**230**
Avermectins	Roaster pigs	0.122	NT	NT	90	+1	230		**230**
Avermectins	Sheep	0.121	1650	0.18	90		90		**90**
Avermectins	Other fowl - ratites	0.089	NT	NT	90	+1	230		**230**
Avermectins	Non-formula	0.070	2219	0.50	90	+1	230		**230**
Avermectins	Other livestock - bison	0.059	NT	NT	90	+1	230		**230**
Avermectins	Rabbits	0.011	NT	NT	90	+1	230		**230**
TOTAL # SAMPLES					**4800**		**5270**		**5270**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2000 FSIS NRP Monitoring Plan and Special Projects

COMPOUND CLASS	PRODUCTION CLASS	SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Sulfonamides	Young chickens	428.853	4170	0.17	460		460	max. 300	300
Sulfonamides	Market hogs	258.426	14510	0.71	460	+2	460	max. 300	300
Sulfonamides	Steers	201.340	2725	0.11	460		460	max. 300	300
Sulfonamides	Heifers	122.105	2346	0.04	460		460	max. 300	300
Sulfonamides	Young turkeys	75.814	3961	0.15	460		460	max. 300	300
Sulfonamides	Egg products	31.911	NT	NT	460	+1	460	max. 300	300
Sulfonamides	Dairy cows	22.632	4157	0.36	300		300		300
Sulfonamides	Beef cows	22.282	3811	0.13	300		300		300
Sulfonamides	Sows	8.993	4394	0.71	300	+2	460	max. 300	300
Sulfonamides	Bulls	7.965	2109	0.09	300		300		300
Sulfonamides	Mature chickens	7.964	3508	0.03	300		300		300
Sulfonamides	Lambs	3.255	2912	0.14	300		300		300
Sulfonamides	Formula-fed	2.346	6021	0.10	300		300		300
Sulfonamides	Boars/Stags	1.724	2760	0.80	230	+2	460	max. 300	300
Sulfonamides	Ducks	1.559	2419	0.08	230		230		230
Sulfonamides	Bob calves	0.577	4459	0.70	230	+2	460	max. 300	300
Sulfonamides	Mature turkeys	0.558	2218	0.50	230	+1	300		300
Sulfonamides	Horses	0.453	1573	0.25	230		230		230
Sulfonamides	Goats	0.355	2309	0.30	230		230		230
Sulfonamides	Heavy calves	0.237	3475	0.17	230		230		230
Sulfonamides	Roaster pigs	0.161	NT	NT	230	+1	300		300
Sulfonamides	Other fowl - ratites	0.118	NT	NT	90	+1	230		230
Sulfonamides	Non-formula	0.093	3028	0.59	90	+1	230		230
Sulfonamides	Other livestock - bison	0.078	NT	NT	90	+1	230		230
Sulfonamides	Geese	0.024	531	0.19	90		90		90
Sulfonamides	Squab		NT	NT	45		45		45
TOTAL # SAMPLES					**7105**		**8285**		**6845**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2000 FSIS NRP Monitoring Plan and Special Projects

COMPOUND CLASS	PRODUCTION CLASS	SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Arsenicals	Young chickens	321.640	3113	0.42	460		460	+740	1200
Arsenicals	Market hogs	193.819	2541	0.00	460	-1	300		300
Arsenicals	Young turkeys	56.861	2502	0.20	460		460		460
Arsenicals	Egg products	23.934	NT	NT	300	+1	460		460
Arsenicals	Beef cows	16.712	765	0.13	300		300		300
Arsenicals	Sows	6.744	1012	0.00	300	-1	230		230
Arsenicals	Mature chickens	5.973	1344	0.00	300	-1	230		230
Arsenicals	Boars/Stags	1.293	871	0.00	230	-1	90		90
Arsenicals	Ducks	1.170	142	0.00	230		230		230
Arsenicals	Mature turkeys	0.419	724	0.00	230	-1	90		90
Arsenicals	Goats	0.266	944	0.64	230	+1	300		300
Arsenicals	Roaster pigs	0.121	NT	NT	90	+1	230		230
Arsenicals	Geese	0.0181	259	0.39	90		90		90
TOTAL # SAMPLES					**3680**		**3470**		**4210**

Key:
#SAMP. = Total number of samples analyzed by the FSIS Monitoring Plan and/or Special Projects (i.e., random sampling only), 1/1/90 - 12/31/99.
%VIOL. = Percent violative, i.e., the percent of samples with residue concentrations exceeding the tolerance or action level (or, for a drug whose use was not permitted in the production class in which it was detected, the percent of samples with any detectable residue).
UNADJ.# = Unadjusted number of samples, obtained from last column of Table 4.7.
INITIAL ADJ.# = Number of samples proposed following adjustment for historical violation rate information or lack of testing information.
FINAL ADJ.# = Finalized sample numbers, obtained following any adjustments needed to match sample volume to laboratory capacity.
NT = Not Tested.
+1 level, +2 levels, -1 level = There are four different sampling levels: 90, 230, 300 and 460 (five for antibiotics: 90, 230, 300, 460, and 690). Sampling levels were increased or decreased (e.g., changed from 300 samples to 230 samples) based on the rules described in Section 4.
NO ADJ = As explained in Section 4, the number of samples taken from geese is limited to 90 per compound class per year, and thus this number could not be adjusted upward based on the rules applied to the other production class.

SECTION 5. PLANNING THE 2001 FSIS IMPORT RESIDUE PLAN: VETERINARY DRUGS

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate veterinary drugs of concern selected by members of the Surveillance Advisory Team (SAT) for the import residue plan are the same as those listed in Section 4. Furthermore, in ranking drugs for inclusion in the Import Residue Plan, FSIS employed the ranking scores generated for the Domestic Residue Plan (see Section 4), because FSIS does not have sufficient historical data on drugs in imported products to predict their violation rates. However, if FSIS has reason to believe that a compound is being misused in a foreign country then it would add that compound/country pair to the Import Residue Plan.

PHASE II - SELECTING DRUGS FOR INCLUSION IN THE 2001 NRP

As stated in Section 4, from the list of ranked veterinary drugs, FSIS selected compounds and compound classes, based purely on their relative public health concern, which should be included in the 2001 NRP. FSIS and FDA decided that those compounds and compound classes ranked 34th or higher represented a potential public health concern sufficient to justify their inclusion in the 2001 NRP.

Once the high-priority compounds and compound classes had been identified, FSIS applied non-public health considerations to determine the compounds FSIS should sample. The principal non-public health consideration was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Where the laboratory resources were limited, FSIS decided that more resources should be used to test domestic products since imported products have been inspected previously by the importing country. Based on these considerations, the following compounds will be included in the 2001 FSIS Import Residue Plan.

--Antibiotics:

- Those antibiotics quantitated by the FSIS Bioassay and associated follow-up methodologies[1] [tetracycline, oxytetracycline, chlortetracycline, beta-lactams (penicillins and cephalosporins; not differentiated within this category), gentamicin, streptomycin/spectinomycin (not differentiated), erythromycin, tilmicosin, tylosin, neomycin, flavomycin, bacitracin, hygromycin, novobiocin, lincomycin*, pirlimycin*, clindamycin*, spiramycin*, oleandomycin*] *identification by mass spectrometry; not quantitated
- Choramphenicol
- Fluoroquinolones

--Other Veterinary Drugs:

[1] FSIS quantitates most antibiotics using a 7-plate Bioassay that measures microbial inhibition. The pattern of inhibition (i.e., the combination of plates showing inhibition) is used to identify the antibiotic. However, there are some antibiotics that share the same pattern of inhibition. In these cases, it is necessary to undertake follow-up testing (HPLC or mass spectrometry) to identify the compound. The compounds that share patterns of inhibition, and which are thus individually identified through follow-up testing, are:
tetracycline/oxytetracycline/chlortetracycline - compounds individually identified by follow-up with HPLC method for tetracyclines
tilmicosin/tylosin - differentiated by mass spectrometry

- Arsenicals (detected as elemental arsenic)
- Avermectins in FSIS multi-residue method (doramectin, ivermectin and moxidectin)
- Carbadox
- Phenylbutazone (detected in the CHC3 method)
- Sulfonamides (sulfapyridine, sulfadiazine, sulfathiazole, sulfamerazine, sulfamethazine, sulfachloropyridazine, sulfadoxine, sulfamethoxypyridazine, sulfaquinoxaline, sulfadimethoxine, sulfisoxazole, sulfacetamide, sulfamethoxazole, sulfamethizole, sulfanilamide, sulfaguanidine, sulfabromomethazine, sulfasalazine, sulfaethoxypyridazine, sulfaphenazole, and sulfatroxazole)

The 2001, FSIS Import Residue Plan will employ 8 methodologies and analyze for over 50 veterinary drugs. Three of these are single-compound methodology, and five are multi-residue methods (phenylbutazone is detected by the FSIS multi-residue method for chlorinated hydrocarbon and chlorinated organophosphate compounds).

PHASE III - IDENTIFYING THE COMPOUND/PRODUCT CLASS PAIRS

SAT participants from the FDA identified, for each of the drugs and drug classes to be included in the 2001 NRP, product classes in which they had a concern. The results are presented in Table 5.1, *Product Classes Considered for Each Drug/Drug Class.* Compound/product class pairs included in the 2001 NRP are designated by a "★." Those compound/product class pairs that are of potential public health concern, but that are not included in the 2001 NRP because of laboratory resource constraints, are marked with a "." Since all product classes will be sampled by the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP) method (see Section 7), and since this method also detects phenylbutazone, the latter, by default, will be sampled in all product classes. However, phenylbutazone is not of regulatory concern in all product classes. Those product classes in which phenylbutazone will be sampled, but where it is not of regulatory concern, are designated by a "."

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

ALLOCATION OF SAMPLING RESOURCES AMONG DIFFERENT PRODUCTION CLASSES

EGG PRODUCTS

The samples, for residue analysis for imported egg products, are selected in a different manner than the other product classes. As stated in Section 2, in order to establish a history of compliance with the U.S. requirements for each category of egg product, the first ten shipments from individual foreign establishments are subjected to 100 % reinspection. If the egg product is in compliance, the rate of inspection is reduced to a random selection of one reinspection out of eight product lots from each foreign establishment. This reinspection rate will continue as long as the product is in compliance.

ANIMAL PRODUCT CLASSES

Table-5.2*, Estimated Annual Amount of Product Imported,* lists the estimated amount of all the product classes imported into U.S. and includes the percentage of each of the product classes. The percent of each product class imported annually is calculated using the following formula:

$$\% \text{ Product Class Imported } (P_C) = \frac{\text{Amount Product Class Imported}}{\text{Total Product Imported}} \times 100 \qquad (5.1)$$

The relative sampling priority is obtained by multiplying the percent product class (P_C) by the drug scores obtained in Phase I, using the following equation

Relative Sampling Priority = (P_C) X Drug Score (5.2)

Based on the scores, one of the following sampling options is chosen: (1) very high regulatory concern (460 analyses/year); (2) high regulatory concern (300 analyses/year); (3) moderate regulatory concern (230 samples/year); or (4) low regulatory concern (90 samples/year). This is indicated in Table 5.5, *Number of Drug Samples/Product Class,* in the column labeled "Number of Samples."

If a product class represents less than one percent (by weight) of total combined U.S. imports of meat, poultry and egg products, then the total number of samples analyzed for any compound or compound class is eight times the number of countries from which that product is imported. For example, if fresh goat is imported from only three countries and the amount imported is 0.24 % relative to the total U.S. import, twenty-four samples of fresh goat would be taken for each analysis, eight from each country.

The adjusted numbers of samples is listed in Table 5.5, *Number of Drug Samples/Product Class,* in the column labeled "Adjusted Number of Samples." The final number of samples for a compound/product class is obtained after the allocation of samples among different countries is completed. The final number of samples is listed in Table 5.5 in the column labeled "Final Number of Samples." The numbers in the column labeled "Adjusted Number of Samples" and "Final Number of Samples" may vary slightly because of the rounding upwards or downwards of the samples. Based on the laboratory capacity, the number of samples for carbadox and chloramphenicol were adjusted downwards.

ALLOCATION OF SAMPLES AMONG DIFFERENT COUNTRIES

The total number of samples chosen for each compound/product class pair was subdivided among the different countries. The number of samples for each country was based on the relative amount of total product class imported: less than one percent and greater than one percent.

Allocation of Samples in Product Classes Whose Total Volume Imported is less than 1%

As stated above, if the amount of an import product class was less than 1%, eight samples per compound/compound class were taken from each country. The relative amounts of fresh goat, fresh chicken, processed beef/pork, fresh and processed turkey, fresh and processed other fowl, processed lamb/mutton, and processed veal were less than 1%. The numbers of samples per country per product class for each compound/compound class are listed in Tables 5.6-5.16.

Allocation of Samples in Product Classes Whose Total Volume Imported is Greater Than 1%

For major product classes, the number of samples was allocated to each country depending upon the relative amount of product imported from that country. Table 5.3, *Estimated Annual Volume of Product Imported/Country*, lists the amount of product imported from each country. The percent of a product class imported from a country was calculated as follows and is in Table 5.4, *Relative Annual Amount of Product Imported/Country.*

$$\text{Percent Product Class Imported per Country } (P_{C/C}) = \frac{\text{Amount of Product Class from Country}}{\text{Total Amount of Product Class}} \times 100 \quad (5.3)$$

Based upon the relative amount of product class imported per country, the number of samples that should be taken at the port-of-entry was calculated using the following formula:

$$\text{Unadjusted Number of Samples per Country } (U_{C/S}) = \text{Total Number of Samples} \times \frac{(P_{C/C})}{100} \quad (5.4)$$

This is indicated in the column labeled "Unadjusted Number of Samples ($U_{C/S}$)," in Tables 5.17 to 5.23 (except 5.17b and 5..21b).

After determining the number of samples required from each country, each country with less than eight samples was assigned a minimum of eight samples. This is indicated in the column labeled "Adjustment #1" in Tables 5.17 to 5.23 (except 5.17b and 5.21b). The results of this adjustment are in the column labeled "Initial Adj #." If the total number of samples for a compound/product class resulted in more than the total number of samples allocated to that compound/product class pair, then a second adjustment had to be made, so that the total number of samples would be within an allocated number. This adjustment was made only to those countries from which greater than eight samples were to be taken. This was accomplished using the following equations:

$$\text{Number of Samples after Adjustment \#2} = (U_{C/S}) - \frac{(N \times P_{C/C})}{(P_{T/C})} \qquad (5.5)$$

where ,

$N = (N_1) - (N_T)$
N_1 = Total Number of Samples after Adjustment #1
N_T = Total Number of Samples Allocated
$P_{T/C}$ = Total Percent of Product Class from the Countries That Had Greater Than Eight Samples
$P_{C/C}$ = Percent Product Class Imported Per Country
$U_{C/S}$ = Unadjusted Number of Samples

The final numbers of product sampled are indicated in Tables 5.17 to 5.23 (except 5.17b and 5.21b) in the column labeled "Final Adj.#."

Notes:

Because of limited laboratory resources twenty-four samples were allocated for chloramphenicol in fresh veal.

Since the U.S. imports processed pork from sixteen countries, the total number of samples were adjusted from 90 to 128, i.e. 8 samples/country.

Phenylbuatzone is detected by the FSIS CHC/COP method. Therefore, all product classes that are sampled for CHC/COP are sampled for phenylbutazone. The number of samples/product class/country is discussed in Section 7.

Table 5.1
Product Classes Considered for Each Drug/Drug Class
2001 Import Residue Plan

DRUG	Antibiotics	Arsenicals	Avermectin	Carbadox	Cloroamphenicol	Fluoroquinolones	Sulfonamides	Phenylbutazone
Beef, fresh	☆		☆	☒	☆	☒	☆	☆
Beef, processed			☒	☒			☆	☆
Beef/Pork, processed		☆	☒	☒			☆	☆
Chicken, fresh	☆	☆				☆	☆	▤
Chicken, processed		☆				☒	☆	▤
Eggs, processed	☒	☆					☆	▤
Goat, fresh	☆						☆	☆
Mutton/Lamb, fresh	☆		☆				☆	☆
Mutton/Lamb, processed			☒				☆	☆
Other Fowl, fresh	☆	☆					☆	▤
Other Fowl, processed	☆	☆					☆	▤
Pork, fresh	☆		☆	☆			☆	☆
Pork, processed		☆	☒	☒			☆	☆
Turkey, fresh	☆	☆				☒	☆	▤
Turkey, processed		☆				☒	☆	▤
Veal, fresh	☆		☆		☆	☒	☆	☆
Veal, processed			☒				☆	☆

Key

☆ = Compound/product class sampled in the 2000 FSIS Import Residue Plan

☒ = Compound/product class pair of regulatory concern but not included in the plan because of lab resources

▤ = Since all product classes will be sampled by the CHC/COP method (see Section 7), and since this method also detects phenylbutazone, the latter, by default, will be sampled in all product classes. However, phenylbutazone is not of regulatory concern in all product classes. Those product classes in which phenylbutazone will be sampled, but where it is NOT of regulatory concern.

Table 5.2
Estimated Annual Amount of Product Imported (in lbs.)
2001 Import Residue Plan

PRODUCT CLASS	PRODUCT IMPORTED IN POUNDS	%PRODUCT IMPORTED
Beef, fresh	2,098,868,024	59.75
Beef, processed	226,792,434	6.46
Beef/Pork, processed	2,836,782	0.08
Chicken, fresh	16,921,461	0.48
Chicken, processed	43,267,820	1.23
Eggs, processed	7,192,956	0.20
Goat, fresh	8,477,381	0.24
Horse, fresh	39,000	0.0011
Mutton/Lamb, fresh	114,638,343	3.26
Mutton/Lamb, processed	393,720	0.01
Other Fowl, fresh	1,060,178	0.03
Other Fowl, processed	2,721,146	0.08
Pork, fresh	716,643,798	20.40
Pork, processed	216,358,664	6.16
Turkey, fresh	1,342,373	0.04
Turkey, processed	5,285,625	0.15
Varied combination, processed	3,018,466	0.09
Veal, fresh	46,598,285	1.33
Veal, processed	69,321	0.002
Total/country	3,512,525,777	100.00

Table 5.3
Estimated Annual Amount (in lbs.) of Product Imported /Country
2001 Import Residue Plan

PRODUCT CLASS	Argentina	Australia	Austria	Belgium	Brazil	Canada	CostaRica	Croatia
Beef, fresh	57,959,971	635,438,680				858,112,757	27,875,576	
Beef, processed	42,863,789	2,561,285			110,939,489	60,066,491	11,192	848,629
Beef/Pork, processed						2,761,123		
Chicken, fresh						16,921,461		
Chicken, processed						42,331,957		
Eggs, processed						7,192,956		
Goat, fresh		7,340,874						
Horse, fresh						39,000		
Mutton/Lamb, fresh		76,218,185				555,179		
Mutton/Lamb, processed		110,053				231,904		
Other Fowl, fresh						921,887		
Other Fowl, processed						2,663,842		
Pork, fresh		32,683				622,645,232		
Pork, processed		15,673	22,273	8,711,898		119,805,742		1,172,813
Turkey, fresh						1,342,373		
Turkey, processed						4,257,862		
Varied combination, processed		37,180				2,833,454		55,830
Veal, fresh		6,120,114				19,825,461		
Veal, processed						69,321		
Total/country	100,823,760	727,874,727	22,273	8,711,898	110,939,489	1,762,578,002	27,886,768	2,077,272

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Denmark	Finland	France	Germany	Honduras	Hong Kong	Hungary
Beef, fresh					345,572		
Beef, processed				6,521			
Beef/Pork, processed							
Chicken, fresh							
Chicken, processed						86,190	
Eggs, processed							
Goat, fresh							
Horses, fresh							
Mutton/Lamb, fresh							
Mutton/Lamb, processed							
Other Fowl, fresh			138,291				
Other Fowl, processed			57,304				
Pork, fresh	77,537,030	1,798,902					
Pork, processed	44,554,559		892,161	450,153			4,576,906
Turkey, fresh							
Turkey, processed						760,558	
Varied combination, processed			33,701				
Veal, fresh							
Veal, processed							
Total/country	122,091,589	1,798,902	1,121,457	456,674	345,572	846,748	4,576,906

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Iceland	Ireland	Israel	Italy	Japan	Mexico	Netherlands	New Zealand
Beef, fresh					28,887	6,917,864		440,221,322
Beef, processed				116,866		4,668,202		2,252,014
Beef/Pork, processed								3,019
Chicken, fresh								
Chicken, processed			509,660			340,013		
Eggs, processed								
Goat, fresh								1,136,507
Horses, fresh								
Mutton/Lamb, fresh	20,408					2,197		37,368,096
Mutton/Lamb, processed								51,763
Other Fowl, fresh								
Other Fowl, processed								
Pork, fresh		6,335,647						
Pork, processed		884,909		3,811,693		462,895	14,828,065	
Turkey, fresh								
Turkey, processed			267,205					
Varied combination, processed								58,301
Veal, fresh								20,652,710
Veal, processed								
Total/country	20,408	7,220,556	776,865	3,928,559	28,887	12,391,171	14,828,065	501,743,732

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Nicaragua	Northern Ireland	Poland	Spain	Sweden	Switzerland	UK	Uruguay
Beef, fresh	20,346,556							51,620,839
Beef, processed						36,369		2,421,587
Beef/Pork, processed			72,640					
Chicken, fresh								
Chicken, processed								
Eggs, processed								
Goat, fresh								
Horses, fresh								
Mutton/Lamb, fresh								474,278
Mutton/Lamb, processed								
Other Fowl, fresh								
Other Fowl, processed								
Pork, fresh					453,829		7,808,127	
Pork, processed		32,348	15,710,351	420,812		37,761		
Turkey, fresh								
Turkey, processed								
Varied combination, processed								
Veal, fresh								
Veal, processed								
Total/country	20,346,556	32,348	15,782,991	420,812	453,829	74,130	7,808,127	54,516,704

Table 5.4
Relative Annual Amount Product Imported /Country
2001 Import Residue Plan

PRODUCT CLASS	Argentina	Australia	Austria	Belgium	Brazil	Canada	CostaRica	Croatia
Beef, fresh	2.76	30.28	-	-	-	40.88	1.33	-
Beef, processed	18.90	1.13	-	-	48.92	26.49	0.00	0.37
Beef/Pork, processed	-	-	-	-	-	97.33	-	-
Chicken, fresh	-	-	-	-	-	100.00	-	-
Chicken, processed	-	-	-	-	-	97.84	-	-
Eggs, processed	-	-	-	-	-	100.00	-	-
Goat, fresh	-	86.59	-	-	-	-	-	-
Horse, fresh	-	-	-	-	-	100.00	-	-
Mutton/Lamb, fresh	-	66.49	-	-	-	0.48	-	-
Mutton/Lamb, processed	-	27.95	-	-	-	58.90	-	-
Other Fowl, fresh	-	-	-	-	-	86.96	-	-
Other Fowl, processed	-	-	-	-	-	97.89	-	-
Pork, fresh	-	0.00	-	-	-	86.88	-	-
Pork, processed	-	0.01	0.01	4.03	-	55.37	-	0.54
Turkey, fresh	-	-	-	-	-	100.00	-	-
Turkey, processed	-	-	-	-	-	80.56	-	-
Varied combination, processed	-	1.23	-	-	-	93.87	-	1.85
Veal, fresh	-	13.13	-	-	-	42.55	-	-
Veal, processed	-	-	-	-	-	100.00	-	-

Table 5.4 - *Continued*
Relative Annual Amount Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Denmark	Finland	France	Germany	Honduras	Hong Kong	Hungary
Beef, fresh	-	-	-	-	0.02	-	-
Beef, processed	-	-	-	0.00	-	-	-
Pork, fresh	10.82	0.25	-	-	-	-	-
Pork, processed	20.59	-	0.41	0.21	-	-	2.12
Beef/Pork, processed	-	-	-	-	-	-	-
Veal, fresh	-	-	-	-	-	-	-
Veal, processed	-	-	-	-	-	-	-
Mutton/Lamb, fresh	-	-	-	-	-	-	-
Mutton/Lamb, processed	-	-	-	-	-	-	-
Goat, fresh	-	-	-	-	-	-	-
Chicken, fresh	-	-	-	-	-	-	-
Chicken, processed	-	-	-	-	-	0.20	-
Turkey, fresh	-	-	-	-	-	-	-
Turkey, processed	-	-	-	-	-	14.39	-
Other Fowl, fresh	-	-	13.04	-	-	-	-
Other Fowl, processed	-	-	2.11	-	-	-	-
Varied combination, processed	-	-	1.12	-	-	-	-
Horses, fresh	-	-	-	-	-	-	-
Eggs, processed	-	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Iceland	Ireland	Israel	Italy	Japan	Mexico	Netherlands	New Zealand
Beef, fresh	-	-	-	-	0.00	0.33	-	20.97
Beef, processed	-	-	-	0.05	-	2.06	-	0.99
Beef/Pork, processed	-	-	-	-	-	-	-	0.11
Chicken, fresh	-	-	-	-	-	-	-	-
Chicken, processed	-	-	1.18	-	-	0.79	-	-
Eggs, processed	-	-	-	-	-	-	-	-
Goat, fresh	-	-	-	-	-	-	-	13.41
Horses, fresh	-	-	-	-	-	-	-	-
Mutton/Lamb, fresh	0.02	-	-	-	-	0.00	-	32.60
Mutton/Lamb, processed	-	-	-	-	-	-	-	13.15
Other Fowl, fresh	-	-	-	-	-	-	-	-
Other Fowl, processed	-	-	-	-	-	-	-	-
Pork, fresh	-	0.88	-	-	-	-	-	-
Pork, processed	-	0.41	-	1.76	-	0.21	6.85	-
Turkey, fresh	-	-	-	-	-	-	-	-
Turkey, processed	-	-	5.06	-	-	-	-	-
Varied combination, processed	-	-	-	-	-	-	-	1.93
Veal, fresh	-	-	-	-	-	-	-	44.32
Veal, processed	-	-	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount Product Imported/Country
2001 Import Residue Plan

PRODUCT CLASS	Nicaragua	Northern Ireland	Poland	Spain	Sweden	Switzerland	UK	Uruguay
Beef, fresh	0.97	-	-	-	-	-	-	-
Beef, processed	-	-	-	-	-	0.02	-	-
Beef/Pork, processed	-	-	2.56	-	-	-	-	-
Chicken, fresh	-	-	-	-	-	-	-	-
Chicken, processed	-	-	-	-	-	-	-	-
Eggs, processed	-	-	-	-	-	-	-	-
Goat, fresh	-	-	-	-	-	-	-	-
Horses, fresh	-	-	-	-	-	-	-	-
Mutton/Lamb, fresh	-	-	-	-	-	-	-	-
Mutton/Lamb, processed	-	-	-	-	-	-	-	-
Other Fowl, fresh	-	-	-	-	-	-	-	-
Other Fowl, processed	-	-	-	-	-	-	-	-
Pork, fresh	-	-	-	-	0.06	-	1.09	0.005
Pork, processed	-	0.005	7.26	0.19	-	0.02	-	-
Turkey, fresh	-	-	-	-	-	-	-	-
Turkey, processed	-	-	-	-	-	-	-	-
Varied combination, processed	-	-	-	-	-	-	-	-
Veal, fresh	-	-	-	-	-	-	-	-
Veal, processed	-	-	-	-	-	-	-	-

Table 5.5
Number of Drug Samples/Product Class
2001 Import Residue Plan

NO. COUNTRIES	PRODUCT CLASS	DRUG	DRUG SCORE	PERCENT PRODUCT	RELATIVE SAMPLING PRIORITY	NUMBER OF SAMPLES	ADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
10	Beef, fresh	Antibiotics	15.00	59.75	896.30	460	460	459
10	Beef, fresh	Avermectins	9.10	59.75	543.76	300	300	301
10	Beef, fresh	Chloramphenicolic	11.00	59.75	657.29	300	300	301
10	Beef, fresh	Sulfa	12.00	59.75	717.04	300	300	301
12	Beef, processed	Sulfa	12.00	6.46	77.48	230	230	229
3	Beef/Pork, processed	Arsenicals	9.00	0.08	0.72	90	24	24
3	Beef/Pork, processed	Sulfa	12.00	0.08	0.97	90	24	24
1	Chicken, fresh	Antibiotics	15.00	0.48	7.23	90	8	8
1	Chicken, fresh	Arsenicals	9.00	0.48	4.34	90	8	8
1	Chicken, fresh	FQ	8.70	0.48	4.19	90	8	8
1	Chicken, fresh	Sulfa	12.00	0.48	5.78	90	8	8
4	Chicken, processed	Arsenicals	9.00	1.23	11.09	90	90	90
4	Chicken, processed	Sulfa	12.00	1.23	14.78	90	90	90
2	Goat, fresh	Antibiotics	15.00	0.24	3.62	90	16	16
2	Goat, fresh	Avermectins	9.10	0.24	2.20	90	16	16
2	Goat, fresh	Sulfa	12.00	0.24	2.90	90	16	16
2	Goat, fresh	Arsenicals	9.00	0.24	2.17	90	16	16
1	Horse, fresh	Antibiotics	15.00	0.0011	0.02	90	8	8
1	Horse, fresh	Avermectins	9.10	0.0011	0.01	90	8	8
1	Horse, fresh	Sulfa	12.00	0.0011	0.01	90	8	8
6	Mutton/Lamb, fresh	Antibiotics	15.00	3.26	48.96	90	90	90
6	Mutton/Lamb, fresh	Avermectins	9.10	3.26	29.70	90	90	90
6	Mutton/Lamb, fresh	Sulfa	12.00	3.26	39.16	90	90	90
3	Mutton/Lamb, processed	Sulfa	12.00	0.01	0.13	90	24	24
2	Other Fowl, fresh	Antibiotics	15.00	0.03	0.45	90	16	16
2	Other Fowl, fresh	Arsenicals	9.00	0.03	0.27	90	16	16
2	Other Fowl, fresh	FQ	8.70	0.03	0.26	90	16	16
2	Other Fowl, fresh	Sulfa	12.00	0.03	0.36	90	16	16
2	Other Fowl, processed	Arsenicals	9.00	0.08	0.70	90	16	16
2	Other Fowl, processed	Sulfa	12.00	0.08	0.93	90	16	16
7	Pork, fresh	Antibiotics	15.00	20.40	306.02	300	300	300
7	Pork, fresh	Arsenicals	9.00	20.40	183.61	300	300	300

Table 5.5 - *Continued*
Number of Drug Samples/Product Class
2001 Import Residue Plan

NO. COUNTRIES	PRODUCT CLASS	DRUG	DRUG SCORE	PERCENT PRODUCT	RELATIVE SAMPLING PRIORITY	NUMBER OF SAMPLES	ADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
7	Pork, fresh	Avermectins	9.10	20.40	185.65	300	300	300
7	Pork, fresh	Carbadox	13.10	20.40	267.26	300	90	92
7	Pork, fresh	Sulfa	12.00	20.40	244.82	300	300	300
17	Pork, processed	Arsenicals	9.00	6.16	55.44	90	136	136
17	Pork, processed	Sulfa	12.00	6.16	73.93	230	230	231
1	Turkey, fresh	Antibiotics	15.00	0.04	0.57	90	8	8
1	Turkey, fresh	Arsenicals	9.00	0.04	0.34	90	8	8
1	Turkey, fresh	FQ	8.70	0.04	0.33	90	8	8
1	Turkey, fresh	Sulfa	12.00	0.04	0.46	90	8	8
3	Turkey, processed	Arsenicals	9.00	0.15	1.35	90	24	24
3	Turkey, processed	Sulfa	12.00	0.15	1.81	90	24	24
5	Varied Combination, processed	Sulfa	12.00	0.09	1.03	90	40	40
3	Veal, fresh	Antibiotics	15.00	1.33	19.90	90	90	90
3	Veal, fresh	Avermectins	9.10	1.33	12.07	90	90	50
3	Veal, fresh	Chloramphenicol	11.00	1.33	21.43	90	24	24
3	Veal, fresh	Sulfa	12.00	1.33	14.59	90	90	90
1	Veal, processed	Sulfa	12.00	0.002	0.024	90	8	8
						6740	4406	4370

Phenylbutazone is detected by the CHC/COP method hence the "No. of Samples/Product Class" for phenylbutazone is the same as that for the CHC's/COP's. (See Section 7).

Table 5.6
Number of Samples/Product Class-Goat, Fresh
2001 FSIS Import Residue Plan

GOAT, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	86.59	8
New Zealand	13.41	8
Total		16
GOAT, FRESH/ ARSENIC		
Australia	88.29	8
New Zealand	11.70	8
Total		16
GOAT, FRESH/ AVERMECTINS		
Australia	88.29	8
New Zealand	11.70	8
Total		16
GOAT, FRESH/ SULFONAMIDES		
Australia	88.29	8
New Zealand	11.70	8
Total		16

Table 5.7
Number of Samples/Product Class-Chicken, Fresh
2001 FSIS Import Residue Plan

CHICKEN, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100	8
Total		8
CHICKEN, FRESH/ ARSENICALS		
Canada	100	8
Total		8
CHICKEN, FRESH/ FLUOROQUINOLONES		
Canada	100	8
Total		8
CHICKEN, FRESH/ SULFONAMIDES		
Canada	100	8
Total		8

Table 5.8
Number of Samples/Product Class-Horse, Fresh
2001 FSIS Import Residue Plan

HORSE, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100	8
Total		8
HORSE, FRESH/ AVERMECTINS		
Canada	100	8
Total		8
HORSE, FRESH/ SULFONAMIDES		
Canada	100	8
Total		8

Table 5.9
Number of Samples/Product Class-Turkey, Fresh
2001 FSIS Import Residue Plan

TURKEY, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100	8
Total		8
TURKEY, FRESH/ ARSENICALS		
Canada	100	8
Total		8
TURKEY, FRESH/ FLUOROQUINOLONES		
Canada	100	8
Total		8
TURKEY, FRESH/SULFONAMIDES		
Canada	100	8
Total		8

Table 5.10
Number of Samples/Product Class-Turkey, Processed
2000 FSIS Import Residue Plan

TURKEY, PROCESSED/ ARSENIC	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	80.56	8
Hong Kong	14.39	8
Israel	5.06	8
Total		24
TURKEY, PROCESSED/SULFONAMIDES		
Canada	80.56	8
Hong Kong	14.39	8
Israel	5.06	8
Total		24

Table 5.11
Number of Samples/Product Class-Varied Combination, Processed
2001 FSIS Import Residue Plan

VARIED COMBINATION, PROCESSED/SULFONAMIDES	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	1.23	8
Canada	93.87	8
Croatia	1.85	8
France	1.12	8
New Zealand	1.93	8
Total		40

Table 5.12
Number of Samples/Product Class-Other, Fowl, Processed
2001 FSIS Import Residue Plan

OTHER, FOWL, PROCESSED/ARSENIC	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	97.89	8
France	2.11	8
Total		16
OTHER, FOWL, PROCESSED/SULFONAMIDES	**PERCENT PRODUCT**	**FINAL NUMBER OF SAMPLES**
Canada	97.89	8
France	2.11	8
Total		16

Table 5.13
Number of Samples/Product Class-Other, Fowl, Fresh
2001 FSIS Import Residue Plan

OTHER FOWL, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	86.96	8
France	13.04	8
Total		16
OTHER FOWL, FRESH/ ARSENIC		
Canada	86.96	8
France	13.04	8
Total		16
OTHER FOWL, FRESH/ FLUOROQINOLONES		
Canada	86.96	8
France	13.04	8
Total		16
OTHER FOWL, FRESH/ SULFONAMIDES		
Canada	86.96	8
France	13.04	8
Total		16

Table 5.14
Number of Samples/Product Class-Lamb/Mutton, Processed
2001 FSIS Import Residue Plan

LAMB/MUTTON, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	27.95	8
Canada	58.90	8
New Zealand	13.15	8
Total		24

Table 5.15
Number of Samples/Product Class-Veal, Processed
2001 FSIS Import Residue Plan

VEAL, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100	8
Total		8

Table 5.16
Number of Samples/Product Class-Beef/Pork, Processed
2001 FSIS Import Residue Plan

BEEF ,PORK, PROCESSED/ARSENIC	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	97.33	8
New Zealand	0.11	8
Poland	2.56	8
Total		24
BEEF ,PORK, PROCESSED/SULFONAMIDES		
Canada	97.33	8
New Zealand	0.11	8
Poland	2.56	8
Total		24

Table 5.17
Number of Samples/Product Class-Beef, Processed
2001 FSIS Import Residue Plan

BEEF, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = $230P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ. NUMBER	ADJUST. # 2	FINAL NUMBER OF SAMPLES
Argentina	18.90	43		43	31	31
Australia	1.13	3	8	8		8
Brazil	48.92	113		113	82	82
Canada	26.49	61		61	44	44
Costa Rica	0.005	00	8	8		8
Croatia	0.37	1	8	8		8
Germany	0.003	0	8	8		8
Italy	0.05	0	8	8		8
Mexico	2.06	5	8	8		8
New Zealand	0.99	2	8	8		8
Switzerland	0.02	0	8	8		8
Uruguay	2.17	2	8	8		8
Total		230		289		229

Table 5.18
Number of Samples/Product Class-Beef, Fresh
2001 FSIS Import Residue Plan

BEEF, FRESH/ ANTIBIOTICS	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES (U) = 460*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ NUMBER**	**ADJUST. # 2**	**FINAL ADJ #**
Argentina	2.76	13		13	13	13
Australia	30.28	139		139	139	139
Canada	40.88	188		188	188	188
Costa Rica	1.33	6	8	8		8
Honduras	0.02	0	8	8		8
Japan	0.0014	0	8	8		8
Mexico	0.33	2	8	8		8
New Zealand	19.58	96		96	96	96
Nicaragua	0.97	4	8	8		8
Uruguay	2.46	11		11	11	11
Total		460		488		459
BEEF, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES (U) = 300$P_{C/C}$)/100)**				
Argentina	2.76	8	8	8		8
Australia	30.28	91		91	80	80
Canada	40.88	123		123	109	109
Costa Rica	1.33	4	8	8		8
Honduras	0.02	0	8	8		8
Japan	0.0014	0	8	8		8
Mexico	0.33	1	8	8		8
New Zealand	19.58	63		63	63	63
Nicaragua	0.97	3	8	8		8
Uruguay	2.46	7		10	9	9
Total		300		333		301
BEEF, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES (U) = 300*(($P_{C/C}$)/100)**				
Argentina	2.76	8	8	8		8
Australia	30.28	91		91	80	80
Canada	40.88	123		123	109	109
Costa Rica	1.33	4	8	8		8
Honduras	0.02	0	8	8		8
Japan	0.0014	0	8	8		8
Mexico	0.33	1	8	8		8
New Zealand	19.58	63		63	63	63
Nicaragua	0.97	3	8	8		8
Uruguay	2.46	7		10	9	9
Total		300		333		301

Table 5.18 - *Continued*
Number of Samples/Product Class-Beef, Fresh
2001 FSIS Import Residue Plan

BEEF, FRESH/ CHLORAMPHENI-COL	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 300*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ NUMBER	ADJUST. # 2	FINAL ADJ #
Argentina	2.76	8	8	8		8
Australia	30.28	91		91	80	80
Canada	40.88	123		123	109	109
Costa Rica	1.33	4	8	8		8
Honduras	0.02	0	8	8		8
Japan	0.0014	0	8	8		8
Mexico	0.33	1	8	8		8
New Zealand	19.58	63		63	63	63
Nicaragua	0.97	3	8	8		8
Uruguay	2.46	7		10	9	9
Total		300		333		301

Table 5.19a
Number of Samples/Product Class-Veal, Fresh
2001 Import Residue Plan

VEAL, FRESH/ ANTIBIOTICS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.	ADJUST. # 2	FINAL ADJ.
Australia	13.13	12	12	12	12	12
Canada	42.55	38	38	38	38	38
New Zealand	44.32	40	40	40	40	40
Total		90				90
VEAL, FRESH/ AVERMECTIN		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100**				
Australia	13.13	12	12	12	12	12
Canada	42.55	38	38	38	38	38
New Zealand	44.32	40	40	40	40	0[1]
Total		90				50
VEAL, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100**				
Australia	13.13	12	12	12	12	12
Canada	42.55	38	38	38	38	38
New Zealand	44.32	40	40	40	40	40
Total		90				90

[1] Consistent with the domestic plan for bob veal, no samples will be taken from New Zealand bob veal shipments for avermectin.

Table 5.19b
Number of Samples/Product Class-Veal, Fresh
2001 Import Residue Plan

VEAL, FRESH/ CHLORAMPHENICOL	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	13.13	8
Canada	42.55	8
New Zealand	44.32	8
Total		24

Table 5.20
Number of Samples/Product Class-Pork, Fresh
2001 Import Residue Plan

PORK, FRESH/ ANTIBIOTICS/	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) =300 * ($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	0.005	0	8	8		8
Canada	88.69	261		261	232	232
Denmark	10.82	32		32	28	28
Finland	0.25	1	8	8		8
Ireland	0.88	3	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	3	8	8		8
Total		300		333		300
PORK, FRESH/ ARSENIC		**UNADJUSTED NUMBER OF SAMPLES (U) = 300*(($P_{C/C}$)/100**				
Australia	0.005	0	8	8		8
Canada	88.68	261		261	232	232
Denmark	10.82	32		32	28	28
Finland	0.25	1	8	8		8
Ireland	0.88	3	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	3	8	8		8
Total		300		333		300
PORK, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES (U) = 300*(($P_{C/C}$)/100)**				
Australia	0.005	0	8	8		8
Canada	886.89	261		261	232	232
Denmark	10.82	32		32	28	28
Finland	0.25	1	8	8		8
Ireland	0.88	3	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	3	8	8		8
Total		300		333		300

Table 5.20- *Continued*
Number of Samples/Product Class-Pork, Fresh
2001 Import Residue Plan

PORK, FRESH/ CARBADOX	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ.#**	**ADJUST. # 2**	**FINAL ADJ.#**
Australia	0.005	0	8	8		8
Canada	86.89	78		78	44	44
Denmark	10.82	10		11	6	8
Finland	0.25	0	8	8		8
Ireland	0.88	1	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	1	8	8		8
Total		90		128		92
PORK, FRESH/ SULFONAMIDES	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES (U) = 300*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ.#**	**ADJUST. # 2**	**FINAL ADJ.#**
Australia	0.005	0	8	8		8
Canada	86.89	261		261	232	232
Denmark	10.82	32		32	28	28
Finland	0.25	1	8	8		8
Ireland	0.88	3	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	3	8	8		8
Total		300		333		300

Table 5.21a
Number of Samples/Product Class-Pork, Processed
2001 Import Residue Plan

PORK, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 230*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	0.01	0	8	8		8
Austria	0.01	0	8	8		8
Belgium	4.03	9		9	5	8
Canada	55.37	12		114	79	79
Croatia	0.54	1	8	8		8
Denmark	20.59	47	8	62	27	27
France	0.41	1	8	8		8
Germany	0.21	0	8	8		8
Hungary	2.12	5	8	8		8
Ireland	0.41	1	8	8		8
Italy	1.76	4	8	8		8
Mexico	0.21	0	8	8		8
Netherlands	6.85	16		13	10	10
Poland	7.26	17		15	11	11
Spain	0.19	0	8	8		8
Switzerland	0.02	0	8	8		8
Northern Ireland	0.01	0				
Total		230		312		233

Table 5.21b
Number of Samples/Product Class-Pork, Processed
2001 Import Residue Plan

PORK, PROCESSED/ ARSENICALS	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	0.01	8
Austria	0.01	8
Belgium	4.03	8
Canada	55.37	8
Croatia	0.54	8
Denmark	20.59	8
France	0.41	8
Germany	0.21	8
Hungary	2.12	8
Ireland	0.41	8
Italy	1.76	8
Mexico	0.21	8
Netherlands	6.85	8
Poland	7.26	8
Spain	0.19	8
Switzerland	0.02	8
Northern Ireland	0.01	8
Total		136

Table 5.22
Number of Samples/Product Class-Lamb/Mutton, Fresh
2001 Import Residue Plan

LAMB/MUTTON, FRESH/ ANTIBIOTICS	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ.#**	**ADJUST. # 2**	**FINAL ADJ.#**
Australia	66.49	60		60	39	39
Canada	0.48	0	8	8		8
Iceland	0.02	0	8	8		8
Mexico	0.002	0	8	8		8
New Zealand	32.60	29		29	19	19
Uruguay	0.41	0	8	8		8
Total		90		121		90
LAMB/MUTTON, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100**				
Australia	66.49	60		60	39	39
Canada	0.48	0	8	8		8
Iceland	0.02	0	8	8		8
Mexico	0.002	0	8	8		8
New Zealand	32.60	29		29	19	19
Uruguay	0.41	0	8	8		8
Total		90		121		90
LAMB/MUTTON, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100**				
Australia	66.49	60		60	39	39
Canada	0.48	0	8	8		8
Iceland	0.02	0	8	8		8
Mexico	0.002	0	8	8		8
New Zealand	32.60	29		29	19	19
Uruguay	0.41	0	8	8		8
Total		90		121		90

Table 5.23
Number of Samples/Product Class-Chicken, Processed
2001 Import Residue Plan

CHICKEN, PROCESSED/ ARSENICALS	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ.#**	**ADJUST. # 2**	**FINAL ADJ.#**
Canada	97.84	88		88	66	66
Hong Kong	0.20	0	8	8		8
Israel	1.18	1	8	8		8
Mexico	0.79	1	8	8		8
Total		90	24	112		90
CHICKEN, PROCESSED/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*(($P_{C/C}$)/100**				
Canada	97.84	88		88	66	66
Hong Kong	0.20	0	8	8		8
Israel	1.18	1	8	8		8
Mexico	0.79	1	8	8		8
Total		90	24	112		90

SECTION 6. PLANNING THE 2001 FSIS DOMESTIC MONITORING PLAN AND SPECIAL PROJECTS: PESTICIDES

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate pesticides of concern selected by the Environmental Protection Agency (EPA) members of the Surveillance Advisory Team (SAT) is presented in Table 6.1, *Scoring Table for Pesticides*. Since the Food Safety and Inspection Service (FSIS) wishes to prioritize which *analyses* should be conducted, compounds that are, or are likely to be, detected by the same analytical methodology have been grouped together.

RANKING OF CANDIDATE COMPOUNDS

COMPOUND SCORING

Using a simple 4-point scale (4 = high; 3 = moderate; 2 = low; 1 = none), members of the SAT scored each of the pesticides in each of the following categories. Note that some of these categories differ from those used for the veterinary drugs:

- FSIS Historical Testing Information on Violations
- Regulatory Concern
- Lack of FSIS Testing Information on Violations
- Pre-slaughter Interval
- Bioconcentration Factor
- Endocrine Disruption
- Toxicity

Definitions of each of these categories, and the criteria used for scoring, appear at the end of this section in the "*Scoring Key for Pesticides, FSIS 2001 Domestic Residue Program*."

The results of the compound scoring process are presented in Table 6.1. Where compounds were grouped together, the score assigned to each category is the highest score for all members of the group.

COMPOUND RANKING

Background

Repeating Equation (4.1), we have:

$$\begin{aligned} \text{Risk} &= \text{Exposure} \times \text{Toxicity} \\ &= \text{Consumption} \times \text{Residue Levels} \times \text{Toxicity} \\ &= \text{Consumption} \times \text{"Risk Per Unit of Consumption"} \end{aligned} \qquad (6.1)$$

As stated above, FSIS chose to employ techniques and principles from the field of risk assessment to obtain a ranking of the relative public health concern represented by each of the candidate compounds or compound classes. However, unlike the case with veterinary drugs (see Section 4), FSIS does not have historical data on a sufficient range of different pesticide compounds or compound classes to predict violation scores (and thus risk per unit of consumption) using a regression equation. Therefore a somewhat different approach (although related to that used for the veterinary drugs) was necessary to estimate the "Risk Per Unit of Consumption" term.

Rating the Pesticides According to Relative Public Health Concern

The categories of "Regulatory Concern," "Pre-slaughter Interval," and "Bioconcentration Factor" were employed as predictors of risk per unit of consumption from pesticides in animal products. As indicated above, the "Regulatory Concern" category reflects EPA's professional judgment of the likelihood that a compound or compound class will exceed EPA's level of concern in meat, poultry, or egg products. Thus, it combines residue level and toxicity information. As with the "Withdrawal Time" category for veterinary drugs, the "Pre-slaughter Interval" category is expected to correlate with residue level because longer pre-slaughter intervals are less likely to be properly observed. When the pre-slaughter interval is not observed, the carcass may contain violative levels of residues, since the time necessary for sufficient metabolism and/or elimination of the pesticide may not have passed. Bioconcentration is a measure of the extent to which a pesticide concentrates within the fat deposits of animals. Pesticides that bioconcentrate are more likely to accumulate to higher levels within animal tissue, thus increasing the potential for human exposure.

The "Toxicity" category reflects both the dose required to achieve a toxic effect and the severity of that effect. It can thus be used directly as a term in Equation (6.1).

By multiplying toxicity times a weighted average of those categories used as indicators of potential residue level, we can obtain a rough estimate of the relative risk per unit of consumption represented by each compound or compound class. And as with the veterinary drugs, we can refine the equation by adding a modifier for "Lack of FSIS Testing Information on Violations." Thus, with appropriate substitution, we obtain the following equation:

Relative Public Health Concern (6.2)
= Estimated relative risk per unit of consumption
x *modifier for* "Lack of FSIS Testing Information on Violations"
= Estimated relative exposure x Relative toxicity
x *modifier for* "Lack of FSIS Testing Information on Violations"
= Weighted average of {"Regulatory Concern," "Pre-slaughter Interval," "Bioconcentration factor"} x "Toxicity" x *modifier for* "Lack of FSIS Testing Information on Violations"

In comparing Equation (6.2), above, to Equation 4.3, it can be seen that the "Weighted average of {'Regulatory Concern,' 'Pre-slaughter Interval,' "Bioconcentration factor'}" has been used in place of "Predicted or Actual Score for 'FSIS Historical Testing Information on Violations.'" Endocrine Disruption" was not included in Equation 6.2, because scores for this category were not available for most of the pesticides.

Table 6.1, the pesticides are rated for relative public health concern by combining the scoring categories presented in Equation (6.2), above, using the weighting formula shown in the last column of this table, and presented in Equation (6.3), below. FSIS selected this formula, based on a consensus about the relative importance of each modifier, and of how much each modifier should be allowed to alter the underlying risk-based score for Relative Public Health Concern. The value of the selected mathematical

formula is that it formalizes the basis of FSIS's judgement. This enables others to observe and understand the adjustments that were made, and it ensures consistency in how these adjustments were applied across a wide range of compounds.

Relative public health concern rating, pesticides = {[(2*R+P+B)/4]*T}*{[(L-1)*0.05]+1} (6.3)

Where: R = score for "Regulatory Concern"
P = score for "Pre-slaughter Interval"
B = score for "Bioconcentration Factor"
T = score for "Toxicity"
L = score for "Lack of FSIS Testing Information on Violations

In this formula, "Regulatory Concern" was weighted twice as heavily as both "Pre-slaughter Interval" and "Bioconcentration Factor," because “Regulatory Concern” was considered a more direct measure of exposure. Moreover, as with the veterinary drugs, the final ratings of compounds or compound classes receiving scores of 4, 3, 2, and 1 in "Lack of FSIS Testing Information on Violations" are increased by 15%, 10%, 5%, and 0% respectively. In other words, the rating of a compound or compound class that had never been tested by FSIS (in the production classes and matrices of concern) would be increased by 15%, while the rating of one that had been recently tested by FSIS (again, in the production classes and matrices of concern) would remain unchanged.

All of the formulas used here for the pesticides, and in Section 4 for the veterinary drugs, have been normalized. In other words, the veterinary drug and pesticide weighting formulas have been adjusted to give the same maximum value. For a given pesticide or pesticide class, this permits comparison of the scores generated by the four different weighting formulas presented in Table 6.1. Because the formulas for veterinary drugs use different terms from those for pesticides, the scores cannot be precisely compared across these two different types of residues. However, because of this normalization, the scores for pesticides and veterinary drugs are comparable in magnitude, permitting a rough comparison of relative public health concern scores to be made across these two very different categories of compounds.

In Table 6.2, *Rank and Status for Pesticides*, the pesticides are ranked by their rating scores, as generated using the selected weighting formula (Equation (6.3), above). The scores presented in Table 6.2 enable FSIS to bring consistency, grounded in formal risk-based considerations, to its efforts to differentiate among a very diverse range of pesticides and pesticide classes in a situation that is marked by minimal data on relative exposures**.** These rankings do not account for differences in exposure due to differences in overall consumption. Data on relative consumption are applied subsequently, in Phase IV, when relative exposure values for each compound/production class (C/PC) pair are estimated.

PHASE II - SELECTING PESTICIDES FOR INCLUSION IN THE 2001 NRP

Following the completion of the ranking of the pesticides, the SAT (1) used these rankings to select those compounds and compound classes that should be included in the 2001 NRP, based purely on their relative public health concern and (2) determined which of these compounds and compound classes actually could be included in the 2001 NRP, based on the availability of laboratory resources.

The consensus of the SAT participants was that those compounds and compound classes ranked fifteenth or higher represented a potential public health concern sufficient to justify their inclusion in the 2001 FSIS National Residue Program (NRP).

Once these high-priority compounds and compound classes had been identified, it was necessary for FSIS to apply considerations beyond those related to public health to determine the compounds that would be sampled. The principal consideration not related to public health was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Based on these constraints, only the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP) compound class can currently be included in the NRP. The 39 compounds that will be analyzed in this class are:

HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor epoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, stirofos, kepone, mirex, methoxychlor, phosalone, coumaphos-O, coumaphos-S, toxaphene, famphur, PCB 1242, PCB 1248, PCB 1254, PCB 1260, dicofol*, PBBs*, polybrominated diphenyl ethers*, and deltamethrin* (*identification only; not quantitated)

The sampling status of each compound or compound class in the 2001 Monitoring Plan and Special Projects is provided in Table 6.2. For each highly ranked compound or compound class that was not scheduled for inclusion in the 2001 NRP, a brief explanation of the reason for its exclusion is provided. This table will be used to identify future method development needs for pesticides for the FSIS NRP.

It can be seen that a number of highly ranked pesticides could not be included in the 2001 NRP due to methodological limitations. FSIS is currently working with EPA to extend the FSIS CHC/COP method to the chlorinated and non-chlorinated organophosphate compounds that were collectively rated as the top priority compound class. FSIS will implement this extended methodology as soon as it becomes available**.**

PHASE III - IDENTIFYING THE COMPOUND/PRODUCTION CLASS (C/PC) PAIRS

The CHC/COP class includes pesticides that may be present in the foods animals eat, creating the potential for the occurrence of "secondary residues" (i.e., residues that are not the result of direct treatment) in all classes of animals. Other compounds within this class (such as the PCB's) are environmental contaminants to which any animal may be exposed. *For these two reasons, FSIS judged it prudent to sample for CHC's and COP's in all production classes.* FSIS also wishes to continue sampling for these compounds in all production classes as a means of monitoring for the occurrence of accidental contamination incidents.

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

Since only the CHC/COP compound class will be included in the 2001 NRP, this phase is relatively straightforward. FSIS has sufficient analytical capability to implement CHC/COP analysis in all production classes. To establish a relative sampling priority for each C/PC pair, the ranking score for the CHC/COP's (as calculated in Table 6.1) was multiplied by the estimated relative percent of domestic consumption for each production class (presented in Table 4.4). This is identical Equation (4.6), which was used to calculate the relative sampling priorities for the veterinary drugs:

$$(\text{Rel. sampling priority})_{C/PC} = (\text{Ranking score})_{C} \times (\text{Est. rel. \% domestic consumption})_{PC} \qquad (6.4)$$

As stated above for veterinary drugs, Equation (6.4) is analogous to the equation used to estimate risk (Equation (6.1)), in which risk per unit of consumption is multiplied by consumption. While the results

of Equation (6.4) do not constitute an estimate of risk, they provide a numerical representation of the relative public health concern associated with each C/PC pair, and thus can be used to prioritize FSIS analytical sampling resources according to the latter. Note that the risk ranking provided by Equation (6.4) is based upon average consumption across the entire U.S. population, rather than upon maximally exposed individuals.

A ranking of the C/PC pairs within this single compound class could be obtained merely using the estimated relative percent of domestic consumption for each production class. In other words, the *rank order and the relative magnitude of the score* assigned to each of the C/PC pairs within this compound class is not changed by multiplying all the relative consumption values by the ranking score, since the ranking score is a constant term. Nevertheless, to maintain a rough parity between the sampling numbers assigned to the veterinary drugs and those assigned to the pesticides, all of the relative consumption figures were multiplied by the ranking score for the CHC/COP compound class. Then, rather than simply dividing the production classes into quartiles, the initial sampling levels were chosen using the same cutoff numbers employed in Table 4.5 for the veterinary drugs. The cutoff scores are as follows: >29 = 460 samples; 2.3 - 29 = 300 samples; 0.14 - 2.2 = 230 samples; < 0.14 = 90 samples. The results of this are presented in Table 6.3, *Pesticide Compound/Production Class Pairs, Sorted by Sampling Priority Score, with Adjusted Number of Analyses*. As described in Section 3, above, these sampling levels provide varying probabilities of detecting residue violations. Thus the larger sample sizes, which provide the greater chance of detecting violations, are directed towards those C/PC pairs that have been identified as representing higher levels of relative public health concern.

Because the numbers of squab produced and consumed are very limited, and because quantitative data on squab production were not available, squab were not included in the above determination, and were instead assigned a sampling frequency of 45 animals. This number was judged to be appropriate relative to the estimated annual U.S. production of squab.

ADJUSTING RELATIVE SAMPLING NUMBERS

Adjusting for historical data on violation rates of individual C/PC pairs

Extensive FSIS historical testing information on violations, subdivided by production class, is available for the CHC/COP compound class. This information has been used to further refine the relative priority of sampling each C/PC pair. Table 6.3 lists, for the period 1/1/90 -12/31/99, the total number of samples analyzed by FSIS in each production class under its Monitoring Plan and Special Projects (i.e., random sampling only), and the percent of samples found to be violative (i.e., present at a level in excess of the action level or regulatory tolerance; or, for those compounds that are prohibited, present at any detectable level). Using these data, the following rules were applied to adjust the sampling numbers:

1. C/PC pair never tested: +1 level (i.e., increase by one sampling level, e.g., from 230 samples to 300 samples)
2. At least 300 samples tested, violation rate $\geq$ 0.25%: +1 level
3. The maximum number of samples to be scheduled for testing is 460

The two exceptions to this system are:

1. Geese are not scheduled for more than 90 samples. Sampling destroys the entire goose carcass. Because very few geese are produced, and because virtually all geese are slaughtered by a very limited number of establishments, collecting a larger number of samples would present an unfair burden to these establishments.
2. As explained above, squab are automatically assigned 45 samples for each analysis performed.

3. Because the use of the CHC/COP method to test for phenylbutazone did not start until recently, FSIS has limited data on the occurrence of this drug in the production classes of interest. Therefore, all production classes for which phenylbutazone was designated as of potential concern (in Table 4.3, with a "✯") were assigned a minimum of 300 samples.

All of the above adjustments were applied. The sampling numbers obtained following these adjustments are listed in Table 6.3 under the heading "INITIAL ADJ. #" (initial adjusted number of samples).

Adjusting for laboratory capacity

No adjustments for laboratory capacity were necessary. Therefore the final sampling numbers for the pesticides, which are listed in the last column of Table 6.3 under the heading "FINAL ADJ. #" (final adjusted number of samples), are unchanged from those listed under the heading "INITIAL ADJ. #."

SCORING KEY FOR PESTICIDES
2001 FSIS DOMESTIC RESIDUE PROGRAM

FSIS Historical Testing Information on Violations (1/1/90 - 12/31/99)

Violation rate scores were calculated by two different methods, A and B, using violation rate data from FSIS random sampling of animals entering the food supply:

Method A: Maximum Violation Rate. Identify the production class exhibiting the highest average violation rate (the number of violations over the period from 1990 - 1999, divided by the total number of samples analyzed). Score as follows:

4 = > 0.5%
3 = 0.25% - 0.5 %
2 = 0.07% - 0.24%
1 = < 0.07%
NT = Not tested by FSIS.
NA = Tested by FSIS, but violation information does not apply.

Method B: Violation Rate Weighted by Size of Production Class. For each production class analyzed, multiply the average violation rate (defined above) by the relative consumption value for that class (weight annual U.S. production for that class, divided by total production for all classes for which FSIS has regulatory responsibility). Add together the values for all production classes. Score as follows:

4 = > 0.08%
3 = 0.035% - 0.08%
2 = 0.003% - 0.034%
1 = < 0.003%
NT = Not tested by FSIS.
NA = Tested by FSIS, but violation information does not apply.

The final score is determined by assigning, to each pesticide or pesticide class, the greater of the scores from Method A and Method B.

It can be seen that Method A identifies those pesticides that are of regulatory concern because they exhibit high violation rates, independent of the relative consumption value of the production class in which the violations have occurred. Method B identifies those pesticides that may not have the highest violation rates, but would nevertheless be of concern because they exhibit moderate violation rates in a relatively large proportion of the U.S. meat supply. By employing Methods A and B together, and assigning a final score based on the highest score received from each, both of the above concerns are captured.

Regulatory Concern

These scores represent EPA's professional assessment of the extent to which the acute or chronic dietary exposure to this compound may exceed EPA's level of concern. For compounds other than carcinogens, this was determined by comparing a compound's Acute or Chronic Population Adjusted Dose (PAD) (whichever was lower) to the estimated level of exposure. The Acute and Chronic PAD's are calculated as follows:

The Acute Reference Dose (Acute RfD) is an estimate (with uncertainty spanning an order of magnitude or greater) of a single oral exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects.

The Chronic Reference Dose (Chronic RfD) 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 Acute and Chronic RFD's 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). Uncertainty Factors 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.

RfD = (NOAEL or LOAEL)/Total UF

The Acute and Chronic Population Adjusted Dose (PAD) are the Acute and Chronic RfD, respectively, modified by the FQPA Safety Factor:

Acute or Chronic PAD = (Acute or Chronic RfD)/FQPA Safety Factor

The acute and chronic dietary risks are expressed as a percentage of the Acute or Chronic PAD. A dietary risk of 100% of the Acute or Chronic PAD (*whichever is lower*) is the target level of exposure that should not be exceeded (i.e., the estimated risk associated with any exposure that is less than 100% of the PAD has been judged not to be of concern). In the following, "PAD" is the lower of the Acute and Chronic PAD's.

4 = PAD exceeder or carcinogen.

3 = Close to PAD.

2 = Exposure estimated to be a low percentage of PAD.

1 = Exposure estimated to be a very low percentage of PAD.

Lack of FSIS Testing Information on Violations

This represents the extent to which FSIS analytical testing information on a residue is limited, absent or obsolete.

4 = FSIS has not included this compound in its sampling program within the past 10 years (1/1/90 - 12/31/99); or FSIS has included this compound within its program only between 6 and 10 years ago (1/1/90 - 12/31/94), but the sampling does not meet the criteria specified for a "3;" or FSIS has included this compound in its sampling program, but the information is not at all useful in predicting future violation rates, because of subsequent significant changes in the conditions of use of the compound (e.g., the reduction in withdrawal time for carbadox), or because regulatory intelligence information indicates that the situation has changed significantly since the last time the compound was sampled; or because the compound is of concern in several production classes of interest, but testing has been carried out in only one.

3 = FSIS has tested within the past 5 years (1/1/95 - 12/31/99), but in fewer than 75% of the production classes of interest; or the only testing was between 6 and 10 years ago, where FSIS has analyzed at least 75% of production classes of interest for at least 2 of these 5 years, with a total of at least 500 samples per production class during this 5-year period and, in the case of a multi-residue method, the method used covers all compounds of interest with the compound class; or, the compound would normally have qualified for a "1" or "2," but the method used was not sufficiently sensitive to permit accurate determination of the true violation rate.

2 = FSIS has included this compound in its sampling program within the past 5 years in at least 75%, but less than 100% of the production classes of interest; or 100% of the production classes of interest have been sampled, but the amount and duration of sampling has been insufficient to qualify for a "1."

1 = FSIS has included this compound in its sampling program within the past 5 years, and has analyzed each production class of interest for at least 2 of these 5 years, with a total of at least 500 samples per production class during this 5-year period, and in the case of a multi-residue method, the method used covers all compounds of interest with the compound class.

Pre-Slaughter Interval

Pesticides accepted for direct dermal application have a minimum specified pre-slaughter interval. This is the interval between the last dermal application and the time of slaughter.

4 = Dermal application permitted, pre-slaughter interval 1 day or greater.

3 = Dermal application permitted, pre-slaughter interval 0 days.

2 = No direct dermal application permitted, but treatment of premises (e.g., holding cells, feedlots, barns, etc.) is permitted.

1 = No direct dermal application or premise treatment permitted.

Bioconcentration Factor

This is a measure of the compound's relative affinity for fat, as measured by the $K_{o/w}$. The $K_{o/w}$ is defined as the logarithm of the partition coefficient between octanol and water. Compounds that have a high affinity for octanol (and thus a high $K_{o/w}$) tend to bioaccumulate in body fat.

4 = log $K_{o/w}$ greater than 3

3 = log $K_{o/w}$ between 2 and 3

2 = log $K_{o/w}$ between 1 and 2

1 = log $K_{o/w}$ less than 1

Endocrine Disruption

This is a measure of the extent to which the compound changes endocrine function and causes adverse effects to individual organisms and/or their progeny, or to organism populations and subpopulations.

4 = Likely.

3 = Suspected.

NT = Not yet tested.

Toxicity

This represents EPA's professional judgment of the toxicity of the compound, including both the dose required to achieve a toxic effect, and the severity of the toxic effect. In the following, "RfD" is the lower of the Acute and Chronic RfD's. [An explanation of Acute and Chronic RfD is provided in the description of Regulatory Concern, above.]

4 = Cholinesterase inhibitor, carcinogen, or low RfD.

3 = Medium RfD.

2 = High RfD.

1 = Very low toxicity concern or eligible for exemption from the requirement of a tolerance.

Table 6.1
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Benzimidazole Pesticides in FSIS Benzimidazole MRM (5-hydroxythiabendazole, benomyl (as carbendazim), thiabendazole)	1	3	1	4	3	4	3	***12.1***
Carbamates in FSIS Carbamate MRM (aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, carbofuran 3-hydroxy)	NA	4	4	2	3	4	4	***16.1***
Carbamates NOT in FSIS Carbamate MRM (carbaryl 5,6-dihydroxy, chlorpropham, propham, thiobencarb, 4-chlorobenzylmethylsulfone,4-chlorobenzylmethylsulfone sulfoxide)	NT	4	1	3	NV	4	4	***13.8***
CHC's and COP's in FSIS CHC/COP MRM (HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor epoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, stirofos, kepone, mirex, methoxychlor, phosalone, coumaphos-O, coumaphos-S, toxaphene, famphur, PCB 1242, PCB 1248, PCB 1254, PCB 1260, dicofol*, PBBs*, polybrominated diphenyl ethers*, deltamethrin*) (*identification only)	3	4	4	4	NV	4	1	***16.0***
COP's and OP's NOT in FSIS CHC/COP MRM (azinphos-methyl, azinphos-methyl oxon, chlorpyrifos, coumaphos, coumaphos oxon, diazinon, diazinon oxon, diazinon met G-27550, dichlorvos, dimethoate, dimethoate oxon, dioxathion, ethion, ethion monooxon, fenthion, fenthion oxon, fenthion oxon sulfone, fenthion oxon sulfoxide, fenthion sulfone, fenthion sulfoxide, malathion, malathion oxon, naled, phosmet, phosmet oxon, pirimiphos-methyl, trichlorfon, tetrachlorvinphos, tetrachlorvinphos-4 metabolites, acephate, methamidophos, chlorpyrifos-methyl, fenamiphos, fenamiphos sulfoxide,fenamiphos sulfone, fenamiphos sulfoxide desisopropyl, fenamiphos sulfone desisopropyl, isofenphos, isofenphos oxon, isofenphos desisopropyl, isofenphos oxon desisopropyl, methidathion, ODM, parathion (ethyl)*, parathion oxon, parathion methyl*, parathion methyl oxon, phorate, phorate oxon, phorate oxon sulfone, phorate oxon sulfoxide, phorate sulfone, phorate sulfoxide, profenofos, sulprofos, sulprofos oxon, sulprofos oxon sulfone, sulprofos oxon sulfoxide, sulprofos sulfone, sulprofos sulfoxide, tribufos (DEF))	NT	4	4	4	NV	4	4	***18.4***
Synthetic Pyrethrins in FSIS Synthetic Pyrethrin MRM (cypermethrin, cis-permethrin, trans-permethrin, fenvalerate, zeta-cypermethrin)	1	3	4	4	3	4	3	***15.4***
Triazines in FSIS Triazine MRM (atrazine, simazine, propazine, terbuthylazine)	1	4	2	3	4	4	3	***14.3***
Triazines NOT in FSIS Triazine MRM (atrazine chloro metabolites, metribuzin, metribuzin DADK, metribuzin DA, metribuzin DK, amitraz, amitraz 2,4-DMA metabs., desdiethyl simazine, desethyl simazine, simazine chloro metabs.)	NT	4	4	3	4	4	4	***17.3***
1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)-1-ethanol	NT	3	4	4	NV	4	4	***16.1***
1,1-(2,2-dichloroethylidene)bis(4-methoxybenzene)	NT	3	4	4	NV	4	4	***16.1***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
1,1,3,3,-tetrakis(2-methyl-2-phenylpropyl)-1,3-dihydroxydistannoxane	NT	2	1	4	NV	3	4	***7.8***
1-methoxy-4-(1,2,2,2-tetrachloroethyl)benzene)	NT	3	4	4	NV	4	4	***16.1***
1-methyl cyromazine	NT	3	4	2	NV	4	4	***13.8***
2-((2-ethyl-6-methylphenyl)-amino)-1-propanol	NT	3	1	3	3	4	4	***11.5***
2-(1-hydroxyethyl)-6-ethylaniline	NT	4	1	3	3	4	4	***13.8***
2-(4-((6-chloro-2-benzoxazolyl)oxy)phenoxy)propanoic acid	NT	3	1	4	NV	4	4	***12.7***
2,3-dihydro-3,3-methyl-2-oxo-5-benzofuranyl methyl sulfonate	NT	2	1	2	NV	2	4	***4.0***
2,4-D	NT	3	2	1	3	2	4	***5.2***
2,5-dichloro-4-methoxyphenol	NT	1	1	2	NV	3	4	***4.3***
2,6-diethylaniline	NT	4	1	3	3	4	4	***13.8***
2-aminobenzimidazole	NT	3	1	2	3	4	4	***10.4***
2-amino-n-isopropylbenzamide	NT	3	1	2	NV	3	4	***7.8***
2-carboxyisopropyl-4-(4-dichloro)-5-isopropoxyphenyl)-1,3,4-oxadiazolin-5-one	NT	3	1	4	NV	4	4	***12.7***
2-hydroxy-2,3-dihydro-3,3-methyl-5-benzofuranyl methyl sulfonate	NT	2	1	2	NV	2	4	***4.0***
2-t-butyl-4-(2,4-chloro-5-hydroxyphenyl)-delta 2-1,3,4-oxadiazolin-5-one	NT	3	1	4	NV	4	4	***12.7***
3-(1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)ethoxy)-1,2-propane diol	NT	3	4	4	NV	4	4	***16.1***
3-(2-chloro-4-hydroxyphenyl)-6-(2-chlorophenyl)-1,2,4,5-tetrazine	NT	3	1	1	NV	4	4	***9.2***
3-(3,4-dichlorophenyl)-1-methoxyurea	NT	3	2	3	NV	4	4	***12.7***
3,4-dichloroaniline	NT	3	2	3	NV	4	4	***12.7***
3,4-dichlorophenylurea	NT	3	2	3	NV	4	4	***12.7***
3-carboxy-5-ethoxy-1,2,4-thiadiazole	NT	3	1	4	NV	3	4	***9.5***
3-t-butyl-5-chloro-6-hydroxymethyluracil	NT	1	1	1	NV	3	4	***3.5***
4-(2-ethyl-6-methylphenyl)-2-hydroxy-5-methyl-3-morpholinone	NT	3	1	3	3	4	4	***11.5***
4-chloro-2-trifluoromethylaniline	NT	3	1	4	NV	3	4	***9.5***
4-hydrocythidiazuron	NT	2	1	2	NV	4	4	***8.1***
6-chloro-2,3-dihydro-3,3,7-methyl-5H-oxazolo(3,2a)pyrimidin-5-one	NT	1	1	1	NV	3	4	***3.5***
6-chloro-2,3-dihydro-7-hydroxymethyl-3,3-methyl-5H-oxazolo(3,2-a)pyrimidin-5-one	NT	1	1	1	NV	3	4	***3.5***
6-chloro-2,3-dihydro-benzoxazol-2-one	NT	3	1	4	NV	4	4	***12.7***
6-chloronicotinic acid	NT	3	1	1	NV	3	4	***6.9***
6-chloropicolinic acid	NT	1	1	4	NV	3	4	***6.0***
6-methyl-2,3-quinoxalinedithiol	NT	3	1	2	NV	4	4	***10.4***
Abamectin	NT	2	1	4	NV	4	4	***10.4***
Abamectin delta 8,9 geometric isomer	NT	2	1	4	NV	4	4	***10.4***
Acifluorfen, amino analog	NT	3	1	2	NV	3	4	***7.8***
Alachlor	NT	4	1	3	3	4	4	***13.8***
Allophanate	NT	3	1	2	NV	4	4	***10.4***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Aminomethylphosphonic acid	NT	1	2	1	NV	1	4	***1.4***
Arsanilic acid	NT	4	1	4	NT	4	4	***15.0***
Azoxystrobin	NT	1	1	3	NV	2	4	***3.5***
Azoxystrobin Z isomer	NT	1	1	3	NV	2	4	***3.5***
Benoxacor	NT	1	1	3	NV	4	4	***6.9***
Bensulfuron methyl ester	NT		1	1	NV	2	4	***1.2***
Bentazon, 6-hydroxy bentazon, 8-hydroxy bentazon	NT	3	1	2	NV	3	4	***7.8***
Bifenthrin	NT	3	1	4	NV	4	4	***12.7***
Bifenthrin, 4'-hydroxy	NT	3	1	4	NV	4	4	***12.7***
Bis(trichloromethyl)disulfide	NT	3	1	4	NV	4	4	***12.7***
Bromoxynil	NT	3	1	1	NV	4	4	***9.2***
Buprofezin	NT	2	1	2	NV	4	4	***8.1***
Butylamine, sec-	NT	2	1	2	NV	2	4	***4.0***
Cacodylic acid	NT	3	3	3	3	4	4	***13.8***
Captan epoxide	NT	3	1	4	NV	4	4	***12.7***
Carboxin	NT	3	1	2	NV	4	4	***10.4***
Carboxin sulfoxide	NT	3	1	2	NV	4	4	***10.4***
Carfentrazone Ethyl	NT	1	1	4	NT	1	4	***2.0***
CGA 150829	NT	2	1	1	NV	4	4	***6.9***
CGA 150829	NT	1	1	1	NV	3	4	***3.5***
CGA 161149	NT	1	1	1	NV	3	4	***3.5***
CGA 171683	NT	2	1	1	NV	4	4	***6.9***
CGA 195654	NT	1	1	1	NV	3	4	***3.5***
Chlorfenapyr	NT	1	1	2	NV	4	4	***5.8***
Chlorobenzilate	NT	3	1	4	NV	3	4	***9.5***
Chloroneb	NT	1	1	2	NV	3	4	***4.3***
Chloroneb, hydroxy-	NT	1	1	2	NV	3	4	***4.3***
Chlorsulfuron	NT	3	1	2	NV	3	4	***7.8***
Chlorsulfuron, 5-hydroxy-	NT	3	1	2	NV	3	4	***7.8***
Clethodim	NT		1	2	NV	3	4	***2.6***
Clofencet	NT	1	1	2	NV	3	4	***4.3***
Clofentezine	NT	3	1	1	NV	4	4	***9.2***
Cloprop	NT	1	1	1	NV	3	4	***3.5***
Clopyralid	NT	1	2	1	NV	2	4	***2.9***
Compound 125670	NT	2	1	2	NV	2	4	***4.0***
CP 101394	NT	4	1	3	3	4	4	***13.8***
CP 108064	NT	4	1	3	3	4	4	***13.8***
CP 108065	NT	4	1	3	3	4	4	***13.8***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
CP 108267	NT	4	1	3	3	4	4	***13.8***
CP 51214	NT	4	1	3	3	4	4	***13.8***
Cyclanilide	NT	3	1	4	NV	4	4	***12.7***
Cyclohexylstannoic acid	NT	2	1	2	NV	4	4	***8.1***
Cyfluthrin	NT	3	4	2	NV	3	4	***10.4***
Cyhalothrin, lambda-	NT	3	4	2	NV	4	4	***13.8***
Cyhexatin	NT	2	1	2	NV	4	4	***8.1***
Cyromazine	NT	3	4	2	NV	4	4	***13.8***
Dalapon	NT	2	2	2	NV	3	4	***6.9***
Dialifor	NT	3	1	4	NV	4	4	***12.7***
Dialifor oxon	NT	3	1	4	NV	4	4	***12.7***
Dicamba	NT	3	2	3	NV	4	4	***12.7***
Dicyclohexyltin oxide	NT	2	1	2	NV	4	4	***8.1***
Difenoconazole	NT	3	1	3	NV	4	4	***11.5***
Difenoconazole	NT	3	1	4	NV	3	4	***9.5***
Difenzoquat	NT	1	1	1	NV	4	4	***4.6***
Diflubenzuron	NT	3	4	4	NV	2	4	***8.1***
Dimethenamid	NT	2	1	1	NT	2	4	***3.5***
Dimethipin	NT	1	1	1	NV	3	4	***3.5***
Dioxathion	NT	3	1	3	NV	4	4	***11.5***
Diphenamid	NT	3	1	1	NV	3	4	***6.9***
Diphenamid	NT	2	1	1	NV	3	4	***5.2***
Diphenamid, desmethyl	NT	3	1	1	NV	3	4	***6.9***
Diphenamid, desmethyl-	NT	2	1	1	NV	3	4	***5.2***
Diphenylamine	NT	3	3	1	NV	3	4	***8.6***
Diphenylamine	NT	2	4	4	NV	3	4	***10.4***
Dipropyl isocinchomerate	NT	3	4	4	NV	2	4	***8.1***
Diquat dibromide	NT	1	1	3	NV	4	4	***6.9***
Diuron	NT	3	2	3	NV	4	4	***12.7***
Dodine	NT	2	1	1	NV	3	4	***5.2***
Emamectin	NT	2	1	4	NT	3	4	***7.8***
Esfenvalerate	NT	3	4	3	NV	3	4	***11.2***
Ethalfluralin	NT	3	1	2	NV	4	4	***10.4***
Ethephon	NT	3	1	1	NV	2	4	***4.6***
Ethofumesate	NT	2	1	2	NV	2	4	***4.0***
Etridiazole .	NT	3	1	4	NV	3	4	***9.5***
ETU*	NT	3	1	2	3	4	4	***10.4***
Fenarimol	NT	1	1	4	NV	3	4	***6.0***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Fenarimol metabolite B	NT	1	1	4	NV	3	4	***6.0***
Fenarimol metabolite C	NT	1	1	4	NV	3	4	***6.0***
Fenbuconazole	NT	3	1	4	NT	3	4	***9.5***
Fenbutatin Oxide	NT	2	1	4	NV	3	4	***7.8***
Fenoxaprop ethyl	NT	3	1	4	NV	4	4	***12.7***
Fenpropathrin	NT	2	1	1	NV	3	4	***5.2***
Fenridazon	NT	2	1	2	NV	3	4	***6.0***
Fipronil	NT	3	4	4	NV	4	4	***16.1***
Fluazifop-butyl	NT	3	1	2	NV	3	4	***7.8***
Fludioxanil	NT	1	1	4	NT	1	4	***2.0***
Flufenacet (thiafluamide)	NT	3	1	4	NT	3	4	***9.5***
Fluridone	NT	2	1	2	NV	3	4	***6.0***
Fluroxypyr	NT	2	1	1	NT	2	4	***3.5***
Fluthiacet-Methyl (CGA-248757)	NT	1	1	1	NT	1	4	***1.2***
Flutolanil	NT	2	1	4	NV	2	4	***5.2***
Fluvalinate	NT	3	1	4	NV	3	4	***9.5***
Glufosinate-Ammonium	NT	1	2	1	NV	3	4	***4.3***
Glufosinate-Ammonium	NT	2	1	1	NT	2	4	***3.5***
Glyphosate	NT	1	2	1	NV	1	4	***1.4***
Glyphosate-Trimesium	NT	1	1	1	NV	2	4	***2.3***
Glyphosate-Trimesium (Sulfosate)	NT	3	1	1	NT	3	4	***6.9***
Halosulfuron	NT	1	1	2	NV	2	4	***2.9***
Hexazinone	NT	3	1	2	NV	3	4	***7.8***
HOE-061517	NT	1	2	1	NV	3	4	***4.3***
HOE-099730	NT	1	2	1	NV	3	4	***4.3***
Imazalil	NT	3	4	4	NV	4	4	***16.1***
Imidacloprid	NT	3	1	1	NV	3	4	***6.9***
IN-A3928	NT	3	1	2	NV	3	4	***7.8***
IN-B2838	NT	3	1	2	NV	3	4	***7.8***
Indoxacarb (DPX-MP062)	NT		1		NT		4	*--*
IN-T3935	NT	3	1	2	NV	3	4	***7.8***
IN-T3936	NT	3	1	2	NV	3	4	***7.8***
IN-T3937	NT	3	1	2	NV	3	4	***7.8***
Iprodione	NT	3	1	3	NV	4	4	***11.5***
Iprodione isomer	NT	3	1	3	NV	4	4	***11.5***
Iprodione metabolite	NT	3	1	3	NV	4	4	***11.5***
Iprodione metabolite 2	NT	3	1	3	NV	4	4	***11.5***
Isoxaflutole	NT	4	1	3	NT	3	4	***10.4***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Kresoxim-methyl	NT	4	1	4	NT	3	4	***11.2***
Maleic hydrazide	NT	3	1	4	NV	1	4	***3.2***
Mancozeb	NT	3	1	2	3	4	4	***10.4***
Maneb	NT	3	1	2	3	4	4	***10.4***
MB 45950	NT	3	4	4	NV	4	4	***16.1***
MB 46136	NT	3	4	4	NV	3	4	***12.1***
MB 46513	NT	3	4	4	NV	4	4	***16.1***
MCPA	NT	1	1	1	NV	4	4	***4.6***
Mepiquat chloride	NT	3	1	1	NV	4	4	***9.2***
Methoprene	NT	2	1	3	NV	2	4	***4.6***
Methoxychlor olefin	NT	3	4	4	4	4	4	***16.1***
Methyl 3,5-dichlorobenzoate	NT	3	1	4	NV	3	4	***9.5***
Metiram	NT	3	1	2	3	4	4	***10.4***
Metolachlor	NT	3	1	3	3	4	4	***11.5***
Metsulfuron Methyl	NT	1	1	1	NV	2	4	***2.3***
Myclobutanil, myclobutanil alcohol metabolite, myclobutanol dihydroxy metabolite	NT	3	1	2	NV	2	4	***5.2***
N-(3,4-dichlorophenyl)-N'-methylurea	NT	3	2	3	NV	4	4	***12.7***
N-(4-chloro-2-trifluoromethylphenyl)-propoxyacetamide	NT	3	1	4	NV	3	4	***9.5***
Nicotine	NT	1	1	3	NV	4	4	***6.9***
Nitrapyrin	NT	1	1	4	NV	3	4	***6.0***
Norfluraxon, desmethyl-	NT	3	1	1	NV	4	4	***9.2***
Norflurazon	NT	3	1	1	NV	4	4	***9.2***
N-phenylurea	NT	2	1	2	NV	4	4	***8.1***
NTN33823	NT	3	1	1	NV	3	4	***6.9***
NTN35884	NT	3	1	1	NV	3	4	***6.9***
Octyl bicycloheptene dicarboximide (MGK-264)	NT	3	4	4	NV	3	4	***12.1***
Oxadiazon	NT	3	1	4	NV	4	4	***12.7***
Oxyfluorfen	NT	3	1	4	NV	4	4	***12.7***
Oxythioquinox	NT	3	1	1	NV	4	4	***9.2***
Paraquat dichloride	NT	3	1	1	NV	4	4	***9.2***
PB-7	NT	2	1	1	NV	4	4	***6.9***
PB-9	NT	2	1	2	NV	4	4	***8.1***
Phosalone oxon	NT	4	1	3	NV	4	4	***13.8***
Picloram	NT	1	2	1	NV	2	4	***2.9***
Piperonyl butoxide	NT	3	4	2	NV	3	4	***10.4***
PP 890	NT	3	4	2	NV	4	4	***13.8***
Primisulfuron-methyl	NT	2	1	1	NV	4	4	***6.9***
Propanil	NT	1	1	3	NV	4	4	***6.9***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Propargite	NT	3	1	2	NV	3	4	***7.8***
Propargite	NT	3	1	2	NV	3	4	***7.8***
Propiconazole	NT	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite 1,2,4-triazole	NT	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite CGA 118244	NT	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite CGA 91305	NT	3	1	3	NV	4	4	***11.5***
Propyzamide	NT	3	1	4	NV	3	4	***9.5***
Prosulfuron	NT	1	1	3	NV	3	4	***5.2***
Pymetrozine	NT	1	1	1	NT	1	4	***1.2***
Pyrazon	NT	3	1	1	NV	4	4	***9.2***
Pyrazon metabolite A	NT	3	1	2	NV	4	4	***10.4***
Pyrazon metabolite B	NT	3	1	2	NV	4	4	***10.4***
Pyrethrin I	NT	2	4	4	NV	3	4	***10.4***
Pyridaben	NT	2	1	2	NV	4	4	***8.1***
Pyriproxifen	NT	1	1	4	NT	1	4	***2.0***
Quinclorac	NT	2	1	2	NV	2	4	***4.0***
Quizalofop-ethyl	NT	3	1	2	NV	4	4	***10.4***
SD 31723	NT	2	1	4	NV	3	4	***7.8***
SD 33608	NT	2	1	4	NV	3	4	***7.8***
SD 54597	NT	3	4	3	NV	3	4	***11.2***
Sethoxydim	NT	2	1	2	NV	2	4	***4.0***
Sethoxydim hydroxylate sulfone	NT	2	1	2	NV	2	4	***4.0***
Sethoxydim sulfoxide	NT	2	1	2	NV	2	4	***4.0***
Sodium acifluorfen	NT	3	1	2	NV	3	4	***7.8***
Spinosad	NT	1	1	4	NT	1	4	***2.0***
Sulfosulfuron	NT	2	1	1	NT	2	4	***3.5***
TCP=3,5,6-trichloro-2-pyridinol	NT	3	2	1	NV	4	4	***10.4***
Tebuconazole	NT	3	1	2	NV	3	4	***7.8***
Tebufenozide	NT	3	1	4	NV	3	4	***9.5***
Tebuthiuron	NT	2	1	2	NV	3	4	***6.0***
Teflubenzuron	NT		1		NT		4	*--*
Terbacil	NT	1	1	1	NV	3	4	***3.5***
Tetradifon	NT	1	1	2	NV	4	4	***5.8***
Thidiazuron	NT	2	1	2	NV	4	4	***8.1***
Thiophanate methyl	NT	3	1	2	NV	4	4	***10.4***
THPI	NT	3	1	4	NV	4	4	***12.7***
Tralkoxydim	NT	2	1	2	NT	2	4	***4.0***
Triadimefon	NT	3	1	4	NV	4	4	***12.7***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND/COMPOUND CLASS	HIST. VIOL. (FSIS)	REG. CON. (R) (EPA)	PSI (P) (EPA)	BIOCON. (B) (EPA)	ENDO. DISRUP. (EPA)	TOX. (T) (EPA)	LACK INFO. (L) (FSIS)	*{[(2*R+P+B)/4]*T} *{[(L-1)*0.05]+1}*
Triadimefon metabolite KWG 1323	NT	3	1	4	NV	4	4	***12.7***
Triadimefon metabolite KWG 1342	NT	3	1	4	NV	4	4	***12.7***
Triadimefon metabolite KWG 1732	NT	3	1	4	NV	4	4	***12.7***
Triadimenol (for metabolites see triadimefon)	NT	3	1	4	NV	4	4	***12.7***
Triasulfuron	NT	1	1	1	NV	3	4	***3.5***
Triclopyr	NT	3	2	1	NV	4	4	***10.4***
Triflumazole	NT	3	1	4	NV	3	4	***9.5***
Triphenyltin hydroxide	NT	1	1	4	NV	4	4	***8.1***
WAK4103	NT	3	1	1	NV	3	4	***6.9***

Key:
MRM = Multiresidue method
NT = Not Tested by FSIS (1/1/90 - 12/31/99)
NA = Compound has been tested by FSIS (1/1/90 - 12/31/99), but the information is Not Applicable (e.g., compound has not been tested in the appropriate matrix)
NV = Value not available
(FSIS) = Scores in this column supplied by FSIS
(EPA) = Scores in this column supplied by EPA
HIST. VIOL. = FSIS Historical Testing Information on Violations
REG. CON. (R) = Regulatory Concern
LACK INFO. (L) = Lack of FSIS Testing Information on Violations
PSI (P) = Pre-slaughter Interval
BIOCON. (B) = Bioconcentration Factor
ENDO. DISRUP. = Endocrine Disruption
TOX. (T) = Toxicity
In the first column, where compounds have been grouped together for analysis or potential analysis by an MRM, the title of that group has been bolded (e.g., "Carbamates in FSIS Carbamate MRM").

Table 6.2
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
1	**COP's and OP's NOT in FSIS CHC/COP MRM** (azinphos-methyl, azinphos-methyl oxon, chlorpyrifos, coumaphos, coumaphos oxon, diazinon, diazinon oxon, diazinon met G-27550, dichlorvos, dimethoate, dimethoate oxon, dioxathion, ethion, ethion monooxon, fenthion, fenthion oxon, fenthion oxon sulfone, fenthion oxon sulfoxide, fenthion sulfone, fenthion sulfoxide, malathion, malathion oxon, naled, phosmet, phosmet oxon, pirimiphos-methyl, trichlorfon, tetrachlorvinphos, tetrachlorvinphos-4 metabolites, acephate, methamidophos, chlorpyrifos-methyl, fenamiphos, fenamiphos sulfoxide, fenamiphos sulfone, fenamiphos sulfoxide desisopropyl, fenamiphos sulfone desisopropyl, isofenphos, isofenphos oxon, isofenphos desisopropyl, isofenphos oxon desisopropyl, methidathion, ODM, parathion (ethyl)*, parathion oxon, parathion methyl*, parathion methyl oxon, phorate, phorate oxon, phorate oxon sulfone, phorate oxon sulfoxide, phorate sulfone, phorate sulfoxide, profenofos, sulprofos, sulprofos oxon, sulprofos oxon sulfone, sulprofos oxon sulfoxide, sulprofos sulfone, sulprofos sulfoxide, tribufos (DEF))	**18.4**	NIP, need regulatory method.
2	**Triazines NOT in FSIS Triazine MRM** (atrazine chloro metabolites, metribuzin, metribuzin DADK, metribuzin DA, metribuzin DK, amitraz, amitraz 2,4-DMA metabs., desdiethyl simazine, desethyl simazine, simazine chloro metabs.)	**17.3**	NIP, need regulatory method.
3	**Carbamates in FSIS Carbamate MRM** (aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, carbofuran 3-hydroxy)	**16.1**	NIP, need to adjust sample handling procedures to prevent degradation.
4	1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)-1-ethanol	**16.1**	NIP, need regulatory method.
5	1,1-(2,2-dichloroethylidene)bis(4-methoxybenzene)	**16.1**	NIP, need regulatory method.
6	1-methoxy-4-(1,2,2,2-tetrachloroethyl)benzene)	**16.1**	NIP, need regulatory method.
7	3-(1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)ethoxy)-1,2-propane diol	**16.1**	NIP, need regulatory method.
8	Fipronil	**16.1**	NIP, need regulatory method.
9	Imazalil	**16.1**	NIP, need regulatory method.
10	MB 45950	**16.1**	NIP, need regulatory method.
11	MB 46513	**16.1**	NIP, need regulatory method.
12	Methoxychlor olefin	**16.1**	NIP, need regulatory method.
13	**CHC's and COP's in FSIS CHC/COP MRM** (HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor expoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, stirofos, kepone, mirex, methoxychlor, phosalone, coumaphos-O, coumaphos-S, toxaphene, famphur, PCB 1242, PCB 1248, PCB 1254, PCB 1260, dicofol*, PBBs*, polybrominated diphenyl ethers*, deltamethrin*) (*identification only)	**16.0**	Monitoring Plan, MRM, all domestic production classes except roaster pigs. Import residue plan, all import production classes.
14	**Synthetic Pyrethrins in FSIS Synthetic Pyrethrin MRM** (cypermethrin, cis-permethrin, trans-permethrin, fenvalerate, zeta-cypermethrin)	**15.4**	NIP, laboratory resources not available.
15	Arsanilic acid	**15.0**	NIP, laboratory resources not available.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
BASED ON CONSULTATION WITH EPA AND OTHER AGENCIES, COMPOUNDS BELOW THIS POINT WERE NOT CONSIDERED TO REPRESENT A BROAD POTENTIAL PUBLIC HEALTH RISK. HOWEVER, SOME OF THESE MAY BE SAMPLED ON A SPECIFIC, AS-NEEDED BASIS.			
16	**Triazines in FSIS Triazine MRM** (atrazine, simazine, propazine, terbuthylazine)	**14.3**	NIP, low priority, method available.
17	**Carbamates NOT in FSIS Carbamate MRM** (carbaryl 5,6-dihydroxy, chlorpropham, propham, thiobencarb, 4-chlorobenzylmethylsulfone,4-chlorobenzylmethylsulfone sulfoxide)	**13.8**	NIP, low priority.
18	1-methyl cyromazine	**13.8**	NIP, low priority.
19	2-(1-hydroxyethyl)-6-ethylaniline	**13.8**	NIP, low priority.
20	2,6-diethylaniline	**13.8**	NIP, low priority.
21	Alachlor	**13.8**	NIP, low priority, method available.
22	Cacodylic acid	**13.8**	NIP, low priority.
23	CP 101394	**13.8**	NIP, low priority.
24	CP 108064	**13.8**	NIP, low priority.
25	CP 108065	**13.8**	NIP, low priority.
26	CP 108267	**13.8**	NIP, low priority.
27	CP 51214	**13.8**	NIP, low priority.
28	Cyhalothrin, lambda-	**13.8**	NIP, low priority.
29	Cyromazine	**13.8**	NIP, low priority, method available.
30	Phosalone oxon	**13.8**	NIP, low priority.
31	PP 890	**13.8**	NIP, low priority.
32	2-(4-((6-chloro-2-benzoxazolyl)oxy)phenoxy)propanoic acid	**12.7**	NIP, low priority.
33	2-carboxyisopropyl-4-(4-dichloro)-5-isopropoxyphenyl)-1,3,4-oxadiazolin-5-one	**12.7**	NIP, low priority.
34	2-t-butyl-4-(2,4-chloro-5-hydroxyphenyl)-delta 2-1,3,4-oxadiazolin-5-one	**12.7**	NIP, low priority.
35	3-(3,4-dichlorophenyl)-1-methoxyurea	**12.7**	NIP, low priority.
36	3,4-dichloroaniline	**12.7**	NIP, low priority.
37	3,4-dichlorophenylurea	**12.7**	NIP, low priority.
38	6-chloro-2,3-dihydro-benzoxazol-2-one	**12.7**	NIP, low priority.
39	Bifenthrin	**12.7**	NIP, low priority.
40	Bifenthrin, 4'-hydroxy	**12.7**	NIP, low priority.
41	Bis(trichloromethyl)disulfide	**12.7**	NIP, low priority.
42	Captan epoxide	**12.7**	NIP, low priority.
43	Cyclanilide	**12.7**	NIP, low priority.
44	Dialifor	**12.7**	NIP, low priority.
45	Dialifor oxon	**12.7**	NIP, low priority.
46	Dicamba	**12.7**	NIP, low priority.
47	Diuron	**12.7**	NIP, low priority.
48	Fenoxaprop ethyl	**12.7**	NIP, low priority.
49	N-(3,4-dichlorophenyl)-N'-methylurea	**12.7**	NIP, low priority.
50	Oxadiazon	**12.7**	NIP, low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
51	Oxyfluorfen	**12.7**	NIP, low priority.
52	THPI	**12.7**	NIP, low priority.
53	Triadimefon	**12.7**	NIP, low priority.
54	Triadimefon metabolite KWG 1323	**12.7**	NIP, low priority.
55	Triadimefon metabolite KWG 1342	**12.7**	NIP, low priority.
56	Triadimefon metabolite KWG 1732	**12.7**	NIP, low priority.
57	Triadimenol (for metabolites see triadimefon)	**12.7**	NIP, low priority.
58	**Benzimidazole Pesticides in FSIS Benzimidazole MRM** (5-hydroxythiabendazole, benomyl (as carbendazim), thiabendazole)	**12.1**	NIP, low priority, method available.
59	MB 46136	**12.1**	NIP, low priority.
60	Octyl bicycloheptene dicarboximide (MGK-264)	**12.1**	NIP, low priority.
61	2-((2-ethyl-6-methylphenyl)-amino)-1-propanol	**11.5**	NIP, low priority.
62	4-(2-ethyl-6-methylphenyl)-2-hydroxy-5-methyl-3-morpholinone	**11.5**	NIP, low priority.
63	Difenoconazole	**11.5**	NIP, low priority.
64	Dioxathion	**11.5**	NIP, low priority.
65	Iprodione	**11.5**	NIP, low priority.
66	Iprodione isomer	**11.5**	NIP, low priority.
67	Iprodione metabolite	**11.5**	NIP, low priority.
68	Iprodione metabolite 2	**11.5**	NIP, low priority.
69	Metolachlor	**11.5**	NIP, low priority.
70	Propiconazole	**11.5**	NIP, low priority.
71	Propiconazole metabolite 1,2,4-triazole	**11.5**	NIP, low priority.
72	Propiconazole metabolite CGA 118244	**11.5**	NIP, low priority.
73	Propiconazole metabolite CGA 91305	**11.5**	NIP, low priority.
74	Esfenvalerate	**11.2**	NIP, low priority.
75	Kresoxim-methyl	**11.2**	NIP, low priority.
76	SD 54597	**11.2**	NIP, low priority.
77	2-aminobenzimidazole	**10.4**	NIP, low priority.
78	6-methyl-2,3-quinoxalinedithiol	**10.4**	NIP, low priority.
79	Abamectin	**10.4**	NIP, low priority.
80	Abamectin delta 8,9 geometric isomer	**10.4**	NIP, low priority.
81	Allophanate	**10.4**	NIP, low priority.
82	Carboxin	**10.4**	NIP, low priority.
83	Carboxin sulfoxide	**10.4**	NIP, low priority.
84	Cyfluthrin	**10.4**	NIP, low priority.
85	Diphenylamine	**10.4**	NIP, low priority.
86	Ethalfluralin	**10.4**	NIP, low priority.
87	ETU*	**10.4**	NIP, low priority.
88	Isoxaflutole	**10.4**	NIP, low priority.
89	Mancozeb	**10.4**	NIP, low priority.
90	Maneb	**10.4**	NIP, low priority.
91	Metiram	**10.4**	NIP, low priority.
92	Piperonyl butoxide	**10.4**	NIP, low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
93	Pyrazon metabolite A	**10.4**	NIP, low priority.
94	Pyrazon metabolite B	**10.4**	NIP, low priority.
95	Pyrethrin I	**10.4**	NIP, low priority.
96	Quizalofop-ethyl	**10.4**	NIP, low priority.
97	TCP=3,5,6-trichloro-2-pyridinol	**10.4**	NIP, low priority.
98	Thiophanate methyl	**10.4**	NIP, low priority.
99	Triclopyr	**10.4**	NIP, low priority.
100	3-carboxy-5-ethoxy-1,2,4-thiadiazole	**9.5**	NIP, low priority.
101	4-chloro-2-trifluoromethylaniline	**9.5**	NIP, low priority.
102	Chlorobenzilate	**9.5**	NIP, low priority.
103	Difenoconazole	**9.5**	NIP, low priority.
104	Etridiazole .	**9.5**	NIP, low priority.
105	Fenbuconazole	**9.5**	NIP, low priority.
106	Flufenacet (thiafluamide)	**9.5**	NIP, low priority.
107	Fluvalinate	**9.5**	NIP, low priority.
108	Methyl 3,5-dichlorobenzoate	**9.5**	NIP, low priority.
109	N-(4-chloro-2-trifluoromethylphenyl)-propoxyacetamide	**9.5**	NIP, low priority.
110	Propyzamide	**9.5**	NIP, low priority.
111	Tebufenozide	**9.5**	NIP, low priority.
112	Triflumazole	**9.5**	NIP, low priority.
113	3-(2-chloro-4-hydroxyphenyl)-6-(2-chlorophenyl)-1,2,4,5-tetrazine	**9.2**	NIP, low priority.
114	Bromoxynil	**9.2**	NIP, low priority.
115	Clofentezine	**9.2**	NIP, low priority.
116	Mepiquat chloride	**9.2**	NIP, low priority.
117	Norfluraxon, desmethyl-	**9.2**	NIP, low priority.
118	Norflurazon	**9.2**	NIP, low priority.
119	Oxythioquinox	**9.2**	NIP, low priority.
120	Paraquat dichloride	**9.2**	NIP, low priority.
121	Pyrazon	**9.2**	NIP, low priority.
122	Diphenylamine	**8.6**	NIP, low priority.
123	4-hydrocythidiazuron	**8.1**	NIP, low priority.
124	Buprofezin	**8.1**	NIP, low priority.
125	Cyclohexylstannoic acid	**8.1**	NIP, low priority.
126	Cyhexatin	**8.1**	NIP, low priority.
127	Dicyclohexyltin oxide	**8.1**	NIP, low priority.
128	Diflubenzuron	**8.1**	NIP, low priority.
129	Dipropyl isocinchomerate	**8.1**	NIP, low priority.
130	N-phenylurea	**8.1**	NIP, low priority.
131	PB-9	**8.1**	NIP, low priority.
132	Pyridaben	**8.1**	NIP, low priority.
133	Thidiazuron	**8.1**	NIP, low priority.
134	Triphenyltin hydroxide	**8.1**	NIP, low priority.
135	1,1,3,3,-tetrakis(2-methyl-2-phenylpropyl)-1,3-dihydroxydistannoxane	**7.8**	NIP, low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
136	2-amino-n-isopropylbenzamide	**7.8**	NIP, low priority.
137	Acifluorfen, amino analog	**7.8**	NIP, low priority.
138	Bentazon, 6-hydroxy bentazon, 8-hydroxy bentazon	**7.8**	NIP, low priority.
139	Chlorsulfuron	**7.8**	NIP, low priority.
140	Chlorsulfuron, 5-hydroxy-	**7.8**	NIP, low priority.
141	Emamectin	**7.8**	NIP, low priority.
142	Fenbutatin Oxide	**7.8**	NIP, low priority.
143	Fluazifop-butyl	**7.8**	NIP, low priority.
144	Hexazinone	**7.8**	NIP, low priority.
145	IN-A3928	**7.8**	NIP, low priority.
146	IN-B2838	**7.8**	NIP, low priority.
147	IN-T3935	**7.8**	NIP, low priority.
148	IN-T3936	**7.8**	NIP, low priority.
149	IN-T3937	**7.8**	NIP, low priority.
150	Propargite	**7.8**	NIP, low priority.
151	Propargite	**7.8**	NIP, low priority.
152	SD 31723	**7.8**	NIP, low priority.
153	SD 33608	**7.8**	NIP, low priority.
154	Sodium acifluorfen	**7.8**	NIP, low priority.
155	Tebuconazole	**7.8**	NIP, low priority.
156	6-chloronicotinic acid	**6.9**	NIP, low priority.
157	Benoxacor	**6.9**	NIP, low priority.
158	CGA 150829	**6.9**	NIP, low priority.
159	CGA 171683	**6.9**	NIP, low priority.
160	Dalapon	**6.9**	NIP, low priority.
161	Diphenamid	**6.9**	NIP, low priority.
162	Diphenamid, desmethyl	**6.9**	NIP, low priority.
163	Diquat dibromide	**6.9**	NIP, low priority.
164	Glyphosate-Trimesium (Sulfosate)	**6.9**	NIP, low priority.
165	Imidacloprid	**6.9**	NIP, low priority.
166	Nicotine	**6.9**	NIP, low priority.
167	NTN33823	**6.9**	NIP, low priority.
168	NTN35884	**6.9**	NIP, low priority.
169	PB-7	**6.9**	NIP, low priority.
170	Primisulfuron-methyl	**6.9**	NIP, low priority.
171	Propanil	**6.9**	NIP, low priority.
172	WAK4103	**6.9**	NIP, low priority.
173	6-chloropicolinic acid	**6.0**	NIP, low priority.
174	Fenarimol	**6.0**	NIP, low priority.
175	Fenarimol metabolite B	**6.0**	NIP, low priority.
176	Fenarimol metabolite C	**6.0**	NIP, low priority.
177	Fenridazon	**6.0**	NIP, low priority.
178	Fluridone	**6.0**	NIP, low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
179	Nitrapyrin	**6.0**	NIP, low priority.
180	Tebuthiuron	**6.0**	NIP, low priority.
181	Chlorfenapyr	**5.8**	NIP, low priority.
182	Tetradifon	**5.8**	NIP, low priority.
183	2,4-D	**5.2**	NIP, low priority.
184	Diphenamid	**5.2**	NIP, low priority.
185	Diphenamid, desmethyl-	**5.2**	NIP, low priority.
186	Dodine	**5.2**	NIP, low priority.
187	Fenpropathrin	**5.2**	NIP, low priority.
188	Flutolanil	**5.2**	NIP, low priority.
189	Myclobutanil, myclobutanil alcohol metabolite, myclobutanol dihydroxy metabolite	**5.2**	NIP, low priority.
190	Prosulfuron	**5.2**	NIP, low priority.
191	Difenzoquat	**4.6**	NIP, low priority.
192	Ethephon	**4.6**	NIP, low priority.
193	MCPA	**4.6**	NIP, low priority.
194	Methoprene	**4.6**	NIP, low priority.
195	2,5-dichloro-4-methoxyphenol	**4.3**	NIP, low priority.
196	Chloroneb	**4.3**	NIP, low priority.
197	Chloroneb, hydroxy-	**4.3**	NIP, low priority.
198	Clofencet	**4.3**	NIP, low priority.
199	Glufosinate-Ammonium	**4.3**	NIP, low priority.
200	HOE-061517	**4.3**	NIP, low priority.
201	HOE-099730	**4.3**	NIP, low priority.
202	2,3-dihydro-3,3-methyl-2-oxo-5-benzofuranyl methyl sulfonate	**4.0**	NIP, low priority.
203	2-hydroxy-2,3-dihydro-3,3-methyl-5-benzofuranyl methyl sulfonate	**4.0**	NIP, low priority.
204	Butylamine, sec-	**4.0**	NIP, low priority.
205	Compound 125670	**4.0**	NIP, low priority.
206	Ethofumesate	**4.0**	NIP, low priority.
207	Quinclorac	**4.0**	NIP, low priority.
208	Sethoxydim	**4.0**	NIP, low priority.
209	Sethoxydim hydroxylate sulfone	**4.0**	NIP, low priority.
210	Sethoxydim sulfoxide	**4.0**	NIP, low priority.
211	Tralkoxydim	**4.0**	NIP, low priority.
212	3-t-butyl-5-chloro-6-hydroxymethyluracil	**3.5**	NIP, low priority.
213	6-chloro-2,3-dihydro-3,3,7-methyl-5H-oxazolo(3,2a)pyrimidin-5-one	**3.5**	NIP, low priority.
214	6-chloro-2,3-dihydro-7-hydroxymethyl-3,3-methyl-5H-oxazolo(3,2-a)pyrimidin-5-one	**3.5**	NIP, low priority.
215	Azoxystrobin	**3.5**	NIP, low priority.
216	Azoxystrobin Z isomer	**3.5**	NIP, low priority.
217	CGA 150829	**3.5**	NIP, low priority.
218	CGA 161149	**3.5**	NIP, low priority.
219	CGA 195654	**3.5**	NIP, low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2001 FSIS NRP, Monitoring Plan and Special Projects

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2001 NRP
220	Cloprop	**3.5**	NIP, low priority.
221	Dimethenamid	**3.5**	NIP, low priority.
222	Dimethipin	**3.5**	NIP, low priority.
223	Fluroxypyr	**3.5**	NIP, low priority.
224	Glufosinate-Ammonium	**3.5**	NIP, low priority.
225	Sulfosulfuron	**3.5**	NIP, low priority.
226	Terbacil	**3.5**	NIP, low priority.
227	Triasulfuron	**3.5**	NIP, low priority.
228	Maleic hydrazide	**3.2**	NIP, low priority.
229	Clopyralid	**2.9**	NIP, low priority.
230	Halosulfuron	**2.9**	NIP, low priority.
231	Picloram	**2.9**	NIP, low priority.
232	Clethodim	**2.6**	NIP, low priority.
233	Glyphosate-Trimesium	**2.3**	NIP, low priority.
234	Metsulfuron Methyl	**2.3**	NIP, low priority.
235	Carfentrazone Ethyl	**2.0**	NIP, low priority.
236	Fludioxanil	**2.0**	NIP, low priority.
237	Pyriproxifen	**2.0**	NIP, low priority.
238	Spinosad	**2.0**	NIP, low priority.
239	Aminomethylphosphonic acid	**1.4**	NIP, low priority.
240	Glyphosate	**1.4**	NIP, low priority.
241	Bensulfuron methyl ester	**1.2**	NIP, low priority.
242	Fluthiacet-Methyl (CGA-248757)	**1.2**	NIP, low priority.
243	Pymetrozine	**1.2**	NIP, low priority.
244	Indoxacarb (DPX-MP062)	**--**	NIP, low priority.
245	Teflubenzuron	**--**	NIP, low priority.

Key:
MRM = Multiresidue Method
NIP = Not Included in 2001 FSIS National Residue Program
CHC = Chlorinated hydrocarbon
COP = Chlorinated organophosphate
OP = Organophosphate
CHC3 = Current FSIS regulatory method for chlorinated hydrocarbons
In the second column, where multiple compounds have been grouped together for analysis or potential analysis by a single MRM, the title of that group has been bolded (e.g., "Carbamates in FSIS Carbamate MRM").

Table 6.3
Pesticide Compound/Production Class Pairs, Sorted by Sampling Priority Score, with Adjusted Number of Analyses
2001 FSIS NRP, Monitoring Plan and Special Projects

COMPOUND CLASS	PRODUCTION CLASS	SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
CHC's/COP's	Young chickens	571.804	6525	0.03	460		460		460
CHC's/COP's	Market hogs	344.568	7080	0.03	460		460		460
CHC's/COP's	Steers	268.454	5193	0.04	460		460		460
CHC's/COP's	Heifers	162.807	4413	0.00	460		460		460
CHC's/COP's	Young turkeys	101.086	6709	0.10	460		460		460
CHC's/COP's	Egg products	42.549	NT	NT	460		460		460
CHC's/COP's	Dairy cows	30.176	3470	0.03	460		460		460
CHC's/COP's	Beef cows	29.710	3710	0.08	460		460		460
CHC's/COP's	Sows	11.990	3826	0.10	300		300		300
CHC's/COP's	Bulls	10.620	2716	0.11	300		300		300
CHC's/COP's	Mature chickens	10.619	3165	0.00	300		300		300
CHC's/COP's	Lambs	4.340	4150	0.05	300		300		300
CHC's/COP's	Formula-fed	3.129	3548	0.00	300		300		300
CHC's/COP's	Boars/Stags	2.299	2919	0.31	300	+1	460		460
CHC's/COP's	Ducks	2.079	2332	0.00	230		230		230
CHC's/COP's	Bob calves	0.769	1350	0.15	230	P, +1	300		300
CHC's/COP's	Mature turkeys	0.744	1769	0.06	230		230		230
CHC's/COP's	Horses	0.604	3379	0.44	230	+1	300		300
CHC's/COP's	Goats	0.474	3454	0.38	230	+1	300		300
CHC's/COP's	Heavy calves	0.316	3510	0.17	230	P, +1	300		300
CHC's/COP's	Sheep	0.213	2809	0.07	230	P, +1	300		300
CHC's/COP's	Other fowl - ratites	0.157	NT	NT	230	+1	300		300
CHC's/COP's	Non-formula	0.124	2956	0.17	90	P, +1	230		230
CHC's/COP's	Other livestock - bison	0.103	NT	NT	90	+1	230		230
CHC's/COP's	Geese	0.032	315	0.00	90		90		90
CHC's/COP's	Rabbits	0.020	946	0.11	90		90		90
CHC's/COP's	Squab		NT	NT	45		45		45
TOTAL # SAMPLES					**7680**		**8585**		**8585**

Key: #SAMP. = Total number of samples analyzed by the FSIS Monitoring Plan and/or Special Projects (i.e., random sampling only), 1/1/90 - 12/31/99.
%VIOL. = Percent violative, i.e., the percent of samples with residue concentrations exceeding the tolerance or action level (or, for a drug whose use was not permitted in the production class in which it was detected, the percent of samples with any detectable residue).
UNADJ. # = Unadjusted number of samples, obtained using cutoff values established for Table 4.5.
INITIAL ADJ.# = Number of samples proposed following adjustment for historical violation rate information or lack of testing information.
FINAL ADJ.# = Final sample numbers, obtained following any adjustments needed to match sample volume to laboratory capacity *(note that no adjustments for laboratory capacity were necessary for the CHC/COP samples*).
+1 level = Increase by one sampling level, e.g., from 300 to 460 (refer to text, Chapter 6, for explanation).
P, min 300 = Because the inclusion of phenylbutazone in the FSIS CHC/COP method did not begin until 1999, FSIS has limited data on this drug in the production classes of interest. Therefore, all production classes in which phenylbutazone was designated as of potential concern (in Table 4.6, with a "✯") were assigned a minimum of 300 samples.

SECTION 7. PLANNING THE 2001 FSIS IMPORT RESIDUE PLAN: PESTICIDES

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

The list of compounds of concern for the Import Residue Plan is identical to that for the Domestic Residue Plan (see Section 6, Table 6.1). Furthermore, in ranking pesticides for inclusion in the Import Residue Plan, FSIS chose to employ the ranking scores generated for the Domestic Residue Plan (see Section 6), because FSIS does not have sufficient historical data on pesticides in imported products to predict their violation rates. However, if FSIS has reason to believe that a compound is being misused in a foreign country then it would add that compound/country pair to the Import Residue Plan.

PHASE II - SELECTING PESTICIDES FOR INCLUSION IN THE 2001 IMPORT RESIDUE PLAN

The list of high priority compounds chosen for the Import Residue Plan by the Surveillance Advisory Team (SAT) was the same as that for the domestic plan. Once the high-priority compounds and compound classes had been identified, FSIS applied non-public health considerations to determine which compounds FSIS should sample. The principal non-public health factor was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Based on these constraints, only the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP)[1] compound class can be included in the NRP. The compounds that can be identified by this multiresidue method are listed in Section 6, Phase II, p 73.

PHASE III- IDENTIFYING THE COMPOUND/PRODUCT CLASS PAIRS

As with the domestic program, the FSIS decided to sample for CHC's and COP's in all product classes as a means of monitoring incidents of accidental contamination.

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

ALLOCATION OF SAMPLING RESOURCES AMONG DIFFERENT PRODUCTION CLASSES

EGG PRODUCTS

The samples for residue analysis for imported egg products are selected in a different manner than the other product classes. As stated in Section 2, in order to establish a history of compliance with the U.S.

[1]Phenylbutazone is also detected by this method.

requirements for each egg product category for egg products, the first ten shipments from individual foreign establishments are subjected to 100 % reinspection. If the egg product is in compliance the rate of inspection is reduced to a random selection of one reinspection out of eight product lots from each foreign establishment. This reinspection rate will continue as long as the product is in compliance.

ANIMAL PRODUCT CLASSES

Table 5.2**,** *Estimated Annual Amount of Product Imported,* lists the estimated amounts of all product classes imported into the U.S. and the percentage of each of the product classes. The percentage of each product class imported annually is calculated using the following formula:

$$\% \text{ Product Class Imported } (P_C) = \frac{\text{Amount Product Class Imported}}{\text{Total Product Imported}} \times 100 \qquad (7.1)$$

The relative sampling priority is obtained by multiplying the percent product class imported (P_C) by the pesticide scores obtained in Phase I, using the following equation:

$$\text{Relative Sampling Priority} = (P_C) \times \text{Pesticide Score} \qquad (7.2)$$

Based on the scores, one of the following sampling options is chosen: (1) very high regulatory concern (460 analyses/year); (2) high regulatory concern (300 analyses/year); (3) moderate regulatory concern (230 samples/year); or (4) low regulatory concern (90 samples/year). This is indicated in Table 7.1, *Number of Pesticide Samples/Product Class,* in the column labeled "Number of Samples."

As stated in Section 5, if a product class represents less than one percent (by weight) of total combined U.S. imports of meat, poultry and egg products, then the total number of samples analyzed for any compound or compound class is eight times the number of countries from which that product is imported. For example, if processed turkey is imported from only three countries and the amount imported is 0.10 % relative to total U.S. imports, 24 samples of processed turkey would be taken for each analysis, eight from each country.

The adjusted number of samples is listed in Table 7.1, *Number of Pesticide Samples/Product Class,* in the column labeled "Adjusted Number of Samples." The final number of samples for a compound/product class is obtained after the allocation of samples among different countries is completed. The final number of samples is listed in Table 7.1 in the column labeled "Final Number of Samples." The numbers in columns labeled "Adjusted Number of Samples" and "Final Number of Samples" may vary slightly because of the rounding upwards or downwards of the samples.

Allocation of Samples among Different Countries

The total number of samples chosen for each compound/product class pair was subdivided among the different countries. The number of samples for each country is based on the relative amount of total product class imported: less than one percent and greater than one percent.

Allocation of Samples in Product Classes Whose Total Volume Imported is Less Than 1%

As stated above, if the amount of an import product class was less than 1%, eight samples per compound/compound class were taken from each country. The relative amounts of fresh chicken, fresh

goat, processed beef/pork, fresh and processed turkey, other fresh and processed fowl, processed varied combination, processed lamb/mutton, and processed veal was less than 1%. The numbers of samples per country per product class for each compound/compound class are listed in Tables 7.2 - 7.11.

Allocation if Samples in Product Classes Whose Total Volume Imported is Greater Than 1%

For major product classes, the number of samples was allocated to each country depending upon the relative amount of product imported from that country. Table 5.3, *Estimated Annual Amount of Product Imported/Country*, lists the amount of product imported from each country. The percent of a product class imported from a country was calculated as follows and is in Table 5.4, *Relative Annual Amount of Product Imported/Country.*

$$\text{Percent Product Class Imported per Country } (P_{C/C}) = \frac{\text{Amount of Product Class from Country}}{\text{Total Amount of Product Class}} \times 100 \quad (7.3)$$

Based upon the relative amount of product class imported per country, the number of samples that should be taken at the port of entry was calculated using the following formula:

$$\text{Unadjusted Number of Samples per Country } (U_{C/S}) = \text{Total Number of Samples} \times \frac{(P_{C/C})}{100} \quad (7.4)$$

This is indicated in the column labeled "Unadjusted Number of Samples ($U_{C/S}$)," in Tables 7.12 to 7.18.

After the determining of the number of samples required from each country, each country with less than eight samples was assigned a minimum of eight samples. This is indicated in the column labeled "Adjustment # 1" in Tables 7.11 to 7.19. The results of this adjustment are in the column labeled "Initial Adj#." If the total number of samples for a compound/product class resulted in more than the total number of samples allocated to that compound/product class pair, then a second adjustment then had to be made so that the total number of samples would be within an allocated number. This adjustment was made only to those countries from which greater than eight samples were to be taken. This was done using the following equation:

$$\text{Number of Samples after Adjustment \# 2} = (U_{C/S}) - \frac{[N \times (P_{C/C})]}{(P_{T/C})} \quad (7.5)$$

where,
$N = (N_1) - (N_T)$
$N_1 =$ Total Number of Samples after Adjustment #1
$N_T =$ Total Number of Samples Allocated
$P_{T/C}$ = Total Percent of Product Class from the Countries That Had Greater Than Eight Samples
$P_{C/C}$ = Percent Product Class Imported per Country
$U_{C/S}$ = Unadjusted Number of Samples

The final numbers of product sampled are indicated in Tables 7.11 - 7.18, in the column labeled "Final Adj.#."

Table 7.1
Number of Pesticide Samples/Product Class
2001 Import Residue Plan

No. Countries	Product	Pesticide	Pesticide Score	Percent Product	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
10	Beef, fresh	CHC's/COP's	16	59.75	956.06	460	459	460
7	Pork, fresh	CHC's/COP's	16	20.40	326.43	300	300	300
12	Beef, processed	CHC's/COP's	16	6.46	103.31	300	300	300
17	Pork, processed	CHC's/COP's	16	6.16	98.57	300	300	301
6	Mutton/Lamb, fresh	CHC's/COP's	16	3.26	52.22	230	230	230
3	Veal, fresh	CHC's/COP's	16	1.33	21.23	90	90	90
4	Chicken, processed	CHC's/COP's	16	1.23	19.71	90	90	90
1	Chicken, fresh	CHC's/COP's	16	0.48	7.71	90	8	8
2	Goat, fresh	CHC's/COP's	16	0.24	3.86	90	16	16
3	Turkey, processed	CHC's/COP's	16	0.15	2.41	90	24	24
5	Varied combination, processed	CHC's/COP's	16	0.09	1.37	90	40	40
3	Beef/Pork, processed	CHC's/COP's	16	0.08	1.29	90	24	24
2	Other fowl, processed	CHC's/COP's	16	0.08	1.24	90	16	16
1	Turkey, fresh	CHC's/COP's	16	0.04	0.61	90	8	8
2	Other fowl, fresh	CHC's/COP's	16	0.03	0.48	90	16	16
3	Mutton/Lamb, processed	CHC's/COP's	16	0.01	0.18	90	24	24
1	Veal, processed	CHC's/COP's	16	0.002	0.03	90	8	8
1	Horse, Fresh	CHC's/COP's	16	0.001	0.02	90	8	8
						2760	1961	1963

Table 7.2
Number of Samples/Product Class-Chicken, Fresh
2001 Import Residue Plan

CHICKEN, FRESH/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100.00	8
Total		8

Table 7.3
Number of Samples/Product Class-Turkey, Fresh
2001 Import Residue Plan

TURKEY, FRESH/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100.00	8
Total		8

Table 7.4
Number of Samples/Product Class-Turkey, Processed
2001 Import Residue Plan

TURKEY, PROCESSED/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	80.56	8
Hong Kong	14.39	8
Israel	5.06	8
Total		24

Table 7.5
Number of Samples/Product Class-Other Fowl, Fresh
2001 Import Residue Plan

OTHER FOWL, FRESH/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	86.96	8
France	13.04	8
Total		16

Table 7.6
Number of Samples/Product Class-Other Fowl, Processed
2001 Import Residue Plan

OTHER, FOWL, PROCESSED/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	97.89	8
France	2.11	8
Total		16

Table 7.7
Number of Samples/Product Class-Veal, Processed
2001 Import Residue Plan

VEAL, PROCESSED/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100.00	8
Total		8

Table 7.8
Number of Samples/Product Class-Horse, Fresh
2001 Import Residue Plan

HORSE, FRESH/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	100.00	8
Total		8

Table 7.9
Number of Samples/Product Class-Beef/Pork, Processed
2001 Import Residue Plan

BEEF/PORK, PROCESSED/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Canada	97.33	8
New Zealand	0.11	8
Poland	2.56	8
Total		24

Table 7.10
Number of Samples/Product Class-Lamb/Mutton, Processed
2001 Import Residue Plan

LAMB/MUTTON, PROCESSED/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	27.95	8
Canada	58.90	8
New Zealand	13.15	8
Total		24

Table 7.11
Number of Samples /Product Class-Goat, Fresh
2001Import Residue Plan

GOAT, FRESH/CHC's/COP's	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	86.59	8
New Zealand	13.41	8
Total		16

Table 7.12
Number of Samples /Product Class-Varied Combination, Processed
2001 Import Residue Plan

VARIED COMBINATION, PROCESSED /CHC'S/COP'S	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	1.23	8
Canada	93.87	8
Croatia	1.85	8
France	1.12	8
New Zealand	1.93	8
Total		40

Table 7.13
Number of Samples/Product Class-Beef, Fresh
2001 Import Residue Plan

BEEF, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 460*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Argentina	2.76	13		13	13	13
Australia	30.28	139		139	139	139
Canada	40.88	188		188	188	188
Costa Rica	1.33	6	8	8		8
Honduras	0.02	0	8	8		8
Japan	0.0014	0	8	8		8
Mexico	0.33	2	8	8		8
New Zealand	20.97	96		96	96	96
Nicaragua	0.97	4	8	8		8
Uruguay	2.46	11		11	11	11
Total		460		488		459

Table 7.14
Number of Samples /Product Class-Lamb/Mutton, Fresh
2001 Import Residue Plan

LAMB/ MUTTON, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 230*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	66.49	153		153	133	133
Canada	0.48	1	8	8		8
Iceland	0.02	0	8	8		8
Mexico	0.002	0	8	8		8
New Zealand	32.60	75		75	65	65
Uruguay	0.41	1	8	8		8
Total		230		260		230

Table 7.15
Number of Samples/Product Class-Pork, Processed
2001 Import Residue Plan

PORK, PROCESSED/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 300*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST..# 2	FINAL ADJ.#
Australia	0.01	0	8	8		8
Austria	0.01	0	8	8		8
Belgium	4.03	12		12	9	9
Canada	55.37	166		166	120	120
Croatia	0.54	2	8	8		8
Denmark	20.59	62		62	45	45
France	0.41	1	8	8		8
Germany	0.21	1	8	8		8
Hungary	2.12	6	8	8		8
Ireland	0.41	1	8	8		8
Italy	1.76	5	8	8		8
Mexico	0.21	1	8	8		8
Netherlands	6.85	21		21	15	15
Poland	7.26	22		22	16	16
Spain	0.19	1	8	8		8
Switzerland	0.02	0	8	8		8
Northern Ireland	0.01	0	8	8		8
Total		300		379		301

Table 7.16
Number of Samples /Product Class-Pork, Fresh
2001 Import Residue Plan

PORK, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 460*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Australia	0.005	0	8	8		8
Canada	86.89	261		261	232	232
Denmark	10.82	32		32	28	28
Finland	0.25	1	8	8		8
Ireland	0.88	3	8	8		8
Sweden	0.06	0	8	8		8
UK	1.09	3	8	8		8
Total		300		333		300

Table 7.17
Number of Samples/Product Class-Chicken, Processed
2001 Import Residue Plan

CHICKEN, PROCESSED/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U)= 90*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Canada	97.84	88		88	66	66
Hong Kong	0.20	0	8	8		8
Israel	1.18	1	8	8		8
Mexico	0.79	1	8	8		8
		90		112		90

Table 7.18
Number of Samples /Product Class-Veal, Fresh
2001 Import Residue Plan

VEAL, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U)= 90*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Australia	13.13	12		12	12	12
Canada	42.55	38		38	38	38
New Zealand	44.32	40		40	40	40
Total		90		90		90

Table 7.19
Number of Samples /Product Class-Beef, Processed
2001 Import Residue Plan

BEEF, PROCESSED CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 300*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Argentina	18.90	57		57	46	46
Australia	1.13	3	8	8		8
Brazil	48.92	147		118	118	118
Canada	26.49	79		64	64	64
Costa Rica	0.005	0	8	8		8
Croatia	0.37	1	8	8		8
Germany	0.003	0	8	8		8
Italy	0.05	0	8	8		8
Mexico	2.06	6	8	8		8
New Zealand	0.99	3	8	8		8
Switzerland	0.02	0	8	8		8
Uruguay	2.17	3	8	8		8
Total		300		355		300

SECTION 8. PLANNING THE 2001 FSIS DOMESTIC MONITORING PLAN AND SPECIAL PROJECTS, AND IMPORT RESIDUE PLAN: ENVIRONMENTAL CONTAMINANTS

The candidate environmental and processing contaminants of concern selected by members of the Surveillance Advisory Team (SAT) were as follows:

--Environmental Contaminants:

- dioxins
- heavy metals
- mycotoxins

--Processing Contaminants:

- nitrosamines
- maillard reaction products (from charring)
- compounds migrating from packaging
- polyaromatic hydrocarbons
- breakdown products of oils used in deep frying

The two compound classes identified as of concern by the Surveillance Advisory Team. The first set of compounds was the heavy metals, particularly lead. Suggested projects included a baseline study for levels of heavy metals in meat and poultry, and a Special Project to analyze for lead in raw meat products used in baby food, and in baby food containing vegetable root material.

The second set of compounds was the dioxins. FSIS would like to conduct a survey of dioxin compounds in steers/heifers, market hogs, young chickens, and young turkeys. However, no sampling for dioxins is anticipated in 2001, because of resource limitations.

If required, processing contaminants can be analyzed as part of an FSIS Emergency Response Project. Should an environmental contamination incident occur, FSIS can initiate Special Projects to respond to such incidents, as needed.

SECTION 9. THE 2001 FSIS NATIONAL RESIDUE PROGRAM: DOMESTIC MONITORING PLAN AND SPECIAL PROJECTS, AND IMPORT RESIDUE PLAN

The Food Safety and Inspection Service (FSIS), working with its partner agencies, has developed sampling allocation systems for compound/production class pairs (domestic residue sampling plans) and compound/product class pairs (import residue sampling plan) that are founded on a public health-based prioritization process. These systems each incorporate a structured planning process that employs risk assessment formulas and uses the best available data to develop relative rankings within these formulas. These systems do not, and were not intended to, generate formal absolute estimates of risk that can be interpreted in an actuarial sense. Nevertheless, their relative risk-based rankings are sufficient to develop sound and internally consistent allocations of sampling resources. These rankings help FSIS to manage the public health concerns presented by a comprehensive range of veterinary drugs and pesticides in the egg product, meat, and poultry production classes for which FSIS has regulatory authority.

The final domestic sampling plan for veterinary drugs and pesticides in all production classes is listed in Table 9.1, *Detailed Sampling Plan, 2001 FSIS NRP, Domestic Monitoring Plan and Special Projects.* This table also specifies, for each combination of compound and production class, which FSIS laboratory will be conducting the analyses, and whether the sampling is considered to fall under the Monitoring Plan or Special Projects. For the convenience of the reader, this information is also presented in summary form (including all sampling numbers, but not including the laboratory and sampling plan designation), in Table 9.2, *Summary, 2001 FSIS NRP, Domestic Monitoring Plan and Special Projects.*

The final detailed import plan sample numbers for all compounds (veterinary drugs and pesticides), in all product classes and all countries, are listed in Table 9.3, *Summary, 2001 FSIS NRP, Import Residue Plan*. The summary of the total number of samples per compound per production class is listed in Table 9.4 *Number of Compounds/Production Class, 2001 FSIS NRP, Import Residue Plan.* In Table 9.5, *Number of Samples/Country/Product Class, 2001 FSIS NRP, Import Residue Plan,* the number of samples per country per production class is listed

Finally, a combined summary of the Domestic Monitoring Plan and Special Projects and the Import Residue Plan is provided in Table 9.6, *Combined Summary, 2001 FSIS NRP, Domestic Monitoring Plan and Special Projects, and Import Residue Plan.*

Table 9.1
Detailed Sampling Plan
2001 FSIS NRP, Monitoring Plan and Special Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Antibiotics by Bioassay	MWL	Dairy cows	**690**	Monitoring Plan
Antibiotics by Bioassay	MWL	Formula-fed	**690**	Monitoring Plan
Antibiotics by Bioassay	MWL	Market hogs	**690**	Monitoring Plan
Antibiotics by Bioassay	MWL	Bob calves	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Heifers	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Horses	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Steers	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Young chickens	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Young turkeys	**460**	Monitoring Plan
Antibiotics by Bioassay	MWL	Beef cows	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Lambs	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Rabbits	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Ratites	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Roaster pigs	**300**	Special Project
Antibiotics by Bioassay	MWL	Sows	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Bison	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Boars/Stags	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Bulls	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Ducks	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Goats	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Heavy calves	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Mature chickens	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Mature turkeys	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Non-formula	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Sheep	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Geese	**90**	Monitoring Plan
Antibiotics by Bioassay	MWL	Squab	**45**	Monitoring Plan
Total Antibiotics by Bioassay	**MWL**		**9065**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2001 FSIS NRP, Monitoring Plan and Special Projects

Avermectins	EL	Horses	**460**	Monitoring Plan
Avermectins	EL	Steers	**460**	Monitoring Plan
Avermectins	EL	Beef cows	**300**	Monitoring Plan
Avermectins	EL	Bulls	**300**	Monitoring Plan
Avermectins	EL	Dairy cows	**300**	Monitoring Plan
Avermectins	EL	Goats	**300**	Monitoring Plan
Avermectins	EL	Heifers	**300**	Monitoring Plan
Avermectins	EL	Lambs	**300**	Monitoring Plan
Avermectins	EL	Market hogs	**300**	Monitoring Plan
Avermectins	EL	Bison	**230**	Special Project
Avermectins	EL	Bob calves	**230**	Monitoring Plan
Avermectins	EL	Formula-fed	**230**	Monitoring Plan
Avermectins	EL	Heavy calves	**230**	Monitoring Plan
Avermectins	EL	Non-formula	**230**	Monitoring Plan
Avermectins	EL	Rabbits	**230**	Monitoring Plan
Avermectins	EL	Ratites	**230**	Monitoring Plan
Avermectins	EL	Roaster pigs	**230**	Special Project
Avermectins	EL	Sows	**230**	Monitoring Plan
Avermectins	EL	Boars/Stags	**90**	Monitoring Plan
Avermectins	EL	Sheep	**90**	Monitoring Plan
Total Avermectins	**EL**		**5270**	
Arsenicals	EL	Young chickens	1200	Monitoring Plan
Arsenicals	EL	Egg products	460	Monitoring Plan
Arsenicals	EL	Young turkeys	460	Monitoring Plan
Arsenicals	EL	Beef cows	300	Monitoring Plan
Arsenicals	EL	Goats	300	Monitoring Plan
Arsenicals	EL	Market hogs	300	Monitoring Plan
Arsenicals	EL	Ducks	230	Monitoring Plan
Arsenicals	EL	Mature chickens	230	Monitoring Plan
Arsenicals	EL	Roaster pigs	230	Special Project
Arsenicals	EL	Sows	230	Monitoring Plan
Arsenicals	EL	Boars/Stags	90	Monitoring Plan
Arsenicals	EL	Geese	90	Monitoring Plan
Arsenicals	EL	Mature turkeys	90	Monitoring Plan
Total Arsenicals	**EL**		**4210**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2001 FSIS NRP, Monitoring Plan and Special Projects

Sulfonamides	MWL or EL	Beef cows	300	Monitoring Plan
Sulfonamides	MWL or EL	Boars/Stags	300	Monitoring Plan
Sulfonamides	MWL or EL	Bob calves	300	Monitoring Plan
Sulfonamides	MWL or EL	Bulls	300	Monitoring Plan
Sulfonamides	MWL or EL	Dairy cows	300	Monitoring Plan
Sulfonamides	EL	Egg products	300	Monitoring Plan
Sulfonamides	MWL or EL	Formula-fed	300	Monitoring Plan
Sulfonamides	MWL or EL	Heifers	300	Monitoring Plan
Sulfonamides	MWL or EL	Lambs	300	Monitoring Plan
Sulfonamides	MWL or EL	Market hogs	300	Monitoring Plan
Sulfonamides	MWL or EL	Mature chickens	300	Monitoring Plan
Sulfonamides	MWL or EL	Mature turkeys	300	Monitoring Plan
Sulfonamides	MWL or EL	Roaster pigs	300	Special Project
Sulfonamides	MWL or EL	Sows	300	Monitoring Plan
Sulfonamides	MWL or EL	Steers	300	Monitoring Plan
Sulfonamides	MWL or EL	Young chickens	300	Monitoring Plan
Sulfonamides	MWL or EL	Young turkeys	300	Monitoring Plan
Sulfonamides	MWL or EL	Bison	230	Special Project
Sulfonamides	MWL or EL	Ducks	230	Monitoring Plan
Sulfonamides	MWL or EL	Goats	230	Monitoring Plan
Sulfonamides	MWL or EL	Heavy calves	230	Monitoring Plan
Sulfonamides	MWL or EL	Horses	230	Monitoring Plan
Sulfonamides	MWL or EL	Non-formula	230	Monitoring Plan
Sulfonamides	MWL or EL	Ratites	230	Monitoring Plan
Sulfonamides	MWL or EL	Geese	90	Monitoring Plan
Sulfonamides	MWL or EL	Squab	45	Monitoring Plan
Total Sulfonamides	**MWL + EL**		**6845**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2001 FSIS NRP, Monitoring Plan and Special Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
CHC's/COP's/Phenylbutazone	WL	Beef cows	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Boars/Stags	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Dairy cows	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Egg products	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Heifers	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Market hogs	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Steers	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Young chickens	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Young turkeys	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bob calves	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bulls	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Formula-fed	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Goats	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Heavy calves	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Horses	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Lambs	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Mature chickens	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Ratites	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Sheep	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Sows	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bison	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Ducks	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Mature turkeys	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Non-formula	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Geese	90	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Rabbits	90	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Squab	45	Monitoring Plan
Total CHC's/COP's/Phenylbutazone	**WL**		**8585**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2001 FSIS NRP, Monitoring Plan and Special Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Carbadox	MWL	Roaster pigs	230	Special Project
Total Carbadox	**MWL**		**230**	
Chloramphenicol	MWL	Dairy cows	300	Special Project
Chloramphenicol	MWL	Formula-fed veal	300	Special Project
Chloramphenicol	MWL	Non-formula-fed veal	300	Special Project
Total Chloramphenicol	**MWL**		**900**	
Clenbuterol and other beta ags.*	WL+FDA	Formula-fed veal	300	Special Project
Clenbuterol and other beta ags.*	WL+FDA	Market hogs	300	Special Project
Clenbuterol and other beta ags.*	WL+FDA	Steers	300	Special Project
Total Clenbuterol, other beta ags.*	**WL+FDA**		**900**	
DES/zeranol/trenbolone	MWL	Formula-fed veal	250	Special Project
Total DES/zeranol/trenbolone	**MWL**		**250**	
Fluoroquinolones	MWL	Dairy cows	460	Monitoring Plan
Fluoroquinolones	MWL	Young chickens	230	Monitoring Plan
Total Fluoroquinolones	**MWL**		**690**	
MGA (melengesterol acetate)	MWL	Heifers	230	Special Project
Total MGA			**230**	
Ractopamine	MWL	Market hogs	230	Special Project
Ractopamine	MWL	Steers	120	Special Project
Total Ractopamine			**350**	

*Samples from a total of 900 animals (from each animal, both eyeballs and a pound of liver will be collected) will be sent to WL. WL will perform a screen for clenbuterol in the eyeball, which is the most sensitive tissue in which to test for the presence of beta agonists. This screen has been officially validated for clenbuterol only, but has also demonstrated the ability to detect other beta agonists, including fenoterol and cimaterol. If the sample is positive, WL will send an eyeball to FDA for confirmatory analysis using mass spectrometry. The FDA confirmatory method detects eight unapproved beta agonists (clenbuterol, cimaterol, fenoterol, mabuterol, salbutamol, brombuterol, and terbutaline). WL will retain the liver should additional testing be necessary.

Key:

PROD. CLASS = Production class; TBD = To be determined, contingent upon availability of resources; CHC = Chlorinated hydrocarbon; COP = Chlorinated organophosphate; EL = FSIS Eastern Laboratory, Athens, GA; MWL = FSIS Midwestern Laboratory, St. Louis, MO; WL = FSIS Western Laboratory, Alameda, CA

Table 9.2
Summary
2001 FSIS NRP, Monitoring Plan and Special Projects

PRODUCTION CLASS	Antibiotics	Arsenicals	Avermectins	Sulfona-mides	CHC's/ COP's/ phenylbute.	Carbadox
Bulls	230		300	300	300	
Beef cows	300	300	300	300	460	
Dairy cows	690		300	300	460	
Heifers	460		300	300	460	
Steers	460		460	300	460	
Bob calves	460		230	300	300	
Formula-fed veal calves	690		230	300	300	
Non-formula-fed veal calves	230		230	230	230	
Heavy calves	230		230	230	300	
SUBTOTAL, CATTLE	**3750**	**300**	**2580**	**2560**	**3270**	**0**
Market hogs	690	300	300	300	460	
Roaster pigs	300	230	230	300		230
Boars/Stags	230	90	90	300	460	
Sows	300	230	230	300	300	
SUBTOTAL, SWINE	**1520**	**850**	**850**	**1200**	**1220**	**230**
Sheep	230		90		300	
Lambs	300		300	300	300	
SUBTOTAL, OVINE	**530**	**0**	**390**	**300**	**600**	**0**
Goats	230	300	300	230	300	
Horses	460		460	230	300	
Bison	230		230	230	230	
TOTAL, ALL LIVESTOCK	**6720**	**1450**	**4810**	**4750**	**5920**	**230**
Young chickens	460	1200		300	460	
Mature chickens	230	230		300	300	
Young turkeys	460	460		300	460	
Mature turkeys	230	90		300	230	
Ducks	230	230		230	230	
Geese	90	90		90	90	
Ratites	300		230	230	300	
Squab	45			45	45	
SUBTOTAL, POULTRY	**2045**	**2300**	**230**	**1795**	**2115**	**0**
Rabbits	300		230		90	
Egg products		460		300	460	
Numbers in table						
GRAND TOTAL, ALL PRODUCTION CLASSES	**9065**	**4210**	**5270**	**6845**	**8585**	**230**

Table 9.2 - *Continued*
Summary
2001 FSIS NRP, Monitoring Plan and Special Projects

PRODUCTION CLASS	Chloram-phenicol	Clenbuterol and other beta agonists*	DES/ zeranol/ trenbolone	Fluoro-quinolones	MGA	Ractopamine
Bulls						
Beef cows						
Dairy cows	300			460		
Heifers					230	
Steers		300				120
Bob calves						
Formula-fed veal calves	300	300	250			
Non-formula-fed veal calves	300					
Heavy calves						
SUBTOTAL, CATTLE	**900**	**600**	**250**	**460**	**230**	**120**
Market hogs		300				230
Roaster pigs						
Boars/Stags						
Sows						
SUBTOTAL, SWINE	**0**	**300**	**0**	**0**	**0**	**230**
Sheep						
Lambs						
SUBTOTAL, OVINE	**0**	**0**	**0**	**0**	**0**	**0**
Goats						
Horses						
Bison						
TOTAL, ALL LIVESTOCK	**0**	**900**	**0**	**0**	**0**	**0**
Young chickens				230		
Mature chickens						
Young turkeys						
Mature turkeys						
Ducks						
Geese						
Ratites						
SUBTOTAL, POULTRY	**0**	**0**	**0**	**230**	**0**	**0**
Rabbits						
Egg products						
GRAND TOTAL, ALL PRODUCTION CLASSES	**900**		**250**	**690**	**230**	**350**
		900				

***** The methodology employs a screen that has been officially validated for clenbuterol only, but has also demonstrated the ability to detect other beta agonists (including fenoterol and cimaterol), followed by a confirmatory method that detects eight unapproved beta agonists (clenbuterol, cimaterol, fenoterol, mabuterol, salbutamol, brombuterol, and terbutaline).

Key:
TBD = To be determined

Table 9.3
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Argentina	Beef , fresh	Antibiotics	12
Argentina	Beef , fresh	Avermectins	8
Argentina	Beef, fresh	CHC's/COP's/Phenylbutazone	12
Argentina	Beef, fresh	Chloramphenicol	8
Argentina	Beef, fresh	Sulfonamides	8
Argentina	Beef, processed	CHC's/COP's/Phenylbutazone	46
Argentina	Beef, processed	Sulfonamides	31
Australia	Beef , fresh	Antibiotics	131
Australia	Beef , fresh	Avermectins	80
Australia	Beef, fresh	CHC's/COP's/Phenylbutazone	131
Australia	Beef, fresh	Chloramphenicol	80
Australia	Beef, fresh	Sulfonamides	80
Australia	Beef, processed	CHC's/COP's/Phenylbutazone	8
Australia	Beef, processed	Sulfonamides	8
Australia	Goat, fresh	Antibiotics	8
Australia	Goat, fresh	Arsenicals	8
Australia	Goat, fresh	Avermectins	8
Australia	Goat, fresh	CHC's/COP's/Phenylbutazone	8
Australia	Goat, fresh	Sulfonamides	8
Australia	Mutton/lamb, fresh	Antibiotics	39
Australia	Mutton/lamb, fresh	Avermectins	39
Australia	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	133
Australia	Mutton/lamb, fresh	Sulfonamides	39
Australia	Mutton/lamb, processed	CHC's/COP's/Phenylbutazone	8
Australia	Mutton/lamb, processed	Sulfonamides	8
Australia	Pork, fresh	Antibiotics	8
Australia	Pork, fresh	Arsenicals	8
Australia	Pork, fresh	Avermectins	8
Australia	Pork, fresh	Carbadox	8
Australia	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Australia	Pork, fresh	Sulfonamides	8
Australia	Pork, processed	Arsenicals	8
Australia	Pork, processed	CHC's/COP's/Phenylbutazone	8
Australia	Pork, processed	Sulfonamides	8
Australia	Varied combination, processed	Sulfonamides	8
Australia	Varied Combo, processed	CHC's/COP's/Phenylbutazone	8
Australia	Veal, fresh	Antibiotics	12
Australia	Veal, fresh	Avermectins	12
Australia	Veal, fresh	CHC's/COP's/Phenylbutazone	12
Australia	Veal, fresh	Chloramphenicol	8
Australia	Veal, fresh	Sulfonamides	12
Austria	Pork, processed	Arsenicals	8
Austria	Pork, processed	CHC's/COP's/Phenylbutazone	8
Austria	Pork, processed	Sulfonamides	8
Belgium	Pork, processed	Arsenicals	8
Belgium	Pork, processed	CHC's/COP's/Phenylbutazone	9
Belgium	Pork, processed	Sulfonamides	8
Brazil	Beef, processed	CHC's/COP's/Phenylbutazone	118
Brazil	Beef, processed	Sulfonamides	82
Canada	Beef , fresh	Antibiotics	176
Canada	Beef , fresh	Avermectins	109

Table 9.3 - *Continued*
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Canada	Beef, fresh	CHC's/COP's/Phenylbutazone	176
Canada	Beef, fresh	Chloramphenicol	109
Canada	Beef, fresh	Sulfonamides	109
Canada	Beef, processed	CHC's/COP's/Phenylbutazone	64
Canada	Beef, processed	Sulfonamides	44
Canada	Beef/pork, processed	Arsenicals	8
Canada	Beef/pork, processed	CHC's/COP's/Phenylbutazone	8
Canada	Beef/pork, processed	Sulfonamides	8
Canada	Chicken, fresh	Antibiotics	8
Canada	Chicken, fresh	Arsenicals	8
Canada	Chicken, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Chicken, fresh	Fluoroquinolones	8
Canada	Chicken, fresh	Sulfonamides	8
Canada	Chicken, processed	Arsenicals	66
Canada	Chicken, processed	CHC's/COP's/Phenylbutazone	66
Canada	Chicken, processed	Sulfonamides	66
Canada	Horse, fresh	Antibiotics	8
Canada	Horse, fresh	Avermectins	8
Canada	Horse, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Horse, fresh	Sulfonamides	8
Canada	Mutton/lamb, fresh	Antibiotics	8
Canada	Mutton/lamb, fresh	Avermectins	8
Canada	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Mutton/lamb, fresh	Sulfonamides	8
Canada	Mutton/lamb, processed	CHC's/COP's/Phenylbutazone	8
Canada	Mutton/lamb, processed	Sulfonamides	8
Canada	Other fowl, fresh	Antibiotics	8
Canada	Other Fowl, fresh	Arsenicals	8
Canada	Other Fowl, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Other Fowl, fresh	Fluoroquinolones	8
Canada	Other fowl, fresh	Sulfonamides	8
Canada	Other fowl, processed	Arsenicals	8
Canada	Other fowl, processed	CHC's/COP's/Phenylbutazone	8
Canada	Other fowl, processed	Sulfonamides	8
Canada	Pork, fresh	Antibiotics	232
Canada	Pork, fresh	Arsenicals	232
Canada	Pork, fresh	Avermectins	232
Canada	Pork, fresh	Carbadox	44
Canada	Pork, fresh	CHC's/COP's/Phenylbutazone	232
Canada	Pork, fresh	Sulfonamides	232
Canada	Pork, processed	Arsenicals	8
Canada	Pork, processed	CHC's/COP's/Phenylbutazone	120
Canada	Pork, processed	Sulfonamides	79
Canada	Turkey, fresh	Antibiotics	8
Canada	Turkey, fresh	Arsenicals	8
Canada	Turkey, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Turkey, fresh	Fluoroquinolones	8
Canada	Turkey, fresh	Sulfonamides	8
Canada	Turkey, processed	Arsenicals	8
Canada	Turkey, processed	CHC's/COP's/Phenylbutazone	8
Canada	Turkey, processed	Sulfonamides	8

Table 9.3 - *Continued*
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Canada	Varied combination processed	Sulfonamides	8
Canada	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
Canada	Veal, fresh	Antibiotics	38
Canada	Veal, fresh	Avermectins	38
Canada	Veal, fresh	CHC's/COP's/Phenylbutazone	38
Canada	Veal, fresh	Chloramphenicol	8
Canada	Veal, fresh	Sulfonamides	38
Canada	Veal, processed	CHC's/COP's/Phenylbutazone	8
Canada	Veal, processed	Sulfonamides	8
Costa Rica	Beef , fresh	Antibiotics	8
Costa Rica	Beef , fresh	Avermectins	8
Costa Rica	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Costa Rica	Beef, fresh	Chloramphenicol	8
Costa Rica	Beef, fresh	Sulfonamides	8
Costa Rica	Beef, processed	CHC's/COP's/Phenylbutazone	8
Costa Rica	Beef, processed	Sulfonamides	8
Croatia	Beef, processed	CHC's/COP's/Phenylbutazone	8
Croatia	Beef, processed	Sulfonamides	8
Croatia	Pork, processed	Arsenicals	8
Croatia	Pork, processed	CHC's/COP's/Phenylbutazone	8
Croatia	Pork, processed	Sulfonamides	8
Croatia	Varied combination processed	Sulfonamides	8
Croatia	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
Denmark	Pork, fresh	Antibiotics	28
Denmark	Pork, fresh	Arsenicals	28
Denmark	Pork, fresh	Avermectins	28
Denmark	Pork, fresh	Carbadox	8
Denmark	Pork, fresh	CHC's/COP's/Phenylbutazone	28
Denmark	Pork, fresh	Sulfonamides	28
Denmark	Pork, processed	Arsenicals	8
Denmark	Pork, processed	CHC's/COP's/Phenylbutazone	45
Denmark	Pork, processed	Sulfonamides	27
Finland	Pork, fresh	Antibiotics	8
Finland	Pork, fresh	Arsenicals	8
Finland	Pork, fresh	Avermectins	8
Finland	Pork, fresh	Carbadox	8
Finland	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Finland	Pork, fresh	Sulfonamides	8
France	Other fowl, fresh	Antibiotics	8
France	Other fowl, fresh	Arsenicals	8
France	Other fowl, fresh	CHC's/COP's/Phenylbutazone	8
France	Other fowl, fresh	Fluoroquinolones	8
France	Other fowl, fresh	Sulfonamides	8
France	Other fowl, processed	Arsenicals	8
France	Other fowl, processed	CHC's/COP's/Phenylbutazone	8
France	Other fowl, processed	Sulfonamides	8
France	Pork, processed	Arsenicals	8
France	Pork, processed	CHC's/COP's/Phenylbutazone	8
France	Pork, processed	Sulfonamides	8
France	Varied combination, processed	Sulfonamides	8
France	Varied Combo, processed	CHC's/COP's/Phenylbutazone	8

Table 9.3 - *Continued*
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Germany	Beef, processed	CHC's/COP's/Phenylbutazone	8
Germany	Beef, processed	Sulfonamides	8
Germany	Pork, processed	Arsenicals	8
Germany	Pork, processed	CHC's/COP's/Phenylbutazone	8
Germany	Pork, processed	Sulfonamides	8
Honduras	Beef , fresh	Antibiotics	8
Honduras	Beef , fresh	Avermectins	8
Honduras	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Honduras	Beef, fresh	Chloramphenicol	8
Honduras	Beef, fresh	Sulfonamides	8
Hong Kong	Chicken, processed	Arsenicals	8
Hong Kong	Chicken, processed	CHC's/COP's/Phenylbutazone	8
Hong Kong	Chicken, processed	Sulfonamides	8
Hong Kong	Turkey, processed	Arsenicals	8
Hong Kong	Turkey, processed	CHC's/COP's/Phenylbutazone	8
Hong Kong	Turkey, processed	Sulfonamides	8
Hungary	Pork, processed	Arsenicals	8
Hungary	Pork, processed	CHC's/COP's/Phenylbutazone	8
Hungary	Pork, processed	Sulfonamides	8
Iceland	Mutton/lamb, fresh	Antibiotics	8
Iceland	Mutton/lamb, fresh	Avermectins	8
Iceland	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	8
Iceland	Mutton/lamb, fresh	Sulfonamides	8
Ireland	Pork, fresh	Antibiotics	8
Ireland	Pork, fresh	Arsenicals	8
Ireland	Pork, fresh	Avermectins	8
Ireland	Pork, fresh	Carbadox	8
Ireland	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Ireland	Pork, fresh	Sulfonamides	8
Ireland	Pork, processed	Arsenicals	8
Ireland	Pork, processed	CHC's/COP's/Phenylbutazone	8
Ireland	Pork, processed	Sulfonamides	8
Israel	Chicken, processed	Arsenicals	8
Israel	Chicken, processed	CHC's/COP's/Phenylbutazone	8
Israel	Chicken, processed	Sulfonamides	8
Israel	Turkey, processed	Arsenicals	8
Israel	Turkey, processed	CHC's/COP's/Phenylbutazone	8
Israel	Turkey, processed	Sulfonamides	8
Italy	Beef, processed	CHC's/COP's/Phenylbutazone	8
Italy	Beef, processed	Sulfonamides	8
Italy	Pork, processed	Arsenicals	8
Italy	Pork, processed	CHC's/COP's/Phenylbutazone	8
Italy	Pork, processed	Sulfonamides	8
Japan	Beef , fresh	Antibiotics	8
Japan	Beef , fresh	Avermectins	8
Japan	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Japan	Beef, fresh	Chloramphenicol	8
Japan	Beef, fresh	Sulfonamides	8
Mexico	Beef , fresh	Antibiotics	8
Mexico	Beef , fresh	Avermectins	8
Mexico	Beef, fresh	CHC's/COP's/Phenylbutazone	8

Table 9.3 - *Continued*
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Mexico	Beef, fresh	Chloramphenicol	8
Mexico	Beef, fresh	Sulfonamides	8
Mexico	Beef, processed	CHC's/COP's/Phenylbutazone	8
Mexico	Beef, processed	Sulfonamides	8
Mexico	Chicken, processed	Arsenicals	8
Mexico	Chicken, processed	CHC's/COP's/Phenylbutazone	8
Mexico	Chicken, processed	Sulfonamides	8
Mexico	Mutton/lamb, fresh	Antibiotics	8
Mexico	Mutton/lamb, fresh	Avermectins	8
Mexico	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	8
Mexico	Mutton/lamb, fresh	Sulfonamides	8
Mexico	Pork, processed	Arsenicals	8
Mexico	Pork, processed	CHC's/COP's/Phenylbutazone	8
Mexico	Pork, processed	Sulfonamides	8
Netherlands	Pork, processed	Arsenicals	8
Netherlands	Pork, processed	CHC's/COP's/Phenylbutazone	15
Netherlands	Pork, processed	Sulfonamides	10
New Zealand	Beef , fresh	Antibiotics	90
New Zealand	Beef , fresh	Avermectins	56
New Zealand	Beef, fresh	CHC's/COP's/Phenylbutazone	90
New Zealand	Beef, fresh	Chloramphenicol	56
New Zealand	Beef, fresh	Sulfonamides	56
New Zealand	Beef, processed	CHC's/COP's/Phenylbutazone	8
New Zealand	Beef, processed	Sulfonamides	8
New Zealand	Beef/pork, processed	Arsenicals	8
New Zealand	Beef/pork, processed	CHC's/COP's/Phenylbutazone	8
New Zealand	Beef/pork, processed	Sulfonamides	8
New Zealand	Goat, fresh	Antibiotics	8
New Zealand	Goat, fresh	Arsenicals	8
New Zealand	Goat, fresh	Avermectins	8
New Zealand	Goat, fresh	CHC's/COP's/Phenylbutazone	8
New Zealand	Goat, fresh	Sulfonamides	8
New Zealand	Mutton/lamb, fresh	Antibiotics	19
New Zealand	Mutton/lamb, fresh	Avermectins	19
New Zealand	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	65
New Zealand	Mutton/lamb, fresh	Sulfonamides	19
New Zealand	Mutton/lamb, processed	CHC's/COP's/Phenylbutazone	8
New Zealand	Mutton/lamb, processed	Sulfonamides	8
New Zealand	Varied combination processed	Sulfonamides	8
New Zealand	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
New Zealand	Veal, fresh	Antibiotics	40
New Zealand	Veal, fresh	CHC's/COP's/Phenylbutazone	40
New Zealand	Veal, fresh	Chloramphenicol	8
New Zealand	Veal, fresh	Sulfonamides	40
Nicaragua	Beef , fresh	Antibiotics	8
Nicaragua	Beef , fresh	Avermectins	8
Nicaragua	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Nicaragua	Beef, fresh	Chloramphenicol	8
Nicaragua	Beef, fresh	Sulfonamides	8
Northern Ireland	Pork, processed	Arsenicals	8
Northern Ireland	Pork, processed	CHC's/COP's/Phenylbutazone	8

Table 9.3 - *Continued*
Summary
2001 FSIS NRP, Import Residue Plan

COUNTRY	PRODUCT	COMPOUND	NO. SAMPLES
Northern Ireland	Pork, processed	Sulfonamides	8
Poland	Beef/pork, processed	Arsenicals	8
Poland	Beef/pork, processed	CHC's/COP's/Phenylbutazone	8
Poland	Beef/pork, processed	Sulfonamides	8
Poland	Pork, processed	Arsenicals	8
Poland	Pork, processed	CHC's/COP's/Phenylbutazone	16
Poland	Pork, processed	Sulfonamides	11
Spain	Pork, processed	Arsenicals	8
Spain	Pork, processed	CHC's/COP's/Phenylbutazone	8
Spain	Pork, processed	Sulfonamides	8
Sweden	Pork, fresh	Antibiotics	8
Sweden	Pork, fresh	Arsenicals	8
Sweden	Pork, fresh	Avermectins	8
Sweden	Pork, fresh	Carbadox	8
Sweden	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Sweden	Pork, fresh	Sulfonamides	8
Switzerland	Beef, processed	CHC's/COP's/Phenylbutazone	8
Switzerland	Beef, processed	Sulfonamides	8
Switzerland	Pork, Processed	Arsenicals	8
Switzerland	Pork, processed	CHC's/COP's/Phenylbutazone	8
Switzerland	Pork, processed	Sulfonamides	8
UK	Pork, fresh	Antibiotics	8
UK	Pork, fresh	Arsenicals	8
UK	Pork, fresh	Avermectins	8
UK	Pork, fresh	Carbadox	8
UK	Pork, fresh	CHC's/COP's/Phenylbutazone	8
UK	Pork, fresh	Sulfonamides	8
Uruguay	Beef , fresh	Antibiotics	10
Uruguay	Beef, fresh	Avermectins	8
Uruguay	Beef, fresh	CHC's/COP's/Phenylbutazone	10
Uruguay	Beef, fresh	Chloramphenicol	8
Uruguay	Beef, fresh	Sulfonamides	8
Uruguay	Beef, processed	CHC's/COP's/Phenylbutazone	8
Uruguay	Beef, processed	Sulfonamides	8
Uruguay	Mutton/lamb, fresh	Antibiotics	8
Uruguay	Mutton/lamb, fresh	Avermectins	8
Uruguay	Mutton/lamb, fresh	CHC's/COP's/Phenylbutazone	8
Uruguay	Mutton/lamb, fresh	Sulfonamides	8
			6332

Table 9.4
Number of Compounds/Production Class
2001 FSIS NRP, Import Residue Plan

Compound →	Anti-biotics	Arsen-icals	Aver-mectin	Carbadox	Chloram-phenicol	Fluoro-quin-olones	Sulfas	CHC/ COP/ Phenyl-butazone	Total
Beef, fresh	459		301		301		301	459	1821
Beef, processed							229	300	529
Beef/Pork, processed		24					24	24	72
Chicken, fresh	8	8				8	8	8	40
Chicken, processed		90					90	90	270
Goat, fresh	16	16	16				16	16	80
Horse, fresh	8		8				8	8	32
Mutton/Lamb, fresh	90		90				90	230	500
Mutton/Lamb, processed							24	24	48
Other Fowl, fresh	16	16				16	16	16	80
Other Fowl, processed		16					16	16	48
Pork, fresh	300	300	300	92			300	300	1592
Pork, processed		136					231	301	668
Turkey, fresh	8	8				8	8	8	40
Turkey, processed		24					24	24	72
Varied combination, processed							40	40	80
Veal, fresh	90		50		24		90	90	344
Veal, processed							8	8	16
Total	995	638	765	92	325	32	1523	1962	6332

Table 9.5
Number of Samples/Country/Product Class
2001 FSIS NRP, Import Residue Plan

	Beef, fresh	Beef, processed	Beef/Pork, processed	Chicken, fresh	Chicken, processed	Goat, fresh	Horse, fresh	Mutton/Lamb, fresh	Mutton/Lamb, processed	Other Fowl, fresh	Other Fowl, processed	Pork, fresh	Pork, processed	Turkey, fresh	Turkey, processed	Varied combination, processed	Veal, fresh	Veal, processed	Total
Argentina	48	77																	125
Australia	502	16				40		250	16			48	24			16	56		968
Austria													24						24
Belgium													25						25
Brazil		200																	200
Canada	679	108	24	40	198		32	32	16	40	24	1204	207	40	24	16	160	16	2860
Costa Rica	40	16																	56
Croatia		16											24				16		56
Denmark												148	80						228
Finland												48							48
France										40	24		24			16			104
Germany		16											24						40
Honduras	40																		40
Hong Kong					24										24				48
Hungary													24						24
Iceland								32											32
Ireland												48	24						72
Israel					24										24				48
Italy	16												24						40
Japan	40																		40
Mexico	40	16			24			32					24						136
Netherlands													33						33
New Zealand	348	16	24			40		122	16							16	128		710
Northern Ireland													24						24
Nicaragua	40																		40
Poland			24										35						59
Spain													24						24
Sweden												48							48
Switzerland													40						40
UK												48							48
Uruguay	44	16						32											92

Table 9.6
Combined Summary
2001 FSIS NRP, Domestic Monitoring Plan and Special Projects and Import Residue Plan

LAB	ANALYSIS	**# SAMPLES SCHEDULED**	# Domestic Samples	# Imported Samples	NOTES
MWL	Antibiotics	10061	9065	996	Domestic: all production classes except egg products Imported: all product classes
EL	Arsenicals	4848	4210	638	Domestic: beef cows, goats, all porcine production classes, and all avian production classes (including egg products) except ratites and squab Imported: fresh and processed poultry and pork
EL	Avermectins	6035	5270	765	Domestic: ratites and all non-avian production classes Imported: all non-avian fresh product classes
MWL, WL	Carbadox	322	230	92	Domestic: 230 roaster pigs Imported: 92 fresh pork
WL	CHC's/COP's/phenylbutazone	10548	8585	1963	Domestic: all production classes except roaster pigs Imported: all product classes
EL	Chloramphenicol	1225	900	325	Domestic: 300 each, dairy cows, formula-fed veal, and non-formula veal Imported: 301 fresh beef and 24 fresh veal
WL	Clenbuterol and other unapproved beta agonists	900	900	0	Domestic: 300 each, market hogs, steers, formula-fed veal
MWL	DES/zeranol/trenbolone (trenbolone tentative)	250	250	0	Domestic: 250 formula-fed veal
MWL	Fluoroquinolones	722	690	32	Domestic: 460 dairy cows and 230 young chickens Imported: 32 fresh chicken, 8 fresh turkey, and 16 fresh other fowl
MWL	MGA	230	230	0	Domestic: 230 heifers
MWL	Ractopamine	350	350	0	Domestic: 230 market hogs and 120 steers
EL, MWL	Sulfonamides	8368	6845	1523	Domestic: all production classes except sheep and rabbits Imported: all product classes
	TOTAL, ALL LABS	**43859**	**37525**	**6334**	

Key:
TBD = To be determined; egg products = liquid, dried, and frozen eggs
CHC = Chlorinated hydrocarbon; COP = Chlorinated organophosphate; OP = Organophosphate
EL = FSIS Eastern Laboratory, Athens, GA; MWL = FSIS Midwestern Laboratory, St. Louis, MO; WL = FSIS Western Laboratory, Alameda, CA

SECTION 10. ADJUSTMENTS TO THE 2000 FSIS NATIONAL RESIDUE PROGRAM

The following changes were made to the originally scheduled 2000 FSIS National Residue Program (NRP):

1. The Food and Drug Administration reevaluated and lowered the "Regulatory Concern" score for dexamethasone. Therefore, the Special Project for dexamethasone in dairy cows, and the Import Residue Plan sampling for dexamethasone in fresh beef, were cancelled to accommodate other priority sampling.

2. The Special Project to test for DES in formula-fed veal was implemented beginning in April 2000. Three hundred and ninety formula-fed veal calves were sampled.

3. The tentatively scheduled sampling for the following were not implemented because method extensions or installations could not be completed: florfenicol and dairy cows; antibiotics in egg products; veterinary tranquilizers in market hogs; lead in various foodstuffs; chloramphenicol in various domestic production classes and imported products; and organophosphates in all domestic production classes and imported products.

4. The Special Project for spectinomycin in dairy cows was cancelled due to continuing instrument problems.

APPENDIX I. TISSUES TO BE COLLECTED FOR ANALYSIS, 2001 FSIS NATIONAL RESIDUE PROGRAM

RESIDUE	TISSUE ANALYZED	AMOUNT	LAB
Antibiotics	Kidney, liver, muscle	1 pound	MWL
Arsenicals	Liver, muscle	1 pound	EL
Avermectins	Liver, muscle	1 pound	EL
Beta agonists	Eyeball, liver	1 pound	WL
Carbadox	Liver, muscle	1 pound	WL
Chloramphenicol	Muscle	1 pound	EL
Chlorinated hydrocarbons/chlorinated organophosphates	Fat	1 pound	WL
DES/zeranol	Liver, muscle	1 pound	MWL
Dexamethasone	Liver, muscle	1 pound	MWL
Florfenicol	Liver, muscle	1 pound	MWL
Flunixin	Liver, muscle	1 pound	MWL
Fluoroquinolones	Muscle (poultry) Liver, muscle (bovine)	1 pound	MWL
Lead	TBD	1 pound	EL
Melengesterol acetate (MGA)	Fat, muscle	1 pound	MWL
Nitroimidazoles	Muscle	1 pound	MWL
Ractopamine	Liver, muscle	1 pound	MWL
Spectinomycin	Kidney, muscle	1 pound	MWL
Sulfonamides	Liver, muscle	1 pound	MWL, EL
Tilmicosin	Liver, muscle	1 pound	MWL
Veterinary tranquilizers	Kidney, liver, muscle	1 pound	MWL

Key:

EL = FSIS Eastern Laboratory, Athens, GA
MWL = FSIS Midwestern Laboratory, St. Louis, Mo
WL = FSIS Western Laboratory, Alameda, Ca
TBD = To be determined

APPENDIX II. U.S. RESIDUE LIMITS FOR VETERINARY DRUGS, FOOD ADDITIVES, AND UNAVOIDABLE CONTAMINANTS IN MEAT, POULTRY, AND EGG PRODUCTS

INTRODUCTION

This Appendix provides information on the residue limits (tolerances) for animal drugs, food additives and unavoidable contaminants in meat, poultry, and egg products, as of March 9, 2001. These tolerances, which are set by the Food and Drug Administration (FDA), are applied by the Food Safety and Inspection Service in its regulatory programs. The official source of these tolerances is Title 21 of the Code of Federal Regulations (CFR): those for animal drugs are found in Title 21, Part 556 (21 CFR 556); those for food additives are found in 21 CFR 172.140 and those for unavoidable contaminants are found in 21 CFR 109.30. This Appendix supplies the relevant citation for each tolerance.

FSIS does not permit concentrations of residues in meat and poultry that exceed the tolerances or action levels published in the CFR or FR. This Appendix supplies the relevant citation for each tolerance and action level.

The tolerances and action levels in poultry and livestock species are listed alphabetically by compound. These tolerances may be for the parent compound (the original chemical form of the compound given to the animal), or for the compound's metabolites (the chemical forms into which the compound is metabolized by the animal), or for a combination of parent plus metabolites. All tolerances are provided in units of parts per million (ppm) unless otherwise noted. Please note that this Appendix has been generated for the convenience of the reader, and if any discrepancies arise between this Appendix and the CFR, the values from the latter source should be used.

Unless otherwise indicated, "meat by-products" include kidney and liver.

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
2-Acetylamino-5-nitrothiazole	Cattle Goat Hogs Horse Poultry Sheep						0.1[1]	21 CFR 556.20
Aklomide	Cattle Goat Hogs Horse Poultry Sheep	3	4.5		4.5			21 CFR 556.30
Albendazole	Cattle Goat Hogs Horse Poultry Sheep		0.05 0.05		0.2 0.25			21 CFR 556.34
Amoxicillin	Cattle Goat Hogs Horse Poultry Sheep						0.01	21 CFR 556.38
Ampicillin	Cattle Goat Hogs Horse Poultry Sheep						0.01 0.01	21 CFR 556.40
Amprolium	Cattle Goat Hogs Horse Poultry Sheep Eggs	2.0 4[w], 8[y]	0.5 0.5		0.5 1[6, 14]	0.5 1[6]		21 CFR 556.50

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Apramycin	Cattle Goat Hogs Horse Poultry Sheep					0.1		21 CFR 556.52
Arsenic	Cattle Goat Hogs Horse Poultry[6] Sheep Eggs	 0.5[W]	 0.5 0.5 	 0.5 2 	 2 	 2 		21 CFR 556.60
Bacitracin	Cattle Goat Hogs Horse Poultry Sheep Eggs	 0.5[W]					0.5 0.5 0.5 [3,6]	21 CFR 556.70
Buquinolate	Cattle Goat Hogs Horse Poultry Sheep Eggs	 0.4 0.5[Y], 0.2[W]	 0.1 	 	 0.4 	 0.4 		21 CFR 556.90
Carbadox	Cattle Goat Hogs Horse Poultry Sheep				 0.03 			21 CFR 556.100
Cephapirin	Cattle Goat Hogs Horse Poultry Sheep						0.1	21 CFR 556.115

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Chlorhexidine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0	21 CFR 556.120
Chlortetracycline[17]	Cattle Goat Hogs Horse Poultry Sheep Eggs	12 12 12 12 0.4 [W]	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.150
Clopidol	Cattle Goat Hogs Horse Poultry Sheep		0.2 0.2 5 0.2		1.5 1.5 15 1.5	3 3 15[6] 3	 0.2	21 CFR 556.160
Clorsulon	Cattle Goat Hogs Horse Poultry Sheep		0.1					21 CFR 556.163
Cloxacillin	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.01	21 CFR 556.165
Colistimethate	Cattle Goat Hogs Horse Poultry[4] Sheep Eggs							21 CFR 556.167

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Decoquinate	Cattle Goat Hogs Horse Poultry[5] Sheep	2 2 2	1 1 1	2 1 2	2 1 2	2 2 2		21 CFR 556.170
Dichlorvos	Cattle Goat Hogs Horse Poultry Sheep						0.1	21 CFR 556.180
Dihydro-streptomycin	Cattle Goat Hogs Horse Poultry Sheep	0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	2.0 2.0		21 CFR 556.200
3,5-Dinitrobenzamide	Cattle Goat Hogs Horse Poultry Sheep						0[5]	21 CFR 556.220
Doramectin	Cattle Goat Hogs Horse Poultry Sheep		0.03		0.1 0.16			21 CFR 556.225
Enrofloxacin	Cattle Goat Hogs Horse Poultry Sheep		 0.3[6]		0.1[7]			21 CFR 556.228

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Eprinomectin	Cattle Goat Hogs Horse Poultry Sheep		0.1		4.8			21 CFR 556.227
Erythromycin	Cattle Goat Hogs Horse Poultry Sheep Eggs	 0.025 [W]					0.1 0.1 0.125[6]	21 CFR 556.230
Estradiol benzoate & related esters [8]	Cattle Goat Hogs Horse Poultry Sheep	480 600	120 120		240 600	360 600		21 CFR 556.240
Ethopabate	Cattle Goat Hogs Horse Poultry Sheep Eggs		 0.5		 1.5	 1.5		21 CFR 556.260
Ethoxyquin	Cattle Goat Hogs Horse Poultry Sheep Eggs	5 5 5 5 3 5 0.5 [W]	0.5 0.5 0.5 0.5 0.5 0.5		 3			21 CFR 172.140
Famphur	Cattle Goat Hogs Horse Poultry Sheep	0.1	0.1	0.1				21 CFR 556.273

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Fenbendazole	Cattle Goat Hogs[9] Horse Poultry Sheep Eggs				0.8 0.8			21 CFR 556.275
Fenprostalene	Cattle[9] Goat Hogs Horse Poultry Sheep Eggs							21 CFR 556.277
Florfenicol	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.3		3.7			21 CFR 556.283
Flunixin meglumine	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.025		0.125			21 CFR 556.286
Furazolidone	Cattle Goat Hogs Horse Poultry Sheep Eggs						0	21 CFR 556.290
Gentamicin sulfate	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.4	0.1		0.3	0.4	0.1[6]	21 CFR 556.300

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Halofuginone hydrpbromide	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.16[5], 0.13[1]			21 CFR 556.308
Haloxon	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1	21 CFR 556.310
Hygromycin B	Cattle Goat Hogs Horse Poultry Sheep Eggs	0[W]					0 0	21 CFR 556.330
Ivermectin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.01 0.02		0.1, 0.015[B] 0.02 0.03			21 CFR 556.344
Lasalocid	Cattle Goat Hogs Horse Poultry Sheep [9] Eggs	0.3[5]			0.7 0.7[R]			21 CFR 556.347
Levamisole hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1 0.1	21 CFR 556.350

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Lincomycin	Cattle Goat Hogs Horse Poultry [5,9] Sheep Eggs		0.1		0.6			21 CFR 556.360
Maduramicin ammonium	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.38[5]						21 CFR 556.375
Melengestrol acetate	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.025						21 CFR 556.380
Metoserpate hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.02[5]	21 CFR 556.410
Monensin	Cattle Goat Hogs Horse Poultry[9] Sheep Eggs						0.05 0.05	21 CFR 556.420
Morantel tartrate	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.7[10] 0.7[10]			21 CFR 556.425

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Moxidectin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.05		0.2			21 CFR 556.426
Narasin	Cattle Goat Hogs Horse Poultry [5,9] Sheep Eggs							21 CFR 556.428
Neomycin	Cattle Goat Hogs Horse Poultry[1] Sheep Eggs	7.2 7.2 7.2 7.2[SF] 7.2	1.2 1.2 1.2 1.2 1.2		3.6 3.6 3.6 3.6 3.6	7.2 7.2 7.2 7.2		21 CFR 556.430
Nequinate	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1[5]	21 CFR 556.440
Nicarbazin	Cattle Goat Hogs Horse Poultry[5] Sheep Eggs	4	4		4	4		21 CFR 556.445
Novobiocin	Cattle Goat Hogs Horse Poultry Sheep Eggs						1 1	21 CFR 556.460

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Nystatin	Cattle Goat Hogs Horse Poultry Sheep Eggs	 0					 0 0	21 CFR 556.470
Oleandomycin	Cattle Goat Hogs Horse Poultry Sheep Eggs						 0.15 0.15[6]	21 CFR 556.480
Ormetoprim	Cattle Goat Hogs Horse Poultry Sheep Eggs						 0.1	21 CFR 556.490
Oxfendazole	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.8			21 CFR 556.495
Oxytetracycline[17]	Cattle Goat Hogs Horse Poultry[6] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.500
PCB's	Cattle Goat Hogs Horse Poultry Sheep Eggs	3[11] 3[11] 3[11] 3[11] 3[11] 3[11]						21 CFR 109.30

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Penicillin	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.05 0 0 [3,5], 0.01[1] 0	21 CFR 556.510
Pirlimycin	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.5			21 CFR 556.515
Progesterone	Cattle Goat Hogs Horse Poultry Sheep Eggs	12[16] 15[16]	3[16] 3[16]		6[16] 15[16]	9[16] 15[16]		21 CFR 556.540
Pyrantel tartrate	Cattle Goat Hogs Horse Poultry Sheep Eggs		1		10	10		21 CFR 556.560
Robenidine hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.2[5,SF]					0.1[5]	21 CFR 556.580
Sarafloxacin	Cattle Goat Hogs Horse Poultry [6,9] Sheep Eggs							21 CFR 556.594

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Spectinomycin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.25			4	 0.1[6]	21 CFR 556.600
Streptomycin	Cattle Goat Hogs Horse Poultry [5] Sheep Eggs	0.5 0.5 0.5	0.5 0.5 0.5	0.5 0.5 0.5	0.5 0.5 0.5	2 2 2	0.5 0.5 0.5	21 CFR 556.610
Sulfabromom-ethazine sodium	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1	21 CFR 556.620
Sulfachloropyrazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						 0[5]	21 CFR 556.625
Sulfachlorpyridazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1	21 CFR 556.630
Sulfadimethoxine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1	21 CFR 556.640

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfaethoxy-pyridazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0	21 CFR 556.650
Sulfamethazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1 0.1[6]	21 CFR 556.670
Sulfanitran	Cattle Goat Hogs Horse Poultry Sheep Eggs						0[5]	21 CFR 556.680
Sulfaquinoxaline	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1[6]	21 CFR 556.685
Sulfathiazole	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1	21 CFR 556.690
Sulfomyxin	Cattle Goat Hogs Horse Poultry Sheep Eggs						0[6]	21 CFR 556.700

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Testosterone propionate	Cattle[12] Goat Hogs Horse Poultry Sheep Eggs	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710
Tetracycline[17]	Cattle[13] Goat Hogs Horse Poultry[6] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.720
Thiabendazole	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1 0.1 0.1[14]	21 CFR 556.730
Tiamulin	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.6[15]			21 CFR 556.738
Tilmicosin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.1		1.2 7.5			21 CFR 556.735
Trenbolone	Cattle[9] Goat Hogs Horse Poultry Sheep Eggs							21 CFR 556.739

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Tripelennamine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.2	21 CFR 556.741
Tylosin	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.2 0.2 0.2 [W]	0.2 0.2		0.2 0.2	0.2 0.2		21 CFR 556.740
Virginiamycin	Cattle[9] Goat Hogs Horse Poultry[6,9] Sheep Eggs	0.4	0.1		0.3	0.4		21 CFR 556.750
Zeranol	Cattle[9] Goat Hogs Horse Poultry Sheep Eggs						0	21 CFR 556.760
Zoalene	Cattle Goat Hogs Horse Poultry Sheep Eggs	2[5]	3[6]		6[5], 3[1]	6[5]		21 CFR 556.770

Footnotes:

1. Turkey
2. Marker residue: albendazole 2-aminosulfone
3. Pheasants and quail
4. No tolerance required

5. Chicken

6. Chicken and turkey

7. Marker residue: desethylene ciprofloxacin

8. Concentration in parts per trillion (ppt)

9. No tolerance required

10. Marker residue: N-methyl-1,3-propanediamine

11. Action level

12. Heifers; no residues are permitted at concentrations above these, which represent the levels naturally present in untreated animals

13. Calves

14. Pheasants

15. Marker residue: 8-alphahydroxymutilin

16. Concentration in parts per billion (ppb)

17. Tolerances are for the sum of all approved tetracycline residues (i.e., tetracycline, chlortetracyline, and oxytetracyline)

B: American bison

S: Chicken skin

SF: Skin with adhering fat

R: Rabbit

W: Whole egg

Y: Egg yolk

APPENDIX III U.S. RESIDUE LIMITS FOR PESTICIDES IN MEAT, POULTRY, AND EGG PRODUCTS

INTRODUCTION

This Appendix provides information on the residue limits (tolerances and action levels) for pesticides in meat, poultry, and egg products, as of April 24, 2001. Tolerances, which are set by the Environmental Protection Agency (EPA) for currently registered pesticides, are applied by the Food Safety and Inspection Service in its regulatory programs. The official source of these tolerances is Title 40, Part 180 of the Code of Federal Regulations (40 CFR 180).

For some cancelled pesticides that persist in the environment, EPA has recommended action levels to FSIS. Action levels are listed in the Federal Register (FR).

FSIS does not permit concentrations of residues in meat and poultry that exceed the tolerances or action levels published in the CFR or FR. This Appendix supplies the relevant citation for each tolerance and action level.

The tolerances and action levels in poultry and livestock species are listed alphabetically by compound. These residue limits may be for the parent compound (the original chemical form of the compound to which the animal is exposed), or for the compound's metabolites (the chemical forms into which the compound is metabolized by the animal), or for a combination of parent plus metabolites. All tolerances and action levels are provided in units of parts per million (ppm). Please note that this Appendix has been generated for the convenience of the reader, and if any discrepancies arise between this Appendix and the CFR or FR, the values from the latter two sources should be used.

Unless otherwise indicated, "meat by-products" include kidney and liver.

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Abamectin	Cattle Goat Hogs Horse Poultry Sheep	0.015	0.02	0.02			40 CFR 180.449
Acephate	Cattle Goat Hogs Horse Poultry Sheep	0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1			40 CFR 180.108
Acifluorfen	Cattle Goat Hogs Horse Poultry Sheep	 0.02	 0.02	 0.02	0.02 0.02 0.02 0.02 0.02	0.02 0.02 0.02 0.02 0.02	40 CFR 180.383
Alachlor	Cattle Goat Hogs Horse Poultry Sheep	0.02 0.02 0.02 0.02 0.02 0.02	0.02 0.02 0.02 0.02 0.02 0.02	0.02 0.02 0.02 0.02 0.02 0.02			40 CFR 180.249
Aldicarb	Cattle Goat Hogs Horse Poultry Sheep	0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01			40 CFR 180.269
Aldrin	Cattle Goat Hogs Horse Poultry Sheep	0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1]					51 FR 46662

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Amitraz	Cattle	0.1	0.05	0.3			40 CFR 180.287
	Goat	0.01	0	0			
	Hogs	0.1	0.05	0.3	0.2	0.2	
	Horse	0	0	0			
	Poultry	0.01	0.01	0.05			
	Sheep	0	0	0			
Atrazine	Cattle	0.02	0.02	0.02			40 CFR 180.220
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
Azinphos-Methyl {O,O-dimethyl S-[(4-oxo-1,2,3-benzotrizin-3(4H)-yl)methyl]phosphorodithioate}	Cattle	0.1	0.1	0.1			40 CFR 180.154
	Goat	0.1	0.1	0.1			
	Hogs						
	Horse	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
Azoxystrobin	Cattle	0.01	0.01	0.01			40 CFR 180.507
	Goat	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horse	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
Benomyl	Cattle	0.1	0.1	0.1			40 CFR 180.294
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1	0.2		
	Sheep	0.1	0.1	0.1			
	Eggs	0.01[W]					
Benoxacor	Cattle	0.01	0.01	0.01	0.01	0.01	40 CFR 180.460
	Goat	0.01	0.01	0.01	0.01	0.01	
	Hogs	0.01	0.01	0.01	0.01	0.01	
	Horse	0.01	0.01	0.01	0.01	0.01	
	Poultry	0.01	0.01	0.01	0.01		
	Sheep	0.01	0.01	0.01	0.01	0.01	
	Eggs	0.01[W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Bentazon	Cattle	0.05	0.05	0.05			40 CFR 180.355
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse						
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
Benzene hexachloride	Cattle	0.3[1]					50 FR 25697
	Goat	0.3[1]					
	Hogs	0.3[1]					
	Horse	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
Bifenthrin	Cattle	1.0	0.5	0.1			40 CFR 180.442
	Goat	1.0	0.5	0.1			
	Hogs	1.0	0.5	0.1			
	Horse	1.0	0.5	0.1			
	Poultry	0.05	0.05	0.05			
	Sheep	1.0	0.5	0.1			
	Eggs	0.05 [W]					
Bromoxynil	Cattle	0.1	0.1	0.1			40 CFR 180.324
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.05	0.05	0.05			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 [W]					
Buprofezin	Cattle	0.02	0.02	0.5			40 CFR 180.511
	Goat	0.02	0.02	0.5			
	Hogs	0.02	0.02	0.5			
	Horse	0.02	0.02	0.5			
	Poultry						
	Sheep	0.02	0.02	0.5			
Cacodylic acid	Cattle	0.7	0.7	0.7	1.4	1.4	40 CFR 180.311
	Goat						
	Hogs						
	Horse						
	Poultry						
	Sheep						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Captan	Cattle	0.05	0.05	0.05			40 CFR 180.103
	Goat						
	Hogs	0.05	0.05	0.05			
	Horse						
	Poultry						
	Sheep						
Carbaryl	Cattle	0.1	0.1	0.1	1	1	40 CFR 180.169
	Goat	0.1	0.1	0.1	1	1	
	Hogs	0.1	0.1	0.1	1	1	
	Horse	0.1	0.1	0.1	1	1	
	Poultry	5.0	5.0				
	Sheep	0.1	0.1	0.1	1	1	
	Eggs	0.5 [W]					
Carbofuran	Cattle	0.05	0.05	0.05			40 CFR 180.254
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
Carboxin	Cattle	0.1	0.1	0.1			40 CFR 180.156
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.01 [W]					
Chlordane	Cattle	0.3 [1]					51 FR 46665
	Goat	0.3 [1]					
	Hogs	0.3 [1]					
	Horse	0.3 [1]					
	Poultry	0.3 [1]					
	Sheep	0.3 [1]					
Chlordimeform	Cattle	0.01	0.1	0.1			40 CFR 180.285
	Goat	0.01	0.1	0.1			
	Hogs	0.01	0.1	0.1			
	Horse	0.01	0.1	0.1			
	Poultry	0.25	0.25	0.25			
	Sheep	0.01	0.1	0.1			

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Chlorfenapyr	Cattle	0.1	0.01	0.3			40 CFR 180.513
	Goat	0.1	0.01	0.3			
	Hogs	0.1	0.01	0.3			
	Horse	0.1	0.01	0.3			
	Poultry						
	Sheep	0.1	0.01	0.3			
2-Chloro-N-isopropylacetanilide [Propachlor]	Cattle	0.02	0.02	0.02			40 CFR 180.211
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
Chloroneb	Cattle	0.2	0.2	0.2			40 CFR 180.257
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
Chlorpyrifos-methyl	Cattle	0.5	0.5	0.5			40 CFR 180.419
	Goat	0.5	0.5	0.5			
	Hogs	0.5	0.5	0.5			
	Horse	0.5	0.5	0.5			
	Poultry	0.5	0.5	0.5			
	Sheep	0.5	0.5	0.5			
Chlorsulfuron	Cattle	0.3	0.3	0.3			40 CFR 180.405
	Goat	0.3	0.3	0.3			
	Hogs	0.3	0.3	0.3			
	Horse	0.3	0.3	0.3			
	Poultry						
	Sheep	0.3	0.3	0.3			
Clethodim	Cattle	0.2	0.2	0.2			40 CFR 180.458
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry	0.2	0.2	0.2			
	Sheep	0.2	0.2	0.2			
	Eggs	0.2 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Clofencet	Cattle	0.04	0.15	0.5		10.0	40 CFR 180.497
	Goat	0.04	0.15	0.5		10.0	
	Hogs	0.04	0.15	0.5		10.0	
	Horse	0.04	0.15	0.5		10.0	
	Poultry	0.04	0.15	0.2			
	Sheep	0.04	0.15	0.5		10.0	
Clofentezine	Cattle	0.05	0.05	0.05	0.4		40 CFR 180.446
	Goat	0.05	0.05	0.05	0.4		
	Hogs	0.05	0.05	0.05	0.4		
	Horse	0.05	0.05	0.05	0.4		
	Poultry						
	Sheep	0.05	0.05	0.05	0.4		
Coumaphos	Cattle	1	1	1			40 CFR 180.189
	Goat	1	1	1			
	Hogs	1	1	1			
	Horse	1	1	1			
	Poultry						
	Sheep	1	1	1			
Cuprous oxide	Cattle		Exempt				40 CFR 180.1021
	Goat		Exempt				
	Hogs		Exempt				
	Horse		Exempt				
	Poultry		Exempt				
	Sheep		Exempt				
	Eggs		Exempt				
Cyclanilide	Cattle	0.1	0.02	0.2		2.0	40 CFR 180.506
	Goat	0.1	0.02	0.2		2.0	
	Hogs	0.1	0.02	0.2		2.0	
	Horse	0.1	0.02	0.2		2.0	
	Poultry						
	Sheep	0.1	0.02	0.2		2.0	
Cyfluthrin	Cattle	5.0	0.4	0.4			40 CFR 180.436
	Goat	5.0	0.4	0.4			
	Hogs	5.0	0.4	0.4			
	Horse	5.0	0.4	0.4			
	Poultry	0.01	0.01	0.01			
	Sheep	5.0	0.4	0.4			
	Eggs	0.01 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Cyhexatin	Cattle	0.2	0.2	0.2	0.5	0.5	40 CFR 180.144
	Goat	0.2	0.2	0.2	0.5	0.5	
	Hogs	0.2	0.2	0.2	0.5	0.5	
	Horse	0.2	0.2	0.2	0.5	0.5	
	Poultry						
	Sheep	0.2	0.2	0.2	0.5	0.5	
Cypermethrin	Cattle	0.05	0.05	0.05			40 CFR 180.418
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
Cyromazine	Cattle	0.05	0.05	0.05			40 CFR 180.414
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.25 [W]					
DDT & metabolites	Cattle	5.0[1]					51 FR 46658
	Goat	5.0[1]					
	Hogs	5.0[1]					
	Horse	5.0[1]					
	Poultry	5.0[1]					
	Sheep	5.0[1]					
	Eggs						
Diazinon	Cattle	0.7	0.7	0.7			40 CFR 180.153
	Goat						
	Hogs						
	Horse						
	Poultry						
	Sheep	0.7	0.7	0.7			
	Eggs						
Dicamba	Cattle	0.2	0.2	0.2	1.5	1.5	40 CFR 180.227
	Goat	0.2	0.2	0.2	1.5	1.5	
	Hogs	0.2	0.2	0.2	1.5	1.5	
	Horse	0.2	0.2	0.2	1.5	1.5	
	Poultry						
	Sheep	0.2	0.2	0.2	1.5	1.5	
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
2,4-Dichlorophenoxyacetic acid	Cattle	0.2	0.2	0.2		2	40 CFR 180.142
	Goat	0.2	0.2	0.2		2	
	Hogs	0.2	0.2	0.2		2	
	Horse	0.2	0.2	0.2		2	
	Poultry	0.05					
	Sheep	0.2	0.2	0.2		2	
	Eggs	0.05 [W]					
3,4-Dichloropropionanilide	Cattle	0.1	0.1	0.1			40 CFR 180.274
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 [W]					
Dichlorvos	Cattle	0.02	0.02	0.02			40 CFR 180.235
	Goat	0.02	0.02	0.02			
	Hogs	0.1	0.1	0.1			
	Horse	0.02	0.02	0.02			
	Poultry	0.05	0.05	0.05			
	Sheep	0.02	0.02	0.02			
	Eggs	0.05 [W]					
Dieldrin	Cattle	0.3 [1]					51 FR 46662
	Goat	0.3 [1]					
	Hogs	0.3 [1]					
	Horse	0.3 [1]					
	Poultry	0.3 [1]					
	Sheep	0.3 [1]					
	Eggs						
Difenoconazole	Cattle	0.05	0.05	0.05			40 CFR 180.475
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 [W]					
Difenzoquat	Cattle	0.05	0.05	0.05			40 CFR 180.369
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Diflubenzuron	Cattle	0.05	0.05	0.05			40 CFR 180.377
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 [W]					
Dimethipin	Cattle	0.02	0.02	0.02			40 CFR 180.406
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry						
	Sheep	0.02	0.02	0.02			
	Eggs						
Dimethoate	Cattle	0.02	0.02	0.02			40 CFR 180.204
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 [W]					
N,N-Dimethylpiperidinium chloride (Mepiquat chloride)	Cattle	0.1	0.1	0.1			40 CFR 180.384
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 [W]					
Diphenamide	Cattle	0.05	0.05	0.05			40 CFR 180.230
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Diphenylamine	Cattle		0				40 CFR 180.190
	Goat		0				
	Hogs						
	Horse		0				
	Poultry						
	Sheep		0				
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Dipropyl isocinchomeronate	Cattle	0.1	0.1	0.1			40 CFR 180.143
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
Diquat dibromide	Cattle	0.02	0.02	0.02			40 CFR 180.226
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 [W]					
Diuron	Cattle	1	1	1			40 CFR 180.106
	Goat	1	1	1			
	Hogs	1	1	1			
	Horse	1	1	1			
	Poultry						
	Sheep	1	1	1			
	Eggs						
Dodin	Cattle		0				40 CFR 180.172
	Goat		0				
	Hogs		0				
	Horse		0				
	Poultry		0				
	Sheep		0				
	Eggs						
Emamectin benzoate	Cattle	0.02	0.02	0.02			40 CFR 180.505
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse						
	Poultry						
	Sheep	0.02	0.02	0.02			
	Eggs						
Endosulfan	Cattle	0.2	0.2	0.2			40 CFR 180.182
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Endrin	Cattle	0.3[1]					MPI Dir 917.1
	Goat	0.3[1]					
	Hogs	0.3[1]					
	Horse	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
	Eggs						
Esfenvalerate	Cattle						40 CFR 180.533
	Goat						
	Hogs						
	Horse						
	Poultry	0.3	0.03	0.3	0.03		
	Sheep						
	Eggs	0.03 [W]					
Ethalfluralin	Cattle						40 CFR 180.416
	Goat	0.05	0.05	0.05			
	Hogs						
	Horse						
	Poultry						
	Sheep						
	Eggs						
Ethephon	Cattle	0.1	0.1	0.1			40 CFR 180.300
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
Ethion	Cattle	2.5	2.5	1.0			40 CFR 180.173
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
	Eggs						
Ethofumesate	Cattle	0.05	0.05	0.05			40 CFR 180.345
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Etridiazole	Cattle	0.1	0.1	0.1			40 CFR 180.370
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 [W]					
Fenamiphos	Cattle	0.05	0.05	0.05			40 CFR 180.349
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Fenarimol	Cattle	0.1	0.01	0.01	0.1	0.1	40 CFR 180.421
	Goat	0.1	0.01	0.01	0.1	0.1	
	Hogs	0.1	0.01	0.01	0.1	0.1	
	Horse	0.1	0.01	0.01	0.1	0.1	
	Poultry	0.01	0.01	0.01			
	Sheep	0.1	0.01	0.01	0.1	0.1	
	Eggs	0.01 [W]					
Fenbuconazole	Cattle		0.01	0.01			40 CFR 180.480
	Goat		0.01	0.01			
	Hogs		0.01	0.01			
	Horse		0.01	0.01			
	Poultry						
	Sheep		0.01	0.01			
	Eggs						
Fenbutatin Oxide	Cattle	0.5	0.5	0.5			40 CFR 180.362
	Goat	0.5	0.5	0.5			
	Hogs	0.5	0.5	0.5			
	Horse	0.5	0.5	0.5			
	Poultry	0.1	0.1	0.1			
	Sheep	0.5	0.5	0.5			
	Eggs	0.1 [W]					
Fenoxaprop-ethyl	Cattle	0.05	0.05	0.05			40 CFR 180.430
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Fenpropathrin	Cattle	1.0	0.1	0.1			40 CFR 180.466
	Goat	1.0	0.1	0.1			
	Hogs	1.0	0.1	0.1			
	Horse	1.0	0.1	0.1			
	Poultry	0.05	0.05	0.05			
	Sheep	1.0	0.1	0.1			
	Eggs	0.05					
Fenridazone-potassium	Cattle	0.05	0.05	0.05	1.0	1.0	40 CFR 180.423
	Goat	0.05	0.05	0.05	1.0	1.0	
	Hogs	0.05	0.05	0.05	1.0	1.0	
	Horse	0.05	0.05	0.05	1.0	1.0	
	Poultry	0.3	0.3	0.3			
	Sheep	0.05	0.05	0.05	1.0	1.0	
	Eggs	0.05					
Fenthion	Cattle	0.1	0.1	0.1			40 CFR 180.214
	Goat						
	Hogs	0.1	0.1	0.1			
	Horse						
	Poultry	0.1	0.1	0.1			
	Sheep						
	Eggs						
Fenvalerate	Cattle	1.5	1.5	1.5			40 CFR 180.379
	Goat	1.5	1.5	1.5			
	Hogs	1.5	1.5	1.5			
	Horse	1.5	1.5	1.5			
	Poultry						
	Sheep	1.5	1.5	1.5			
	Eggs						
Fipronil	Cattle	0.4	0.04	0.04	0.1		40 CFR 180.517
	Goat	0.4	0.04	0.04	0.1		
	Hogs	0.04	0.01	0.01	0.02		
	Horse	0.4	0.04	0.04	0.1		
	Poultry	0.05	0.02	0.02			
	Sheep	0.4	0.04	0.04	0.1		
	Eggs	0.03					
Fluazifop-butyl	Cattle	0.05	0.05	0.05			40 CFR 180.411
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Flufenacet	Cattle	0.05	0.05	0.1		0.5	40 CFR 180.527
	Goat	0.05	0.05	0.1		0.5	
	Hogs	0.05	0.05	0.1		0.5	
	Horse	0.05	0.05	0.1		0.5	
	Poultry						
	Sheep	0.05	0.05	0.1		0.5	
	Eggs						
Fluridone	Cattle	0.05	0.05	0.05	0.1	0.1	40 CFR 180.420
	Goat	0.05	0.05	0.05	0.1	0.1	
	Hogs	0.05	0.05	0.05	0.1	0.1	
	Horse	0.05	0.05	0.05	0.1	0.1	
	Poultry	0.05	0.05	0.05	0.1	0.1	
	Sheep	0.05	0.05	0.05	0.1	0.1	
	Eggs	0.05					
Fluroxypyr 1-methylheptyl ester	Cattle	0.1	0.1	0.1		0.5	40 CFR 180.535
	Goat	0.1	0.1	0.1		0.5	
	Hogs	0.1	0.1	0.1		0.5	
	Horse	0.1	0.1	0.1		0.5	
	Poultry						
	Sheep	0.1	0.1	0.1		0.5	
	Eggs						
Flutolanil	Cattle	0.1	0.05	0.05	2.00	1.00	40 CFR 180.484
	Goat	0.1	0.05	0.05	2.00	1.00	
	Hogs	0.1	0.05	0.05	2.00	1.00	
	Horse	0.1	0.05	0.05	2.00	1.00	
	Poultry	0.05	0.05	0.05			
	Sheep	0.1	0.05	0.05	2.00	1.00	
	Eggs	0.05					
Fluvalinate	Cattle	0.01	0.01	0.01			40 CFR 180.427
	Goat	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horse	0.01	0.01	0.01			
	Poultry	0.01	0.01	0.01			
	Sheep	0.01	0.01	0.01			
	Eggs	0.01					
Glufosinate – ammonium	Cattle	0.05	0.05	0.1			40 CFR 180.473
	Goat	0.05	0.05	0.1			
	Hogs	0.05	0.05	0.1			
	Horse	0.05	0.05	0.1			
	Poultry	0.05	0.05	0.1			
	Sheep	0.05	0.05	0.1			
	Eggs	0.05					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Glyphosate and its metabolites	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.5 0.5 0.5 0.5 0.5 0.5	4.0 4.0 4.0 4.0 0.5 4.0	40 CFR 180.364
Halosulfuron	Cattle Goat Hogs Horse Poultry Sheep Eggs			0.1 0.1 0.1 0.1 0.1			40 CFR 180.479
HCB	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.5[1] 0.5[1] 0.5[1] 0.5[1] 0.5[1] 0.5[1]					MPI Dir 917.1
Heptachlor & heptachlor epoxide	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1]	0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1]	0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1] 0.2[1]			54 FR 33690 MPI Dir 917.1
Hexazinone	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1			40 CFR 180.396
Imazalil	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01	0.01 0.01 0.01 0.01 0.01	0.5 0.5 0.5 0.5 0.5		40 CFR 180.413

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Imidacloprid	Cattle	0.3	0.3	0.3			40 CFR 180.472
	Goat	0.3	0.3	0.3			
	Hogs	0.3	0.3	0.3			
	Horse	0.3	0.3	0.3			
	Poultry	0.05	0.05	0.05			
	Sheep	0.3	0.3	0.3			
	Eggs	0.02 [W]					
Iprodione	Cattle	0.5	0.5	0.5	3.0	3.0	40 CFR 180.399
	Goat	0.5	0.5	0.5	3.0	3.0	
	Hogs	0.5	0.5	0.5	3.0	3.0	
	Horse	0.5	0.5	0.5	3.0	3.0	
	Poultry	3.5	1.0	1.0			
	Sheep	0.5	0.5	0.5	3.0	3.0	
	Eggs	1.5 [W]					
Isoxaflutole	Cattle	0.2	0.2	0.1	0.5		40 CFR 180.537
	Goat	0.2	0.2	0.1	0.5		
	Hogs	0.2	0.2	0.1	0.5		
	Horse	0.2	0.2	0.1	0.5		
	Poultry	0.2	0.2	0.1	0.3		
	Sheep	0.2	0.2	0.1	0.5		
	Eggs	0.2 [W]					
Lambda-cyhalothrin	Cattle	3.0	0.2	0.2			40 CFR 180.438
	Goat	3.0	0.2	0.2			
	Hogs	3.0	0.2	0.2			
	Horse	3.0	0.2	0.2			
	Poultry	0.03	0.01	0.01			
	Sheep	3.0	0.2	0.2			
	Eggs	0.01 [W]					
Lindane	Cattle	7	7				40 CFR 180.133
	Goat	7	7				MPI Dir 917.1
	Hogs	4	4				
	Horse	7	7				
	Poultry	4 [1]					
	Sheep	7	7				
	Eggs						
Linuron	Cattle	1	1	1			40 CFR 180.184
	Goat	1	1	1			
	Hogs	1	1	1			
	Horse	1	1	1			
	Poultry						
	Sheep	1	1	1			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Malathion	Cattle	4	4	4			40 CFR 180.111
	Goat	4	4	4			
	Hogs	4	4.	4			
	Horse	4	4	4			
	Poultry	4	4	4			
	Sheep	4	4	4			
	Eggs	0.1 [W]					
Maleic hydrazide	Cattle	3	2.5		7	32	40 CFR 180.175
	Goat	3	2.5		7	32	
	Hogs	3	2.5		7	32	
	Horse	3	2.5		7	32	
	Poultry	0.5	0.5	1.4	0.5		
	Sheep	3	2.5		7	32	
	Eggs	0.5 [W]					
Mancozeb	Cattle				0.5	0.5	40 CFR 180.176
	Goat				0.5	0.5	
	Hogs				0.5	0.5	
	Horse				0.5	0.5	
	Poultry				0.5	0.5	
	Sheep				0.5	0.5	
	Eggs						
Metalxyl	Cattle	0.4	0.05	0.05	0.4	0.4	40 CFR 180.408
	Goat	0.4	0.05	0.05	0.4	0.4	
	Hogs	0.4	0.05	0.05	0.4	0.4	
	Horse	0.4	0.05	0.05	0.4	0.4	
	Poultry	0.4	0.05	0.05	0.4	0.4	
	Sheep	0.4	0.05	0.05	0.4	0.4	
	Eggs						
Methidathion	Cattle	0.05	0.05	0.05			40 CFR 180.298
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs						
Methoprene	Cattle	1.0	0.1	0.1			40 CFR 180.359
	Goat	1.0	0.1	0.1			
	Hogs	1.0	0.1	0.1			
	Horse	1.0	0.1	0.1			
	Poultry	1.0	0.1	0.1			
	Sheep	1.0	0.1	0.1			
	Eggs	0.1 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Methoxychlor	Cattle	3	3				40 CFR 180.120
	Goat	3	3				MPI Dir. 917.1
	Hogs	3	3				
	Horse	3	3				
	Poultry	3[1]					
	Sheep	3	3				
	Eggs						
Methoxyfenozide	Cattle	0.1	0.02	0.02	0.1		40 CFR 180.544
	Goat	0.1	0.02	0.02	0.1		
	Hogs	0.1	0.02	0.02	0.1		
	Horse	0.1	0.02	0.02	0.1		
	Poultry						
	Sheep	0.1	0.02	0.02	0.1		
	Eggs						
2-Methyl-4-chlorophenoxy-acetic acid [MCPA]	Cattle	0.1	0.1	0.1			40 CFR 180.339
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
6-Methyl-1,3- dithiolo [4,5-b] quinoxalin-2-one [Oxythioquinox]	Cattle	0.05	0.05	0.05			40CFR 180.338
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
1-Methylethyl-2-ethoxy-1-methylethyl amino phosphinothioyl -oxy benzoate [Isofenphos]	Cattle	0.1	0.1	0.1			40CFR 180.387
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
Metolachlor	Cattle	0.02	0.02	0.02	0.05	0.2	40CFR 180.368
	Goat	0.02	0.02	0.02	0.05	0.2	
	Hogs	0.02	0.02	0.02	0.05	0.2	
	Horse	0.02	0.02	0.02	0.05	0.2	
	Poultry	0.02	0.02	0.02	0.05		
	Sheep	0.02	0.02	0.02	0.05	0.2	
	Eggs	0.02 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Metribuzin	Cattle	0.7	0.7	0.7			40 CFR 180.332
	Goat	0.7	0.7	0.7			
	Hogs	0.7	0.7	0.7			
	Horse	0.7	0.7	0.7			
	Poultry	0.7	0.7	0.7			
	Sheep	0.7	0.7	0.7			
	Eggs	0.01 [W]					
Metsulfuron-methyl	Cattle	0.1	0.1	0.1		0.5	40 CFR 180.428
	Goat	0.1	0.1	0.1		0.5	
	Hogs	0.1	0.1	0.1		0.5	
	Horse	0.1	0.1	0.1		0.5	
	Poultry						
	Sheep	0.1	0.1	0.1		0.5	
	Eggs						
Mirex	Cattle	0.1 [1]	0.1 [1]	0.1 [1]			51 FR45114
	Goat	0.1 [1]	0.1 [1]	0.1 [1]			
	Hogs	0.1 [1]	0.1 [1]	0.1 [1]			
	Horse	0.1 [1]	0.1 [1]	0.1 [1]			
	Poultry	0.1 [1]	0.1 [1]	0.1 [1]			
	Sheep	0.1 [1]	0.1 [1]	0.1 [1]			
	Eggs						
Myclobutanil	Cattle	0.05	0.1	0.2	1.0		40 CFR 180.443
	Goat	0.05	0.1	0.2	1.0		
	Hogs	0.05	0.1	0.2	1.0		
	Horse	0.05	0.1	0.2	1.0		
	Poultry	0.02	0.02	0.02			
	Sheep	0.05	0.1	0.2	1.0		
	Eggs	0.02 [W]					
Naled	Cattle	0.05	0.05	0.05			40 CFR 180.215
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 [W]					
Nicotine	Cattle						40 CFR 180.167
	Goat						
	Hogs						
	Horse						
	Poultry	1	1	1			
	Sheep						
	Eggs	1 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Nitrapyrin	Cattle	0.05	0.05	0.05			40 CFR 180.350
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep						
	Eggs						
Norflurazon	Cattle	0.1	0.1	0.1	0.25		40 CFR 180.356
	Goat	0.1	0.1	0.1	0.25		
	Hogs	0.1	0.1	0.1	0.25		
	Horse	0.1	0.1	0.1	0.25		
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1	0.25		
	Eggs						
N-Octyl bicycloheptene dicarboximide	Cattle	0.3					40 CFR 180.367
	Goat	0.3					
	Hogs	0.3					
	Horse	0.3					
	Poultry						
	Sheep	0.3					
	Eggs						
Oxadiazon	Cattle	0.01	0.01	0.01			40 CFR 180.346
	Goat	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horse	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
	Eggs						
Oxydemeton-methyl	Cattle	0.01	0.01	0.01			40 CFR 180.330
	Goat	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horse	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
	Eggs						
Oxyfluorfen	Cattle	0.05	0.05	0.05			40 CFR 180.381
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Paraquat dichloride	Cattle	0.05	0.05	0.05		0.3	40 CFR 180.205
	Goat	0.05	0.05	0.05		0.3	
	Hogs	0.05	0.05	0.05		0.3	
	Horse	0.05	0.05	0.05		0.3	
	Poultry						
	Sheep	0.05	0.05	0.05		0.3	
	Eggs	0.01 [W]					
Permethrin	Cattle	3.0	0.25	2.0			40 CFR 180.378
	Goat	3.0	0.25	2.0			
	Hogs	3.0	0.25	3.0			
	Horse	3.0	0.25	2.0			
	Poultry	0.15	0.05	0.25			
	Sheep	3.0	0.25	2.0			
	Eggs	1 [W]					
Phosmet	Cattle	0.2	0.2	0.2			40 CFR 180.261
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
	Eggs						
Picloram	Cattle	0.2	0.2	0.2	0.5	5	40 CFR 180.292
	Goat	0.2	0.2	0.2	0.5	5	
	Hogs	0.2	0.2	0.2	0.5	5	
	Horse	0.2	0.2	0.2	0.5	5	
	Poultry	0.05	0.05	0.05			
	Sheep	0.2	0.2	0.2	0.5	5	
	Eggs	0.05 [W]					
Piperonyl butoxide	Cattle	0.1	0.1	0.1			40 CFR 180.127
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	3.0	3.0	3.0			
	Sheep	0.1	0.1	0.1			
	Eggs	1 [W]					
Pirimiphos-methyl	Cattle	0.2	0.2	0.2	2.0	2.0	40 CFR 180.409
	Goat	0.2	0.2	0.2	2.0	2.0	
	Hogs	0.2	0.2	0.2	2.0	2.0	
	Horse	0.2	0.2	0.2	2.0	2.0	
	Poultry	0.2	2.0	2.0			
	Sheep	0.2	0.2	0.2	2.0	2.0	
	Eggs	0.5 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Polyoxyethylene	Cattle Goat Hogs Horse Poultry Sheep Eggs		Exempt Exempt Exempt Exempt Exempt Exempt Exempt [W]				40 CFR 180.1078
Primisulfuron	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 [W]	0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1			40 CFR 180.452
Profenofos	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.05 0.05 0.05 0.05 0.05 0.05 0.05 [W]	0.05 0.05 0.05 0.05 0.05 0.05	0.05 0.05 0.05 0.05 0.05 0.05			40 CFR 180.404
Prohexadione calcium	Cattle Goat Hogs Horse Poultry Sheep Eggs			0.05 0.05 0.05 0.05	0.1 0.1 0.1 0.1		40 CFR 180.547
Propamocarb hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1			40 CFR 180.499
Propargite	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 [W]	0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1			40 CFR 180.259

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Propham	Cattle	0.5	0.5	0.5			40 CFR 180.319
	Goat	0.5	0.5	0.5			
	Hogs	0.5	0.5	0.5			
	Horse	0.5	0.5	0.5			
	Poultry	0.5	0.5	0.5			
	Sheep	0.5	0.5	0.5			
	Eggs	0.5 [W]					
Propiconazole	Cattle	0.1	0.1	0.1 [3]	2.0	2.0	40 CFR 180.434
	Goat	0.1	0.1	0.1 [3]	2.0	2.0	
	Hogs	0.1	0.1	0.1 [3]	2.0	2.0	
	Horse	0.1	0.1	0.1 [3]	2.0	2.0	
	Poultry	0.1	0.1	0.1 [3]	0.2	0.2	
	Sheep	0.1	0.1	0.1 [3]	2.0	2.0	
	Eggs	0.1 [W]					
Propionic acid	Cattle		Exempt	Exempt			40 CFR 180.1023
	Goat		Exempt	Exempt			
	Hogs		Exempt	Exempt			
	Horse		Exempt	Exempt			
	Poultry		Exempt	Exempt			
	Sheep		Exempt	Exempt			
	Eggs		Exempt [W]				
Propyzamide	Cattle	0.02	0.02	0.02 [3]	0.4	0.4	40 CFR 180.317
	Goat	0.02	0.02	0.02 [3]	0.4	0.4	
	Hogs	0.02	0.02	0.02 [3]	0.4	0.4	
	Horse	0.02	0.02	0.02 [3]	0.4	0.4	
	Poultry	0.02	0.02	0.02 [3]	0.2	0.2	
	Sheep	0.02	0.02	0.02 [3]	0.4	0.4	
	Eggs	0.02 [W]					
Pyrethrins	Cattle	0.1	0.1	0.1			40 CFR 180.128
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.2	0.2	0.2			
	Sheep	0.1	0.1	0.1			
	Eggs	0.1 [W]					
Pyridaben	Cattle	0.05	0.05	0.05			40 CFR 180.494
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Quinclorac	Cattle	0.7	0.05	1.5			40 CFR 180.463
	Goat	0.7	0.05	1.5			
	Hogs	0.7	0.05	1.5			
	Horse	0.7	0.05	1.5			
	Poultry	0.2	0.05	0.1			
	Sheep	0.7	0.05	1.5			
	Eggs	0.05 [W]					
Quizalofop-ethyl	Cattle	0.05	0.02	0.05			40 CFR 180.441
	Goat	0.05	0.02	0.05			
	Hogs	0.05	0.02	0.05			
	Horse	0.05	0.02	0.05			
	Poultry	0.05	0.02	0.05			
	Sheep	0.05	0.02	0.05			
	Eggs	0.02 [W]					
Sethoxydim	Cattle	0.2	0.2	0.2			40 CFR 180.412
	Goat	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horse	0.2	0.2	0.2			
	Poultry	0.2	0.2	2.0			
	Sheep	0.2	0.2	0.2			
	Eggs	2.0 [W]					
Simazine	Cattle	0.02	0.02	0.02			40 CFR 180.213
	Goat	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horse	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 [W]					
Sodium acifluorfen	Cattle				0.02	0.02	40 CFR 180.383
	Goat				0.02	0.02	
	Hogs				0.02	0.02	
	Horse				0.02	0.02	
	Poultry	0.02	0.02	0.02			
	Sheep				0.02	0.02	
	Eggs	0.02 [W]					
Spinosad	Cattle	0.6	0.04	0.2			40 CFR 180.495
	Goat	0.6	0.04	0.2			
	Hogs	0.6	0.04	0.2			
	Horse	0.6	0.04	0.2			
	Poultry						
	Sheep	0.6	0.04	0.04			
	Eggs						

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Sulfosate	Cattle	0.5	1.0	1.5		6.0	40 CFR 180.489
	Goat	0.5	1.0	1.5		6.0	
	Hogs	0.5	1.0	1.5		6.0	
	Horse	0.5	1.0	1.5		6.0	
	Poultry	0.05	0.05	0.1			
	Sheep	0.5	1.0	1.5		6.0	
	Eggs	0.05 [W]					
Tebuconazole	Cattle			0.2			40 CFR 180.474
	Goat			0.2			
	Hogs			0.2			
	Horse			0.2			
	Poultry			0.2			
	Sheep			0.2			
	Eggs						
Tebufenozide	Cattle	0.1	0.08	0.08			40 CFR 180.482
	Goat	0.1	0.08	0.08			
	Hogs	0.1	0.08	0.08	1.0	0.02	
	Horse	0.1	0.08	0.08			
	Poultry	0.1	0.01	0.05			
	Sheep	0.1	0.08	0.08	1.0	0.02	
	Eggs	0.01 [W]					
Tebuthiuron	Cattle	2	2	2			40 CFR 180.390
	Goat	2	2	2			
	Hogs						
	Horse	2	2	2			
	Poultry						
	Sheep	2	2	2			
	Eggs						
Terbacil	Cattle	0.1	0.1	0.1			40 CFR 180.209
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
Tetrachlovinphos	Cattle	1.5					40 CFR 180.252
	Goat	0.5					
	Hogs	1.5					
	Horse	0.5					
	Poultry	0.75					
	Sheep	0.5					
	Eggs	0.1 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Tetraconazole	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.6	0.03	0.03	6.0	0.2	40 CFR 180.557
Tetradifon	Cattle Goat Hogs Horse Poultry Sheep Eggs		0 0 0 0 0 0				40 CFR 180.174
Thiabendazole	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 [W]	0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1			40 CFR 180.242
Thiobencarb	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.2 0.2 0.2 0.2 0.2 0.2 0.2 [W]	0.2 0.2 0.2 0.2 0.2 0.2	0.2 0.2 0.2 0.2 0.2 0.2			40 CFR 180.401
Thiophanate-methyl	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 [W]	0.1 0.1 0.1 0.1 0.1 0.1	0.1 [3] 0.1 [3] 0.1 [3] 0.1 [3] 0.1 [3] 0.1 [3]	2.5 2.5 1.0 1.0 0.2 2.5	0.2 0.2 0.2	40 CFR 180.371
Triadimefon	Cattle Goat Hogs Horse Poultry Sheep Eggs	1.0 1.0 0.04 1.0 0.04 1.0 0.04 [W]	1.0 1.0 0.04 1.0 0.04 1.0	1.0 1.0 0.04 1.0 0.04 1.0			40 CFR 180.410

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Triadimenol	Cattle	0.1	0.1	0.1			40 CFR 180.450
	Goat	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horse	0.1	0.1	0.1			
	Poultry	0.01	0.01	0.01			
	Sheep	0.1	0.1	0.1			
	Eggs	0.01 [W]					
Triasulfuron	Cattle	0.1	0.1	0.1[4]		0.5	40 CFR 180.459
	Goat	0.1	0.1	0.1[4]		0.5	
	Hogs	0.1	0.1	0.1[4]		0.5	
	Horse	0.1	0.1	0.1[4]		0.5	
	Poultry						
	Sheep	0.1	0.1	0.1[4]		0.5	
	Eggs						
S,S,S-Tributyl phosphorotrithioate	Cattle	0.02	0.02	0.02			40 CFR 180.272
	Goat	0.02	0.02	0.02			
	Hogs						
	Horse						
	Poultry						
	Sheep	0.02	0.02	0.02			
	Eggs						
Trichlorfon	Cattle	0.1	0.1	0.1			40 CFR 180.198
	Goat						
	Hogs						
	Horse						
	Poultry						
	Sheep						
	Eggs						
Trifloxystrobin	Cattle	0.05	0.05	0.05			40 CFR 180.555
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Triclopyr	Cattle	0.05	0.05	0.05	0.5	0.5	40 CFR 180.417
	Goat	0.05	0.05	0.05	0.5	0.5	
	Hogs	0.05	0.05	0.05	0.5	0.5	
	Horse	0.05	0.05	0.05	0.5	0.5	
	Poultry	0.1	0.1	0.1			
	Sheep	0.05	0.05	0.05	0.5	0.5	
	Eggs	0.05 [W]					

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Triflumazole	Cattle	0.5	0.05	0.5			40 CFR 180.476
	Goat	0.5	0.05	0.5			
	Hogs	0.5	0.05	0.5			
	Horse	0.5	0.05	0.5			
	Poultry	0.05	0.05	0.1			
	Sheep	0.5	0.05	0.5			
	Eggs	0.05 [W]					
Triphenyltin hydroxide	Cattle				0.05	0.05	40 CFR 180.236
	Goat				0.05	0.05	
	Hogs				0.05	0.05	
	Horse				0.05	0.05	
	Poultry						
	Sheep				0.05	0.05	
	Eggs						
Vinclozolin	Cattle	0.05	0.05	0.05			40 CFR 180.380
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry	0.1	0.1	0.1			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 [W]					
Zeta-cypermethrin	Cattle	0.05	0.05	0.05			40 CFR 180.418
	Goat	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horse	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						

1. Action level

2. All tissues of poultry excluding kidneys

3. Excluding liver and kidneys

4. Excluding kidneys

W: Whole eggs

APPENDIX IV. ANALYTICAL METHODS, 2001 NATIONAL RESIDUE PROGRAM

INTRODUCTION

The Food Safety and Inspection Service (FSIS) requires analytical methods for detecting, quantifying, and identifying residues that may be present in meat, poultry, and processed egg products. These methods can be used by the Agency for monitoring and surveillance activities to determine whether a product is adulterated and for human risk assessment evaluations. The Agency uses available methodology to take appropriate regulatory action against adulterated products, consistent with the reliability of the analytical data. This section describes the types of methods used by FSIS to conduct analyses.

KEY TO ABBREVIATIONS

APCI -- Atmospheric Pressure Chemical Ionization

Confirm -- Confirmatory Method

Determ. -- Determinative Method

ECD -- Electron Capture Detector

ELISA -- Enzyme-Linked Immuno Sorbent Assay

GC -- Gas Chromatograph

GPC -- Gel Permeation Chromatography

HPLC -- High Performance Liquid Chromatography

Method Detection Limit -- The lowest amount of individual residue or sample component that can be reliably observed or found in the sample matrix by the current appropriate analytical methodology.

MS -- Mass Spectrometry

NA -- Not Applicable

ppb -- Parts per billion

ppm -- Parts per million

SIM -- Selected-Ion Monitoring Mode

TBD -- To Be Determined

Compound Class	Compound	Method Type	Methodology	Method Detection Limit
Antibiotics	Carbadox	Determ.	GC-ECD	7.5 ppb
		Confirm.	GC-MS-SIM	NA
	Chloramphenicol	Determ.	GC	0.25 ppb
		Confirm.	GC-MS	0.5 ppb
	Florfenicol	Confirm.	GC-MS	1.9 ppm
	<u>Floroquinolones:</u> Enrofloxacin Ciprofloxacin Desethylene ciprofloxacin Sarafloxacin Danofloxacin Difloxacin Marbofloxacin Orbifloxacin	Determ.	HPLC	 25 ppb 50 ppb 12.5 ppb 50 ppb 50 ppb 50 ppb 50 ppb 25 ppb
	Tilmicosin	Determ.	HPLC- Ion Pairing	Muscle 300 ppb Liver and Kidney 600 ppb
		Confirm.	APCI-LC-MS	0.05 ppm
	<u>Antibiotics in FSIS Bioassay Method:</u> Penicillin Chlortetracycline Tetracycline or Oxytetracycline Streptomycin Neomycin Erythromycin Gentamicin Ampicillin Novobiocin Spectinomycin Tylosin	Determ. .	7-plate microbiological inhibition assay	 0.01 ppm 0.01 ppm 0.08 ppm 0.1 ppm 0.25 ppm 0.05 ppm 0.15 ppm 0.01 ppm 0.25 ppm 10 ppm 0.2 ppm
Arsenicals	Arsenicals	Determ.	Atomic Absorption Spectrophotometry	
Avermectins	Ivermectin Doramectin Moxidectin	Determ.	HPLC	2.0 ppb
		Confirm.	APCI-LC-MS	25 ppb
Beta Agonists	Ractopamine	Determ.	HPLC	
		Confirm.	LC/MS	25ppb
	Clenbuterol	Screen	ELISA	TBD
		Confirm.	LC-MS-MS	

Compound Class	Compound	Method Type	Methodology	Method Detection Limit
Chlorinated Hydrocarbons/ Chlorinated Organophosphates/ Polychlorinated Biphenyls	Organohalides: HCB Alpha BHC Lindane Heptachlor Aldrin Ronnel Linuron Oxychlordane Chlorpyrifos Nonachlor Heptachlor epoxide Endosulfan I Trans-chlordane Cis-chlordane Chlorfenvinphos Dieldrin P, p'-DDE Captan Stirofos Kepone Endrin P, p'-TDE O, p'-DDT Endosulfan II P, p'-DDT Carbophenothion Mirex Methoxychlor Phosalone Coumaphos-O Coumaphos-S Toxaphene CB 1242 PCB 1248 PCB1254 PCB 1260	Determ.	GPC with GC-ECD	 0.01 ppm 0.01 ppm 0.01 ppm 0.01 ppm 0.02 ppm 0.02 ppm 0.25 ppm 0.02 ppm 0.05 ppm 0.03 ppm 0.01 ppm 0.01 ppm 0.10 ppm 0.10 ppm 0.03 ppm 0.01 ppm 0.02 ppm 0.02 ppm 0.05 ppm 0.03 ppm 0.03 ppm 0.03 ppm 0.04 ppm 0.02 ppm 0.03 ppm 0.03 ppm 0.04 ppm 0.15 ppm 0.01 ppm 0.15 ppm 0.15 ppm 0.50 ppm 0.30 ppm 0.30 ppm 0.30 ppm 0.30 ppm
		Confirm.	GC-MS	NA
Hormones, synthetic	DES/Zeranol	Determ. & Confirm.	GC-MS	0.5 ppb
Nonsteroidal Anti-inflammatory Drugs (NSAID's)	Phenylbutazone	Determ.	GPC with GC-ECD	TBD
		Confirm.	GC-MS	TBD
Steroids	Melengesterol Acetate (MGA)	Determ.	GC	5 ppb
		Confirm.		NA

Compound Class	Compound	Method Type	Methodology	Method Detection Limit
Sulfonamides	Sulfapyridine Sulfadiazine Sulfathiazole Sulfamerazine Sulfamethazine Sulfachloropyridazine Sulfamethoxypryridazine Sulfaquinoxaline Sulfadimethoxine Sulfaethoxypyridazine Sulfaphenazole Sulfatroxazole Sulfisoxazole Sulfadoxine	Determ.	TLC	0.05 ppm
		Confirm.	GC-MS	NA