2004 FSIS National Residue Program

FOOD SAFETY AND INSPECTION SERVICE

2004 FSIS NATIONAL RESIDUE PROGRAM

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PREFACE

Welcome to the 2004 "Blue Book." This book presents the 2004 Food Safety and Inspection Service (FSIS) National Residue Program (NRP).

This text presents a comprehensive explanation of the process used to plan the NRP for 2004. 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 2004 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 2004 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 Science, FSIS, hope that you will find this *2004 National Residue Program* to be useful and informative. 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

Questions about the FSIS NRP should be directed to the USDA-FSIS Zoonotic Diseases and Residue Surveillance Division, Residue Branch, 344 Aerospace Center, 1400 Independence Avenue, SW, Washington, DC 20250-3700, telephone (202) 690-6566, fax (202) 690-6565.

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Section 1
The 2004 FSIS National Residue Program
Introduction

An essential aspect of food safety in meat, poultry, and egg products is the control of residues that may result from the use of animal drugs and pesticides, or from incidents involving environmental contaminants. The United States has a complex residue control system, with rigorous processes for approval, sampling, testing, and enforcement. Three principal agencies are involved in the control of residues in meat, poultry, and egg products: the Food Safety and Inspection Service (FSIS) of the United States Department of Agriculture (USDA), the Food and Drug Administration (FDA), and the Environmental Protection Agency (EPA). 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 (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), which are published in 40 CFR. Action Levels for industrial chemicals (e.g., cancelled pesticides) and industrial chemicals (e.g., PCBs) are established by FDA or FSIS based on recommendations published by EPA 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 strategies 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 voluntary recall and/or other actions. 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. As of

September 5, 2001, FSIS will post, on its website (www.fsis.usda.gov), the names and addresses of parties that FDA has determined are responsible for more than one drug, pesticide or other chemical residue violation in a 12-month period. FSIS believes that this new policy will act as a more effective deterrent against the repeated sale of livestock or poultry containing violative levels of chemical residues, and enable 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
The 2004 FSIS National Residue Program Components

Domestic Residue Sampling Program

The Food Safety and Inspection Service (FSIS) National Residue Program (NRP) provides a variety of sampling plans to verify and ensure 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 residue data are collected in the NRP and the data are used to support risk assessment, enforcement, and educational activities. Residue data are entered into the FSIS 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 the following:

- **Monitoring Plan**

  The FSIS Monitoring Plan is designed to provide statistical information about the occurrence of violations. A violation occurs when a chemical residue is found in a production (food) animal or egg product and the residue is in excess of an established tolerance or action level. FSIS monitors for violations by collecting samples from food animals. Collected monitoring samples are sent directly to an FSIS laboratory. Monitoring plan data are obtained from sampling healthy food animals and normal egg products that have passed inspection. Neither the animal carcass nor the egg product is retained after sampling, and these products are permitted to enter the food supply. Food animals and egg products are sampled at one of the following four levels: 460; 300; 230; or 90 samples per year (see Section 4 for an explanation). If the test results indicate that there is a potential public health concern, product that has entered the food supply can be subjected to voluntary recall. The monitoring data are analyzed on an annual, national basis.[1]

  The compounds considered for monitoring have tolerances or action levels established by either FDA or EPA. Compounds are selected for Domestic Monitoring Plan using the formal selection procedures described in the publication "2002 FSIS National Residue Program" Chapters 4, 6, and 8.

  Monitoring Plan data are used to indicate the prevalence and concentrations of residues, to evaluate residue trends, and to identify problems within the industry for which educational or other corrective efforts may be needed. Monitoring results can also be used to identify producers or other entities that market animals with violative concentrations of residues. The Monitoring Plan, therefore, not only gathers information, but also assists in deterring practices that lead to violative residues.

[1] Certain residues may be sampled for less than 12 months.

- **Surveillance**

  Surveillance sampling is scheduled to investigate and control the occurrence of residue violations in slaughter classes or egg products that are suspect because of previous residue findings, information from the field, and information from FDA. Surveillance consists of random sampling designed to measure the extent of problems in suspect populations/products and to evaluate the impact of actions taken to reduce the occurrence of residues. In-plant testing procedures may be performed by the veterinarian-in-charge, or samples may be submitted to an FSIS laboratory for analysis. Depending upon the weight of evidence that led to the testing, product may be retained until test results indicate the appropriate regulatory disposition.

- **Exploratory Projects**

  Exploratory Projects are conducted for a variety of reasons. Test results are not used to take regulatory action or to trigger follow-up action. Exploratory projects generally fall into one of the following categories:

  1. Exploratory Projects study the occurrence of residues for which no residue limits have been established. There are many chemicals (e.g., trace metals, industrial chemicals, and mycotoxins) that may be inadvertently present in animals yet have not established residue limits. Their presence in edible tissues and the resulting need for residue limits to protect public health have not been established. FSIS may conduct studies to develop information on the frequency and concentration at which such residues occur.

  2. Other projects may be designed for various purposes, such as evaluating new methods and approaches to monitoring, or supplementing the information used in considering a compound for monitoring.

- **Enforcement Testing**

  FSIS Enforcement samples are collected from individual suspect animals. FSIS in-plant personnel select animals for testing based on herd history, and antemortem or postmortem findings. Enforcement testing is performed to detect individual animals with violative concentrations of residues. This testing is used as a tool to prevent carcasses with violative residues from entering the food supply. Enforcement testing 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.

  Samples collected under enforcement testing can either be tested in the plant using a rapid screening test, in which samples with positive test results are sent to the laboratory for confirmatory testing, or sent directly to the laboratory for testing. The carcass is retained pending the laboratory results. Carcasses found to contain violative concentrations of residues are considered adulterated and are condemned.

FSIS On-Site Rapid Screening Tests

FSIS currently employs the following on-site rapid screening tests:

1. Swab Test on Premises (STOP) was implemented in 1979 to detect the presence of antibiotic residues in kidney tissues. Originally developed for testing dairy cows, now it is 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.
2. Fast Antimicrobial Screen Test (FAST) detects both antibiotic and sulfonamide drug residues in kidney tissues. At this time, it has been approved for use in bovines only. It has proved to be a suitable replacement for CAST and STOP in this species, as it is both quicker and more sensitive. FAST was implemented in bovine pilot plants in 1995 extended to approximately 50 of the largest cow and bob veal slaughtering plants in 1996, and is currently employed in all plants that slaughter cattle.

3. The Sulfa-On-Site Test (SOS) was implemented in 1988 to test swine urine for sulfonamide residues. SOS was used in many of the largest swine slaughtering facilities, but was cancelled in January 2004.

In summary, the Monitoring Plan is designed to obtain information for exposure assessment and to determine the prevalence of residue violations in the U.S. food supply. Monitoring samples are collected only from food animals and egg products that have passed USDA inspection and these products are permitted entry into the food supply. In contrast to the Monitoring Plan, enforcement testing is designed to prevent adulterated product from entering the food supply. Enforcement sampling targets suspect animals that have an abnormal or unhealthy appearance, show abnormal postmortem signs, or which are suspicious based on herd history. Under enforcement testing a carcass is retained pending laboratory results and if violative residue level is found, the carcass is considered adulterated and is condemned. Enforcement testing also occasionally includes samples from animals that have already been condemned by FSIS based on postmortem inspection.

In contrast to enforcement testing, which targets suspect animals, surveillance testing targets suspect populations. Carcasses selected for surveillance testing may or may not be retained pending the results of laboratory tests.

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. 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**

  Import 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 increase testing until compliance is demonstrated. The product is not retained after the sample is taken.

- **Increased Monitoring**

  Increased import monitoring occurs when FSIS finds a violation in a sample from a foreign country.

- **Surveillance**

  Import surveillance occurs when FSIS suspects that product from a specific country may 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**

  Import 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 to 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
The 2004 FSIS National Residue Program Design

The Food Safety and Inspection Service (FSIS) has focused special attention on the design of the monitoring plan 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 2004 FSIS National Residue Program (NRP) Domestic Monitoring Plan, 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), 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 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 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.

The final form of the scheduled sampling plans is determined by the estimated relative public health risk represented by each combination of residue and production class and by 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 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.

Because different countries have different approved compounds and different use practices, the compounds analyzed in the Import Residue Plan may not necessarily be the same as those in the Domestic Monitoring Plan.

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, Zoonotic Diseases and Residue Surveillance 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
The 2004 FSIS Domestic Monitoring Plan
Veterinary Drugs

Phase I. Generating and Ranking the 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 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. Compounds banned from extralabel use under the Animal Medicinal Drug Use Clarification Act (AMDUCA), are shown in bold type.

Antibiotics:

- At present, the following antibiotics are quantitated using the 7-plate bioassay[1] after a specific identification is made using mass spectroscopy (MS) or using high performance liquid chromatography (HPLC): tetracycline, oxytetracycline, chlortetracycline, gentamicin, streptomycin, dihydrostreptomycin, erythromycin, tylosin, neomycin, beta-lactams (quantitated as penicillin-G; penicillins and cephalosporins are not differentiated within this category), and tilmicosin (quantitated by HPLC). The following antimicrobials can be identified by MS; however, no quantitative methods are available: spectinomycin, hygromycin, amikacin, kanamycin, apramycin, tobramycin, lincomycin, pirlimycin, clindamycin, and oleandomycin.
- **Chloramphenicol**
- Florfenicol (chloramphenicol derivative)
- Thiamphenicol (chloramphenicol derivative)
- **Fluoroquinolones in FSIS MRM (ciprofloxacin, desethyleneciprofloxacin, danofloxacin, difloxacin, enrofloxacin, marbofloxacin, orbifloxacin, and sarafloxacin)**
- **Avoparcin (glycopeptide)**
- **Vancomycin (glycopeptide)**

Other Veterinary Drugs:

- Amprolium (coccidiostat)
- Arsenicals (detected as elemental arsenic)
- Avermectins in FSIS MRM (doramectin, ivermectin, and moxidectin) (antiparasitics)

[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. There are some antibiotics, however, that share the same pattern of inhibition. For these antibiotics, it is necessary to undertake follow-up testing (High Performance Liquid Chromatography, HPLC, or mass spectrometry) to establish their identities, where such follow-up methodologies are available. Tetracycline, oxytetracycline, and chlortetracycline share patterns of inhibition and are individually identified by follow-up with the HPLC method for tetracyclines; tilmicosin, tylosin, lincomycin, clindamycin, erythromycin, and pirlimycin, which are individually identified by ion-trap LC/MS/MS. Tissues found to be positive for tilmicosin are quantitated by a NADA method using HPLC. Amikacin, apramycin, dihydrostreptomycin, gentamycin, hygromycin, kanamycin, neomycin, spectinomycin, streptomycin, and tobramycin are individually identified by ion-trap LC/MS/MS. Confirmation for sulfa drugs and flunixin are also provided by the residue chemistry section at the FSIS, Midwestern Laboratory.

- Eprinomectin (avermectin)
- Benzimidazoles in FSIS MRM (thiabendazole and its 5-hydroxythiabendazole metabolite, albendazole 2-animosulfone metabolite, benomyl in the active hydrolyzed form carbendazim, oxfendazole, mebendazole, cambendazole, and fenbendazole) (anthelmintics)
- Berenil (antiprotozoal)
- Carbadox (antimicrobial)
- **Clenbuterol and other unapproved beta agonists (growth promotants)**[2]
- 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)
- 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, sulfachlorpyridazine, 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

Drugs Banned from Extralabel use under AMDUCA

[2]The screening test used by FSIS has been officially validated for clenbuterol (bovine and porcine) and has been extended to salbutamol and cimaterol (bovine). The method has also demonstrated the ability to detect other beta agonists, including ractopamine. The follow-up confirmatory method may detect several unapproved beta agonists, including the following: clenbuterol; cimaterol; fenoterol; mabuterol; salbutamol; brombuterol; and terbutaline.

FDA has advised FSIS that drugs banned from extralabel use under AMDUCA, are of high public health concern. Therefore, these drugs are not evaluated for inclusion using the ranking formula presented below. Instead, all AMDUCA drugs are automatically assigned a high sampling priority, and are included in the NRP if methodologies and resources are available. All these drugs are listed in Table 4.2a, *Drugs Banned from Extralabel use under AMDUCA*.

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:

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

Definitions of each of these categories, and the criteria used for scoring, appear at the end of this section in the "*Scoring Key for Veterinary Drugs, 2004 Domestic Residue Program*."

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

Compound Ranking

1. 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 1993 - 2002); and (b) the maximum, for any class, of the violation rate (again, averaged over 1993 - 2002), but weighted by the size of the production class. The final score for each drug was assigned based on the higher of these two scores.[3] 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.[4] However, for the many candidate compounds or compound classes of concern that have never been included in the FSIS NRP, data on violation rates are not available. It was therefore necessary to generate an estimate of the overall violation rate for each these untested compounds and compound classes.

2. 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.

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 scores for "Regulatory Concern" and "Relative Number of Animals Treated."

Table 4.1 lists 12 compounds or compound classes for which current, reliable data were available to score the category "FSIS Historical Testing Information on Violations," and 20 compounds or compound classes for which there were not. Of the 12 compounds for which there were violation rate scores, 3 (nitroimidazoles, fluoroquinolones, and phenylbutazone) were eliminated from the regression calculation because, as explained in the definition of "Regulatory Concern" at the end of this section, their scores in this category automatically default to a "4" because they are banned from extralabel use under AMDUCA. A least squares linear regression model, using the value of the independent variable from the remaining 11 scored compounds or compound classes, was then used to predict scores in the category

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

[4] 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, using Equation (4.6); the results are presented in Table 4.5.

"FSIS Historical Testing Information on Violations" for the 20 compounds for which this information is not available. The following equation was derived:

$$Vp = 0.81 + 0.16 * (W*N) \quad (4.2)$$

Where:

- Vp= Predicted score for "FSIS Historical Testing Information on Violations"
- N = score for "Relative Number of Animals Treated"
- W = score for "Withdrawal Time"
- W*N = product of W 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 are:

- A score for Regulatory Concern (R)
- A score for Withdrawal Time (W)
- A score for Relative Number of Animals Treated (N)
- R^2
- W^2
- N^2
- The product of R and W
- The product of R and N
- The product of W and N.

No terms involving "Regulatory Concern" 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 0.0316, and an R^2 value of 0.61, accounting for 61 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).

3. 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. This score, once multiplied by relative consumption data for each production class, yields a purely risk-based ranking. In addition to historical violation data, FSIS includes scores for acute and chronic toxicity concerns, impact on new and existing human disease and lack of testing information on violations as parameters for the relative public health concern calculation. The general form of the calculation is given in equation 4.3 and the scores for relative public health concern are summarized in Table 4.1.

Relative Public Health Concern = *Predicted* or *Actual* score for "FSIS Historical Testing Information on Violations" (Estimate of Relative Hazard) (4.3)
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"

A drug 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 the category "Acute or Chronic Toxicity Concerns." Compounds in this category that have the highest degree of human toxicity receive the highest score.

The category "Impact on New and Existing Human Disease" represents the extent to which the use or misuse of a 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 category "Lack of FSIS Testing Information on Violations" has been incorporated because violation data for a compound may be absent, dated or sparse. The lack of test information increases the relative public health need to obtain information on residue violations for a compound or compound class. For example, consider two hypothetical compounds, A and B. Compound A has been tested extensively and has a measured violation rate; however, there are no test data for compound B. Since there are no test data for B, a violation rate is calculated. If the measured violation rate for A and the calculated rate for B are identical and if their scores for the categories "Regulatory Concern," "Withdrawal Time," and "Number of animals treated" are also identical, FSIS believes there is greater need to sample for B than for A, because there is extensive information on A, but not for B.

The use categories for acute and chronic toxicity concerns, impact on new and existing human disease and lack of testing information on violations introduces an element of arbitrariness into the calculation for the relative public health concern because there are no fundamentally "correct" assumptions for the appropriate weight that should be given to each. FSIS considered several possible sets of weighting factors for use in Equation 4.3. The various formulas that were considered differed principally in the relative weights given to the categories "Acute or Chronic Toxicity Concerns" versus "Impact on New and Existing Human Disease," and in the magnitude of the calculated value for "Lack of FSIS Testing Information on Violations." FSIS selected the formula shown in the column for "Relative Public Health Concern Score" in Table 4.1. The selection is based on a consensus about the relative importance of each category, and how much each category should be allowed to alter the underlying risk-based score, "V," in Equation (4.4). In this formula, the score for "FSIS Historical Testing Information on Violations" has been multiplied by a weighted average of the categories 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." The selected formula formalizes the basis of FSIS's judgment for relative public health concern for each compound and enables others to observe and understand the adjustments that were made. It also 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, 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 formulas used here for the veterinary drugs, and in Chapter 6 for the pesticides, have been normalized to give the same maximum value. Because the formula for the pesticides uses different terms (i.e., scoring categories) from that for the veterinary drugs, their scores are not comparable in a quantitative sense. However, as a result of the normalization, the scores for the pesticides and veterinary drugs are comparable in magnitude which enables a rough comparison to be made between the two different categories of compounds.

In Table 4.2b, *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 4.2b 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.[5] 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 2004 NRP

Following the completion of the ranking of the veterinary drugs, FSIS (1) used the ranking scores for relative public health concern as criteria for selecting compounds and compound classes to include in the 2004 NRP and (2) determined which of these compounds and compound classes could be included in the 2004 NRP, based on the availability of laboratory resources.

The consensus of FSIS and FDA was that those compounds and compound classes ranked 11th or higher (out of a total of 31) represent a potential public health concern sufficient to justify their inclusion in the 2004 NRP. In addition, FDA expressed an interest in having FSIS perform limited testing on two compound that did not fall within this group of 24 (veterinary tranquilizers, ranked 29th, in market hogs); and MGA (ranked 23rd).

Once the high-priority compounds and compound classes had been identified, it was necessary for FSIS to apply practical considerations to determine the compounds for which the Agency would sample. The principal consideration 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 2004 Monitoring Plan:

Antibiotics:

At present, the following antibiotics are quantitated using the 7-plate bioassay after a specific identification is made using mass spectroscopy (MS) or using high performance liquid chromatography (HPLC): tetracycline, oxytetracycline, chlortetracycline, gentamicin, streptomycin, dihydrostreptomycin,

[5] See footnote 4.

erythromycin, tylosin, neomycin, beta-lactams (quantitated as penicillin-G; penicillins and cephalosporins are not differentiated within this category), and tilmicosin (quantitated by HPLC). The following antimicrobials can be identified by MS; however, no quantitative methods are available: spectinomycin, hygromycin, amikacin, kanamycin, apramycin, tobramycin, lincomycin, pirlimycin, clindamycin, and oleandomycin.

- Chloramphenicol

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)[6]
- Flunixin (NSAID)
- MGA (hormone, synthetic)
- Phenylbutazone (NSAID)
- Phenylbutazone (ELISA)
- Sulfonamides in FSIS MRM

In the 2004 NRP, FSIS plans to employ 12 methodologies that analyze for veterinary drugs. Six 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.

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 2004 Monitoring Plan. For each highly ranked compound or compound class that was not included in the 2004 Monitoring Plan, 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.

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 2004 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 to be Considered for Each Veterinary Drug/Drug Class*. C/PC pairs included in the 2004 NRP are designated by a "●." Those C/PC pairs that are of regulatory concern, but that could not be included in the 2004 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 "**O**" (i.e., these production classes will be sampled for phenylbutazone, but only because it is automatically detected through the CHC/COP methodology). **In addition, FSIS has suspended monitoring testing for certain production classes in 2004, which are marked with a "■."**

[6]See footnote 2.

Nomenclature

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 veal are calves up to three weeks of age or 150 pounds
- Formula-fed veal are confinement-raised calves fed on a liquid milk replacer diet and weighing more than 150 pounds.
- Non-formula-fed veal 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, sexually intact male swine.
- Stags are male swine castrated after they have reached sexual maturity.
- Sows are mature female swine.
- Sheep are mature sheep with no distinction by gender.
- Lambs are young sheep for which there is proof that the ovine was less than 14 months of age, or that exhibit a break joint (epiphysis) of the distal metacarpal bone of either foreleg.
- Goats are of either sex and any age.
- Horses are of either sex and any age.
- Bison are of either sex and any age.
- Young chickens are 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 are 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 4.4 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 for animals (and egg products) that were presented for slaughter (or processing) in federally inspected establishments during calendar year 2002 were employed as a surrogate for consumption. The production data for calves were collected, collated and reported by FSIS, using the Automated Data Reporting System. The production data for all other production classes, including egg products, were collected by FSIS, and collated and reported by the National Agricultural Statistical Service. 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:

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

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

FSIS has sufficient analytical capability to consider sampling production classes of concern for the following compounds/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 (as calculated in Table 4.1) was multiplied by the estimated relative percent of domestic consumption for each production class (as calculated in Table 4.5 and as presented in Table 4.4). This is shown in Equation (4.6):

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

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 through 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: > 78 = 460 samples; 3.85 – 46.6 = 300 samples; 0.31 – 3.02 = 230 samples; < 0.31 = 90 samples. These priority scores were combined with historical violation rate information for each individual C/PC pair, information on laboratory sampling capacity, and the number of slaughter facilities 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).[7] 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 v is the true violation rate in the population and n is the number of

samples, the probability, P, of finding at least one violation among the n samples (assuming random sampling) is: $P = 1-(1-v)^n$. Therefore, if the true violation rate is 1%, the probabilities of detecting at least one violation with sampling levels of 460, 300, 230, and 90 are 99%, 95%, 90%, and 60%, respectively. The higher sampling levels are useful when FSIS wishes to monitor slaughter classes with somewhat lower violation rates (which is typically done for larger slaughter classes, since these represent a larger potential consumer exposure). For example, if the true violation rate is 0.5%, increasing the sampling level from 300 to 460 increases the chance of detecting a violation from 78% to 90%. By contrast, the lower sampling levels enable FSIS to ensure, without expending excessive resources that gross residue violation problems do not exist in minor slaughter classes. For example, while 90 samples offers only a 60% probability of violation detection at a violation rate of 1%, at a violation rate of 3% the detection probability increases to 94%.

Horses, rabbits, ratites, squab, geese, ducks, and bison will not be scheduled for the 2004 domestic monitoring program for the 2004 NRP because the minor species are low production animals. However, horses are of concern for residue violations and enforcement testing will continue. Not scheduling the minor species will allow FSIS to focus those resources on the development of methodologies in areas that are of high public health concern.

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 4.6a, *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 01/01/1993 - 12/31/2002, the total number of samples analyzed by FSIS under its Monitoring Plan (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:

- Less than 300 samples from the C/PC pair tested over the 10-year period: +1 level (i.e., increase by one sampling level, e.g., from 230 samples to 300 samples).
- At least 300 samples tested over the 10-year period, violation rate $\geq$ 0.50%, but < 0.70%: +1 level.
- At least 300 samples tested over the 10-year period, violation rate $\geq$ 0.70%: +2 levels.
- At least 300 samples tested over the 10-year period, violation rate = 0.00%: -1 level.
- The maximum number of samples to be scheduled for testing is 460.

All of the above adjustments were applied, and the sampling numbers obtained following these adjustments are listed in Table 4.6a and 4.6b under the heading "Initial Adjustment" (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.

For antibiotics and sulfonamides, it was decided to increase the number of analyses in market hogs from 460 to 1000. The increase in sampling numbers for market hogs for antibiotics was offset by reducing the number of samples for young chickens, formula-fed veal, and bob veal.

For sulfonamides, the number of samples for market hogs was increased to 1000. The number of samples for steers and bob veal was reduced from 460 to 300 for both production classes. FSIS is in the process of validating FAST in swine; to complete the validation study, a large number of samples is needed.

Adjustment for the Number of Slaughter Facilities

An adjustment to the total number of monitoring samples was made based on the number of production facilities. For this adjustment, FSIS considered the total number of production facilities (USDA Inspected Establishments for 2002) for each production class. If the total number of production facilities for a production class was found to be low relative to other production classes, the total number of monitoring samples was reduced for that production class. The number of samples selected for the reduction is based on FSIS professional judgment. If the number of facilities is less than 100, but greater than 10, the number of monitoring samples was adjusted down by 1 level. If the total number of facilities is less than 10, the number of monitoring samples was adjusted down by 2 levels. Based on these parameters, the number of monitoring samples was adjusted for the following production classes: “Young Turkeys”, “Mature Chickens”, “Ducks”, “Mature Turkeys” and “Horses.”

Adjustment for a zero (0%) violation rate for the three year period, 2000 – 2002

FSIS historical violation data were examined for the 2000 - 2002 production years. For compound slaughter class pairs that had a zero percent violation rate for the three year period, the number of scheduled samples was reduced to zero.

Final Adjustment

The sample numbers obtained following adjustments for laboratory capacity, production, and violation rate data are listed in Table 4.6, under the heading "Final Adjustment."

"Limited Resource" Sampling

The 2004 NRP includes a number of compounds for which FSIS does not have extensive sampling data. In monitoring for these compounds, FSIS is concerned with obtaining information on their occurrence in particular production classes where it is suspected they might be of concern. To enable FSIS to sample this entire range of compounds, it is 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 be taken from each production class analyzed. If too few samples are taken from a production class, and no violations are detected, it would be difficult to interpret such a result. Where possible, a minimum of 300 analyses are scheduled in each production class to be sampled. This yields a 95% chance of detecting a violation, if the true violation rate is 1%. However, because of laboratory resource limitations, it is not always possible to sample at this level.

For the 2004 NRP, selection of production classes for the limited resource sampling for compounds (Table 4.6b) was made as follows:

- Chloramphenicol is of concern in dairy cows, formula-fed veal, non-formula-fed veal, young chickens, mature chickens, young turkeys, and mature turkeys. The analytical capacity is 910 samples for chloramphenicol for the 2004 NRP.

- Flunixin is of concern in dairy cows. The analytical capacity for domestic scheduled sampling of flunixin is 300 samples; therefore, 300 dairy cows will be scheduled for the 2004 NRP.

- MGA is of concern in heifers, steers, formula-fed veal, and non-formula-fed veal. The analytical capacity for MGA in 2004 is 300 samples, and the top priority production class is heifers. FSIS will conduct 300 analyses for MGA in heifers.

- Ractopamine is not scheduled in the 2004 NRP; however, ractopamine is identified in the clenbuterol MRM. Clenbuterol is scheduled to be tested in steers, formula-fed veal, and market hogs.

- Clenbuterol is of concern in steers, formula-fed veal, and market hogs. The analytical capacity for clenbuterol in 2004 is 830 samples. FSIS will conduct 830 analyses for clenbuterol in steers, formula-fed veal, and market hogs.

The above information is presented in tabular format at the end of Section 10 in Table 10.1, *Detailed Sampling Plan, 2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*, Table 10.2, *Summary, 2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*, and in Table 10.6, *Combined Summary, 2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects and Import Monitoring Plan*.

Scoring Key for Veterinary Drugs

FSIS Historical Testing Information on Violations (01/01/1993 - 12/31/2002)

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 1993 - 2002, divided by the total number of samples analyzed). Score as follows:

4 = > 0.70%
3 = 0.31% - 0.70 %
2 = 0.15% - 0.30%
1 = < 0.15%
NT = Not tested by FSIS
NA = Tested by FSIS, but violation information does not apply

Note that the above violation rate criteria are different from those used in planning the 1998 – 2002 NRP's. For previous NRP's the criteria were as follows: 4 = > 1.0%; 3 = 0.50% - 1.0 %; 2 = 0.15% - 0.49%; and 1 = < 0.15%. These new cutoffs permit FSIS to better distinguish between "high-violation" and "low-violation" slaughter classes.

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

A 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, information concerning 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 not approved for use in food animals in th 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 (1/1/1993 - 12/31/2002); or FSIS has included this compound within its program only between 6 and 10 years ago (1/1/1993 - 12/31/1997), 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 (1/1/1998 - 12/31/2002), but in fewer than 75% of the production classes of interest; or even if 75% of production classes were tested, there was no production class from which at least 300 samples have been analyzed; 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, with at least 300 samples in at least one production class; 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 100% of the 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 an MRM, the method used covers all compounds of interest with the compound class. Or if FSIS has included this compound in its sampling program for at least 4 of the past 5 years, and at least 6,000 samples have been analyzed during this period.

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, principally from the potential to change patterns of antibiotic resistance in human pathogens.

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 economic data on doses sold, as well as surveys of treatment practices in animal populations that are representative of national feedlot, dairy, poultry, 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.

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
2004 FSIS NRP, Domestic Monitoring Plan

Compound / Compound Class	Historical Testing Info. on Violations (FSIS) (V)	Regulatory Concern (CVM) (R)	Withdrawal Time (CVM) (W)	Relative Number Animals Treated (CVM) (N)	Predicted V =0.81227 + 0.16319 * W*N	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]})
Antibiotics quantitated by the FSIS Bioassay MRM	4	4	4	4	3.42	4.00	3	4	1	15.0
Carbadox (antimicrobial)	3	4	4	3	2.77	3.00	3	4	3	12.4
Sulfonamides (antimicrobials, some are coccidiostats)	4	4	3	4	2.77	4.00	3	3	1	12.0
Florfenicol (chloramphenicol deriv.)	NT	3	4	4	3.42	3.42	3	3	4	11.8
Avermectins in FSIS MRM (incl. doramectin, ivermectin, moxidectin) (antiparasitics)	3	3	4	4	3.42	3.00	2	4	1	10.5
Sulfanitran (antibacterial, coccidiostat)	NT	4	3	4	2.77	2.77	3	3	4	9.6
Arsenicals (detected as As)	3	4	2	4	2.12	3.00	3	2	1	6.8
Flunixin	3	4	2	3	1.79	3.00	1	2	2	5.5
Ractopamine (beta agonist)	NA-O [NT]	4	2	3	1.79	1.79	2	3	3	5.4
Thyreostats (incl. thiouracil)	NT	4	3	1	1.30	1.30	2	4	4	5.2
Dipyrone (NSAID)	NT	4	3	1	1.30	1.30	1	4	4	4.9
Berenil (antiprotozoal, Histomonas)	NA-G, Mx	4	4	1	1.47	1.47	2	3	4	4.6
Trenbolone (hormone, synthetic)	NT	4	1	3	1.30	1.30	3	3	4	4.5
Zeranol (hormone, synthetic)	NT	3	1	3	1.30	1.30	3	3	4	4.5
Methyl prednisone (glucocorticoid)	NT	4	2	2	1.47	1.47	1	3	4	4.2
Eprinomectin (avermectin)	NT	2	2	3	1.79	1.79	2	2	4	4.1
Clorsulon (anthelmintic, Trematodes)	NT	2	3	2	1.79	1.79	2	2	4	4.1
Dexamethasone (glucocorticoid)	NA-O	4	2	2	1.47	1.47	1	3	3	4.0
Thiamphenicol (chloramphen. deriv.)	NT	3	2	1	1.14	1.14	3	3	4	3.9

Table 4.1 - *Continued*
Scoring Table for Veterinary Drugs
2004 FSIS NRP, Domestic Monitoring Plan

Compound / Compound Class	Historical Testing Info. on Violations (FSIS) (V)	Regulatory Concern (CVM) (R)	Withdrawal Time (CVM) (W)	Relative Number Animals Treated (CVM) (N)	Predicted V =0.81227 + 0.16319 * W*N	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	1.47	1.47	3	2	4	3.8
Hormones, naturally-occurring	NT	2	1	4	1.47	1.47	2	2	4	3.4
Lasalocid (coccidiostat)	NT	2	1	3	1.30	1.30	3	2	4	3.4
MGA (hormone, synthetic)	1	3	1	4	1.47	1.00	3	3	3	3.3
Levamisole (anthelmintic, Nematodes)	3	3	3	2	1.79	3.00	1	1	3	3.3
Prednisone (glucocorticoid)	NT	2	2	1	1.14	1.14	1	3	4	3.3
Etodolac (NSAID)	NT	3	2	1	1.14	1.14	1	3	4	3.3
Halofuginone (antiprotozoal, coccidiostat)	1	1	2	2	1.47	1.00	2	2	3	2.2
Benzimidazoles (anthelmintic)	1	1	3	2	1.79	1.00	1	2	4	2.0
Veterinary tranquilizers	NT	4	2	2	1.47	1.47	1	1	4	1.7
Nicarbazin (coccidiostat)	NA-O [1]	2	2	1	1.14	1.14	2	1	4	1.6
Morantel and pyrantel (anthelmintic)	1	1	1	2	1.14	1.00	2	1	3	1.4

Key:
MRM = multiresidue method
NT = not tested by FSIS (01/01/1993 - 12/31/2002)
NA = compound has been tested by FSIS (01/01/1993 - 12/31/2002), but the information is not applicable
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-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-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.

Table 4.2a
Drugs Banned from Extralabel use under AMDUCA*
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Drug	Status in the 2004 NRP
1	Chloramphenicol	Domestic: 230, 90, 90, 230, 90, 90, 90, 90 samples for dairy cows, formula-fed veal, non-formula-fed veal, young chickens, mature chickens, young turkeys and mature turkeys, respectively. Import: 90 samples for fresh beef and 24 samples for fresh veal
2	Nitrofurans, including furazolidone and nitrofurazone (antimicrobials)	NIP; no method
3	Clenbuterol**	Domestic: 300, 230, and 300 samples are scheduled for steers, formula-fed veal, and market hogs, respectively. Confirmation done by FDA-NCTR. Import: No samples scheduled
4	Ronidazole (nitroimidazole; antimicrobial use)	NIP
5	Nitroimidazoles (FSIS MRW: dimetridazole and ipronidazole; antiprotozoal use)	NIP
6	Avoparcin (glycopeptide)	NIP
7	Vancomycin (glycopeptide)	NIP
8	Diethylstilbestrol (DES; synthetic hormone)	Domestic: special project for 2004
9	Phenylbutazone (NSAID)	Monitoring Plan: Immunoassay (ELISA) and as part of the CHC/COP MRM Domestic: all production classes except horses, bob-veal, ducks, bison, ratites, geese, rabbits, and squab Import: all production classes except processed veal

*Drugs banned from extralabel use under AMDUCA were not evaluated using the ranking formula for inclusion in Table 4.2a. Instead, these drugs were automatically assigned a high sampling priority and will be included in the NRP if methodologies and resources are available.

**The clenbuterol methodology employs a screen that has been officially validated for clenbuterol (bovine and porcine) and has been extended to salbutamol and cimaterol (bovine). The method has also demonstrated the ability to detect other beta agonists, including ractopamine. The follow-up confirmatory method may detect several unapproved beta agonists, including the following: clenbuterol; cimaterol; fenoterol; mabuterol; salbutamol; brombuterol; and terbutaline.

Table 4.2b
Rank and Status of Veterinary Drugs
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Drug	Score	Status in the 2004 NRP
1	**Antibiotics** At present, the following antibiotics are quantitated using the 7-plate bioassay after a specific identification is made using mass spectroscopy (MS) or using high performance liquid chromatography (HPLC): tetracycline, oxytetracycline, chlortetracycline, gentamicin, streptomycin, dihydrostreptomycin, erythromycin, tylosin, neomycin, beta-lactams (quantitated as penicillin-G; penicillins and cephalosporins are not differentiated within this category), and tilmicosin (quantitated by HPLC). The following antimicrobials can be identified by MS; however, no quantitative methods are available: spectinomycin, hygromycin, amikacin, kanamycin, apramycin, tobramycin, lincomycin, pirlimycin, clindamycin, and oleandomycin.	**15.0**	Monitoring Plan: MRM Domestic: all production classes except sheep, rabbits, ratites, geese, squab, horses, goats, ducks, steers, young turkeys, bulls, mature turkeys, and egg products Imported: all fresh product classes
2	Carbadox (antimicrobial)	**12.4**	Monitoring Plan: Not scheduled
3	**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. Domestic: all production classes except young chickens, young turkeys, heifers, egg products, sows, mature chickens, ducks, goats, horses, bison, squab, sheep, ratites, geese, and rabbits Imported: all production classes
4	Florfenicol (chloramphenicol derivative)	**11.8**	NIP
5	**Avermectins** in FSIS MRM (doramectin, ivermectin, and moxidectin) (antiparasitic)	**10.5**	Monitoring Plan, MRM Domestic: scheduled for beef cows, bulls, goats, non-formula fed veal, and sheep production classes Imported: all non-avian fresh product classes, except goats
6	Sulfanitran (antibacterial, coccidiostat)	**9.6**	NIP; no method; need to add to sulfonamide MRM, or find a new method
7	Arsenicals (detected as As)	**6.8**	Domestic: scheduled for young chickens, young turkeys, and goats Imported: All avian production classes. Fresh goat and pork. Processed pork and beef/pork
8	Flunixin (NSAID)	**5.5**	Domestic: 300 dairy cows
9	Ractopamine (beta agonist)	**5.4**	Monitoring Plan: Not scheduled for 2004
10	Thyreostats (incl. thiouracil)	**5.2**	NIP
11	Dipyrone (NSAID)	**4.9**	NIP
Based on consultation with FDA, CDC, and other agencies, compounds below this point (with the exception of MGA and veterinary tranquilizers) were not considered to represent a potential public health risk. However, samples may be collected for testing for these compounds on an as-needed basis. Based on these considerations, the following compounds were not selected for inclusion in the 2004 FSIS National Residue Program (NRP).			
12	Berenil (antiprotozoal)	**4.6**	NIP
13	Trenbolone (hormone, synthetic)	**4.5**	NIP
14	Zeranol (hormone, synthetic)	**4.5**	Monitoring Plan: Domestic: Not scheduled for 2004

Table 4.2b - *Continued*
Rank and Status for Veterinary Drugs
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Drug	Score	Status in the 2004 NRP
15	Methyl prednisone (glucocorticoid)	**4.2**	NIP
16	Eprinomectin (avermectin)	**4.1**	NIP
17	Clorsulon (anthelmintic)	**4.1**	NIP
18	Dexamethasone (glucocorticoid)	**4.0**	NIP
19	Thiamphenicol (chloramphenicol derivative)	**3.9**	NIP
20	Amprolium (coccidiostat)	**3.8**	NIP
21	**Hormones, naturally-occurring** (17-estradiol, testosterone, and progesterone)	**3.4**	NIP
22	Lasalocid (coccidiostat)	**3.4**	NIP
23	MGA (hormone, synthetic)	**3.3**	Monitoring Plan: Domestic: 300 heifers
24	Levamisole (anthelmintic)	**3.3**	NIP
25	Prednisone (glucocorticoid)	**3.3**	NIP
26	Etodolac (NSAID)	**3.3**	NIP
27	Halofuginone (antiprotozoal, coccidiostat)	**2.2**	NIP
28	**Benzimidazoles** in FSIS MRM (thiabendazole and its 5-hydroxythiabendazole metabolite, albendazole 2-animosulfone metabolite, benomyl in the active hydrolyzed form carbendazim, oxfendazole, mebendazole, cambendazole, and fenbendazole) (anthelmintics)	**2.0**	NIP
29	**Veterinary tranquilizers (azaperone and its metabolite azaperol, xylazine, haloperidol, acetopromazine, propionylpromazine, and chlorpromazine)**	**1.7**	NIP
30	Nicarbazin (coccidiostat)	**1.6**	NIP
31	**Morantel and pyrantel (anthelmintic)**	**1.4**	NIP

*FDA has not set a tolerance for the following sulfonamides: sulfapyridine, sulfadiazine, sulfadoxine, sulfamethoxypyridazine, sulfisoxazole, sulfacetamide, sulfamethoxazole, sulfamethizole, sulfanilamide, sulfaguanidine, sulfasalazine, sulfaphenazole, and sulfatroxazole.

Key:
MRM = Multiresidue method
CHC/COP = Chlorinated hydrocarbon/chlorinated organophosphate
NIP = Not included in 2004 FSIS National Residue Program (NRP)
NSAID = Non-steroidal anti-inflammatory drug
FDA-NCTR = Food and Drug Administration, National Center for Toxicological Research, Jefferson, AR.

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
2004 FSIS NRP, Domestic Monitoring Plan

ERC	Production Class	Drug and Priority Rating						AMDUCA Drugs			
		Antibiotics 15.0	Avermectins 10.5	Arsenic 6.8	Flunixin 5.5	MGA[a] 3.3	Sulfonamides 12	CAM[b]	Clenbuterol	Phen[c] (CHC)	Phen[d] (ELISA)
0.021	Horses	■	■				■			■	●
0.547	Bulls	■	●				●			●	
1.806	Beef cows	●	●	■			●			●	●
1.543	Dairy cows	●	■		●		●	●		●	●
8.57	Heifers	●	■			●	■			●	●
14.471	Steers		■			○	●		●	●	●
0.026	Bob veal	●	■				●	○		■	
0.154	Formula-fed veal	●	■			○	●	●	●	●	
0.009	Non-formula-fed veal	●	●			○	●	●		●	
0.014	Heavy calves	●	■				●			●	●
0.016	Bison	■	■				■			■	
0.009	Sheep	■	●				■			●	
0.201	Lambs	●	■				●			●	
0.03	Goats	■	●	●			■			●	
18.487	Market hogs	●	■	■			●		●	●	
0.011	Roaster pigs	●	■	■			●			●	
0.064	Boars/Stags	●	■	■			●			●	
1.013	Sows	●	■	■			■			●	
42.943	Young chickens	●		●			■	●		●	
0.566	Mature chickens	●		■			■	●		●	
6.851	Young turkeys	■		●			■	●		●	
0.086	Mature turkeys	■		■			●	●		●	
0.16	Ducks	■		■			■			■	
0.003	Geese	■		■			■			■	
>>0.01	Squab	■					■			■	
0.007	Ratites	■	■				■			■	
0.002	Rabbits	■	○				■			■	
2.388	Egg products	○		■			■			●	

a. MGA = Melengestrol acetate
b. CAM = Chloramphenicol
c. Phen (CHC) = Phenulbutazone by the CHC method
d. Phen (ELISA) = Phenylbutazone by ELISA method

Table 4.3
Production Classes to be Considered for Each Veterinary Drug/Drug Class
2004 FSIS NRP, Domestic Monitoring Plan

Key:
ERC = Estimated relative percent of domestic consumption, calendar year 2002. 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 and squab.
● = Scheduled for sampling under the 2004 FSIS NRP
○ = Of potential regulatory concern, but could not be sampled under the 2004 FSIS NRP because of laboratory resource constraints or methodological limitations
⭘ = Not of regulatory concern, but sampled anyway because comes through during CHC/COP method
■ = FSIS has suspended monitoring testing for this drug/production class pair in 2004.

Table 4.4
Estimated Relative Consumption, Domestically Produced Meat, Poultry, and Egg Products
2004 FSIS NRP, Domestic Monitoring Plan

PRODUCTION CLASS	NUMBER HEAD SLAUGHTERED	LBS./ ANIMAL, DRESSED WT.	TOTAL LBS., DRESSED WT.	EST. RELATIVE CONSUMPTION
Bulls	598,000	912	545,376,000	0.547
Beef cows	3,051,000	590	1,800,090,000	1.806
Dairy cows	2,607,000	590	1,538,130,000	1.543
Heifers	11,342,000	753	8,540,526,000	8.570
Steers	17,523,000	823	14,421,429,000	14.471
Bob veal	347,145	75	26,035,875	0.026
Formula-fed veal	626,868	245	153,582,660	0.154
Non-formula-fed veal	24,254	350	8,488,900	0.009
Heavy calves	35,280	400	14,112,000	0.014
SUBTOTAL, CATTLE	**36,154,547**		**27,047,770,435**	**27.141**
Market hogs	95,459,000	193	18,423,587,000	18.487
Roaster pigs	[160,000]	70	11,200,000	0.011
Boars/Stags	271,000	235	63,685,000	0.064
Sows	3,185,000	317	1,009,645,000	1.013
SUBTOTAL, SWINE	**99,075,000**		**19,508,117,000**	**19.576**
Sheep	148,000	63	9,324,000	0.009
Lambs	2,944,000	68	200,192,000	0.201
SUBTOTAL, OVINE	**3,092,000**		**209,516,000**	**0.21**
Goats	595,501	50	29,775,050	0.030
Horses	42,312	500	21,156,000	0.021
Bison	25,340	610	15,457,400	0.016
TOTAL, ALL LIVESTOCK	**138,321,547**		**46,765,403,435**	**46.994**
Young chickens			42,794,468,277	42.943
Mature chickens			563,586,672	0.566
Young turkeys			6,827,679,975	6.851
Mature turkeys			85,602,119	0.086
Ducks			159,260,242	0.160
Geese			3,301,258	0.003
Other fowl (includes ratites)			7,363,383	0.007
SUBTOTAL, POULTRY			**50,441,261,926**	**50.616**
Rabbits			2,556,797	0.003
Egg products			2,379,668,000	2.388
GRAND TOTAL, ALL PRODUCTION CLASSES			**99,655,278,608**	**100%**

Notes on Table --- Sources 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 2002 (CY '02), with the exception of the numbers for veal and calves, which were obtained from the FSIS Automated Data Reporting System. **Livestock:** For livestock, NASS does not provide figures for total pounds dressed weight. Therefore, CY '02 NASS figures for number of head slaughtered were multiplied by CY '02 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. **Poultry, rabbits, and egg products:** For these production classes, figures for total pounds dressed weight, CY '02, were available from NASS, and it was therefore not necessary to calculate them from the number of head slaughtered. **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 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 or processing in federally inspected establishments. Dressed weight, which represents the weight of the carcass after hide, hoof, hair, and viscera 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).*

Table 4.5
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound Class	Compound Priority Rating (P)	Production Class	Relative Percent Consumption in 2002 (C)	Priority Score (P * C)	Unadjusted Number of Samples
1	Antibiotic	15.00	Young chickens	42.943	644.145	460
2	Sulfonamides	12.00	Young chickens	42.943	515.316	460
3	Arsenicals	6.80	Young chickens	42.943	292.012	460
4	Antibiotic	15.00	Market hogs	18.487	277.305	460
5	Sulfonamides	12.00	Market hogs	18.487	221.844	460
6	Antibiotic	15.00	Steers	14.471	217.065	460
7	Avermectins	10.50	Market hogs	18.487	194.114	460
8	Sulfonamides	12.00	Steers	14.471	173.652	460
9	Avermectins	10.50	Steers	14.471	151.946	460
10	Antibiotic	15.00	Heifers	8.570	128.550	460
11	Arsenicals	6.80	Market hogs	18.487	125.712	460
12	Sulfonamides	12.00	Heifers	8.570	102.840	460
13	Antibiotic	15.00	Young turkeys	6.851	102.765	460
14	Avermectins	10.50	Heifers	8.570	89.985	460
15	Sulfonamides	12.00	Young turkeys	6.851	82.212	460
16	Arsenicals	6.8	Young turkeys	6.851	46.587	300
17	Sulfonamides	12.00	Egg products	2.388	28.656	300
18	MGA	3.3	Heifers	8.570	28.281	300
19	Antibiotic	15.00	Beef cows	1.806	27.090	300
20	Antibiotic	15.00	Dairy cows	1.543	23.145	300
21	Sulfonamides	12.00	Beef cows	1.806	21.672	300
22	Avermectins	10.50	Beef cows	1.806	18.963	300
23	Sulfonamides	12.00	Dairy cows	1.543	18.516	300
24	Arsenicals	6.80	Egg products	2.388	16.238	300
25	Avermectins	10.50	Dairy cows	1.543	16.202	300
26	Antibiotic	15.00	Sows	1.013	15.195	300
27	Arsenicals	6.80	Beef cows	1.806	12.281	300
28	Sulfonamides	12.00	Sows	1.013	12.156	300
29	Avermectins	10.50	Sows	1.013	10.637	300
30	Antibiotic	15.00	Mature chickens	0.566	8.490	300
31	Antibiotic	15.00	Bulls	0.547	8.205	300
32	Arsenicals	6.80	Sows	1.013	6.888	300
33	Sulfonamides	12.00	Sows	1.013	12.156	300
34	Sulfonamides	12.00	Mature chickens	0.566	6.792	300
35	Sulfonamides	12.00	Bulls	0.547	6.564	300
36	Avermectins	10.50	Bulls	0.547	5.744	300
37	Arsenicals	6.80	Mature chickens	0.566	3.849	300
38	Antibiotic	15.00	Lambs	0.201	3.015	230
39	Sulfonamides	12.00	Lambs	0.201	2.412	230
40	Antibiotic	15.00	Ducks	0.160	2.400	230
41	Antibiotic	15.00	Formula-fed veal	0.154	2.310	230

Table 4.5 - *continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound Class	Compound Priority Rating (P)	Production Class	Relative Percent Consumption in 2002 (C)	Priority Score (P * C)	Unadjusted Number of Samples
42	Avermectins	10.50	Lambs	0.201	2.111	230
43	Sulfonamides	12.00	Ducks	0.160	1.920	230
44	Sulfonamides	12.00	Formula-fed veal	0.154	1.848	230
45	Avermectins	10.50	Formula-fed veal	0.154	1.617	230
46	Antibiotic	15.00	Mature turkeys	0.086	1.290	230
47	Arsenicals	6.80	Ducks	0.160	1.088	230
48	Sulfonamides	12.00	Mature turkeys	0.086	1.032	230
49	Antibiotic	15.00	Boars/Stags	0.064	0.960	230
50	Sulfonamides	12.00	Boars/Stags	0.064	0.768	230
51	Avermectins	10.50	Boars/Stags	0.064	0.672	230
52	Arsenicals	6.80	Mature turkeys	0.086	0.585	230
53	Antibiotic	15.00	Goats	0.030	0.450	230
54	Arsenicals	6.80	Boars/Stags	0.064	0.435	230
55	Antibiotic	15.00	Bob veal	0.026	0.390	230
56	Sulfonamides	12.00	Goats	0.030	0.360	230
57	Antibiotic	15.00	Horses	0.021	0.315	230
58	Avermectins	10.50	Goats	0.030	0.315	230
59	Sulfonamides	12.00	Bob veal	0.026	0.312	230
60	Avermectins	10.50	Bob veal	0.026	0.273	90
61	Sulfonamides	12.00	Horses	0.021	0.252	90
62	Antibiotic	15.00	Bison	0.016	0.240	90
63	Avermectins	10.50	Horses	0.021	0.221	90
64	Antibiotic	15.00	Heavy calves	0.014	0.210	90
65	Arsenicals	6.80	Goats	0.030	0.204	90
66	Sulfonamides	12.00	Bison	0.016	0.192	90
67	Sulfonamides	12.00	Heavy calves	0.014	0.168	90
68	Avermectins	10.50	Bison	0.016	0.168	90
69	Antibiotic	15.00	Roaster pigs	0.011	0.165	90
70	Antibiotic	15.00	Squab	0.010	0.150	90
71	Avermectins	10.50	Heavy calves	0.014	0.147	90
72	Antibiotic	15.00	Non-formula-fed veal	0.009	0.135	90
73	Antibiotic	15.00	Sheep	0.009	0.135	90
74	Sulfonamides	12.00	Roaster pigs	0.011	0.132	90
75	Sulfonamides	12.00	Squab	0.010	0.120	90
76	Avermectins	10.50	Roaster pigs	0.011	0.116	90
77	Sulfonamides	12.00	Non-formula-fed veal	0.009	0.108	90
78	Sulfonamides	12.00	Sheep	0.009	0.108	90
79	Antibiotic	15.00	Ratites	0.007	0.105	90
80	Avermectins	10.50	Non-formula-fed veal	0.009	0.095	90

Table 4.5 - *continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound Class	Compound Priority Rating (P)	Production Class	Relative Percent Consumption in 2002 (C)	Priority Score (P * C)	Unadjusted Number of Samples
81	Avermectins	10.50	Sheep	0.009	0.095	90
82	Sulfonamides	12.00	Ratites	0.007	0.084	90
83	Arsenicals	6.80	Roaster pigs	0.011	0.075	90
84	Avermectins	10.50	Ratites	0.007	0.074	90
85	Antibiotic	15.00	Geese	0.003	0.045	90
86	Sulfonamides	12.00	Geese	0.003	0.036	90
87	Antibiotic	15.00	Rabbits	0.002	0.030	90
88	Sulfonamides	12.00	Rabbits	0.002	0.024	90
89	Arsenicals	6.80	Geese	0.003	0.020	90

Table 4.6a
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Antibiotics	Young Chickens	644.145	3,153	0.02	0.07	460		460	300		300
Antibiotics	Market Hogs	277.305	4,760	0.32	0.29	460		460	1,000		1,000
Antibiotics	Steers	217.065	3,911	0.03	0.00	460		460			0
Antibiotics	Heifers	128.550	3,650	0.05	0.07	460		460			460
Antibiotics	Young Turkeys	102.765	4,489	0.13	0.00	460		460		300	0
Antibiotics	Beef Cows	27.090	4,370	0.14	0.34	300		300			300
Antibiotics	Dairy Cows	23.145	5,027	0.52	0.86	300	1	460			460
Antibiotics	Sows	15.195	4,224	0.43	1.16	300		300			300
Antibiotics	Mature Chickens	8.490	3,153	0.03	0.14	300		300		230	230
Antibiotics	Bulls	8.205	2,705	0.00	0.00	300	-1	230			0
Antibiotics	Lambs	3.015	3,904	0.15	0.10	230		230			230
Antibiotics	Ducks	2.400	3,674	0.11	0.00	230		230		90	0
Antibiotics	Formula-fed Veal	2.310	5,603	0.39	0.23	230		230	90		90
Antibiotics	Mature Turkeys	1.290	1,855	0.11	0.00	230		230		90	0
Antibiotics	Boars/Stags	0.960	3,088	0.23	0.57	230		230			230
Antibiotics	Goats	0.450	2,940	0.07	0.00	230		230			0
Antibiotics	Bob Veal	0.390	4,339	0.31	2.26	230	2	460	300		300
Antibiotics	Horses	0.315	2,827	6.15	6.10	230		230		90	0
Antibiotics	Bison	0.240	51	0.00	0.00	90	1	230			0
Antibiotics	Heavy Calves	0.210	3,052	0.39	0.44	90		90			90
Antibiotics	Roaster Pigs	0.165	608	1.15	1.13	90	2	300			300
Antibiotics	Squab	0.150	56	0.00	0.00	45		45			0
Antibiotics	Non-formula-fed Veal	0.135	2,525	0.55	0.33	90	1	230			230
Antibiotics	Sheep	0.135	2,556	0.04	0.00	90		90			0
Antibiotics	Ratites	0.105	168	0.00	0.00	90	-1	45			0
Antibiotics	Geese	0.045	442	0.00	0.00	90		90		45	0
Antibiotics	Rabbits	0.030	1,390	3.02	2.80	90		90			0
Total Samples						6,405		7,170			**4,520**

Table 4.6a - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Avermectins	Market Hogs	194.114	2,819	0.00	0.00	460	-1	300			0
Avermectins	Steers	151.946	3,986	0.03	0.00	460		460			0
Avermectins	Heifers	89.985	2,946	0.00	0.00	460	-1	300			0
Avermectins	Beef cows	18.963	3,214	0.12	0.11	300		300			300
Avermectins	Dairy Cows	16.202	2,822	0.11	300.00			300			0
Avermectins	Sows	10.637	2,237	0.00	0.00	300	-1	230			0
Avermectins	Bulls	5.744	2,362	0.34	0.36	300		300			300
Avermectins	Lambs	2.110	2,624	0.08	0.00	230		230			0
Avermectins	Formula-fed Veal	1.617	2,672	0.00	0.00	230	-1	90			0
Avermectins	Boars/Stags	0.672	1,454	0.00	0.00	230	-1	90			0
Avermectins	Goats	0.315	2,949	1.05	1.78	230	2	300			300
Avermectins	Bob Veal	0.273	555	0.00	0.00	90	-1	45			0
Avermectins	Horses	0.221	1,898	0.79	0.89	90	2	300			0
Avermectins	Bison	0.168	40	0.00	0.00	90	-1	45			0
Avermectins	Heavy Calves	0.147	2,498	0.28	0.00	90		90			0
Avermectins	Roaster Pigs	0.116	415	0.00	0.00	90	-1	45			0
Avermectins	Non-formula-fed veal	0.095	1,614	0.43	0.41	90		90			90
Avermectins	Sheep	0.095	1,721	0.29	1.32	90		90			90
Avermectins	Ratites	0.074	141	0.00	0.00	90	1	230			0
Total Samples						2,450		2,545			**1,080**

Table 4.6a - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Sulfonamides	Young Chickens	515.316	3896	0.1	0	460			300		0
Sulfonamides	Market hogs	221.844	3952	0.46	0.65	460		460	300		1,000
Sulfonamides	Steers	173.652	3254	0.15	0.18	460		460	300		300
Sulfonamides	Heifers	102.840	3095	0.03	0.00	460		460			0
Sulfonamides	Young Turkeys	82.212	3938	0.20	0.00	460		460		300	0
Sulfonamides	Egg Products	28.656	818	0.00	0.00	300	-1	230			0
Sulfonamides	Beef cows	21.672	4006	0.15	0.23	300		300			300
Sulfonamides	Dairy cows	18.516	3434	0.29	0.25	300		300			300
Sulfonamides	Sows	12.156	4319	0.63	0.00	300	1	460	300		0
Sulfonamides	Mature Chickens	6.792	3015	0.00	0.00	300	-1	230		90	0
Sulfonamides	Bulls	6.564	2945	0.10	0.11	300		300			300
Sulfonamides	Lambs	2.412	2964	0.13	0.10	230		230			230
Sulfonamides	Ducks	1.920	2939	0.03	0.00	230		230		45	0
Sulfonamides	Formula-fed veal	1.848	3955	0.20	0.46	230		230		90	90
Sulfonamides	Mature turkeys	1.032	2038	0.39	0.45	230		230		45	45
Sulfonamides	Boars/Stags	0.768	3333	0.63	0.15	230	1	300			300
Sulfonamides	Bob veal	0.312	4196	0.81	0.79	230	2	460	300		300
Sulfonamides	Horses	0.520	1676	0.24	0.16	90		90		45	0
Sulfonamides	Goats	0.360	2666	0.23	0.00	230		230			0
Sulfonamides	Bison	0.192	43	0.00	0.00	90	1	230		90	0
Sulfonamides	Heavy calves	0.168	2765	0.22	0.44	90		230			230
Sulfonamides	Roaster pigs	0.132	490	0.82	0.75	90	2	300			300
Sulfonamides	Squab	0.120	62	0.00	0.00	90	1	230		45	0
Sulfonamides	Non-formula-fed veal	0.108	2507	0.64	0.63	90	1	230			230
Sulfonamides	Sheep	0.108	1386	0.00	0.00	90	-1	45			0
Sulfonamides	Ratites	0.084	133	0.00	0.00	90	1	230		90	0
Sulfonamides	Geese	0.036	120	0.83	NT	90	2	300		90	0
Sulfonamides	Rabbits	0.024	462	0.00	NT	90	-1	45			0
Total Samples						5,880		7,500			**3,925**

Table 4.6a - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Arsenicals	Young Chickens	292.01	6338	0.25	0.11	460		460			460
Arsenicals	Market Hogs	125.71	2501	0.00	0.00	460	-1	300			0
Arsenicals	Young Turkeys	46.59	3380	0.27	0.07	300		300			300
Arsenicals	Egg Products	16.24	825	0.00	0.00	300	-1	230			0
Arsenicals	Beef Cows	12.28	989	0.00	0.00	300	-1	230			0
Arsenicals	Sows	6.89	1832	0.00	0.00	300	-1	230			0
Arsenicals	Mature Chickens	3.85	2052	0.00	0.00	300	-1	230		90	0
Arsenicals	Ducks	1.09	1095	0.18	0.54	230		230		45	0
Arsenicals	Mature Turkeys	0.58	695	0.00	0.00	230	-1	90		45	0
Arsenicals	Boars/Stags	0.44	1012	0.00	0.00	230	-1	90			0
Arsenicals	Goats	0.20	3975	0.30	0.12	90		90			90
Arsenicals	Roaster Pigs	0.08	438	0.00	0.00	90	-1	90			0
Arsenicals	Geese	0.02	NT	NT	NT	90		90		45	0
Total Samples						3,380		2,660			**850**

Table 4.6b
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Limited Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
MGA	Heifers	28.28	264	0.00	0.00	300		300			300
Total Samples						300		300			**300**

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Flunixin	Dairy Cows	8.502	880	0.57	0	300	1	460	300		300
Total Samples						300		460			**300**

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Chloramphenicol	Dairy cows	NA	474	0.00	0.00	45		45	230		230
Chloramphenicol	Formula-fed veal	NA	632	0.00	0.00	90	-1	45	90		90
Chloramphenicol	Non-formula-fed veal	NA	187	0.00	0.00	90	-1	45	90		90
Chloramphenicol	Young chickens	NA	NT	NT	NT	90		230			230
Chloramphenicol	Mature chickens	NA	NT	NT	NT	230		90			90
Chloramphenicol	Young turkeys	NA	NT	NT	NT	90		90			90
Chloramphenicol	Mature turkeys	NA	NT	NT	NT	230		90			90
Total Samples						865		635			**910**

Table 4.6b - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Limited Resource" Sampling
2004 FSIS NRP, Domestic Monitoring Plan

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Clenbuterol	Steers	NA	NT	NT	NA	300		300			300
Clenbuterol	Formula-fed veal	NA	NT	NT	0.00	90		90	230		230
Clenbuterol	Market hogs	NA	NT	NT	0.00	300		300			300
Total Samples						690		690			**830**

CC.	PC.	PS.	NS.[a]	VR. (%) (10 Year)[b]	VR. (%) (3 Year)[b]	UNS.[c]	Adj.[d]	IA.[e]	ALC.	APV.	FA.[f]
Phenylbutazone (by ELISA)	Dairy cows		NA	NT	NT	300		300			300
Phenylbutazone (by ELISA)	Beef cows		NA	NT	NT	230		230			230
Phenylbutazone (by ELISA)	Heifers		NA	NT	NT	90		90			90
Phenylbutazone (by ELISA)	Steers		NA	NT	NT	90		90			90
Phenylbutazone (by ELISA)	Heavy calves		NA	NT	NT	90		90			90
Total Samples						800		800			**800**

a. The total number of samples analyzed in the FSIS Monitoring Plan (01/01/1993 to 12/31/2002)
b. 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)
c. The number obtained from the last column of Table 4.5
d. For a discussion of adjustments to sampling levels (+1, +2, and -1), see the text discussion in Section 4
e. Number of samples proposed following adjustment for historical violation rate information or lack of testing information
f. Final adjustment numbers were obtained following an assessment of laboratory capacity, production volume, and 3-year violation rate data. FSIS has suspended sampling for all drugs in horses and minor species (ducks, ratites, geese, rabbits, and squab). FSIS has also suspended sampling for slaughter classes that have a violation rate of zero for the years 2000-2002.

Key:
CC. = Compound Class
PC. = Production Class
PS. = Priority Score
NS. = Number of Samples (1993-2002 analyzed by the FSIS Monitoring Plan (i.e., random sampling only)
VR. (10 Year) = Violation Rate (1993-2002) is 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).
VR. (3 Year) = Violation Rate (2000-2002) is 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).
UNS. = Unadjusted number of samples, which is obtained from last column of Table 4.7
Adj. = Adjustment based on FSIS Historical Testing Information (refer to text discussion in Section 4); +1 level, +2 levels, -1 level = There are four different sampling levels: 90, 230, 300 and 460. Sampling levels were increased or decreased (e.g., changed from 300 samples to 230 samples) based on the rules described in Section 4.
IA. = Number of samples proposed following adjustment for historical violation rate information or lack of testing information
ALC. = Adjustment for Laboratory Capacity (refer to text discussion in Section 4)
APV. = Adjustment for Production Volume (refer to text discussion in Section 4)
FA. = Final Adjustment. Finalized sample numbers, obtained following adjustments based on production volume, laboratory capacity, and 3 year violation rates
NA = Not applicable
NT = Not tested.

Section 5
The 2004 FSIS Import Monitoring Plan
Veterinary Drugs

Phase I. Generating and Ranking the 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 Monitoring Plan are the same as those listed in Section 4. Furthermore, in ranking drugs for inclusion in the Import Monitoring Plan, FSIS employed the ranking scores generated for the Domestic Monitoring 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 Monitoring Plan.

Phase II. Selecting Drugs for Inclusion in the 2004 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 2004 NRP. FSIS and FDA decided that those compounds and compound classes ranked 11th or higher (out of 31 compounds) represented a potential public health concern sufficient to justify their inclusion in the 2004 NRP.

Once the high-priority compounds and compound classes had been identified, FSIS applied other practical considerations to determine the compounds FSIS should sample. The principal consideration is the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Where the laboratory resources are limited, FSIS decided that more resources should be allocated to test domestic products since imported products have been inspected previously by the importing country. Based on these considerations, the following compounds are included in the 2004 FSIS Import Monitoring Plan.

Antibiotics:

- Those antibiotics quantitated by the FSIS Bioassay Multiresidue Method (MRM) and associated follow-up methodologies as described in chapter 4 [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

Other Veterinary Drugs:

- Arsenicals (detected as elemental arsenic (Single compound method))
- Avermectins in FSIS MRM (doramectin, ivermectin and moxidectin)
- Phenylbutazone in FSIS MRM (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)

AMDUCA Drugs

- Chloramphenicol (Single compound method)

The 2004, FSIS Import Monitoring Plan employ 6 methodologies and analyzes over 50 veterinary drugs. Two of these are single-compound methodologies, and other four are MRMs (phenylbutazone is detected by the FSIS MRM 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 2004 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 2004 NRP are designated by a "●". Those compound/product class pairs that are of potential public health concern, but that are not included in the 2004 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 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 among Different Product 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 (in lbs.) 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 data for the product classes is obtained from Automated Import Information System. 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 data presented in Table 5.5, *Number of Drug Samples/Product Class,* in the column labeled "Number of Samples."

FSIS in its Import Monitoring Plan will not test (1) processed products from eligible foreign countries that also ship fresh products to the United States; and (2) processed products from countries that source all their raw materials from other foreign countries that are eligible to ship fresh product and are actively exporting to the United States. **Processed chicken products from Hong Kong and Mexico, processed turkey products from Hong Kong, and processed pork products from Belgium will not be sampled since the raw materials used are from countries that are eligible to ship raw products to the U.S**.

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 (3 countries X 8 samples) of fresh goat would be taken for each analysis, eight from each country.

The adjusted number of samples is listed in Table 5.5, in the column labeled "Adj No 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.

Allocation of Samples among Different Countries

The total number of samples chosen for each compound/product class pair is 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 is less than 1%, eight samples per compound/compound class are taken from each country. The relative amounts of beef/pork processed, veal fresh and processed, eggs processed, chicken fresh, goat fresh, turkey processed, mutton/lamb processed, other fowl processed and fowl fresh are less than 1%. In addition, as stated above if a country is exporting either fresh and processed products or sources all their raw materials from eligible sources then no residue samples are scheduled for processed products from that country. The unadjusted numbers of samples are listed in the columns labeled, "Unadjusted Number of Samples" in Tables 5.6 to 5.11 and 5.16b. The adjusted numbers of samples per country/per product class is listed in the column labeled, "Final Number of Samples" in Tables 5.6 to 5.11 and 5.16b.

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

For major product classes, the number of samples is allocated to each country depending upon the relative amount of product imported from that country. Table 5.3, *Estimated Annual Amount (in lbs.) of Product Imported/Country*, lists the amount of product imported from each country. The percent of a product class imported from a country is 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 5.12 to 5.19.

After determining the number of samples required from each country, each country with less than eight samples is assigned a minimum of eight samples. This is indicated in the column labeled "Adjustment #1" in Tables 5.12 to 5.19 (except 5.16b). 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 is made only to those countries from which greater than eight samples are to be taken. This adjustment is accomplished using the following equations:

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

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

As mentioned above, if a country is exporting both fresh and processed products or sources all their raw materials from eligible sources then no residue samples will be processed from that country. The final numbers of products sampled are indicated in Tables 5.12 to 5.19 (except 5.16b) in the column labeled "Final Adj.#."

Notes:

The candidate veterinary drugs of concern selected by members of the Surveillance Advisory Team (SAT) for the Import Monitoring Plan are the same as those listed in Section 4.

Phenylbutazone 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.

Due to limited resources, chloramphenicol is scheduled for beef fresh (90 samples), veal fresh (24 samples). The total number of scheduled samples for chloramphenicol is 114 for the 2004 import monitoring program.

Table 5.1
Product Classes Considered for Each Drug/Drug Class
2004 FSIS NRP, Import Monitoring Plan

DRUG→	Antibiotics	Arsenicals	Avermectin	Chloramphenicol	Sulfonamides	Phenylbutazone
Beef, fresh	●		●	●	●	●
Beef, processed			○		●	●
Pork, fresh	●	●	●		●	●
Pork, processed		●	○		●	●
Beef/Pork, processed		●	○		●	●
Veal, fresh	●		●	●	●	●
Veal, processed			○		●	●
Lamb/ Mutton, fresh	●		●		●	●
Lamb/ Mutton, processed	●		●		●	●
Goat, fresh	●	●			●	●
Chicken, fresh	●	●			●	●
Chicken, processed		●			●	●
Turkey processed		●			●	●
Other fowl fresh						
Other fowl processed						
Varied combinations processed					●	●
Eggs, processed	○	●			●	

Key
● = Compound/product class sampled in the 2004 FSIS Import Monitoring Plan
○ = Compound/product class pair of regulatory concern but not included in the plan because of lab resources
O = 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 (in lbs.) of Product Imported
2004 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	PRODUCT IMPORTED IN POUNDS	% PRODUCT IMPORTED
Beef, fresh	2058212267	54.43
Beef, processed	759255955	20.08
Pork, fresh	459801822	12.16
Pork, processed	207675743	5.49
Beef/Pork, processed	32503443	0.86
Veal, fresh	14328594	0.38
Veal, processed	2819906	0.07
Lamb/Mutton, fresh	86718991	2.29
Lamb/Mutton, processed	170710	0.005
Goat, fresh	9152413	0.24
Chicken, fresh	11513207	0.30
Chicken, processed	48139413	1.27
Turkey, processed	4823340	0.13
Other Fowl, fresh	62269	0.002
Other Fowl, processed	470221	0.01
Varied combination, processed	72264199	1.91
Eggs, processed	13250935	0.35
Total/Country	**3781163428**	**100**

Table 5.3
Estimated Annual Amount (in lbs.) of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Argentina	Australia	Austria	Belgium	Brazil	Canada
Beef, Fresh		520001127				1020189220
Beef, Processed	45303505	370954087			113688218	218571658
Pork, Fresh						366524518
Pork, Processed		44	59251	6511694		128717538
Beef/Pork, Processed		12544				32353551
Veal, Fresh		1121129				7504747
Veal, Processed		2789284				30622
Lamb/Mutton, Fresh		57529300				671810
Lamb/Mutton, Processed		83062				52676
Goat, Fresh		8385882				
Chicken, Fresh						11513207
Chicken, Processed						46270365
Turkey, Processed						3554264
Other Fowl, Fresh						
Other Fowl, Processed						470221
Varied combination, Processed		6895402				58049808
Eggs, Processed						13250935
Total/Country	**45303505**	**967771861**	**59251**	**6511694**	**113688218**	**1907725140**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Costa Rica	Croatia	Czechoslovakia	Denmark	Finland	France
Beef, Fresh	18293917					
Beef, Processed						71571
Pork, Fresh				85527453	2113564	38809
Pork, Processed		233039	6572	32460383		490261
Beef/Pork, Processed						
Veal, Fresh						
Veal, Processed						
Lamb/Mutton, Fresh						
Lamb/Mutton, Processed						
Goat, Fresh						
Chicken, Fresh						
Chicken, Processed						95270
Turkey, Processed						5929
Other Fowl, Fresh						
Other Fowl, Processed						
Varied combination, Processed						64145
Eggs, Processed						
Total/Country	**18293917**	**233039**	**6572**	**117987836**	**2113564**	**765985**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Germany	Honduras	Hungary	Iceland	Ireland	Israel
Beef, Fresh		259200				
Beef, Processed						
Pork, Fresh					5505266	
Pork, Processed	875269		4103573		636518	
Beef/Pork, Processed						
Veal, Fresh						
Veal, Processed						
Lamb/Mutton, Fresh				89266		
Lamb/Mutton, Processed						
Goat, Fresh						
Chicken, Fresh						
Chicken, Processed						970816
Turkey, Processed						608832
Other Fowl, Fresh						
Other Fowl, Processed						
Varied combination, Processed						
Eggs, Processed						
Total/Country	**875269**	**259200**	**4103573**	**89266**	**6141784**	**1579648**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Italy	Mexico	Netherlands	New Zealand	Nicaragua	N. Ireland
Beef, Fresh		5079878		461576911	31599083	1212931
Beef, Processed		568533		2887173		
Pork, Fresh		82012				
Pork, Processed	5121000	1445642	9880791			
Beef/Pork, Processed		137348				
Veal, Fresh				5702718		
Veal, Processed						
Lamb/Mutton, Fresh				28428615		
Lamb/Mutton, Processed				34972		
Goat, Fresh				766531		
Chicken, Fresh						
Chicken, Processed		802962				
Turkey, Processed		654315				
Other Fowl, Fresh				62269		
Other Fowl, Processed						
Varied combination, Processed		4259874		2280733		
Eggs, Processed						
Total/Country	**5121000**	**13030564**	**9880791**	**501739922**	**31599083**	**1212931**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	**Poland**	**Spain**	**United Kingdom**	**Uruguay**
Beef, Fresh				
Beef, Processed				7211210
Pork, Fresh			10200	
Pork, Processed	16151460	982708		
Beef/Pork, Processed				
Veal, Fresh				
Veal, Processed				
Lamb/Mutton, Fresh				
Lamb/Mutton, Processed				
Goat, Fresh				
Chicken, Fresh				
Chicken, Processed				
Turkey, Processed				
Other Fowl, Fresh				
Other Fowl, Processed				
Varied combination, Processed				714237
Eggs, Processed				
Total/Country	**16151460**	**982708**	**10200**	**7925447**

Table 5.4
Relative Annual Amount of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Argentina	Australia	Austria	Belgium	Brazil	Canada
Beef, Fresh	-	25.26	-	-	-	49.57
Beef, Processed	5.97	48.86	-	-	14.97	28.79
Pork, Fresh	-	-	-	-	-	79.71
Pork, Processed	-	0.00002	0.03	3.14	-	61.98
Beef/Pork, Processed	-	0.04	-	-	-	99.54
Veal, Fresh	-	7.82	-	-	-	52.38
Veal, Processed	-	98.91	-	-	-	1.09
Lamb/Mutton, Fresh	-	66.34	-	-	-	0.77
Lamb/Mutton, Processed	-	48.66	-	-	-	30.86
Goat, Fresh	-	91.62	-	-	-	-
Chicken, Fresh	-	-	-	-	-	100.00
Chicken, Processed	-	-	-	-	-	96.12
Turkey, Processed	-	-	-	-	-	73.69
Other Fowl, Fresh	-	-	-	-	-	-
Other Fowl, Processed	-	-	-	-	-	100.00
Varied combination, Processed	-	9.54	-	-	-	80.33
Eggs, Processed	-	-	-	-	-	100.00

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Costa Rica	Croatia	Czechoslovakia	Denmark	Finland	France
Beef, Fresh	0.89	-	-	-	-	-
Beef, Processed	-	-	-	-	-	0.01
Pork, Fresh	-	-	-	18.60	0.46	0.01
Pork, Processed	-	0.11	0.003	15.63	-	0.24
Beef/Pork, Processed	-	-	-	-	-	-
Veal, Fresh	-	-	-	-	-	-
Veal, Processed	-	-	-	-	-	-
Lamb/Mutton, Fresh	-	-	-	-	-	-
Lamb/Mutton, Processed	-	-	-	-	-	-
Goat, Fresh	-	-	-	-	-	-
Chicken, Fresh	-	-	-	-	-	-
Chicken, Processed	-	-	-	-	-	0.20
Turkey, Processed	-	-	-	-	-	0.12
Other Fowl, Fresh	-	-	-	-	-	-
Other Fowl, Processed	-	-	-	-	-	-
Varied combination, Processed	-	-	-	-	-	0.09
Eggs, Processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Germany	Honduras	Hungary	Iceland	Ireland	Israel
Beef, Fresh	-	0.01	-	-	-	-
Beef, Processed	-	-	-	-	-	-
Pork, Fresh	-	-	-	-	1.20	-
Pork, Processed	0.42	-	1.98	-	0.31	-
Beef/Pork, Processed	-	-	-	-	-	-
Veal, Fresh	-	-	-	-	-	-
Veal, Processed	-	-	-	-	-	-
Lamb/Mutton, Fresh	-	-	-	0.10	-	-
Lamb/Mutton, Processed	-	-	-	-	-	-
Goat, Fresh	-	-	-	-	-	-
Chicken, Fresh	-	-	-	-	-	-
Chicken, Processed	-	-	-	-	-	2.02
Turkey, Processed	-	-	-	-	-	12.62
Other Fowl, Fresh	-	-	-	-	-	-
Other Fowl, Processed	-	-	-	-	-	-
Varied combination, Processed	-	-	-	-	-	-
Eggs, Processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Italy	Mexico	Netherlands	New Zealand	Nicaragua	N. Ireland
Beef, Fresh	-	0.25	-	22.43	1.54	0.06
Beef, Processed	-	0.07	-	0.38	-	-
Pork, Fresh	-	0.02	-	-	-	-
Pork, Processed	2.47	0.70	4.76	-	-	-
Beef/Pork, Processed	-	0.42	-	-	-	-
Veal, Fresh	-	-	-	39.80	-	-
Veal, Processed	-	-	-	-	-	-
Lamb/Mutton, Fresh	-	-	-	32.78	-	-
Lamb/Mutton, Processed	-	-	-	20.49	-	-
Goat, Fresh	-	-	-	8.38	-	-
Chicken, Fresh	-	-	-	-	-	-
Chicken, Processed	-	1.67	-	-	-	-
Turkey, Processed	-	13.57	-	-	-	-
Other Fowl, Fresh	-	-	-	100.00	-	-
Other Fowl, Processed	-	-	-	-	-	-
Varied combination, Processed	-	5.89	-	3.16	-	-
Eggs, Processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2004 FSIS NRP, Import Monitoring Plan

Product Class	Poland	Spain	United Kingdom	Uruguay
Beef, Fresh	-	-	-	-
Beef, Processed	-	-	-	0.95
Pork, Fresh	-	-	0.002	-
Pork, Processed	7.78	0.47	-	-
Beef/Pork, Processed	-	-	-	-
Veal, Fresh	-	-	-	-
Veal, Processed	-	-	-	-
Lamb/Mutton, Fresh	-	-	-	-
Lamb/Mutton, Processed	-	-	-	-
Goat, Fresh	-	-	-	-
Chicken, Fresh	-	-	-	-
Chicken, Processed	-	-	-	-
Turkey, Processed	-	-	-	-
Other Fowl, Fresh	-	-	-	-
Other Fowl, Processed	-	-	-	-
Varied combination, Processed	-	-	-	0.99
Eggs Processed				

Table 5.5
Number of Drug Samples/Product Class
2004 FSIS NRP, Import Monitoring Plan

No of Countries	Product Class	% Product Imported	Drug	Drug Score	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
8	Beef, fresh	54.43	Antibiotics	15	816	460	300	301
8	Beef, fresh	54.43	Sulfonamides	12	653	460	300	301
8	Beef, fresh	54.43	Avermectins	11	599	460	460	461
8	Beef, processed	20.08	Sulfonamides	12	241	300	230	61
7	Pork, fresh	12.16	Antibiotics	15	182	300	300	308
7	Pork, fresh	12.16	Sulfonamides	12	146	300	300	308
7	Pork, fresh	12.16	Avermectins	11	134	300	300	308
7	Pork, fresh	12.16	Aresenicals	7	85	230	230	238
16	Pork, processed	5.49	Sulfonamides	12	66	90	72	80
16	Pork, processed	5.49	Aresenicals	7	38	90	72	80
4	Lamb/Mutton, fresh	2.29	Antibiotics	15	34	90	90	90
4	Lamb/Mutton, fresh	2.29	Sulfonamides	12	28	90	90	90
4	Lamb/Mutton, fresh	2.29	Avermectins	11	25	90	90	90
6	Varied combination, processed	1.91	Sulfonamides	12	23	90	90	48
4	Chicken, processed	1.27	Sulfonamides	12	15	90	90	16
3	Beef/Pork, processed	0.86	Sulfonamides	12	10	90	90	8
4	Chicken, processed	1.27	Aresenicals	7	9	90	90	16
3	Beef/Pork, processed	0.86	Aresenicals	7	6	90	24	8
3	Veal, fresh	0.38	Antibiotics	15	6	90	24	24
1	Chicken, fresh	0.30	Antibiotics	15	5	90	8	8
3	Veal, fresh	0.38	Sulfonamides	12	5	90	24	24

Table 5.5 - *Continued*
Number of Drug Samples/Product Class
2004 FSIS NRP, Import Monitoring Plan

No of Countries	Product Class	% Product Imported	Drug	Drug Score	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
3	Veal, fresh	0.38	Avermectins	11	4	90	24	24
1	Chicken, fresh	0.30	Sulfonamides	12	4	90	8	8
2	Goat, fresh	0.24	Antibiotics	15	4	90	16	16
2	Goat, fresh	0.24	Sulfonamides	12	3	90	16	16
1	Chicken, fresh	0.30	Aresenicals	7	2	90	8	8
2	Goat, fresh	0.24	Aresenicals	7	2	90	16	16
4	Turkey, processed	0.13	Sulfonamides	12	2	90	32	32
2	Veal, processed	0.07	Sulfonamides	12	1	90	0	0
4	Turkey, processed	0.13	Aresenicals	7	1	90	32	32
1	Other Fowl, processed	0.01	Sulfonamides	12	0.10	90	0	0
1	Other Fowl, processed	0.01	Aresenicals	7	0.10	90	0	0
3	Lamb/Mutton, processed	0.005	Sulfonamides	12	0.10	90	24	0
1	Other Fowl, fresh	0.002	Antibiotics	15	0.02	90	0	0
1	Other Fowl, fresh	0.002	Sulfonamides	12	0.02	90	0	0
1	Other Fowl, fresh	0.002	Aresenicals	7	0.01	90	0	0
8	Beef, fresh		Chloramphenicol				90	90
3	Veal, fresh		Chloramphenicol				24	24
	Total					**5330**	**3564**	**3134**

Note: Phenylbutazone is detected by the CHC/COP method. Hence the "No. of Samples/Product Class" for phenylbutazone is the same as that for the CHCs/COPs. [See Section 7.]

Table 5.6
Number of Samples/Product Class - Goat, Fresh
2004 FSIS NRP, Import Monitoring Plan

GOAT, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	91.62	8	8
New Zealand	8.38	8	8
Total		**16**	**16**
GOAT, FRESH/ ARSENICALS			
Australia	91.62	8	8
New Zealand	8.38	8	8
Total		**16**	**16**
GOAT, FRESH/ SULFONAMIDES			
Australia	91.62	8	8
New Zealand	8.38	8	8
Total		**16**	**16**

Table 5.7
Number of Samples/Product Class – Mutton/Lamb Processed
2004 FSIS NRP, Import Monitoring Plan

MUTTON/LAMB PROCESSED/ ANTIBIOTICS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	48.66	8	0[1]
Canada	30.86	8	0[1]
New Zealand	20.49	8	0[1]
Total		**24**	**0**
MUTTON/LAMB PROCESSED/ AVERMECTINS			
Australia	48.66	8	0[1]
Canada	30.86	8	0[1]
New Zealand	20.49	8	0[1]
Total		**24**	**0**
MUTTON/LAMB PROCESSED/ SULFONAMIDES			
Australia	48.66	8	0[1]
Canada	30.86	8	0[1]
New Zealand	20.49	8	0[1]
Total		**24**	**0**

Table 5.8
Number of Samples/Product Class – Varied Combination, Processed
2004 FSIS Import Monitoring Plan

VARIED COMBINATION, PROCESSED, SULFONAMIDES	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	9.54	8	8
Canada	80.33	8	8
France	0.09	8	8
Mexico	5.89	8	8
New Zealand	3.16	8	8
Uruguay	0.99	8	8
Total		**48**	**48**

Table 5.9
Number of Samples/Product Class - Chicken, Fresh
2004 FSIS NRP, Import Monitoring Plan

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

Table 5.10
Number of Samples/Product Class - Turkey, Processed
2004 FSIS Import Monitoring Plan

TURKEY, PROCESSED/ ARSENICALS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Costa Rica	73.69	8	8
Germany	0.12	8	8
Italy	12.62	8	8
Netherlands	14.00	8	8
Total		**32**	**32**
TURKEY, PROCESSED/SULFONAMIDES			
Costa Rica	73.69	8	8
Germany	0.12	8	8
Italy	12.62	8	8
Netherlands	14.00	8	8
Total		**32**	**32**

Table 5.11
Number of Samples/Product Class - Veal, Processed
2004 FSIS NRP, Import Monitoring Plan

VEAL, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	98.91	8	0[1]
Canada	1.09	8	0[1]
Total		**16**	**0**

Table 5.12
Number of Samples/Product Class - Beef/Pork, Processed
2004 FSIS NRP, Import Monitoring Plan

BEEF/PORK, PROCESSED/ ARSENICALS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 24*$P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ. NUMBER	ADJUST. # 2	FINAL NUMBER OF SAMPLES
Australia	0.04	0	8	8	8	8
Canada	99.54	24		24	8	0[1]
Mexico	0.42	0	8	8	8	0[1]
Total		**24**		**40**	**24**	**8**
BEEF/PORK, PROCESSED/ SULFONAMIDES						
Australia	0.04	0	8	8	8	8
Canada	99.54	24		24	8	0[1]
Mexico	0.42	0	8	8	8	0[1]
Total		**24**	**32**	**40**	**24**	**8**

Table 5.13
Number of Samples/Product Class - Beef, Processed
2004 FSIS NRP, Import Monitoring Plan

BEEF, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 230*$P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ. NUMBER	ADJUST. # 2	FINAL NUMBER OF SAMPLES
Argentina	5.97	18	0	14	15	15
Australia	48.86	147	0	114	126	0[1]
Brazil	14.97	45	0	30	38	38
Canada	28.79	86	0	67	74	0[1]
France	0.01	0	8	8	0	8
Mexico	0.07	0	8	8	0	0[1]
New Zealand	0.38	1	8	8	1	0[1]
Uruguay	0.95	3	8	8	2	0[1]
Total		**282**	**32**	**257**	**257**	**61**

Table 5.14
Number of Samples/Product Class - Chicken, Processed
2004 FSIS NRP, Import Monitoring Plan

CHICKEN, PROCESSED/ ARSENICALS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Canada	96.12	86		0	0	0[1]
France	0.20	0	8	8	8	8
Israel	2.02	1		8	8	8
Mexico	1.67	2		8	8	0[1]
Total		**90**		**24**	**24**	**16**
CHICKEN, PROCESSED/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100**				
Canada	96.12	86		0	0	0[1]
France	0.20	0.2	8	8	8	8
Israel	2.02	1		8	8	8
Mexico	1.67	2		8	8	0[1]
Total		**90**		**24**	**24**	**16**

Table 5.15
Number of Samples/Product Class - Beef, Fresh
2004 FSIS NRP, Import Monitoring Plan

BEEF, FRESH/ ANTIBIOTICS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 300*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ NUMBER	ADJUST. # 2	FINAL ADJ #
Australia	25.26	76		76	68	68
Canada	49.57	149		149	133	133
Costa Rica	0.89	2	8	8	8	8
Honduras	0.01	0	8	8	8	8
Mexico	0.25	1	8	8	8	8
New Zealand	22.43	67		67	60	60
Nicaragua	1.54	5	8	8	8	8
Uruguay	0.06	0	8	8	8	8
Total		**300**	**40**	**332**	**301**	**301**

Table 5.15 - *Continued*
Number of Samples/Product Class - Beef, Fresh
2004 FSIS NRP, Import Monitoring Plan

BEEF, FRESH/ AVERMECTINS	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 460*(($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ NUMBER**	**ADJUST. # 2**	**FINAL ADJ #**
Australia	25.26	116		116	109	109
Canada	49.57	228		228	215	215
Costa Rica	0.89	3	8	8		8
Honduras	0.01	0	8	8		8
Mexico	0.25	1	8	8		8
New Zealand	22.43	103		103	97	97
Nicaragua	1.54	7	8	8		8
Uruguay	0.06	0	8	8		8
Total		**460**	**40**	**487**		**461**
BEEF, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 300*(($P_{C/C}$)/100)**				
Australia	25.26	76		76	68	68
Canada	49.57	149		149	133	133
Costa Rica	0.89	2	8	8	8	8
Honduras	0.01	0	8	8	8	8
Mexico	0.25	1	8	8	8	8
New Zealand	22.43	67		67	60	60
Nicaragua	1.54	5	8	8	8	8
Uruguay	0.06	0	8	8	8	8
Total		**300**	**40**	**332**	**301**	**301**
BEEF, FRESH/ CHLORAM-PHENICOL		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*((PC/C)/100)**				
Australia	25.26	23		23	13	13
Canada	49.57	45		45	25	25
Costa Rica	0.89	1	8	8	8	8
Honduras	0.01	0	8	8	8	8
Mexico	0.25	0	8	8	8	8
New Zealand	22.43	20		20	11	12
Nicaragua	1.54	1	8	8	8	8
Uruguay	0.06	0	8	8	8	8
Total		**90**	**40**	**128**	**89**	**90**

Table 5.16 a
Number of Samples/Product Class - Veal, Fresh
2004 FSIS NRP, Import Monitoring Plan

VEAL, FRESH/ ANTIBIOTICS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =24*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Australia	7.82	2		8	8	8
Canada	52.38	13		13	8	8
New Zealand	39.80	10		10	8	8
Total		**25**		**31**	**24**	**24**
VEAL, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =24*[($P_{C/C}$)/100]**				
Australia	7.82	2		8	8	8
Canada	52.38	13		13	8	8
New Zealand	39.80	10		10	8	8
Total		**25**		**31**	**24**	**24**
VEAL, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =24*[($P_{C/C}$)/100]**				
Australia	7.82	2		8	8	8
Canada	52.38	13		13	8	8
New Zealand	39.80	10		10	8	8
Total		**25**		**31**	**24**	**24**

Table 5.16 b
Number of Samples/Product Class - Veal, Fresh
2004 FSIS NRP, Import Monitoring Plan

VEAL, FRESH/ CHLORAMPHENICOL	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	7.82	8	8
Canada	52.38	8	8
New Zealand	39.80	8	8
Total		**24**	**24**

Table 5.17
Number of Samples/Product Class - Pork, Fresh
2004 FSIS NRP, Import Monitoring Plan

PORK, FRESH/ ANTIBIOTICS/	**PERCENT PRODUCT ($P_{C/C}$)**	**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) =300 * ($P_{C/C}$)/100)**	**ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)**	**INITIAL ADJ.#**	**ADJUST. # 2**	**FINAL ADJ.#**
Canada	79.71	239		239	217	217
Denmark	18.60	56		56	51	51
Finland	0.46	1	8	8	8	8
France	0.01	0	8	8	8	8
Ireland	1.20	4		8	8	8
Mexico	0.02	0	8	8	8	8
United Kingdom	0.02	0	8	8	8	8
Total		**300**	**32**	**335**	**308**	**308**
PORK, FRESH/ ARSENICALS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) =230 * ($P_{C/C}$)/100)**				
Canada	79.71	183		183	161	161
Denmark	18.60	43		43	37	37
Finland	0.46	1	8	8		8
France	0.01	0	8	8		8
Ireland	1.20	3		8		8
Mexico	0.02	0	8	8		8
United Kingdom	0.02	0	8	0		8
Total		**230**	**32**	**258**	**198**	**238**
PORK, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) =300 * ($P_{C/C}$)/100**				
Canada	79.71	239		239	217	217
Denmark	18.60	56		56	51	51
Finland	0.46	1	8	8	8	8
France	0.01	0	8	8	8	8
Ireland	1.20	4		8	8	8
Mexico	0.02	0	8	8	8	8
United Kingdom	0.02	0	8	8	8	8
Total		**300**	**32**	**335**	**308**	**308**
PORK, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 300*(($P_{C/C}$)/100**				
Canada	79.71	239		239	217	217
Denmark	18.60	56		56	51	51
Finland	0.46	1	8	8	8	8
France	0.01	0	8	8	8	8
Ireland	1.20	4		8	8	8
Mexico	0.02	0	8	8	8	8
United Kingdom	0.02	0	8	8	8	8
Total		**300**	**32**	**335**	**308**	**308**

Table 5.18
Number of Samples/Product Class - Lamb/Mutton, Fresh
2004 FSIS NRP, Import Monitoring Plan

LAMB/MUTTON, FRESH/ ANTIBIOTICS	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	66.34	60		60	49	50
Canada	0.77	1	8	8	8	8
Iceland	0.10	0	8	8	8	8
New Zealand	32.78	30		30	24	24
Total		**91**	**16**	**106**	**89**	**90**
LAMB/MUTTON, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)**				
Australia	66.34	60		60	49	50
Canada	0.77	1	8	8	8	8
Iceland	0.10	0	8	8	8	8
New Zealand	32.78	30		30	24	24
Total		**91**	**16**	**106**	**89**	**90**
LAMB/MUTTON, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)**				
Australia	66.34	60		60	49	50
Canada	0.77	1	8	8	8	8
Iceland	0.10	0	8	8	8	8
New Zealand	32.78	30		30	24	24
Total		**91**	**16**	**106**	**89**	**90**

Table 5.19
Number of Samples/Product Class - Pork, Processed
2004 FSIS NRP, Import Monitoring Plan

PORK, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	0.00002	0	8	8	8	8
Austria	0.02	0	8	8	8	8
Belgium	3.14	3		8	8	0[1]
Canada	61.98	56		58	58	0[1]
Croatia	0.11	0	8	8	8	8
Czechoslovakia	0.003	8	8			8
Denmark	15.63	14		13	13	0[1]
France	0.24	0	8	8	8	0[1]
Germany	0.42	0	8	8	8	8
Hungary	1.98	2		8	8	8
Ireland	0.31	0	8	8	8	0[1]
Italy	2.47	2		8	8	8
Mexico	0.70	1	8	8	8	0[1]
Netherlands	4.76	4		8	8	8
Poland	7.78	7		7	7	8
Spain	0.47	0	8	8	8	8
Total		**98**		**174**	**174**	**80**
PORK, PROCESSED/ ARSENICALS						
Australia	0.00002	0	8	8	8	8
Austria	0.02	0	8	8	8	8
Belgium	3.14	3		8	8	0[1]
Canada	61.98	56		58	58	0[1]
Croatia	0.11	0	8	8	8	8
Czechoslovakia	0.003	8				8
Denmark	15.63	14		13	13	0[1]
France	0.24	0	8	8	8	0[1]
Germany	0.42	0	8	8	8	8
Hungary	1.98	2		8	8	8
Ireland	0.31	0	8	8	8	0[1]
Italy	2.47	2		8	8	8
Mexico	0.70	1	8	8	8	0[1]
Netherlands	4.76	4		8	8	8
Poland	7.78	7		8	8	8
Spain	0.47	0	8	8	8	8
Total		**98**		**175**	**175**	**80**

[1] There will be no sampling of processed products from countries that also ship fresh products to the United States or source their raw material from other foreign countries that are eligible to ship fresh product and are actually exporting to United States.

Section 6
The 2004 FSIS Domestic Monitoring Plan
Pesticides

Phase I. Generating and Ranking the 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) are 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 2003 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

1. 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.

2. 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, which is expected to increase the potential for human exposure.

The "Toxicity" category reflects both the dose required to achieve a toxic effect and the severity of that effect. Since the numerical value assigned to toxicity is independent of other parameters, it can be used directly as a term in Equation (6.1).

EPA assigns a value to regulatory concern, pre-slaughter interval and bioconcentration factor to each pesticide compound or class of compounds. These values are multiplied by a weighted average and then by the toxicity value to give an estimate of the relative risk per unit of consumption. As with the veterinary drugs, we can refine the equation by adding a modifier for the category, "Lack of FSIS Testing Information on Violations." With an 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.

The pesticides in Table 6.1 are rated according to their relative public health concern by combining the scoring categories presented in Equation 6.2 using a weighting formula. The formula is presented in Equation (6.3) and in Table 6.1. 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 formula 6.3, the variable for regulatory concern (R) is given twice as much weight as the pre-slaughter interval (P) and bioconcentration factor (B) because FSIS considers regulatory concern to be more of a direct measurement 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.

Formula 6.3 and formula 4.4 have been normalized to give the same maximum value so that their values appear to be comparable. However, because formula 6.3 for the pesticides uses variables that are derived from terms (scoring categories) that are not the same as the terms used in formula 4.4 for the veterinary drugs, their scores are not precisely comparable. The scores for the pesticides and drugs were normalized to provide a rough comparison between these two 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 2004 NRP

Once SAT completed ranking the pesticides according to their relative public health concern, the ranking scores were used to select compounds for the 2004 NRP. Using professional judgment, SAT participants decided that the pesticide compounds and compound classes that received a ranking of fifteen or higher represent a potential public health concern that is sufficient to justify their inclusion in the 2004 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 that was not related to public health was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Based on this constraint, only the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP) compound class can currently be included in the NRP. There are 39 compounds in this compound class that FSIS will analyze for quantity and chemical identity. There are 4 additional compounds that will only be identified. The compounds 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, tetrachlorvinphos [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 2004 Monitoring Plan is provided in Table 6.2. For each highly ranked compound or compound class that was not scheduled for inclusion in the 2004 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 2004 NRP due to methodological limitations. FSIS will apply methodology capable of capturing chlorinated hydrocarbons and chlorinated and non-chlorinated organophosphates when such methodology can be implemented.

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 PCBs) are environmental contaminants to which any animal may be exposed. **For the 2004 NRP, FSIS has suspended monitoring testing for CHCs and COPs for the following production classes: minor species (ducks, geese, ratites, rabbits, squab, and bison); horses; and bob veal. However, horses are of concern for residue violations and enforcement testing will continue. Not scheduling the minor species will allow FSIS to focus those resources on the development of methodologies in areas that are of high public health concern.** FSIS will continue sampling for CHCs and COPs 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 2004 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/COPs (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 to 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: >29.00 = 460 samples; 2.51 – 29.00 = 300 samples; 0.14 - 2.50 = 230 samples; < 0.14 = 90 samples. The results 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. 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.

Bob veal, Horses, rabbits, ratites, squab, geese, ducks, and bison will not be scheduled for the 2004 domestic monitoring program for the 2004 NRP because the minor species are low production animals. However, horses are of concern for residue violations and enforcement testing will continue. Not scheduling the minor species will allow FSIS to focus those resources on the development of methodologies in areas that are of high public health concern.

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 01/01/1993 -12/31/2002 the total number of samples analyzed by FSIS in each production class under its monitoring plan (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. Less than 300 samples from the C/PC pair tested over the 10-year period: +1 level (i.e., increase by one sampling level, e.g., from 230 samples to 300 samples).
2. At least 300 samples tested over the 10-year period, violation rate $\geq$ 0.25%: +1 level.
3. At least 300 samples tested over the 10-year period, violation rate = 0.00%: -1 level.
4. The maximum number of samples to be scheduled for testing is 460.

Exceptions to these rules are:

1. 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.
2. **For the 2004 NRP, FSIS has suspended monitoring testing for for CHCs and COPs for the following production classes: minor species (ducks, geese, ratites, rabbits, squab, and bison); horses; and bob veal** (marked with a "■" In table 4.3).

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

Adjusting for laboratory capacity

No adjustment for laboratory capacity was necessary for the 2004 NRP.

Adjustment for the Number of Slaughter Facilities

An adjustment to the total number of monitoring samples was made based on the number of production facilities (Table 6.3). For this adjustment, FSIS considered the total number of production facilities (USDA Inspected Establishments for 2002) for each production class. If the total number of production facilities for a production class was found to be low relative to other production classes, the total number of monitoring samples was reduced for that production class. The number of samples selected for the reduction is based on FSIS professional judgment. If the number of facilities is less than 100, but greater than 10, the number of monitoring samples was adjusted down by 1 level. If the total number of facilities is less than 10, the number of monitoring samples was adjusted down by 2 levels. Based on these parameters, the number of monitoring samples was adjusted for the following production classes: “Young Turkeys”, “Mature Chickens”, “Ducks”, “Mature Turkeys” and “Horses.” As mentioned above, testing for horses and ducks has been suspended for the 2004 NRP.

Scoring Key for Pesticides

FSIS Historical Testing Information on Violations (01/01/1993 - 12/31/2002)

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 1993 - 2002, 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). UF's are used to account for differences between different humans (intraspecies variability) and for differences between the test animals and humans (interspecies extrapolation). If the LOAEL is used, an additional UF is required.

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

A numerical value of 1, 2, 3 or 4 is assigned to a pesticide compound (or a group of compounds) for the category "Lack of Testing Information on Violations" (Table 6.1). To determine the numerical value, FSIS considers how long a pesticide substance has been in the monitoring program, the number of production classes that were tested, the number of samples analyzed and any change in how the pesticide compound is used. These factors are assessed and a numerical score is assigned as follows:

- A value of 4 is assigned when:
  - FSIS has not included this compound in its sampling program within the past 10 years (1/1/93 - 12/31/02); or,
  - FSIS has included this compound within its program only between 6 and 10 years ago (1/1/93 - 12/31/97), 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 useful in predicting future violation rates because of 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,
  - The compound is of concern in several production classes of interest, but testing has been carried out in only one.

- A value of 3 is assigned when:
  - FSIS has tested within the past 5 years (1/1/98 - 12/31/02), but in fewer than 75% of the production classes of interest; or,
  - 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 within 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.

- A value of 2 is assigned when:
  - 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."

- A value of 1 is assigned when:
  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 within the compound class.

Pre-Slaughter Interval

A numerical value of 1, 2, 3 or 4 is assigned by EPA to pesticides for the category "Pre-Slaughter Interval" (Table 6.1). Pesticides in this category have been accepted for direct dermal application and have a minimum pre-slaughter interval, which is the interval between the last dermal application and the time of slaughter. FSIS determines a value for a pesticide in this category as follows:

- A value of 4 is assigned when dermal application is permitted and the pre-slaughter interval is 1 day or greater.

- A value of 3 is assigned when dermal application is permitted and pre-slaughter interval 0 days.

- A value of 2 is assigned when dermal application is not permitted, but the treatment of premises (e.g., holding cells, feedlots, barns, etc.) is permitted.

- A value of 1 is assigned when neither dermal application nor premise treatment are permitted.

Bioconcentration Factor

A numerical value of 1, 2, 3 or 4 is assigned by EPA to pesticides for the category "Bioconcentration Factor" (Table 6.1). Bioconcentration is a measure of a 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 (log $P_{o/w}$). Compounds that have a high affinity for octanol (and thus a high $K_{o/w}$) tend to bioaccumulate in body fat. A bioconcentration value is determined according to the following criteria:

- A value of 4 is assigned if the log $K_{o/w}$ is greater than 3.

- A value of 3 is assigned if the log $K_{o/w}$ is between 2 and 3.

- A value of 2 is assigned if the log $K_{o/w}$ is between 1 and 2.

- A value of 1 is assigned if the log $K_{o/w}$ is less than 1.

Endocrine Disruption

A numerical value of 3 or 4 (or NT if not tested) is assigned by EPA to pesticides for the category "Endocrine Disruption" (Table 6.1). Endocrine disruption 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. A value for endocrine disruption is assigned as follows:

- A value of 4 is assigned if endocrine disruption is likely.

- A value of 3 is assigned if endocrine disruption is suspected.

- NT is reported if the compound has not been tested.

Toxicity

A numerical value of 1, 2, 3 or 4 is assigned by EPA to pesticides for the category "Toxicity" (Table 6.1). The toxicity value 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.] A value for toxicity is determined as follows:

- A value of 4 is assigned if the pesticide compound is a cholinesterase inhibitor, carcinogen or has a low RfD.

- A value of 3 is assigned if the pesticide compound has a medium RfD.
- A value of 2 is assigned if the pesticide compound has a high RfD.
- A value of 1 is assigned if the pesticide compound has a high RfD.

Table 6.1
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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)	NT	3	1	4	3	4	4	**12.7**
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, tetrachlorvinphos [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)	NT	3	4	4	3	4	4	**16.1**
Triazines in FSIS Triazine MRM (atrazine, simazine, propazine, terbuthylazine)	NT	4	2	3	4	4	4	**15.0**
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
2004 FSIS NRP, Domestic Monitoring Plan

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-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**
1,2,4-Triazole	NT	4	1	3	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-dimethyl-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-(2,4-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-dimethyl-5-benzofuranyl methyl sulfonate	NT	2	1	2	NV	2	4	**4.0**
2-t-butyl-4-(2,4-dichloro-5-hydroxyphenyl)-delta 2-1,3,4-oxadiazolin-1,3,4,5-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-trimethyl-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-dimethyl-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
2004 FSIS NRP, Domestic Monitoring Plan

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 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**
CP 108267	NT	4	1	3	3	4	4	**13.8**

Table 6.1 – *Continued*
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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 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	4	4	2	NV	3	4	**12.1**
Cyhalothrin, lambda-	NT	4	4	2	NV	4	4	**16.1**
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	4	1	4	NV	3	4	**11.2**
Difenzoquat	NT	1	1	1	NV	4	4	**4.6**
Diflubenzuron	NT	3	4	4	NV	2	4	**8.1**
Diflufenzopyr	NT	1	1	2	NV	4	4	**5.8**
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, desmethyl	NT	3	1	1	NV	3	4	**6.9**
Diphenylamine	NT	3	3	1	NV	3	4	**8.6**
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**
Ethoxyquin	NT	4	2	4	NV	2	4	**8.1**
Etridiazole .	NT	4	1	4	NV	3	4	**11.2**
ETU	NT	3	1	2	3	4	4	**10.4**
Fenarimol	NT	1	1	4	NV	3	4	**6.0**
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	4	1	4	NT	3	4	**11.2**

Table 6.1 – *Continued*
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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}*
Fenbutatin Oxide	NT	2	1	4	NV	3	4	**7.8**
Fenoxaprop ethyl	NT	3	1	4	NV	4	4	**12.7**
Fenpropathrin	NT	4	1	1	NV	3	4	**8.6**
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	4	1	4	NV	3	4	**11.2**
Glufosinate-Ammonium	NT	1	2	1	NV	3	4	**4.3**
Glyphosate	NT	1	2	1	NV	1	4	**1.4**
Glyphosate-Trimesium	NT	1	1	1	NV	2	4	**2.3**
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	4	4	4	NV	4	4	**18.4**
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	**0.0**
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**
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**

Table 6.1 – *Continued*
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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}*
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**
Propargite	NT	3	1	2	NV	3	4	**7.8**
Propargite	NT	3	1	2	NV	3	4	**7.8**
Propiconazole	NT	4	1	3	NV	4	4	**13.8**
Propiconazole metabolite 1,2,4-triazole	NT	4	1	3	NV	4	4	**13.8**
Propiconazole metabolite CGA 118244	NT	4	1	3	NV	4	4	**13.8**

Table 6.1 – *Continued*
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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}*
Propiconazole metabolite CGA 91305	NT	4	1	3	NV	4	4	**13.8**
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**
Pyradostrobin	NT	1	1	3	NV	2	4	**3.5**
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	4	1	2	NV	3	4	**9.5**
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	**0.0**
Terbacil	NT	1	1	1	NV	3	4	**3.5**
Tetradifon	NT	1	1	2	NV	4	4	**5.8**
Thiamethoxam	NT	4	2	1	NV	4	4	**12.7**
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**
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**

Table 6.1 – *Continued*
Scoring Table for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

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}*
Triadimenol (for metabolites see triadimefon)	NT	3	1	4	NV	4	4	**12.7**
Triasulfuron	NT	1	1	1	NV	3	4	**3.5**
Triazole analine	NT	4	1	3	NV	4	4	**13.8**
Triazole lactic acid	NT	4	1	3	NV	4	4	**13.8**
Triclopyr	NT	3	2	1	NV	4	4	**10.4**
Trifloxystrobin	NT	1	1	3	NV	2	4	**3.5**
Triflumazole	NT	4	1	4	NV	3	4	**11.2**
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
CHC = Chlorinated hydrocarbon
COP = Chlorinated organophosphate
OP = Organophosphate
NT = Not Tested by FSIS (01/01/93 - 12/31/2002)
NA = Compound has been tested by FSIS (01/01/93 - 12/31/2002), 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
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
1	**COPs and OPs 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
2	Imazalil	18.4	NIP
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.)	17.3	NIP
4	**Carbamates in FSIS Carbamate MRM** (aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, carbofuran 3-hydroxy)	16.1	NIP
5	1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)-1-ethanol	16.1	NIP
6	1,1-(2,2-dichloroethylidene)bis(4-methoxybenzene)	16.1	NIP
7	1-methoxy-4-(1,2,2,2-tetrachloroethyl)benzene)	16.1	NIP
8	3-(1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)ethoxy)-1,2-propane diol	16.1	NIP
9	Fipronil	16.1	NIP
10	MB 45950	16.1	NIP
11	MB 46513	16.1	NIP
12	Methoxychlor olefin	16.1	NIP
13	Cyhalothrin, lambda-	16.1	NIP
14	**Synthetic Pyrethrins in FSIS Synthetic Pyrethrin MRM** (cypermethrin, cis-permethrin, trans-permethrin, fenvalerate, zeta-cypermethrin)	16.1	NIP
15	**CHCs and COPs 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, tetrachlorvinphos [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: minor species (rabbits, ratites, squab, geese, ducks, and bison); horses; and bob-veal. Import residue plan, all import production classes.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 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 compounds may be samples on a specific, as-needed basis.			
16	**Triazines in FSIS Triazine MRM** (atrazine, simazine, propazine, terbuthylazine)	15.0	NIP; low priority
17	Arsanilic acid	15.0	NIP; low priority
18	Alachlor	13.8	NIP; low priority
19	Cyromazine	13.8	NIP; low priority
20	**Carbamates NOT in FSIS Carbamate MRM** (carbaryl 5,6-dihydroxy, chlorpropham, propham, thiobencarb, 4-chlorobenzylmethylsulfone,4-chlorobenzylmethylsulfone sulfoxide)	13.8	NIP; low priority
21	1-methyl cyromazine	13.8	NIP; low priority
22	2-(1-hydroxyethyl)-6-ethylaniline	13.8	NIP; low priority
23	2,6-diethylaniline	13.8	NIP; low priority
24	Cacodylic acid	13.8	NIP; low priority
25	CP 101394	13.8	NIP; low priority
26	CP 108064	13.8	NIP; low priority
27	CP 108065	13.8	NIP; low priority
28	CP 108267	13.8	NIP; low priority
29	CP 51214	13.8	NIP; low priority
30	Phosalone oxon	13.8	NIP; low priority
31	PP 890	13.8	NIP; low priority
32	Propiconazole	13.8	NIP; low priority
33	Propiconazole metabolite 1,2,4-triazole	13.8	NIP; low priority
34	Propiconazole metabolite CGA 118244	13.8	NIP; low priority
35	Propiconazole metabolite CGA 91305	13.8	NIP; low priority
36	1,2,4-Triazole	13.8	NIP; low priority
37	Triazole analine	13.8	NIP; low priority
38	Triazole lactic acid	13.8	NIP; low priority
39	Thiamethoxam	12.7	NIP; low priority
40	**Benzimidazole Pesticides in FSIS Benzimidazole MRM** (5-hydroxythiabendazole, benomyl (as carbendazim), thiabendazole)	12.7	NIP; low priority
41	2-(4-((6-chloro-2-benzoxazolyl)oxy)phenoxy)propanoic acid	12.7	NIP; low priority
42	2-carboxyisopropyl-4-(2,4-dichloro)-5-isopropoxyphenyl)-1,3,4-oxadiazolin-5-one	12.7	NIP; low priority
43	2-t-butyl-4-(2,4-dichloro-5-hydroxyphenyl)-delta 2-1,3,4-oxadiazolin-1,3,4,5-one	12.7	NIP; low priority
44	3-(3,4-dichlorophenyl)-1-methoxyurea	12.7	NIP; low priority
45	3,4-dichloroaniline	12.7	NIP; low priority
46	3,4-dichlorophenylurea	12.7	NIP; low priority
47	6-chloro-2,3-dihydro-benzoxazol-2-one	12.7	NIP; low priority
48	Bifenthrin	12.7	NIP; low priority
49	Bifenthrin, 4'-hydroxy	12.7	NIP; low priority
50	Bis(trichloromethyl)disulfide	12.7	NIP; low priority

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
51	Captan epoxide	12.7	NIP; low priority
52	Cyclanilide	12.7	NIP; low priority
53	Dialifor	12.7	NIP; low priority
54	Dialifor oxon	12.7	NIP; low priority
55	Dicamba	12.7	NIP; low priority
56	Diuron	12.7	NIP; low priority
57	Fenoxaprop ethyl	12.7	NIP; low priority
58	N-(3,4-dichlorophenyl)-N'-methylurea	12.7	NIP; low priority
59	Oxadiazon	12.7	NIP; low priority
60	Oxyfluorfen	12.7	NIP; low priority
61	THPI	12.7	NIP; low priority
62	Triadimefon	12.7	NIP; low priority
63	Triadimefon metabolite KWG 1323	12.7	NIP; low priority
64	Triadimefon metabolite KWG 1342	12.7	NIP; low priority
65	Triadimefon metabolite KWG 1732	12.7	NIP; low priority
66	Triadimenol (for metabolites see triadimefon)	12.7	NIP; low priority
67	Cyfluthrin	12.1	NIP; low priority
68	MB 46136	12.1	NIP; low priority
69	Octyl bicycloheptene dicarboximide (MGK-264)	12.1	NIP; low priority
70	2-((2-ethyl-6-methylphenyl)-amino)-1-propanol	11.5	NIP; low priority
71	4-(2-ethyl-6-methylphenyl)-2-hydroxy-5-methyl-3-morpholinone	11.5	NIP; low priority
72	Dioxathion	11.5	NIP; low priority
73	Iprodione	11.5	NIP; low priority
74	Iprodione isomer	11.5	NIP; low priority
75	Iprodione metabolite	11.5	NIP; low priority
76	Iprodione metabolite 2	11.5	NIP; low priority
77	Metolachlor	11.5	NIP; low priority
78	Difenoconazole	11.2	NIP; low priority
79	Esfenvalerate	11.2	NIP; low priority
80	Etridiazole .	11.2	NIP; low priority
81	Fenbuconazole	11.2	NIP; low priority
82	Fluvalinate	11.2	NIP; low priority
83	Kresoxim-methyl	11.2	NIP; low priority
84	SD 54597	11.2	NIP; low priority
85	Triflumazole	11.2	NIP; low priority
86	2-aminobenzimidazole	10.4	NIP; low priority
87	6-methyl-2,3-quinoxalinedithiol	10.4	NIP; low priority
88	Abamectin	10.4	NIP; low priority
89	Abamectin delta 8,9 geometric isomer	10.4	NIP; low priority
90	Allophanate	10.4	NIP; low priority
91	Carboxin	10.4	NIP; low priority
92	Carboxin sulfoxide	10.4	NIP; low priority
93	Ethalfluralin	10.4	NIP; low priority

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
94	ETU	10.4	NIP; low priority
95	Isoxaflutole	10.4	NIP; low priority
96	Mancozeb	10.4	NIP; low priority
97	Maneb	10.4	NIP; low priority
98	Metiram	10.4	NIP; low priority
99	Piperonyl butoxide	10.4	NIP; low priority
100	Pyrazon metabolite A	10.4	NIP; low priority
101	Pyrazon metabolite B	10.4	NIP; low priority
102	Pyrethrin I	10.4	NIP; low priority
103	Quizalofop-ethyl	10.4	NIP; low priority
104	TCP=3,5,6-trichloro-2-pyridinol	10.4	NIP; low priority
105	Thiophanate methyl	10.4	NIP; low priority
106	Triclopyr	10.4	NIP; low priority
107	3-carboxy-5-ethoxy-1,2,4-thiadiazole	9.5	NIP; low priority
108	4-chloro-2-trifluoromethylaniline	9.5	NIP; low priority
109	Chlorobenzilate	9.5	NIP; low priority
110	Flufenacet (thiafluamide)	9.5	NIP; low priority
111	Methyl 3,5-dichlorobenzoate	9.5	NIP; low priority
112	N-(4-chloro-2-trifluoromethylphenyl)-propoxyacetamide	9.5	NIP; low priority
113	Propyzamide	9.5	NIP; low priority
114	Tebuconazole	9.5	NIP; low priority
115	Tebufenozide	9.5	NIP; low priority
116	3-(2-chloro-4-hydroxyphenyl)-6-(2-chlorophenyl)-1,2,4,5-tetrazine	9.2	NIP; low priority
117	Bromoxynil	9.2	NIP; low priority
118	Clofentezine	9.2	NIP; low priority
119	Mepiquat chloride	9.2	NIP; low priority
120	Norfluraxon, desmethyl-	9.2	NIP; low priority
121	Norflurazon	9.2	NIP; low priority
122	Oxythioquinox	9.2	NIP; low priority
123	Paraquat dichloride	9.2	NIP; low priority
124	Pyrazon	9.2	NIP; low priority
125	Diphenylamine	8.6	NIP; low priority
126	Fenpropathrin	8.6	NIP; low priority
127	Ethoxyquin	8.1	NIP; low priority
128	4-hydrocythidiazuron	8.1	NIP; low priority
129	Buprofezin	8.1	NIP; low priority
130	Cyclohexylstannoic acid	8.1	NIP; low priority
131	Cyhexatin	8.1	NIP; low priority
132	Dicyclohexyltin oxide	8.1	NIP; low priority
133	Diflubenzuron	8.1	NIP; low priority
134	Dipropyl isocinchomerate	8.1	NIP; low priority
135	N-phenylurea	8.1	NIP; low priority
136	PB-9	8.1	NIP; low priority

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
137	Pyridaben	8.1	NIP; low priority
138	Thidiazuron	8.1	NIP; low priority
139	Triphenyltin hydroxide	8.1	NIP; low priority
140	1,1,3,3,-tetrakis(2-methyl-2-phenylpropyl)-1,3-dihydroxydistannoxane	7.8	NIP; low priority
141	2-amino-n-isopropylbenzamide	7.8	NIP; low priority
142	Acifluorfen, amino analog	7.8	NIP; low priority
143	Bentazon, 6-hydroxy bentazon, 8-hydroxy bentazon	7.8	NIP; low priority
144	Chlorsulfuron	7.8	NIP; low priority
145	Chlorsulfuron, 5-hydroxy-	7.8	NIP; low priority
146	Emamectin	7.8	NIP; low priority
147	Fenbutatin Oxide	7.8	NIP; low priority
148	Fluazifop-butyl	7.8	NIP; low priority
149	Hexazinone	7.8	NIP; low priority
150	IN-A3928	7.8	NIP; low priority
152	IN-B2838	7.8	NIP; low priority
153	IN-T3935	7.8	NIP; low priority
154	IN-T3936	7.8	NIP; low priority
155	IN-T3937	7.8	NIP; low priority
156	Propargite	7.8	NIP; low priority
157	SD 31723	7.8	NIP; low priority
158	SD 33608	7.8	NIP; low priority
159	Sodium acifluorfen	7.8	NIP; low priority
160	6-chloronicotinic acid	6.9	NIP; low priority
161	Benoxacor	6.9	NIP; low priority
162	CGA 150829	6.9	NIP; low priority
163	CGA 171683	6.9	NIP; low priority
164	Dalapon	6.9	NIP; low priority
165	Diphenamid	6.9	NIP; low priority
166	Diphenamid, desmethyl	6.9	NIP; low priority
167	Diquat dibromide	6.9	NIP; low priority
168	Imidacloprid	6.9	NIP; low priority
169	Nicotine	6.9	NIP; low priority
170	NTN33823	6.9	NIP; low priority
171	NTN35884	6.9	NIP; low priority
172	PB-7	6.9	NIP; low priority
173	Primisulfuron-methyl	6.9	NIP; low priority
174	Propanil	6.9	NIP; low priority
175	WAK4103	6.9	NIP; low priority
176	6-chloropicolinic acid	6.0	NIP; low priority
177	Fenarimol	6.0	NIP; low priority
178	Fenarimol metabolite B	6.0	NIP; low priority
179	Fenarimol metabolite C	6.0	NIP; low priority
180	Fenridazon	6.0	NIP; low priority

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
181	Fluridone	6.0	NIP; low priority
182	Nitrapyrin	6.0	NIP; low priority
183	Tebuthiuron	6.0	NIP; low priority
184	Chlorfenapyr	5.8	NIP; low priority
185	Tetradifon	5.8	NIP; low priority
186	Diflufenzopyr	5.8	NIP; low priority
187	2,4-D	5.2	NIP; low priority
188	Dodine	5.2	NIP; low priority
189	Flutolanil	5.2	NIP; low priority
190	Myclobutanil, myclobutanil alcohol metabolite, myclobutanol dihydroxy metabolite	5.2	NIP; low priority
191	Prosulfuron	5.2	NIP; low priority
192	Difenzoquat	4.6	NIP; low priority
193	Ethephon	4.6	NIP; low priority
194	MCPA	4.6	NIP; low priority
195	Methoprene	4.6	NIP; low priority
196	2,5-dichloro-4-methoxyphenol	4.3	NIP; low priority
197	Chloroneb	4.3	NIP; low priority
198	Chloroneb, hydroxy-	4.3	NIP; low priority
199	Clofencet	4.3	NIP; low priority
200	Glufosinate-Ammonium	4.3	NIP; low priority
201	HOE-061517	4.3	NIP; low priority
202	HOE-099730	4.3	NIP; low priority
203	2,3-dihydro-3,3-dimethyl-2-oxo-5-benzofuranyl methyl sulfonate	4.0	NIP; low priority
204	2-hydroxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methyl sulfonate	4.0	NIP; low priority
205	Butylamine, sec-	4.0	NIP; low priority
206	Compound 125670	4.0	NIP; low priority
207	Ethofumesate	4.0	NIP; low priority
208	Quinclorac	4.0	NIP; low priority
209	Sethoxydim	4.0	NIP; low priority
210	Sethoxydim hydroxylate sulfone	4.0	NIP; low priority
211	Sethoxydim sulfoxide	4.0	NIP; low priority
212	Tralkoxydim	4.0	NIP; low priority
213	3-t-butyl-5-chloro-6-hydroxymethyluracil	3.5	NIP; low priority
214	6-chloro-2,3-dihydro-3,3,7-trimethyl-5H-oxazolo(3,2a)pyrimidin-5-one	3.5	NIP; low priority
215	6-chloro-2,3-dihydro-7-hydroxymethyl-3,3-dimethyl-5H-oxazolo(3,2-a)pyrimidin-5-one	3.5	NIP; low priority
216	Azoxystrobin	3.5	NIP; low priority
217	Azoxystrobin Z isomer	3.5	NIP; low priority
218	CGA 161149	3.5	NIP; low priority
219	CGA 195654	3.5	NIP; low priority
220	Cloprop	3.5	NIP; low priority
221	Dimethenamid	3.5	NIP; low priority

Table 6.2 – *Continued*
Rank and Status for Pesticides
2004 FSIS NRP, Domestic Monitoring Plan

Rank	Compound / Compound Class	Score	Status in the 2004 NRP
222	Dimethipin	3.5	NIP; low priority
223	Fluroxypyr	3.5	NIP; low priority
224	Sulfosulfuron	3.5	NIP; low priority
225	Terbacil	3.5	NIP; low priority
226	Triasulfuron	3.5	NIP; low priority
227	Pyradostrobin	3.5	NIP; low priority
228	Trifloxystrobin	3.5	NIP; low priority
229	Maleic hydrazide	3.2	NIP; low priority
230	Clopyralid	2.9	NIP; low priority
231	Halosulfuron	2.9	NIP; low priority
232	Picloram	2.9	NIP; low priority
233	Clethodim	2.6	NIP; low priority
234	Glyphosate-Trimesium	2.3	NIP; low priority
235	Metsulfuron Methyl	2.3	NIP; low priority
236	Carfentrazone Ethyl	2.0	NIP; low priority
237	Fludioxanil	2.0	NIP; low priority
238	Pyriproxifen	2.0	NIP; low priority
239	Spinosad	2.0	NIP; low priority
240	Aminomethylphosphonic acid	1.4	NIP; low priority
241	Glyphosate	1.4	NIP; low priority
242	Bensulfuron methyl ester	1.2	NIP; low priority
243	Fluthiacet-Methyl (CGA-248757)	1.2	NIP; low priority
244	Pymetrozine	1.2	NIP; low priority
245	Indoxacarb (DPX-MP062)		NIP; low priority
246	Teflubenzuron		NIP; low priority

Key:
MRM = Multiresidue Method
NIP = Not Included in 2003 FSIS National Residue Program
CHC = Chlorinated hydrocarbon
COP = Chlorinated organophosphate
OP = Organophosphate
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
2004 FSIS NRP, Domestic Monitoring Plan

Compound Class	Production Class	Priority Score	TNS.[a]	Violation Rate (%) (10 Year)[b]	UNS.[c]	Adjust[d]	Initial Adjust.[e]	Adjust: LC[f]	Adjust: PV[g]	Final Adjust[h]
CHCs/COPs	Young chickens	687.09	3,756	0.03	460		460			460
CHCs/COPs	Market hogs	295.79	4,380	0.00	460		460			460
CHCs/COPs	Steers	231.54	4,126	0.05	460		460			460
CHCs/COPs	Heifers	137.12	4,146	0.03	460		460			460
CHCs/COPs	Young turkeys	109.62	4,006	0.05	460		460		300	300
CHCs/COPs	Egg products	38.21	1,027	0.00	460	-1	300			300
CHCs/COPs	Beef cows	28.90	4,213	0.07	300		300			300
CHCs/COPs	Dairy cows	24.69	3,805	0.03	300		300			300
CHCs/COPs	Sows	16.21	3,821	0.10	300		300			300
CHCs/COPs	Mature chickens	9.06	3,010	0.00	300	-1	230		90	90
CHCs/COPs	Bulls	8.75	3,484	0.11	300		300			300
CHCs/COPs	Lambs	3.22	4,134	0.02	300		300			300
CHCs/COPs	Ducks	2.56	2,754	0.00	300	-1	230		90	0
CHCs/COPs	Formula-fed veal	2.46	3,432	0.00	300	-1	230			230
CHCs/COPs	Mature turkeys	1.38	1,639	0.06	230		230		90	90
CHCs/COPs	Boars/Stags	1.02	3,384	0.27	230	+1	300			300
CHCs/COPs	Goats	0.48	3,975	0.30	230	+1	300			300
CHCs/COPs	Bob veal	0.42	2,033	0.10	230		230			0
CHCs/COPs	Horses	0.34	3,584	0.39	230	+1	300		90	0
CHCs/COPs	Bison	0.26	61	0.00	230	+1	300			0
CHCs/COPs	Heavy calves	0.22	3,150	0.19	230		230			230
CHCs/COPs	Roaster pigs	0.18	NT	NT	230	+1	300			300
CHCs/COPs	Non-formula-fed veal	0.14	2,465	0.12	230		230			230
CHCs/COPs	Sheep	0.14	3,263	0.06	230		230			230
CHCs/COPs	Ratites	0.11	152	0.00	90	+1	230			0
CHCs/COPs	Geese	0.05	142	0.00	90		90			0
CHCs/COPs	Rabbits	0.05	912	0.11	90		90			0
CHCs/COPs	Squab		59	0.00	45		45			0
TOTAL #					7,775		7,895			**5,940**

a. NS = the total number of samples analyzed in the FSIS Monitoring Plan (01/01/1993 to 12/31/2002)
b. Violation rate for the period 1993-2002 (10 Years). 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)
c. UNS. = Unadjusted number of samples

Table 6.3
Pesticide Compound/Production Class Pairs, Sorted by Sampling Priority Score, with Adjusted Number of Analyses
2004 FSIS NRP, Domestic Monitoring Plan

d. Adjustment based on FSIS Historical Testing Information (refer to text discussion in Section 4); +1 level, +2 levels, -1 level. There are four different sampling levels: 90, 230, 300 and 460. Sampling levels were increased or decreased (e.g., changed from 300 samples to 230 samples) based on the rules described in Section 6
e. Number of samples proposed following adjustment for lack of testing information
f. Adjustment for Laboratory Capacity. For a discussion, see Section 6
g. Adjustment for Production Volume. For a discussion, see Section 6
h. Final adjustment numbers were obtained following an assessment of laboratory capacity and production volume. In addition, FSIS has suspended sampling for CHCs/COPs in bob veal, horses and minor species (ducks, ratites, geese, rabbits, and squab) for the 2004 NRP.

Section 7
The 2004 FSIS Import Monitoring Plan
Pesticides

Phase I. Generating and Ranking the List of Candidate Compounds

The list of compounds of concern for the Import Monitoring Plan is identical to that for the Domestic Monitoring Plan (see Section 6, Table 6.1). Furthermore, in ranking pesticides for inclusion in the Import Monitoring Plan, FSIS chose to employ the ranking scores generated for the Domestic Monitoring 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 Monitoring Plan.

Phase II. Selecting Pesticides for Inclusion in the 2004 Import Monitoring Program

The list of high priority compounds chosen for the Import Monitoring Plan by the Surveillance Advisory Team (SAT) is 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, page 76.

Phase III. Identifying the Compound/Product Class Pairs

As with the domestic program, the FSIS decided to sample for CHCs and COPs as a means of monitoring incidents of accidental contamination.

Phase IV. Allocation of Sampling Resources

Allocation among Different Product 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 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.

[1]Phenylbutazone is also detected by this method.

Animal Product Classes

Table 5.2**,** *Estimated Annual Amount (in lbs.) 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."

FSIS in its Import Monitoring Plan will not test (1) processed products from eligible foreign countries that also ship fresh products to the United States; and (2) processed products from countries that source all their raw materials from other foreign countries that are eligible to ship fresh products and are actively exporting to the United States. Processed chicken products from Hong Kong and Mexico, processed turkey products from Hong Kong, and processed pork products from Belgium will not be sampled since the raw materials used are from countries that are eligible to ship raw products to the U.S.

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 No. 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 No. 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 is 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 is less than 1%, eight samples per compound/compound class are taken from each country. The relative amounts of beef/pork processed, eggs processed, chicken fresh, goat fresh, turkey processed and mutton/lamb processed are less than 1%. Also, as stated above, if a country is exporting both fresh and processed products or sources all their raw materials from eligible sources then no residue samples will be scheduled for the processed products from that country. The numbers of samples per country per product class for each compound/compound class are listed in Tables 7.2 - 7.6.

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 (in lbs.) 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.*

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

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:

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

This is indicated in the column labeled "Unadjusted Number of Samples ($U_{C/S}$)," in Tables 7.7 to 7.14.

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 7.7 to 7.14. 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 adjustment will be accomplished by using the following equation:

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

As mentioned above, if a country is exporting both fresh and processed products or sources all their raw materials from eligible sources then no residue samples will be processed from that country. The final numbers of products sampled are indicated in Tables 7.2 - 7.6 in the column labeled “Final number of samples.”

Table 7.1
Number of Pesticide Samples/Product Class
2004 FSIS NRP, Import Monitoring Plan

No. of Countries	Product	Pesticide	Pesticide Score	Percent Product	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
8	Beef, fresh	CHCs/COPs	16	54.43	871	460	460	456
8	Beef, processed	CHCs/COPs	16	20.08	321	300	300	104
7	Pork, fresh	CHCs/COPs	16	12.16	195	230	239	239
16	Pork, processed	CHCs/COPs	16	5.49	88	230	230	80
3	Beef/Pork, processed	CHCs/COPs	16	0.86	14	90	24	8
3	Veal fresh	CHCs/COPs	16	0.38	6	90	90	90
2	Veal processed	CHCs/COPs	16	0.07	1	90	16	0
4	Mutton/Lamb, fresh	CHCs/COPs	16	2.29	37	90	90	90
3	Mutton/Lamb, processed	CHCs/COPs	16	0.005	0.1	90	24	0
2	Goat, fresh	CHCs/COPs	16	0.24	4	90	16	16
1	Chicken, fresh	CHCs/COPs	16	0.30	5	90	8	8
4	Chicken, processed	CHCs/COPs	16	1.27	20	90	90	16
4	Turkey, processed	CHCs/COPs	16	0.13	2	90	32	32
1	Other fowl fresh	CHCs/COPs	16	0.002	0.03	0	0	0
1	Other fowl processed	CHCs/COPs	16	0.01	0.2	0	8	0
6	Varied combination	CHCs/COPs	16	1.91	31	90	48	48
	Total					**2120**	**1675**	**1187**

Table 7.2
Number of Samples/Product Class - Chicken, Fresh
2004 FSIS NRP, Import Monitoring Plan

CHICKEN, FRESH/ CHC/COP	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	100	8	8
Total		**8**	**8**

Table 7.3
Number of Samples/Product Class - Turkey, Processed
2003 FSIS NRP, Import Monitoring Plan

CHICKEN, FRESH/ CHC/COP	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Costa Rica	73.69	8	8
Germany	0.12	8	8
Italy	12.62	8	8
Netherlands	14.00	8	8
Total		**32**	**32**

Table 7.4
Number of Samples/Product Class – Mutton/Lamb Processed
2003 FSIS NRP, Import Monitoring Plan

MUTTON/LAMB, PROCESSED/CHC/COP	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	48.66	8	0[1]
Canada	30.86	8	0[1]
New Zealand	20.49	8	0[1]
Total		**8**	**0**

Table 7.5
Number of Samples /Product Class - Goat, Fresh
2004 Import Residue Plan

GOAT, FRESH/CHC/COP	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	91.62	8	8
New Zealand	8.38	8	8
Total		**16**	**16**

Table 7.6
Number of Samples /Product Class - Varied Combination, Processed
2004 FSIS NRP, Import Monitoring Plan

VARIED COMBINATION, PROCESSED/CHC/COP	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	9.54	8	8
Canada	80.33	8	8
France	0.09	8	8
Mexico	5.89	8	8
New Zealand	3.16	8	8
Uruguay	0.99	8	8
Total		**48**	**48**

Table 7.7
Number of Samples/Product Class - Beef/Pork, Processed
2004 FSIS NRP, Import Monitoring Plan

BEEF/PORK, PROCESSED/ CHC/COP	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	0.04	0	8	8	8	8
Canada	99.54	24		24	8	0[1]
Mexico	0.42	0	8	8	8	0[1]
Total		**24**		**40**	**24**	**8**

Table 7.8
Number of Samples/Product Class - Beef, Fresh
2004 FSIS NRP, Import Monitoring Plan

BEEF, FRESH/ CHC/COP	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	25.26	116		116	108	108
Canada	49.57	228		229	212	212
Costa Rica	0.89	4	8	8	8	8
Honduras	0.01	0	8	8	8	8
Mexico	0.25	1	8	8	8	8
New Zealand	22.43	103		104	96	96
Nicaragua	1.54	7	8	8	8	8
Uruguay	0.06	0	8	8	8	8
Total		**460**	**40**	**489**	**456**	**456**

Table 7.9
Number of Samples /Product Class - Lamb/Mutton, Fresh
2004 FSIS NRP, Import Monitoring Plan

LAMB/ MUTTON, FRESH/ CHC/COP	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =90*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	66.34	60		60	49	50
Canada	0.77	1	8	8	8	8
Iceland	0.10	0	8	8	8	8
New Zealand	32.78	29		30	24	24
Total		**90**		**106**		**90**

Table 7.10
Number of Samples/Product Class - Pork, Processed
2004 FSIS NRP, Import Monitoring Plan

PORK, PROCESSED/ CHC/COP	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =230*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	0.00002	0	8	8	8	8
Austria	0.02	0	8	8	8	8
Belgium	3.14	7		8	8	0[1]
Canada	61.98	143		142	58	0[1]
Croatia	0.11	0	8	8	8	8
Czechoslovakia	0.003	0	8		8	8
Denmark	15.63	36		13	13	0[1]
France	0.24	1	8	8	8	0[1]
Germany	0.42	1	8	8	8	8
Hungary	1.98	5		8	8	8
Ireland	0.31	1	8	8	8	0[1]
Italy	2.47	6		8	8	8
Mexico	0.70	2	8	8	8	0[1]
Netherlands	4.76	11		8	8	8
Poland	7.78	18		7	7	8
Spain	0.47	0	8	8	8	8
Total		**230**		**258**	**174**	**80**

Table 7.11
Number of Samples /Product Class - Pork, Fresh
2004 FSIS NRP, Import Monitoring Plan

PORK, FRESH/ CHC/COP	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =230*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Canada	80	183		183	161	161
Denmark	19	43		56	38	38
Finland	1	1	8	8	8	8
France	0.01	0	8	8	8	8
Ireland	1	3		8	8	8
Mexico	0.02	0	8	8	8	8
United Kingdom	0.02	0	8	8	8	8
Total		**230**		**279**	**239**	**239**

Table 7.12
Number of Samples/Product Class - Chicken, Processed
2004 FSIS NRP, Import Monitoring Plan

CHICKEN, PROCESSED/ CHC/COP	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	96	86		0	0	0[1]
France	0.2	0	8	8	8	8
Israel	2.0	2		8	8	8
Mexico	1.7	2		8	8	0[1]
Total		**90**		**24**	**24**	**16**

Table 7.13
Number of Samples /Product Class - Beef, Processed
2004 FSIS NRP, Import Monitoring Plan

BEEF, PROCESSED CHC/COP	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =460*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Argentina	6	27	0	27	27	27
Australia	49	225	0	225	225	0[1]
Brazil	15	69	0	69	69	69
Canada	29	132	0	132	132	0[1]
France	0.01	0	8	8	0	8
Mexico	0.1	0	8	8	0	0[1]
New Zealand	0.4	2	8	8	2	0[1]
Uruguay	1	4	8	8	4	0[1]
Total		**460**	**32**	**485**	**459**	**104**

Table 7.14
Number of Samples /Product Class – Veal Fresh
2004 FSIS NRP, Import Monitoring Plan

VEAL FRESH, CHC/COP	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =90*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Australia	8	7		7	7	7
Canada	52	47		47	47	47
New Zealand	40	36		36	36	36
Total		**90**		**90**	**90**	**90**

[1] There will be no sampling of processed products from countries that also ship products to the United States or source their raw materials from other foreign countries that are eligible to ship fresh product and are actually exporting to the United States.

Section 8
The 2004 FSIS Domestic and Import Monitoring Exploratory Projects: Environmental Contaminants

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

A. Environmental Contaminants

- heavy metals
- mycotoxins

B. Processing Contaminants

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

Of these, the heavy metals were identified by the Surveillance Advisory Team as meriting inclusion in the NRP. FSIS will conduct and exploratory project to survey the heavy metals, lead and cadmium, in the following production classes: dairy cows, boars and stags, and mature chickens. Sampling for the survey began in 2003 (October through December; 62 samples) and will continue in 2004. Production classes and sample numbers are summarized in table 8.1.

No processing contaminants have been designated for analysis this year.

Even if a contaminant is not scheduled for inclusion in the FSIS NRP, should a contamination incident occur during the year, FSIS can initiate residue sampling as part of an FSIS Emergency Response Project.

Table 8.1
2004 FSIS NRP Domestic Exploratory Project
Number of Samples/Product Class for Lead and Cadmium

Production Class	Number of Samples
Dairy Cows	300
Boars/Stags	90
Mature Chickens	230
Total	**620**

Section 9
The 2004 FSIS National Residue Program Exploratory Projects: Residues

Exploratory Projects

Flunixin meglumine is a non-steroidal anti-inflammatory drug (NSAID) that has been approved for use in beef cattle. Tolerances of 0.125 and 0.025 parts per million (ppm) have been established in liver and muscle tissue, respectively. Flunixin may be used to disguise lameness in animals since it has an immediate analgesic effect on bone, joint, and soft-tissue inflammation and has been experimentally shown to be effective in suppressing the cough and fever associated with influenza in calves. Because of its effectiveness, flunixin shows a great potential for overuse, abuse, and extra-label use without adequate withdrawal times being followed. To determine the extent of misuse, USDA Food Safety Inspection Service (FSIS) initiated an exploratory project to examine the number of flunixin residue violation in dairy cows. Cattle "at-risk" for flunixin meglumine residues are animals subject to Fast Antimicrobial Screening Testing (FAST). Animals that are expected to be "at-risk" are: down/disabled cows, cows with active inflammatory conditions, cows receiving an injection of flunixin immediately prior to or during transport to reduce pain and improve mobility, and cows with arthritis and/or chronic traumatic injuries. For the project, tissues from 840 cows will be taken over a 12-month period (16/week) for 2003 and 2004. The samples will be taken at the top 20 establishments that kill at least 50% dairy cows. These plants accounted for approximately 46% of all the dairy cows slaughtered in the U.S. during 2002. Production class and sample numbers for the flunixin special project are summarized in Table 9.1.

Table 9.1
2004 FSIS NRP Domestic Exploratory Project for Flunixin
Production Class and Number of Samples

Production Class	Number of Samples
Dairy Cows	300
Total	**300**

Section 10
The 2004 FSIS National Residue Program
Domestic and Import Monitoring Plans

Domestic Monitoring Plan

The Food Safety and Inspection Service (FSIS), working with its partner agencies, has developed sampling allocation systems for compound/production class pairs (domestic and import residue sampling plans) that are founded on a public health-based prioritization process. Each system incorporates a structured planning process that employs risk assessment formulas and uses the best available data to develop relative rankings within these formulas. These systems are 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 address the public health concerns presented by a comprehensive range of veterinary drugs and pesticides in the egg products, 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 10.1, *Detailed Sampling Plan, 2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*. This table also specifies, for each combination of compound and production class, which FSIS laboratory will be conducting the analyses and the category into which the sampling falls. The categories are: "Monitoring"; and "Exploratory". 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 10.2, *Summary, 2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*.

Import Monitoring Plan

The final detailed import plan sample numbers for all compounds (veterinary drugs and pesticides), in all production classes and all countries, are listed in Table 10.3, *Summary, 2004 FSIS NRP, Import Monitoring Plan*. The summary of the total number of samples per compound per production class is listed in Table 10.4 *Number of Compounds/Product Class, 2004 FSIS NRP, Import Monitoring Plan.* In Table 10.5, *Number of Samples/Country/Product Class, 2004 FSIS NRP, Import Monitoring Plan,* the number of samples per country per production class is listed

A combined summary of all random sampling for domestic and imported products is provided in Table 10.6, *Combined Summary, 2004 FSIS NRP, Domestic Monitoring Plan, Exploratory Projects and Import Monitoring Plan.*

Table 10.1
Detailed Sampling Plan
2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

Analysis	Lab	Production Class	Number of Samples	Plan Type
Antibiotics by Bioassay	MWL	Market hogs	1,000	Monitoring
Antibiotics by Bioassay	MWL	Dairy cows	460	Monitoring
Antibiotics by Bioassay	MWL	Formula-fed veal	90	Monitoring
Antibiotics by Bioassay	MWL	Young chickens	300	Monitoring
Antibiotics by Bioassay	MWL	Steers		Monitoring
Antibiotics by Bioassay	MWL	Heifers	460	Monitoring
Antibiotics by Bioassay	MWL	Young turkeys		Monitoring
Antibiotics by Bioassay	MWL	Bob veal	300	Monitoring
Antibiotics by Bioassay	MWL	Horses		Monitoring
Antibiotics by Bioassay	MWL	Beef cows	300	Monitoring
Antibiotics by Bioassay	MWL	Sows	300	Monitoring
Antibiotics by Bioassay	MWL	Lambs	230	Monitoring
Antibiotics by Bioassay	MWL	Roaster pigs	300	Monitoring
Antibiotics by Bioassay	MWL	Bison		Monitoring
Antibiotics by Bioassay	MWL	Ratites		Monitoring
Antibiotics by Bioassay	MWL	Rabbits		Monitoring
Antibiotics by Bioassay	MWL	Bulls		Monitoring
Antibiotics by Bioassay	MWL	Mature chickens	230	Monitoring
Antibiotics by Bioassay	MWL	Ducks		Monitoring
Antibiotics by Bioassay	MWL	Boars/stags	230	Monitoring
Antibiotics by Bioassay	MWL	Mature turkeys		Monitoring
Antibiotics by Bioassay	MWL	Goats		Monitoring
Antibiotics by Bioassay	MWL	Heavy calves	90	Monitoring
Antibiotics by Bioassay	MWL	Sheep		Monitoring
Antibiotics by Bioassay	MWL	Non-formula-fed veal	230	Monitoring
Antibiotics by Bioassay	MWL	Geese		Monitoring
Antibiotics by Bioassay	MWL	Squab		Monitoring
Total Antibiotics by Bioassay			**4,520**	

Table 10.1 - *Continued*
Detailed Sampling Plan
2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

Analysis	Lab	Production Class	Number of Samples	Plan Type
Avermectins	EL	Steers		Monitoring
Avermectins	EL	Horses		Monitoring
Avermectins	EL	Market hogs		Monitoring
Avermectins	EL	Heifers		Monitoring
Avermectins	EL	Dairy cows		Monitoring
Avermectins	EL	Beef cows	300	Monitoring
Avermectins	EL	Bulls	300	Monitoring
Avermectins	EL	Lambs		Monitoring
Avermectins	EL	Goats	300	Monitoring
Avermectins	EL	Sows		Monitoring
Avermectins	EL	Formula-fed veal		Monitoring
Avermectins	EL	Bob veal		Monitoring
Avermectins	EL	Heavy calves		Monitoring
Avermectins	EL	Roaster pigs		Monitoring
Avermectins	EL	Bison		Monitoring
Avermectins	EL	Ratites		Monitoring
Avermectins	EL	Non-formula-fed veal	90	Monitoring
Avermectins	EL	Boars/stags		Monitoring
Avermectins	EL	Sheep	90	Monitoring
Total Avermectins			**1,080**	
Arsenicals	EL	Young chickens	460	Monitoring
Arsenicals	EL	Young turkeys	300	Monitoring
Arsenicals	EL	Egg products		Monitoring
Arsenicals	EL	Market hogs		Monitoring
Arsenicals	EL	Beef cows		Monitoring
Arsenicals	EL	Goats	90	Monitoring
Arsenicals	EL	Sows		Monitoring
Arsenicals	EL	Mature chickens		Monitoring
Arsenicals	EL	Ducks		Monitoring
Arsenicals	EL	Roaster pigs		Monitoring
Arsenicals	EL	Boars/stags		Monitoring
Arsenicals	EL	Mature turkeys		Monitoring
Arsenicals	EL	Geese		Monitoring
Total Arsenicals	**EL**		**850**	

Table 10.1 - *Continued*
Detailed Sampling Plan
2004 FSIS NRP, Monitoring Plan and Exploratory Projects

Analysis	Lab	Production Class	Number of Samples	Plan Type
Sulfonamides	MWL or EL	Market hogs	1,000	Monitoring
Sulfonamides	MWL or EL	Steers	300	Monitoring
Sulfonamides	EL	Egg products		Monitoring
Sulfonamides	MWL or EL	Dairy cows	300	Monitoring
Sulfonamides	MWL or EL	Beef cows	300	Monitoring
Sulfonamides	MWL or EL	Sows		Monitoring
Sulfonamides	MWL or EL	Bulls	300	Monitoring
Sulfonamides	MWL or EL	Mature chickens		Monitoring
Sulfonamides	MWL or EL	Lambs	230	Monitoring
Sulfonamides	MWL or EL	Formula-fed veal	90	Monitoring
Sulfonamides	MWL or EL	Boars/stags	300	Monitoring
Sulfonamides	MWL or EL	Mature turkeys	45	Monitoring
Sulfonamides	MWL or EL	Bob veal	300	Monitoring
Sulfonamides	MWL or EL	Roaster pigs	300	Monitoring
Sulfonamides	MWL or EL	Bison		Monitoring
Sulfonamides	MWL or EL	Ducks		Monitoring
Sulfonamides	MWL or EL	Goats		Monitoring
Sulfonamides	MWL or EL	Horses		Monitoring
Sulfonamides	MWL or EL	Heavy calves	230	Monitoring
Sulfonamides	MWL or EL	Ratites		Monitoring
Sulfonamides	MWL or EL	Non-formula-fed veal	230	Monitoring
Sulfonamides	MWL or EL	Geese		Monitoring
Sulfonamides	MWL or EL	Squab		Monitoring
Total Sulfonamides			**3,925**	

Table 10.1 - *Continued*
Detailed Sampling Plan
2004 FSIS NRP, Monitoring Plan and Exploratory Projects

Analysis	Lab	Production Class	Number of Samples	Plan Type
CHC's/COP's/Phenylbutazone	WL	Young chickens	460	Monitoring
CHC's/COP's/Phenylbutazone	WL	Market hogs	460	Monitoring
CHC's/COP's/Phenylbutazone	WL	Steers	460	Monitoring
CHC's/COP's/Phenylbutazone	WL	Heifers	460	Monitoring
CHC's/COP's/Phenylbutazone	WL	Young turkeys	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Egg products	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Dairy cows	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Beef cows	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Sows	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Bulls	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Mature chickens	90	Monitoring
CHC's/COP's/Phenylbutazone	WL	Roaster pigs	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Lambs	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Formula-fed veal	230	Monitoring
CHC's/COP's/Phenylbutazone	WL	Ducks		Monitoring
CHC's/COP's/Phenylbutazone	WL	Boars/stags	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Mature turkeys	90	Monitoring
CHC's/COP's/Phenylbutazone	WL	Goats	300	Monitoring
CHC's/COP's/Phenylbutazone	WL	Bob veal		Monitoring
CHC's/COP's/Phenylbutazone	WL	Horses		Monitoring
CHC's/COP's/Phenylbutazone	WL	Heavy calves	230	Monitoring
CHC's/COP's/Phenylbutazone	WL	Bison		Monitoring
CHC's/COP's/Phenylbutazone	WL	Sheep	230	Monitoring
CHC's/COP's/Phenylbutazone	WL	Ratites		Monitoring
CHC's/COP's/Phenylbutazone	WL	Non-formula-fed veal	230	Monitoring
CHC's/COP's/Phenylbutazone	WL	Geese		Monitoring
CHC's/COP's/Phenylbutazone	WL	Rabbits		Monitoring
CHC's/COP's/Phenylbutazone	WL	Squab		Monitoring
Total CHC's/COP's/Phenylbutazone			**5,940**	

Table 10.1 - *Continued*
Detailed Sampling Plan
2004 FSIS NRP, Monitoring Plan and Exploratory Projects

Analysis	Lab	Production Class	Number of Samples	Plan Type
Chloramphenicol	EL	Dairy cows	230	Monitoring
Chloramphenicol	EL	Formula-fed veal	90	Monitoring
Chloramphenicol	EL	Non-formula-fed veal	90	Monitoring
Chloramphenicol	EL	Young Chickens	230	Monitoring
Chloramphenicol	EL	Mature Chickens	90	Monitoring
Chloramphenicol	EL	Young Turkeys	90	Monitoring
Chloramphenicol	EL	Mature Turkeys	90	Monitoring
Total Chloramphenicol			**910**	
Clenbuterol and other beta agonists*	WL	Formula-fed veal	230	Monitoring[1]
Clenbuterol and other beta agonists*	WL	Market hogs	300	Monitoring[1]
Clenbuterol and other beta agonists*	WL	Steers	300	Monitoring[1]
Clenbuterol and other beta ags. *			**830**	
Flunixin	MWL	Dairy cows	300	Monitoring[1]
Flunixin	MWL	Dairy cows	840	Exploratory
Total Flunixin			**1,140**	
Lead and Cadmium	EL	Dairy cows	300	Exploratory
	EL	Boars/Stags	90	Exploratory
	EL	Mature chickens	230	Exploratory
Total Lead and Cadmium			**620**	
MGA (melengesterol acetate)	WL	Heifers	300	Monitoring[1]
Total MGA			**300**	
Phenylbutazone (ELISA)	WL	Dairy cows	300	Monitoring
Phenylbutazone (ELISA)	WL	Beef cows	230	Monitoring
Phenylbutazone (ELISA)	WL	Heifers	90	Monitoring
Phenylbutazone (ELISA)	WL	Steers	90	Monitoring
Phenylbutazone (ELISA)	WL	Heavy calves	90	Monitoring
Total Phenylbutazone (ELISA)			**800**	

*Samples from a total of 830 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 clenbuterol (bovine and porcine) and has been extended to salbutamol and cimaterol (bovine). The method has also demonstrated the ability to detect other beta agonists, including ractopamine.

[1] Because of laboratory scheduling requirements, these sampling plans will be conducted for less than a full calendar year.

Table 10.1 - *Continued*
Detailed Sampling Plan
2004 FSIS NRP, Monitoring Plan and Exploratory Projects

Key:
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; FDA = Food and Drug Administration, National Center for Toxicological Research, Jefferson, AR
ELISA = Enzyme Linked Immunoassay
MGA = Melengesterol acetate

Table 10.2 - *Continued*
Summary
2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

Production Class	Antibiotics	Arsenicals	Avermectins	CHCs/COPs/ Phenylbutazone	Phenylbutazone (ELISA)
Bulls			300	300	
Beef cows	300		300	300	230
Dairy cows	460			300	300
Heifers	460			460	90
Steers				460	90
Bob veal	300				
Formula-fed veal	90			230	
Non-formula-fed veal	230			230	
Heavy calves	90			230	90
Subtotal, Cattle	**1,930**	**0**	**600**	**2,510**	**800**
Market hogs	1,000			460	
Roaster pigs	300			300	
Boars/Stags	230			300	
Sows	300			300	
Subtotal, Swine	**1,830**	**0**	**0**	**1,360**	**0**
Sheep			90	230	
Lambs	230			300	
Subtotal, Ovine	**230**	**0**	**90**	**530**	**0**
Goats		90	300	300	
Horses					
Bison					
Subtotal, Other Livestock	**0**	**90**	**300**	**300**	**0**
Total, All Livestock	**3,990**	**90**	**1,080**	**4,700**	**800**
Young chickens	300	460		460	
Mature chickens	230			90	
Young turkeys		300		300	
Mature turkeys				90	
Ducks					
Geese					
Ratites					
Squab					
Subtotal, Poultry	**530**	**760**	**0**	**940**	**0**
Rabbits					
Egg products				300	
Total, All Production Classes	**4,520**	**850**	**1,080**	**5,940**	**800**

Table 10.2 - *Continued*
Summary
2004 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

Production Class	Chloramphenicol	Clenbuterol (and other beta agonists)	Flunixin	Lead and Cadmium	MGA	Sulfonamides
Bulls						300
Beef cows						300
Dairy cows	230		300	300		300
Heifers					300	
Steers		300				300
Bob veal						300
Formula-fed veal	90	230				90
Non-formula-fed veal	90					230
Heavy calves						230
Subtotal, Cattle	**410**	**530**	**300**	**300**	**300**	**2,050**
Market hogs		300				1000
Roaster pigs						300
Boars/Stags				90		300
Sows						
Subtotal, Swine	**0**	**300**	**0**	**90**	**0**	**1,600**
Sheep						
Lambs						230
Subtotal, Ovine	**0**	**0**	**0**	**0**	**0**	**230**
Goats						
Horses						
Bison						
Subtotal, Other Livestock	**0**	**0**	**0**	**0**	**0**	**0**
Total, All Livestock	**410**	**830**	**300**	**390**	**300**	**3,880**
Young chickens	230					
Mature chickens	90			230		
Young turkeys	90					
Mature turkeys	90					45
Ducks						
Geese						
Ratites						
Squab						
Subtotal, Poultry	**500**	**0**	**0**	**230**	**0**	
						45
Rabbits						
Egg products						
Total, All Production Classes	**910**	**830**	**300**	**620**	**300**	**3,925**

Table 10.3
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
Argentina	Beef Processed	Sulfonamides	15
Argentina	Beef Processed	CHCs/COPs/Phenylbutazone	27
Australia	Beef Fresh	Antibiotics	68
Australia	Beef Fresh	Avermectins	109
Australia	Beef Fresh	Sulfonamides	68
Australia	Beef Fresh	Chloramphenicol	13
Australia	Beef Fresh	CHCs/COPs/Phenylbutazone	108
Australia	Beef Processed	CHCs/COPs/Phenylbutazone	0
Australia	Beef/Pork Processed	Arsenicals	8
Australia	Beef/Pork Processed	Sulfonamides	8
Australia	Beef/Pork Processed	CHCs/COPs/Phenylbutazone	8
Australia	Goat Fresh	Antibiotics	8
Australia	Goat Fresh	Arsenicals	8
Australia	Goat Fresh	Sulfonamides	8
Australia	Goat Fresh	CHCs/COPs/Phenylbutazone	8
Australia	Mutton/Lamb Fresh	Antibiotics	50
Australia	Mutton/Lamb Fresh	Avermectins	50
Australia	Mutton/Lamb Fresh	Sulfonamides	50
Australia	Mutton/Lamb Fresh	CHCs/COPs/Phenylbutazone	50
Australia	Pork Processed	Sulfonamides	8
Australia	Pork Processed	Arsenicals	8
Australia	Pork Processed	CHCs/COPs/Phenylbutazone	8
Australia	Varied combination, Processed	Sulfonamides	8
Australia	Varied combinations	CHCs/COPs/Phenylbutazone	8
Australia	Veal Fresh	Antibiotics	8
Australia	Veal Fresh	Avermectins	8
Australia	Veal Fresh	Sulfonamides	8
Australia	Veal Fresh	Chloramphenicol	8
Australia	Veal Fresh	CHCs/COPs/Phenylbutazone	7
Austria	Pork Processed	Sulfonamides	8
Austria	Pork Processed	Arsenicals	8
Austria	Pork Processed	CHCs/COPs/Phenylbutazone	8

Table 10.3 - *Continued*
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
Brazil	Beef Processed	Sulfonamides	38
Brazil	Beef Processed	CHCs/COPs/Phenylbutazone	69
Canada	Beef Fresh	Antibiotics	133
Canada	Beef Fresh	Avermectins	215
Canada	Beef Fresh	Sulfonamides	133
Canada	Beef Fresh	Chloramphenicol	25
Canada	Beef Fresh	CHCs/COPs/Phenylbutazone	212
Canada	Chicken Fresh	Antibiotics	8
Canada	Chicken Fresh	Arsenicals	8
Canada	Chicken Fresh	CHCs/COPs/Phenylbutazone	8
Canada	Chicken Processed	Sulfonamides	8
Canada	Mutton/Lamb Fresh	Antibiotics	8
Canada	Mutton/Lamb Fresh	Avermectins	8
Canada	Mutton/Lamb Fresh	Sulfonamides	8
Canada	Mutton/Lamb Fresh	CHCs/COPs/Phenylbutazone	8
Canada	Pork Fresh	Antibiotics	217
Canada	Pork Fresh	Arsenicals	161
Canada	Pork Fresh	Avermectins	217
Canada	Pork Fresh	Sulfonamides	217
Canada	Pork Fresh	CHCs/COPs/Phenylbutazone	161
Canada	Varied combination, Processed	Sulfonamides	8
Canada	Varied combinations	CHCs/COPs/Phenylbutazone	8
Canada	Veal Fresh	Antibiotics	8
Canada	Veal Fresh	Avermectins	8
Canada	Veal Fresh	Sulfonamides	8
Canada	Veal Fresh	Chloramphenicol	8
Canada	Veal Fresh	CHCs/COPs/Phenylbutazone	47
Costa Rica	Beef Fresh	Antibiotics	8
Costa Rica	Beef Fresh	Avermectins	8
Costa Rica	Beef Fresh	Sulfonamides	8
Costa Rica	Beef Fresh	Chloramphenicol	8
Costa Rica	Beef Fresh	CHCs/COPs/Phenylbutazone	8
Costarica	Turkey Processed	Arsenicals	8
Costarica	Turkey Processed	Sulfonamides	8
Costarica	Turkey Processed	CHCs/COPs/Phenylbutazone	8
Crotalia	Pork Processed	Sulfonamides	8
Crotalia	Pork Processed	Arsenicals	8
Crotalia	Pork Processed	CHCs/COPs/Phenylbutazone	8

Table 10.3 - *Continued*
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
Czechoslovakia	Pork Processed	Sulfonamides	8
Czechoslovakia	Pork Processed	Arsenicals	8
Czechoslovakia	Pork Processed	CHCs/COPs/Phenylbutazone	8
Denmark	Pork Fresh	Antibiotics	51
Denmark	Pork Fresh	Arsenicals	37
Denmark	Pork Fresh	Avermectins	51
Denmark	Pork Fresh	Sulfonamides	51
Denmark	Pork Fresh	CHCs/COPs/Phenylbutazone	38
Finland	Pork Fresh	Antibiotics	8
Finland	Pork Fresh	Arsenicals	8
Finland	Pork Fresh	Avermectins	8
Finland	Pork Fresh	Sulfonamides	8
Finland	Pork Fresh	CHCs/COPs/Phenylbutazone	8
France	Beef Processed	Sulfonamides	8
France	Beef Processed	CHCs/COPs/Phenylbutazone	8
France	Chicken Processed	Arsenicals	8
France	Chicken Processed	Sulfonamides	8
France	Chicken Processed	CHCs/COPs/Phenylbutazone	8
France	Pork Fresh	Antibiotics	8
France	Pork Fresh	Arsenicals	8
France	Pork Fresh	Avermectins	8
France	Pork Fresh	Sulfonamides	8
France	Pork Fresh	CHCs/COPs/Phenylbutazone	8
France	Varied combination, Processed	Sulfonamides	8
France	Varied combinations	CHCs/COPs/Phenylbutazone	8
Germany	Pork Processed	Sulfonamides	8
Germany	Pork Processed	Arsenicals	8
Germany	Pork Processed	CHCs/COPs/Phenylbutazone	8
Germany	Turkey Processed	Arsenicals	8
Germany	Turkey Processed	Sulfonamides	8
Germany	Turkey Processed	CHCs/COPs/Phenylbutazone	8
Honduras	Beef Fresh	Antibiotics	8
Honduras	Beef Fresh	Avermectins	8
Honduras	Beef Fresh	Sulfonamides	8
Honduras	Beef Fresh	Chloramphenicol	8
Honduras	Beef Fresh	CHCs/COPs/Phenylbutazone	8
Hungary	Pork Processed	Sulfonamides	8
Hungary	Pork Processed	Arsenicals	8

Table 10.3 - *Continued*
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
Hungary	Pork Processed	CHCs/COPs/Phenylbutazone	8
Iceland	Mutton/Lamb Fresh	Antibiotics	8
Iceland	Mutton/Lamb Fresh	Avermectins	8
Iceland	Mutton/Lamb Fresh	Sulfonamides	8
Iceland	Mutton/Lamb Fresh	CHCs/COPs/Phenylbutazone	8
Ireland	Pork Fresh	Antibiotics	8
Ireland	Pork Fresh	Arsenicals	8
Ireland	Pork Fresh	Avermectins	8
Ireland	Pork Fresh	Sulfonamides	8
Ireland	Pork Fresh	CHCs/COPs/Phenylbutazone	8
Israel	Chicken Processed	Arsenicals	8
Israel	Chicken Processed	Sulfonamides	8
Israel	Chicken Processed	CHCs/COPs/Phenylbutazone	8
Italy	Pork Processed	Sulfonamides	8
Italy	Pork Processed	Arsenicals	8
Italy	Pork Processed	CHCs/COPs/Phenylbutazone	8
Italy	Turkey Processed	Arsenicals	8
Italy	Turkey Processed	Sulfonamides	8
Italy	Turkey Processed	CHCs/COPs/Phenylbutazone	8
Mexico	Beef Fresh	Antibiotics	8
Mexico	Beef Fresh	Avermectins	8
Mexico	Beef Fresh	Sulfonamides	8
Mexico	Beef Fresh	Chloramphenicol	8
Mexico	Beef Fresh	CHCs/COPs/Phenylbutazone	8
Mexico	Pork Fresh	Antibiotics	8
Mexico	Pork Fresh	Arsenicals	8
Mexico	Pork Fresh	Avermectins	8
Mexico	Pork Fresh	Sulfonamides	8
Mexico	Pork Fresh	CHCs/COPs/Phenylbutazone	8
Mexico	Varied combination, Processed	Sulfonamides	8
Mexico	Varied combinations	CHCs/COPs/Phenylbutazone	8
Netherlands	Pork Processed	Sulfonamides	8
Netherlands	Pork Processed	Arsenicals	8
Netherlands	Pork Processed	CHCs/COPs/Phenylbutazone	8
Netherlands	Turkey Processed	Arsenicals	8
Netherlands	Turkey Processed	CHCs/COPs/Phenylbutazone	8
Netherlands	Varied combination, Processed	Sulfonamides	8
New Zealand	Beef Fresh	Antibiotics	60

Table 10.3 - *Continued*
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
New Zealand	Beef Fresh	Avermectins	97
New Zealand	Beef Fresh	Sulfonamides	60
New Zealand	Beef Fresh	Chloramphenicol	12
New Zealand	Beef Fresh	CHCs/COPs/Phenylbutazone	96
New Zealand	Chicken Fresh	Sulfonamides	8
New Zealand	Goat Fresh	Sulfonamides	24
New Zealand	Goat Fresh	Antibiotics	8
New Zealand	Goat Fresh	Arsenicals	8
New Zealand	Goat Fresh	CHCs/COPs/Phenylbutazone	8
New Zealand	Mutton/Lamb Fresh	Antibiotics	24
New Zealand	Mutton/Lamb Fresh	Avermectins	24
New Zealand	Mutton/Lamb Fresh	CHCs/COPs/Phenylbutazone	24
New Zealand	Varied combination, Processed	Sulfonamides	8
New Zealand	Varied combinations	CHCs/COPs/Phenylbutazone	8
New Zealand	Veal Fresh	Antibiotics	8
New Zealand	Veal Fresh	Avermectins	8
New Zealand	Veal Fresh	Sulfonamides	8
New Zealand	Veal Fresh	CHCs/COPs/Phenylbutazone	36
New Zealand	Veal Processed	Chloramphenicol	8
Nicaragua	Beef Fresh	Antibiotics	8
Nicaragua	Beef Fresh	Avermectins	8
Nicaragua	Beef Fresh	Sulfonamides	8
Nicaragua	Beef Fresh	Chloramphenicol	8
Nicaragua	Beef Fresh	CHCs/COPs/Phenylbutazone	8
Poland	Pork Processed	Sulfonamides	8
Poland	Pork Processed	Arsenicals	8
Poland	Pork Processed	CHCs/COPs/Phenylbutazone	8
Spain	Beef/Pork Processed	Arsenicals	8
Spain	Pork Processed	Sulfonamides	8
Spain	Pork Processed	CHCs/COPs/Phenylbutazone	8
Spain	Pork Processed	Arsenicals	8
United Kingdom	Pork Fresh	Antibiotics	8
United Kingdom	Pork Fresh	Arsenicals	8
United Kingdom	Pork Fresh	Avermectins	8
United Kingdom	Pork Fresh	CHCs/COPs/Phenylbutazone	8
Uruguay	Beef Fresh	Antibiotics	8
Uruguay	Beef Fresh	Avermectins	8
Uruguay	Beef Fresh	Sulfonamides	8

Table 10.3 - *Continued*
Summary
2004 FSIS NRP, Import Monitoring Plan

COUNTRY	PRODUCT	COMPOUND	NUMBER OF SAMPLES
Uruguay	Beef Fresh	Chloramphenicol	8
Uruguay	Beef Fresh	CHCs/COPs/Phenylbutazone	8
Uruguay	Varied combinations	Sulfonamides	8
Uruguay	Varied combinations	CHCs/COPs/Phenylbutazone	8
			4321

Table 10.4
Number of Compounds/Production Class
2004 FSIS NRP, Import Residue Plan

COMPOUND/ PRODUCTION CLASS	AB	AS	AVM	CAP	SULFAs	CHC/COP/PHB	Total
Beef, Fresh	301		461	90	301	456	1609
Beef, Processed					61	104	165
Pork, Fresh	308	238	308		308	239	1401
Pork, Processed		80			80	80	240
Beef/Pork, Processed		8			8	8	24
Veal, Fresh	24		24	24	24	90	186
Veal Processed							0
Lamb/Mutton, Fresh	90		90		90	90	360
Lamb/Mutton, Processed							0
Goat, Fresh	16	16			16	16	64
Chicken, Fresh	8	8			8	8	32
Chicken, Processed		16			16	16	48
Turkey, Processed		32			32	32	96
Other Fowl, Fresh							0
Other Fowl, Processed							0
Varied combination, essed					48	48	96
Eggs, Processed							0
Total/Country	747	398	883	114	992	1187	4321

AB=Antibiotics; AS=Arsenicals; AVM=Avermectins; CAP=Chloramphenicol; SULFAs=Sulfonamides;
CHC/COP/PHB =Chlorinated hydrocarbons/Organophosphates/Phenylbutazone

Table 10.5
Number of Samples/Country/Product Class
2004 FSIS NRP, Import Monitoring Plan

	Beef, Fresh	Beef, Processed	Beef/Pork, Processed	Chicken, Fresh	Chicken, Processed	Goat, Fresh	Mutton/Lamb, Fresh	Mutton/Lamb, Processed	Other Fowl, Fresh	Other Fowl, Processed	Pork, Fresh	Pork, Processed	Turkey, Processed	Varied combination, Processed	Veal, Fresh	Veal, Processed	Total
Argentina		42															**42**
Australia	366		24			32	200					24		16	39		**701**
Austria												24					**24**
Brazil		107															**107**
Canada	718			32			32				973			16	79		**1850**
Costa Rica	40												24				**64**
Croatia												24					**24**
Czechoslovakia												24					**24**
Denmark											228						**228**
Finland											40						**40**
France		16			24						40			16			**96**
Germany												24	24				**48**
Honduras	40																**40**
Hungary												24					**24**
Iceland							32										**32**
Ireland											40						**40**
Israel					24												**24**
Italy												24	24				**48**
Mexico	40										40			16			**96**
Netherlands												24	24	16			**64**
New Zealand	325					32	96							16	68		**537**
Nicaragua	40																**40**
Poland												24					**24**
Spain												24					**24**
Sweden																	
Switzerland																	
United Kingdom											40						**40**
Uruguay	40																**40**
Total	**1609**	**165**	**24**	**32**	**48**	**64**	**360**				**1401**	**240**	**96**	**96**	**186**		**4321**

Table 10.6
Combined Summary
2004 FSIS NRP, Domestic Monitoring Plan, Exploratory Projects, and Import Monitoring Plan

Lab	Analysis	Number of Scheduled Domestic Samples	Number of Scheduled Imported Samples	Number of Scheduled Samples for Exploratory Projects	Total Number of Samples	NOTES
MWL	Antibiotics	4,520	747	604	5,871	Domestic: all production classes except sheep, rabbits, ratites, geese, squab, horses, goats, ducks, steers, young turkeys, bulls, mature turkeys, and egg products Imported: all fresh product classes
EL	Arsenicals	850	398		1,248	Domestic: scheduled for young chickens, young turkeys, and goats Imported: All avian production classes; fresh goat and pork, processed pork and beef/pork
EL	Avermectins	1,080	883		1,963	Domestic: scheduled for beef cows, bulls, goats, non-formula fed veal, and sheep production classes Imported: all non-avian fresh product classes, except goats
WL	CHCs/COPs/ Phenylbutazone	5,940	1,187		7,127	Domestic: all domestic production classes except: minor species (rabbits, ratites, squab, geese, ducks, and bison); horses; and bob-veal Import: all import production classes
WL	Phenylbutazone by Immunoassay	800			800	Domestic: all production classes except horses, bob-veal, ducks, bison, ratites, geese, rabbits, and squab Import: all production classes except processed veal
EL	Chloramphenicol	910	114		1,024	Domestic: 230, 90, 90, 230, 90, 90, 90, 90 samples for dairy cows, formula-fed veal, non-formula-fed veal, young chickens, mature chickens, young turkeys and mature turkeys, respectively. Import: 90 samples for fresh beef and 24 samples for fresh veal
WL	Clenbuterol and other unapproved beta agonists	830				Domestic: 300, 230, and 300 samples are scheduled for steers, formula-fed veal, and market hogs. Confirmation done by FDA-NCTR Import: No samples scheduled
MWL	Flunixin	300		840	1,140	Domestic: 1,140 dairy cows
WL	MGA	300			300	Domestic: 300 heifers
EL, MWL	Sulfonamides	3,925	992		4,917	Domestic: all production classes except sheep and rabbits Imported: all product classes

Table 10.6 - *Continued*
Combined Summary
2004 FSIS NRP, Domestic Monitoring Plan, Exploratory Projects, and Import Monitoring Plan

Lab	Analysis	Number of Scheduled Domestic Samples	Number of Scheduled Imported Samples	Number of Scheduled Samples for Exploratory Projects	Total Number of Samples	NOTES
EL	Lead and Cadmium			620	620	Domestic: Dairy cows; boars/stags; mature chickens
Total		**19,455**	**4,321**	**2,064**	**25,840**	

Key:
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
ARS-RRVARC = Agricultural Research Service, Red River Valley Agricultural Research Center, Fargo, ND

Section 11
2004 FSIS National Residue Program Adjustments

The following changes were made to the originally scheduled 2003 FSIS National Residue Program (NRP):

1. Horse sample collection for monitoring was reduced to 90 samples due to reduced slaughtering volume.

2. Lead and Cadmium were added to the 2003 domestic monitoring program from October to December. A total of 62 monitoring samples were collected for the three month period.

3. The number of monitoring samples for avermecitns was increased for steers, beef cows, dairy cows, sows, heifers and market hogs by 80, 80, 80, 35, 80 and 80, respectively, for a total of 435 samples.

4. The number of monitoring samples for sulfonamides was increased for steers, beef cows, dairy cows, sows, heifers, market hogs, boars and stags, young turkeys and mature chickens by 80, 35, 35, 80, 80, 80, 80, 80 and 70, respectively, for a total of 540 samples.

Appendix I
Tissues Required for Analysis
2004 FSIS National Residue Program

Table A-I, *Tissues Required for Analysis*, lists the tissue, the amount required for analysis, and the laboratory to which the tissue is sent.

Table A-I

Residue	Tissue Analyzed	Quantity (lb)	Lab
Antibiotics	Kidney, liver, muscle	1	MWL
Arsenicals	Liver, muscle	1	EL
Avermectins	Liver, muscle	1	EL
Beta agonists (e.g. clenbuterol)	Eyeball	1	WL
Chloramphenicol	Muscle	1	EL
Chlorinated hydrocarbons/chlorinated organophosphates/Phenylbutazone	Fat	1	WL
Flunixin	Liver, muscle	1	MWL
Lead and Cadmium	Kidney, liver, muscle	1	EL
Melengesterol acetate (MGA)	Fat	1	WL
Phenylbutazone by Immunoassay	Kidney	1	WL
Sulfonamides	Liver, muscle	1	MWL, EL

Key:
EL = FSIS Eastern Laboratory, Athens, GA
MWL = FSIS Midwestern Laboratory, St. Louis, Mo
WL = FSIS Western Laboratory, Alameda, Ca

Appendix II
U.S. Residue Limits for Veterinary Drugs and Unavoidable Contaminates in Meat, Poultry, and Egg Products

This appendix provides information on the residue limits (tolerances) for animal drugs and unavoidable contaminants in meat, poultry, and egg products. The Food Safety and Inspection Service in its regulatory programs apply tolerances, which are set by the Food and Drug Administration (FDA). The official source of these tolerances is Title 21 of the Code of Federal Regulations (CFR): those for animal drugs are found in CFR, Title 21, Part 556; and those for unavoidable contaminants are found in CFR, Title 21 CFR, Part 109, Section 109.30. This Appendix supplies the relevant citation for each tolerance and action level.

The tolerances and action levels for the various tissues in meat, poultry and egg products are listed alphabetically by compound in Table A II, *Residue Limits for Veterinary Drugs, and Unavoidable Contaminants*. 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.

Table A II
Residue Limits for Veterinary Drugs, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
2-Acetylamino-5-nitrothiazole	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1[2]	21 CFR 556.20
Aklomide	Cattle Goats Hogs Horses Poultry Sheep Eggs	3	4.5		4.5			21 CFR 556.30
Albendazole[3]	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05 0.05		0.2 0.25			21 CFR 556.34
Altrenogest	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.001		0.004			
Amoxicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.38
Ampicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01 0.01	21 CFR 556.40
Amprolium	Cattle Goats Hogs Horses Poultry Sheep Eggs	2.0	0.5 0.5[4]		0.5 1	0.5 1[5]	 4[6], 8[7]	21 CFR 556.50

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Apramycin	Cattle Goats Hogs Horses Poultry Sheep Eggs					0.1		21 CFR 556.52
Arsenic	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs	 0.5	 0.5 	 0.5 2 	 	 2 	 	21 CFR 556.60
Bacitracin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.5 0.5 0.5[8] 0.5	21 CFR 556.70
Bambermycin	Cattle[9] Goats Hogs Horses Poultry[9] Sheep Eggs							
Buquinolate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.4	0.1		0.4	0.4	0.5,.2[7]	21 CFR 556.90
Carbadox	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.03			21 CFR 556.100
Ceftiofur[10]	Cattle Goats Hogs Horses Poultry Sheep Eggs		166		2	8		21 CFR 556.113

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Cephapirin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.115
Chlorhexidine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.120
Chlortetra-cycline[11]	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12	 0.4	21 CFR 556.150
Clopidol	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.2 0.2 5 0.2		1.5 1.5 15 1.5	3 3 15 3	0.2	21 CFR 556.160
Clorsulon	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		1			21 CFR 556.163
Cloxacillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.165
Colistimethate	Cattle Goats Hogs Horses Poultry [9] Sheep Eggs							21 CFR 556.167

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Danofloxacin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.2		0.2			
Decoquinate	Cattle Goats Hogs Horses Poultry[12] Sheep Eggs	2 2 2	1 1 1	2 1 2	2 1 2	2 2 2		21 CFR 556.170
Dichlorvos	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.180
Diclazuril	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs	1[16]	0.5		3			21 CFR 556.175
Dihydro-streptomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	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-Dinitro-benzamide	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.220
Doramectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.03[29]		0.1[29] 0.16			21 CFR 556.225

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Enrofloxacin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.3		0.1[13]			21 CFR 556.228
Eprinomectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		4.8			21 CFR 556.227
Erythromycin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1 0.125 0.025	21 CFR 556.230
Estradiol benzoate and related esters[14]	Cattle Goats Hogs Horses Poultry Sheep Eggs	480[14,28] 600[14]	120[14,28] 120[14]		240[14,28] 600[14]	360[14,28] 600[14]		21 CFR 556.240
Ethopabate	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.5		1.5	1.5		21 CFR 556.260
Ethoxyquin	Cattle Goats Hogs Horses Poultry Sheep Eggs	5 5 5 5 3 5	0.5 0.5 0.5 0.5 0.5 0.5		3		0.5	21 CFR 172.140
Famphur	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1	0.1	0.1				21 CFR 556.273

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Fenbendazole	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.4 0.4 2 2		0.8 0.8 6 6			21 CFR 556.275
Fenprostalene	Cattle Goats Hogs Horses Poultry Sheep Eggs							21 CFR 556.277
Florfenicol	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.3 0.2		3.7 2.5			21 CFR 556.283
Flunixin meglumine	Cattle[29] Goats Hogs Horses Poultry Sheep Eggs		0.025		0.125			21 CFR 556.286
Furazolidone	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.290
Gentamicin sulfate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.4	0.1		0.3	0.4	0.1	21 CFR 556.300
Halofuginone hydrobromide	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.16,0.13			21 CFR 556.308

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Haloxon	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.310
Hygromycin B	Cattle Goats Hogs Horses Poultry Sheep Eggs						0 0 0	21 CFR 556.330
Ivermectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.01 0.02		0.01, 0.015[15] 0.02 0.03			21 CFR 556.344
Lasalocid	Cattle Goats Hogs Horses Poultry Sheep Eggs[9] Rabbit	0.2[16]			0.7 0.4 0.7			21 CFR 556.347
Levamisole hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1 0.1	21 CFR 556.350
Lincomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		0.6			21 CFR 556.360

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Maduramicin ammonium	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.38						21 CFR 556.375
Melengestrol acetate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.025						21 CFR 556.380
Metoserpate hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.02[5]	21 CFR 556.410
Monensin	Cattle Goats Hogs Horses Poultry[,17] Sheep Eggs						0.05 0.05	21 CFR 556.420
Morantel tartrate[18]	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.7 0.7			21 CFR 556.425
Moxidectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05		0.2			21 CFR 556.426

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Narasin	Cattle Goats Hogs Horses Poultry Sheep Eggs	 0.48						21 CFR 556.428
Neomycin	Cattle[27] Goats Hogs Horses Poultry[2] Sheep Eggs	7.2 7.2 7.2 7.2[16] 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 Goats Hogs Horses Poultry Sheep Eggs						0.1[5]	21 CFR 556.440
Nicarbazin	Cattle Goats Hogs Horses Poultry Sheep Eggs	4[19]	4		4	4		21 CFR 556.445
Novobiocin	Cattle Goats Hogs Horses Poultry Sheep Eggs						1 1	21 CFR 556.460
Nystatin	Cattle Goats Hogs Horses Poultry Sheep Eggs	 0					0 0	21 CFR 556.470
Oleandomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.15 0.15[6]	21 CFR 556.480

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Ormetoprim	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.490
Oxfendazole	Cattle[20] Goats Hogs Horses Poultry Sheep Eggs				0.8			21 CFR 556.495
Oxytetracycline	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.500
PBB's	Cattle Goats Hogs Horses Poultry Sheep Eggs							FDA revoked, effective January 5,1987, all action levels in meat and poultry
PCB's[21]	Cattle Goats Hogs Horses Poultry Sheep Eggs	3 3 3 3 3 3						21 CFR 109.30
Penicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.05 0 0[22],.01[2] 0 0	21 CFR 556.510

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Pirlimycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3			0.5			21 CFR 556.515
Progesterone	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.012 0.015	0.003 0.003		0.006 0.0015	0.009 0.015		21 CFR 556.540
Pyrantel tartrate	Cattle Goats Hogs Horses Poultry Sheep Eggs		1		10	10		21 CFR 556.560
Ractopamine hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.03 0.05		0.09 0.15			21 CFR 556.570
Robenidine hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2					0.1[5]	21 CFR 556.580
Sarafloxacin	Cattle Goats Hogs Horses Poultry[5, 9] Sheep Eggs							21 CFR 556.594

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Spectinomycin	Cattle[27] Goats Hogs Horses Poultry Sheep Eggs		0.25			4	 0.1	21 CFR 556.600
Streptomycin	Cattle[24] Goats Hogs Horses Poultry 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
Sulfabromo-methazine sodium	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.620
Sulfachloro-pyrazine	Cattle Goats Hogs Horses Poultry[12] Sheep Eggs						 0	21 CFR 556.625
Sulfachlor-pyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.630
Sulfadi-methoxine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.640
Sulfaethoxy-pyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0	21 CFR 556.650

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfamethazine	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs						0.1 0.1 0.1	21 CFR 556.670
Sulfanitran	Cattle Goats Hogs Horses Poultry[12] Sheep Eggs						0	21 CFR 556.680
Sulfaquinoxaline	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs						0.1 0.1	21 CFR 556.685
Sulfathiazole	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.690
Sulfomyxin	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs						0	21 CFR 556.700
Testosterone propionate	Cattle[22] Goats Hogs Horses Poultry Sheep Eggs	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Tetracycline[11]	Cattle[23] Goats Hogs Horses Poultry[5] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.720
Thiabendazole	Cattle Goats Hogs Horses Poultry[24] Sheep Eggs						0.1 0.1 0.1 0.1	21 CFR 556.730
Tiamulin	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.6[25]			21 CFR 556.738
Tilmicosin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1 0.1 0.1		1.2 7.5	 1.2		21 CFR 556.735
Trenbolone	Cattle[9] Goats Hogs Horses Poultry Sheep Eggs							21 CFR 556.739
Tripelennamine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.2	21 CFR 556.741
Tylosin	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs	0.2 0.2 0.2 0.2[6]	0.2 0.2 0.2		0.2 0.2 0.2	0.2 0.2 0.2		21 CFR 556.740

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Virginiamycin	Cattle[9] Goats Hogs Horses Poultry[9] Sheep Eggs	0.4	0.1		0.3	0.4		21 CFR 556.750
Zeranol	Cattle[9] Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.760
Zoalene[26]	Cattle Goats Hogs Horses Poultry Sheep Eggs	2[12]	3[5]		6[12], 3[2]	6[12]		21 CFR 556.770

[1] Unless otherwise indicated meat by product includes liver and kidney

[2] Turkey only

[3] Marker residue: albendazole 2-aminosulfone

[4] Chicken, turkey and pheasants

[5] Chicken and turkey

[6] Whole egg

[7] Egg yolk

[8] Chicken, turkey, pheasants and quails

[9] No tolerance required

[10] Marker residue is desfuroylceftiofur

[11] Tolerances are for the sum of all approved tetracycline residues (i.e., tetracycline, chlortetracycline, and oxytetracyline)

[12] Chicken only

[13] Marker desethylene ciprofloxacin

[14] Tolerance in parts per trillion

[15] American bison and reindeer

[16] Skin with adhering fat

[17] Chicken, turkey, and quail

[18] N-methyl-1,3-propanediamine

[19] Skin

[20] Marker residue is fenbendazole

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2004 FSIS National Residue Program

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[21] Action levels

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

[23] Calves

[24] Pheasants only

[25] Marker residue is 8-alphahydroxymutilin

[26] Tolerances are established for residues of zoalene (3,5-dinitro-o- toluamide) and its metabolite 3-amino-5-nitro-o-toluamide

[27] For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance

[28] For use in heifers, steers, and calves. Do not use in calves intended for reproduction or calves less than 30 days old. Do not use in calves to be processed for veal. For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance

[29] For diary cows, bob veal, formula fed veal and non-formula fed veal the tolerances are zero

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. 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).

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.

Table A III
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Abamectin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.015	0.02	0.02			40 CFR 180.449
Acephate	Cattle Goats Hogs Horses 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 0.1 0.1 0.1			40 CFR 180.108
Acifluorfen	Cattle Goats Hogs Horses Poultry Sheep Eggs	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 Goats Hogs Horses Poultry Sheep Eggs	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 Goats Hogs Horses 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			40 CFR 180.269
Aldrin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1]					51 FR 46662
Amitraz	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.01 0.1 0 0.01 0	0.05 0 0.05 0 0.01 0	0.3 0 0.3 0 0.05 0	0.2	0.2	40 CFR 180.287

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Atrazine	Cattle	0.02	0.02	0.02			40 CFR 180.220
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs						
Azinphos-Methyl {O,O-dimethyl S-[(4-oxo-1,2,3-benzotrizin-3(4H)-yl) methyl]phosphoro-dithioate}	Cattle	0.1	0.1	0.1			40 CFR 180.154
	Goats	0.1	0.1	0.1			
	Hogs						
	Horses	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
Azoxystrobin	Cattle	0.01	0.01	0.01			40 CFR 180.507
	Goats	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horses	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
	Eggs						
Boscalid	Cattle	0.30	0.10	0.35			
	Goats	0.30	0.10	0.35			
	Hogs	0.10	0.05	0.10			
	Horses	0.30	0.10	0.35			
	Poultry	0.05	0.05	0.10			
	Sheep	0.30	0.10	0.35			
	Eggs	0.02[Whl]					
Benomyl	Cattle	0.1	0.1	0.1			40 CFR 180.294
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	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[Whl]					
Benoxacor	Cattle	0.01	0.01	0.01	0.01	0.01	40 CFR 180.460
	Goats	0.01	0.01	0.01	0.01	0.01	
	Hogs	0.01	0.01	0.01	0.01	0.01	
	Horses	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 [Whl]					
Bentazon	Cattle	0.05	0.05	0.05			40 CFR 180.355
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses						
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Benzene hexachloride	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1]					50 FR 25697
Bifenazate	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.02 0.02 0.02 0.02 0.02	0.02 0.02 0.02 0.02 0.02			40 CFR 180.572
Bifenthrin	Cattle Goats Hogs Horses Poultry Sheep Eggs	1.0 1.0 1.0 1.0 0.05 1.0 0.05 Whl	0.5 0.5 0.5 0.5 0.05 0.5	0.1 0.1 0.1 0.1 0.05 0.1			40 CFR 180.442
Bromoxynil	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.05 0.1 0.05 Whl	0.1 0.1 0.1 0.1 0.05 0.1	0.1 0.1 0.1 0.1 0.05 0.1			40 CFR 180.324
Buprofezin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.05 0.05 0.05 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 180.511
Cacodylic acid	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.7	0.7	0.7	1.4	1.4	40 CFR 180.311
Captan	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.05 0.05	0.05 0.05	0.05 0.05			40 CFR 180.103

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Carbaryl	Cattle	0.1	0.1	0.1	1	1	40 CFR 180.169
	Goats	0.1	0.1	0.1	1	1	
	Hogs	0.1	0.1	0.1	1	1	
	Horses	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 Whl					
Carbofuran	Cattle	0.05	0.05	0.05			40 CFR 180.254
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Carboxin	Cattle	0.1	0.1	0.1			40 CFR 180.156
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.01 Whl					
Chlordane	Cattle	0.3[1]					51 FR 46665
	Goats	0.3[1]					
	Hogs	0.3[1]					
	Horses	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
	Eggs						
Chlordimeform	Cattle	0.01	0.1	0.1			40 CFR 180.285
	Goats	0.01	0.1	0.1			
	Hogs	0.01	0.1	0.1			
	Horses	0.01	0.1	0.1			
	Poultry	0.25	0.25	0.25			
	Sheep	0.01	0.1	0.1			
	Eggs						
Chlorfenapyr	Cattle	0.1	0.01	0.3			40 CFR 180.513
	Goats	0.1	0.01	0.3			
	Hogs	0.1	0.01	0.3			
	Horses	0.1	0.01	0.3			
	Poultry						
	Sheep	0.1	0.01	0.3			
	Eggs						
2-Chloro-N-isopropylacetanilide [Propachlor]	Cattle	0.02	0.02	0.02			40 CFR 180.211
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Chloroneb	Cattle	0.2	0.2	0.2			40 CFR 180.257
	Goats	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horses	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
	Eggs						
Chlorpyrifos-methyl	Cattle	0.5	0.5	0.5			40 CFR 180.419
	Goats	0.5	0.5	0.5			
	Hogs	0.5	0.5	0.5			
	Horses	0.5	0.5	0.5			
	Poultry	0.5	0.5	0.5			
	Sheep	0.5	0.5	0.5			
	Eggs						
Chlorsulfuron	Cattle	0.3	0.3	0.3			40 CFR 180.405
	Goats	0.3	0.3	0.3			
	Hogs	0.3	0.3	0.3			
	Horses	0.3	0.3	0.3			
	Poultry						
	Sheep	0.3	0.3	0.3			
	Eggs						
Clethodim	Cattle	0.2	0.2	0.2			40 CFR 180.458
	Goats	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horses	0.2	0.2	0.2			
	Poultry	0.2	0.2	0.2			
	Sheep	0.2	0.2	0.2			
	Eggs	0.2 [Whl]					
Clofencet	Cattle	0.04	0.15	0.5		10.0	40 CFR 180.497
	Goats	0.04	0.15	0.5		10.0	
	Hogs	0.04	0.15	0.5		10.0	
	Horses	0.04	0.15	0.5		10.0	
	Poultry	0.04	0.15	0.2			
	Sheep	0.04	0.15	0.5		10.0	
	Eggs						
Clofentezine	Cattle	0.05	0.05	0.05	0.4		40 CFR 180.446
	Goats	0.05	0.05	0.05	0.4		
	Hogs	0.05	0.05	0.05	0.4		
	Horses	0.05	0.05	0.05	0.4		
	Poultry						
	Sheep	0.05	0.05	0.05	0.4		
	Eggs						
Clopyralid	Cattle	1.0	1.0	36.0[5]	3.0		40 CFR 180.431
	Goats	1.0	1.0	36.0[5]	3.0		
	Hogs	0.2	0.2	0.2			
	Horses	1.0	1.0	36.0[5]	3.0		
	Poultry	0.2	0.2	0.2			
	Sheep	1.0	1.0	36.0[5]	3.0		
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Coumaphos	Cattle	1	1	1			40 CFR 180.189
	Goats	1	1	1			
	Hogs	1	1	1			
	Horses	1	1	1			
	Poultry						
	Sheep	1	1	1			
	Eggs						
Cuprous oxide	Cattle		Exempt				40 CFR 180.1021
	Goats		Exempt				
	Hogs		Exempt				
	Horses		Exempt				
	Poultry		Exempt				
	Sheep		Exempt				
	Eggs		Exempt				
Cyclanilide	Cattle	0.1	0.02	0.2		2.0	40 CFR 180.506
	Goats	0.1	0.02	0.2		2.0	
	Hogs	0.1	0.02	0.2		2.0	
	Horses	0.1	0.02	0.2		2.0	
	Poultry						
	Sheep	0.1	0.02	0.2		2.0	
	Eggs						
Cyfluthrin	Cattle	10.0	0.4	0.4			40 CFR 180.436
	Goats	10.0	0.4	0.4			
	Hogs	10.0	0.4	0.4			
	Horses	10.0	0.4	0.4			
	Poultry	0.01	0.01	0.01			
	Sheep	10.0	0.4	0.4			
	Eggs	0.01 Whl					
Cyhexatin	Cattle	0.2	0.2	0.2	0.5	0.5	40 CFR 180.144
	Goats	0.2	0.2	0.2	0.5	0.5	
	Hogs	0.2	0.2	0.2	0.5	0.5	
	Horses	0.2	0.2	0.2	0.5	0.5	
	Poultry						
	Sheep	0.2	0.2	0.2	0.5	0.5	
	Eggs						
Cypermethrin	Cattle	0.05	0.05	0.05			40 CFR 180.418
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Cyromazine	Cattle	0.05	0.05	0.05		0.2	40 CFR 180.414
	Goats	0.05	0.05	0.05		0.2	
	Hogs	0.05	0.05	0.05		0.2	
	Horses	0.05	0.05	0.05		0.2	
	Poultry	0.05	0.05				
	Sheep	0.05	0.05	0.05		0.2	
	Eggs	0.25 Whl					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
DDT & metabolites	Cattle Goats Hogs Horses Poultry Sheep Eggs	5.0[1] 5.0[1] 5.0[1] 5.0[1] 5.0[1] 5.0[1]					51 FR 46658
Diazinon	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.7 0.7	0.7 0.7	0.7 0.7			40 CFR 180.153
Dicamba	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2 0.2 0.2 0.2 0.2	0.2 0.2 0.2 0.2 0.2	0.2 0.2 0.2 0.2 0.2	1.5 1.5 1.5 1.5 1.5	1.5 1.5 1.5 1.5 1.5	40 CFR 180.227
2,4-Dichlorophenoxyacetic acid	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2 0.2 0.2 0.2 0.05 0.2 0.05 [Whl]	0.2 0.2 0.2 0.2 0.2	0.2 0.2 0.2 0.2 0.2		2 2 2 2 2	40 CFR 180.142
3,4-Dichloropropionanilide	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.05 [Whl]	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 180.274
Dichlorvos	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.02 0.02 0.1 0.02 0.05 0.02 0.05 [Whl]	0.02 0.02 0.1 0.02 0.05 0.02	0.02 0.02 0.1 0.02 0.05 0.02			40 CFR 180.235
Dieldrin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1] 0.3[1]					51 FR 46662

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Difenoconazole	Cattle	0.05	0.05	0.05			40 CFR 180.475
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 Whl					
Difenzoquat	Cattle	0.05	0.05	0.05			40 CFR 180.369
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs						
Diflubenzuron	Cattle	0.05	0.05	0.15			40 CFR 180.377
	Goats	0.05	0.05	0.15			
	Hogs	0.05	0.05	0.15			
	Horses	0.05	0.05	0.15			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.15			
	Eggs	0.05 Whl					
2,6-Diisopropylnaphthalene	Cattle		1.35	1.35			
	Goats		1.35	1.35			
	Hogs		1.35	1.35			
	Horses		1.35	1.35			
	Poultry		1.35	1.35			
	Sheep		1.35	1.35			
	Eggs						
Dimethipin	Cattle	0.02	0.02	0.02			40 CFR 180.406
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	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
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 Whl					
N,N-Dimethylpiperidinium chloride (Mepiquat chloride)	Cattle	0.1	0.1	0.1			40 CFR 180.384
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 Whl					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Diphenamide	Cattle	0.05	0.05	0.05			40 CFR 180.230
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Diphenylamine	Cattle	0.01	0.01	0.01	0.10		40 CFR 180.190
	Goats	0.01	0.01	0.01	0.10		
	Hogs						
	Horses	0.01	0.01	0.01	0.10		
	Poultry						
	Sheep	0.01	0.01	0.01	0.01		
	Eggs						
Dipropyl isocinchomeronate	Cattle	0.1	0.1	0.1			40 CFR 180.143
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	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
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 [Whl]					
Diuron	Cattle	1	1	1			40 CFR 180.106
	Goats	1	1	1			
	Hogs	1	1	1			
	Horses	1	1	1			
	Poultry						
	Sheep	1	1	1			
	Eggs						
Dodin	Cattle		0				40 CFR 180.172
	Goats		0				
	Hogs		0				
	Horses		0				
	Poultry		0				
	Sheep		0				
	Eggs						
Emamectin benzoate	Cattle	0.003	0.002	0.005[5]	0.02		40 CFR 180.505
	Goats	0.003	0.002	0.005[5]	0.02		
	Hogs	0.003	0.002	0.005[5]	0.02		
	Horses	0.003	0.002	0.005[5]	0.02		
	Poultry						
	Sheep	0.003	0.002	0.005[5]	0.02		
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Endosulfan	Cattle	0.2	0.2	0.2			40 CFR 180.182
	Goats	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horses	0.2	0.2	0.2			
	Poultry						
	Sheep	0.2	0.2	0.2			
	Eggs						
Endrin	Cattle	0.3[1]					MPI Dir 917.1
	Goats	0.3[1]					
	Hogs	0.3[1]					
	Horses	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
	Eggs						
Esfenvalerate	Cattle						40 CFR 180.533
	Goats						
	Hogs						
	Horses						
	Poultry	0.3	0.03	0.3	0.03		
	Sheep						
	Eggs	0.03 Whl					
Ethalfluralin	Cattle						40 CFR 180.416
	Goats	0.05	0.05	0.05			
	Hogs						
	Horses						
	Poultry						
	Sheep						
	Eggs						
Ethephon	Cattle	0.1	0.1	0.1			40 CFR 180.300
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	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
	Goats	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horses	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
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Etoxazole	Cattle	0.02			0.01		40 CFR 180.593
	Goats	0.02			0.01		
	Hogs						
	Horses	0.02			0.01		
	Poultry						
	Sheep	0.02			0.01		
	Eggs						
Etridiazole	Cattle	0.1	0.1	0.1			40 CFR 180.370
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 Whl					
Famozadone	Cattle	0.02			0.05		40 CFR 180.587
	Goats	0.02			0.05		
	Hogs						
	Horses	0.02			0.05		
	Poultry						
	Sheep	0.02			0.05		
	Eggs						
Fenamiphos	Cattle	0.05	0.05	0.05			40 CFR 180.349
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	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
	Goats	0.1	0.01	0.01	0.1	0.1	
	Hogs	0.1	0.01	0.01	0.1	0.1	
	Horses	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 Whl					
Fenbuconazole	Cattle	0.01	0.01	0.01			40 CFR 180.480
	Goats	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horses	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
	Eggs						
Fenbutatin Oxide	Cattle	0.5	0.5	0.5			40 CFR 180.362
	Goats	0.5	0.5	0.5			
	Hogs	0.5	0.5	0.5			
	Horses	0.5	0.5	0.5			
	Poultry	0.1	0.1	0.1			
	Sheep	0.5	0.5	0.5			
	Eggs	0.1 Whl					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Fenoxaprop-ethyl	Cattle	0.05	0.05	0.05			40 CFR 180.430
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Fenpropathrin	Cattle	1.0	0.1	0.1			40 CFR 180.466
	Goats	1.0	0.1	0.1			
	Hogs	1.0	0.1	0.1			
	Horses	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
	Goats	0.05	0.05	0.05	1.0	1.0	
	Hogs	0.05	0.05	0.05	1.0	1.0	
	Horses	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
	Goats						
	Hogs	0.1	0.1	0.1			
	Horses						
	Poultry						
	Sheep						
	Eggs						
Fenvalerate	Cattle	1.5	1.5	1.5			40 CFR 180.379
	Goats	1.5	1.5	1.5			
	Hogs	1.5	1.5	1.5			
	Horses	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
	Goats	0.4	0.04	0.04	0.1		
	Hogs	0.04	0.01	0.01	0.02		
	Horses	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
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

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
	Goats	0.05	0.05	0.1		0.5	
	Hogs	0.05	0.05	0.1		0.5	
	Horses	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
	Goats	0.05	0.05	0.05	0.1	0.1	
	Hogs	0.05	0.05	0.05	0.1	0.1	
	Horses	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		1.5	40 CFR 180.535
	Goats	0.1	0.1	0.1		1.5	
	Hogs	0.1	0.1	0.1		1.5	
	Horses	0.1	0.1	0.1		1.5	
	Poultry						
	Sheep	0.1	0.1	0.1		1.5	
	Eggs						
Flutolanil	Cattle	0.1	0.05	0.05	2.00	1.00	40 CFR 180.484
	Goats	0.1	0.05	0.05	2.00	1.00	
	Hogs	0.1	0.05	0.05	2.00	1.00	
	Horses	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
	Goats	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horses	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	0.04	0.15	6.0			40 CFR 180.473
	Goats	0.04	0.15	6.0			
	Hogs	0.04	0.15	6.0			
	Horses	0.04	0.15	6.0			
	Poultry	0.15	0.15	6.0			
	Sheep	0.04	0.15	6.0			
	Eggs	0.15^{Whl}					
Glyphosate and its metabolites	Cattle				0.5	4.0	40 CFR 180.364
	Goats				0.5	4.0	
	Hogs				0.5	4.0	
	Horses				0.5	4.0	
	Poultry				0.5	0.5	
	Sheep				0.5	4.0	
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Halosulfuron	Cattle			0.1			40 CFR 180.479
	Goats			0.1			
	Hogs			0.1			
	Horses			0.1			
	Poultry						
	Sheep			0.1			
	Eggs						
HCB	Cattle	0.5[1]					MPI Dir 917.1
	Goats	0.5[1]					
	Hogs	0.5[1]					
	Horses	0.5[1]					
	Poultry	0.5[1]					
	Sheep	0.5[1]					
	Eggs						
Heptachlor & heptachlor epoxide	Cattle	0.2[1]	0.2[1]	0.2[1]			54 FR 33690 MPI Dir 917.1
	Goats	0.2[1]	0.2[1]	0.2[1]			
	Hogs	0.2[1]	0.2[1]	0.2[1]			
	Horses	0.2[1]	0.2[1]	0.2[1]			
	Poultry	0.2[1]	0.2[1]	0.2[1]			
	Sheep	0.2[1]	0.2[1]	0.2[1]			
	Eggs						
Hexazinone	Cattle	0.1	0.1	0.1			40 CFR 180.396
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry						
	Sheep	0.1	0.1	0.1			
	Eggs						
Imazalil	Cattle	0.01	0.01	0.01	0.5		40 CFR 180.413
	Goats	0.01	0.01	0.01	0.5		
	Hogs	0.01	0.01	0.01	0.5		
	Horses	0.01	0.01	0.01	0.5		
	Poultry						
	Sheep	0.01	0.01	0.01	0.5		
	Eggs						
Imazapyr	Cattle	0.05	0.05	0.05[4]		0.20	40 CFR 180.500
	Goats	0.05	0.05	0.05[4]		0.02	
	Hogs						
	Horses	0.05	0.05	0.05[4]		0.02	
	Poultry						
	Sheep	0.05	0.05	0.05[4]		0.02	
	Eggs						
Imazethapyr	Cattle			0.10			40 CFR 180.447
	Goats			0.10			
	Hogs			0.10			
	Horses			0.10			
	Poultry						
	Sheep			0.10			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

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
	Goats	0.3	0.3	0.3			
	Hogs	0.3	0.3	0.3			
	Horses	0.3	0.3	0.3			
	Poultry	0.05	0.05	0.05			
	Sheep	0.3	0.3	0.3			
	Eggs	0.02 Whl					
Indoxacarb	Cattle	1.5	0.05	0.03			40 CFR 180.564
	Goats	1.5	0.05	0.03			
	Hogs	1.5	0.05	0.03			
	Horses	1.5	0.05	0.03			
	Poultry						
	Sheep	1.5	0.05	0.03			
	Eggs						
Iprodione	Cattle	0.5	0.5	0.5	3.0	3.0	40 CFR 180.399
	Goats	0.5	0.5	0.5	3.0	3.0	
	Hogs	0.5	0.5	0.5	3.0	3.0	
	Horses	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 Whl					
Isoxaflutole	Cattle	0.2	0.2	0.1	0.5		40 CFR 180.537
	Goats	0.2	0.2	0.1	0.5		
	Hogs	0.2	0.2	0.1	0.5		
	Horses	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 Whl					
Lambda-cyhalothrin	Cattle	3.0	0.2	0.2			40 CFR 180.438
	Goats	3.0	0.2	0.2			
	Hogs	3.0	0.2	0.2			
	Horses	3.0	0.2	0.2			
	Poultry	0.03	0.01	0.01			
	Sheep	3.0	0.2	0.2			
	Eggs	0.01 Whl					
Lindane (gamma isomer of benzene hexachloride)	Cattle	7	7				40 CFR 180.133 MPI Dir 917.1
	Goats	7	7				
	Hogs	4	4				
	Horses	7	7				
	Poultry	4[1]					
	Sheep	7	7				
	Eggs						
Linuron	Cattle	1	1	1			40 CFR 180.184
	Goats	1	1	1			
	Hogs	1	1	1			
	Horses	1	1	1			
	Poultry						
	Sheep	1	1	1			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Malathion	Cattle	4	4	4			40 CFR 180.111
	Goats	4	4	4			
	Hogs	4	4.	4			
	Horses	4	4	4			
	Poultry	4	4	4			
	Sheep	4	4	4			
	Eggs	0.1 Whl					
Maleic hydrazide	Cattle	3	2.5		7	32	40 CFR 180.175
	Goats	3	2.5		7	32	
	Hogs	3	2.5		7	32	
	Horses	3	2.5		7	32	
	Poultry	0.5	0.5	1.4	0.5		
	Sheep	3	2.5		7	32	
	Eggs	0.5 Whl					
Mancozeb	Cattle				0.5	0.5	40 CFR 180.176
	Goats				0.5	0.5	
	Hogs				0.5	0.5	
	Horses				0.5	0.5	
	Poultry				0.5	0.5	
	Sheep				0.5	0.5	
	Eggs						
Mefenpyr-diethyl	Cattle						
	Goats			0.1			
	Hogs			0.1			
	Horses			0.1			
	Poultry						
	Sheep			0.1			
	Eggs						
Metalxyl	Cattle	0.4	0.05	0.05	0.4	0.4	40 CFR 180.408
	Goats	0.4	0.05	0.05	0.4	0.4	
	Hogs	0.4	0.05	0.05	0.4	0.4	
	Horses	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						
Methoprene	Cattle	1.0	0.1	0.1			40 CFR 180.359
	Goats	1.0	0.1	0.1			
	Hogs	1.0	0.1	0.1			
	Horses	1.0	0.1	0.1			
	Poultry	1.0	0.1	0.1			
	Sheep	1.0	0.1	0.1			
	Eggs	0.1 Whl					
Methoxychlor	Cattle	3	3				40 CFR 180.120 MPI Dir. 917.1
	Goats	3	3				
	Hogs	3	3				
	Horses	3	3				
	Poultry	3[1]					
	Sheep	3	3				
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Methoxyfenozide	Cattle	0.1	0.02	0.02	0.1		40 CFR 180.544
	Goats	0.1	0.02	0.02	0.1		
	Hogs	0.1	0.02	0.02	0.1		
	Horses	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
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	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
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
1-Methylethyl-2-ethoxy-1-methylethyl amino phosphinothioyl -oxy benzoate [Isofenphos]	Cattle	0.1	0.1	0.1			40CFR 180.387
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.1	0.1	0.1			
	Sheep	0.1	0.1	0.1			
	Eggs						
Metolachlor	Cattle	0.02	0.02	0.02	0.05	0.2	40CFR 180.368
	Goats	0.02	0.02	0.02	0.05	0.2	
	Hogs	0.02	0.02	0.02	0.05	0.2	
	Horses	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 [Whl]					
Metribuzin	Cattle	0.7	0.7	0.7			40 CFR 180.332
	Goats	0.7	0.7	0.7			
	Hogs	0.7	0.7	0.7			
	Horses	0.7	0.7	0.7			
	Poultry	0.7	0.7	0.7			
	Sheep	0.7	0.7	0.7			
	Eggs	0.01 [Whl]					
Metsulfuron-methyl	Cattle	0.1	0.1	0.1		0.5	40 CFR 180.428
	Goats	0.1	0.1	0.1		0.5	
	Hogs	0.1	0.1	0.1		0.5	
	Horses	0.1	0.1	0.1		0.5	
	Poultry						
	Sheep	0.1	0.1	0.1		0.5	
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Mirex	Cattle	0.1[1]	0.1[1]	0.1[1]			51 FR45114
	Goats	0.1[1]	0.1[1]	0.1[1]			
	Hogs	0.1[1]	0.1[1]	0.1[1]			
	Horses	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
	Goats	0.05	0.1	0.2	1.0		
	Hogs	0.05	0.1	0.2	1.0		
	Horses	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 Whl					
Nicotine	Cattle						40 CFR 180.167
	Goats						
	Hogs						
	Horses						
	Poultry	0	0	0			
	Sheep						
	Eggs	0					
Nitrapyrin	Cattle	0.05	0.05	0.05			40 CFR 180.350
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	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
	Goats	0.1	0.1	0.1	0.25		
	Hogs	0.1	0.1	0.1	0.25		
	Horses	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
	Goats	0.3					
	Hogs	0.3					
	Horses	0.3					
	Poultry						
	Sheep	0.3					
	Eggs						
Oxydemeton-methyl	Cattle	0.01	0.01	0.01			40 CFR 180.330
	Goats	0.01	0.01	0.01			
	Hogs	0.01	0.01	0.01			
	Horses	0.01	0.01	0.01			
	Poultry						
	Sheep	0.01	0.01	0.01			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
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Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Oxyfluorfen	Cattle	0.05	0.05	0.05			40 CFR 180.381
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry	0.05	0.05	0.05			
	Sheep	0.05	0.05	0.05			
	Eggs	0.05 Whl					
Paraquat dichloride	Cattle	0.05	0.05	0.05		0.3	40 CFR 180.205
	Goats	0.05	0.05	0.05		0.3	
	Hogs	0.05	0.05	0.05		0.3	
	Horses	0.05	0.05	0.05		0.3	
	Poultry						
	Sheep	0.05	0.05	0.05		0.3	
	Eggs	0.01 Whl					
Permethrin	Cattle	3.0	0.25	2.0			40 CFR 180.378
	Goats	3.0	0.25	2.0			
	Hogs	3.0	0.25	3.0			
	Horses	3.0	0.25	2.0			
	Poultry	0.15	0.05	0.25			
	Sheep	3.0	0.25	2.0			
	Eggs	1 Whl					
Phosmet	Cattle	0.2	0.2	0.2			40 CFR 180.261
	Goats	0.2	0.2	0.2			
	Hogs	0.2	0.2	0.2			
	Horses	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
	Goats	0.2	0.2	0.2	0.5	5	
	Hogs	0.2	0.2	0.2	0.5	5	
	Horses	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 Whl					
Piperonyl butoxide	Cattle	0.1	0.1	0.1			40 CFR 180.127
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	3.0	3.0	3.0			
	Sheep	0.1	0.1	0.1			
	Eggs	1 Whl					
Pirimiphos-methyl	Cattle	0.2	0.2	0.2	2.0	2.0	40 CFR 180.409
	Goats	0.2	0.2	0.2	2.0	2.0	
	Hogs	0.2	0.2	0.2	2.0	2.0	
	Horses	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 Whl					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Polyoxyethylene	Cattle Goats Hogs Horses Poultry Sheep Eggs		Exempt Exempt Exempt Exempt Exempt Exempt Exempt				40 CFR 180.1078
Primisulfuron	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 Whl	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 Goats Hogs Horses Poultry Sheep Eggs	0.05 0.05 0.05 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 Goats Hogs Horses Poultry Sheep Eggs			0.05 0.05 0.05 0.05 0.05		0.1 0.1 0.1 0.1 0.1	40 CFR 180.547
Propamocarb hydrochloride	Cattle Goats Hogs Horses 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 Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 Whl	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
Propham	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.5 0.5 0.5 0.5 0.5 0.5 0.5 Whl	0.5 0.5 0.5 0.5 0.5 0.5	0.5 0.5 0.5 0.5 0.5 0.5			40 CFR 180.319

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Propiconazole	Cattle	0.1	0.1	0.1[3]	2.0	2.0	40 CFR 180.434
	Goats	0.1	0.1	0.1[3]	2.0	2.0	
	Hogs	0.1	0.1	0.1[3]	2.0	2.0	
	Horses	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 [Whl]					
Propionic acid	Cattle		Exempt	Exempt			40 CFR 180.1023
	Goats		Exempt	Exempt			
	Hogs		Exempt	Exempt			
	Horses		Exempt	Exempt			
	Poultry		Exempt	Exempt			
	Sheep		Exempt	Exempt			
	Eggs		Exempt				
Propyzamide	Cattle	0.02	0.02	0.02[3]	0.4	0.4	40 CFR 180.317
	Goats	0.02	0.02	0.02[3]	0.4	0.4	
	Hogs	0.02	0.02	0.02[3]	0.4	0.4	
	Horses	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 [Whl]					
Pyraclostrobin	Cattle	0.10	0.10	0.20	1.50		40 CFR 180.582
	Goats	0.10	0.10	0.20	1.50		
	Hogs	0.10	0.10	0.20	1.50		
	Horses	0.10	0.10	0.20	1.50		
	Poultry						
	Sheep	0.10	0.10	0.20	1.50		
	Eggs						
Pyrethrins	Cattle	0.1	0.1	0.1			40 CFR 180.128
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.2	0.2	0.2			
	Sheep	0.1	0.1	0.1			
	Eggs	0.1 [Whl]					
Pyridaben	Cattle	0.05	0.05	0.05			40 CFR 180.494
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry						
	Sheep	0.05	0.05	0.05			
	Eggs						
Quinclorac	Cattle	0.7	0.05	1.5			40 CFR 180.463
	Goats	0.7	0.05	1.5			
	Hogs	0.7	0.05	1.5			
	Horses	0.7	0.05	1.5			
	Poultry	0.2	0.05	0.1			
	Sheep	0.7	0.05	1.5			
	Eggs	0.05 [Whl]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Quizalofop-ethyl	Cattle	0.05	0.02	0.05			40 CFR 180.441
	Goats	0.05	0.02	0.05			
	Hogs	0.05	0.02	0.05			
	Horses	0.05	0.02	0.05			
	Poultry	0.05	0.02	0.05			
	Sheep	0.05	0.02	0.05			
	Eggs	0.02 Whl					
Sethoxydim	Cattle	0.2	0.2	1.0			40 CFR 180.412
	Goats	0.2	0.2	1.0			
	Hogs	0.2	0.2	1.0			
	Horses	0.2	0.2	1.0			
	Poultry	0.2	0.2	2.0			
	Sheep	0.2	0.2	1.0			
	Eggs	2.0 Whl					
Simazine	Cattle	0.02	0.02	0.02			40 CFR 180.213
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses	0.02	0.02	0.02			
	Poultry	0.02	0.02	0.02			
	Sheep	0.02	0.02	0.02			
	Eggs	0.02 Whl					
Sodium acifluorfen	Cattle				0.02	0.02	40 CFR 180.383
	Goats				0.02	0.02	
	Hogs				0.02	0.02	
	Horses				0.02	0.02	
	Poultry	0.02	0.02	0.02			
	Sheep				0.02	0.02	
	Eggs	0.02 Whl					
Spinosad	Cattle	3.5	.15	1.0			40 CFR 180.495
	Goats	3.5	.15	1.0			
	Hogs	3.5	.15	1.0			
	Horses	3.5	.15	1.0			
	Poultry	0.2	.02	.02			
	Sheep	3.5	.15	1.0			
	Eggs						
Sulfonium, trimethyl-salt with n-(phosphonomethyl)glycine	Cattle						40 CFR 180.489
	Goats						
	Hogs						
	Horses						
	Poultry			0.50			
	Sheep						
	Eggs						
Sulfosate	Cattle	0.5	1.0	1.5		6.0	40 CFR 180.489
	Goats	0.5	1.0	1.5		6.0	
	Hogs	0.5	1.0	1.5		6.0	
	Horses	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 Whl					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Tebuconazole	Cattle Goats Hogs Horses Poultry Sheep Eggs			0.2 0.2 0.2 0.2 0.2 0.2			40 CFR 180.474
Tebufenozide	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.01 Whl	0.08 0.08 0.08 0.08 0.01 0.08	0.08 0.08 0.08 0.08 0.05 0.08	1.0 1.0	0.02 0.02	40 CFR 180.482
Tebuthiuron	Cattle Goats Hogs Horses Poultry Sheep Eggs	2 2 2 2	2 2 2 2	2 2 2 2			40 CFR 180.390
Tepraloxydim	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.15 0.15 0.15 0.15 0.30 0.15 0.20 Whl	0.20 0.20 0.20 0.20 0.20 0.20	0.20[4] 0.20[4] 0.20[4] 0.20[4] 0.20[5] 0.20[4]	 1.0 	0.50 0.50 0.50 0.50 0.50	
Terbacil	Cattle Goats Hogs Horses Poultry Sheep Eggs	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0			40 CFR 180.209
Tetrachlorvinphos [Stirofos, Gardona]	Cattle Goats Hogs Horses Poultry Sheep Eggs	1.5 0.5 1.5 0.5 0.75 0.5 0.1 Whl					40 CFR 180.252
Tetraconazole	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.6	0.03	0.03	6.0	0.2	40 CFR 180.557

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Tetradifon	Cattle Goats Hogs Horses Poultry Sheep Eggs		0 0 0 0 0 0				40 CFR 180.174
Thiabendazole	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 Whl	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
Thiacloprid	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.02 0.02 0.02 0.02	0.03 0.03 0.03 0.03	0.05 0.05 0.05 0.05	0.15 0.15 0.15 0.15	0.05 0.05 0.05 0.05	40 CFR 180.594
Thiobencarb	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2 0.2 0.2 0.2 0.2 0.2 0.2 Whl	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 Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.1 0.1 0.1 Whl	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 Goats Hogs Horses Poultry Sheep Eggs	1.0 1.0 0.04 1.0 0.04 1.0 0.04 Whl	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
Triadimenol	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1 0.1 0.1 0.1 0.01 0.1 0.01 Whl	0.1 0.1 0.1 0.1 0.01 0.1	0.1 0.1 0.1 0.1 0.01 0.1			40 CFR 180.450

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Triasulfuron	Cattle	0.1	0.1	0.1[4]		0.5	40 CFR 180.459
	Goats	0.1	0.1	0.1[4]		0.5	
	Hogs	0.1	0.1	0.1[4]		0.5	
	Horses	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
	Goats	0.02	0.02	0.02			
	Hogs						
	Horses						
	Poultry						
	Sheep	0.02	0.02	0.02			
	Eggs						
Trichlorfon	Cattle	0.1	0.1	0.1			40 CFR 180.198
	Goats						
	Hogs						
	Horses						
	Poultry						
	Sheep						
	Eggs						
Trifloxystrobin	Cattle	0.05	0.05	0.05			40 CFR 180.555
	Goats	0.05	0.05	0.05			
	Hogs	0.05	0.05	0.05			
	Horses	0.05	0.05	0.05			
	Poultry	0.04	0.04	0.04			
	Sheep	0.05	0.05	0.05			
	Eggs	0.04					
Triclopyr	Cattle	0.05	0.05	0.05	0.5	0.5	40 CFR 180.417
	Goats	0.05	0.05	0.05	0.5	0.5	
	Hogs	0.05	0.05	0.05	0.5	0.5	
	Horses	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 Whl					
Triflumazole	Cattle	0.5	0.05	0.5			40 CFR 180.476
	Goats	0.5	0.05	0.5			
	Hogs	0.5	0.05	0.5			
	Horses	0.5	0.05	0.5			
	Poultry	0.05	0.05	0.1			
	Sheep	0.5	0.05	0.5			
	Eggs	0.05 Whl					
Triphenyltin hydroxide	Cattle				0.05	0.05	40 CFR 180.236
	Goats				0.05	0.05	
	Hogs				0.05	0.05	
	Horses				0.05	0.05	
	Poultry						
	Sheep				0.05	0.05	
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2004 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Vinclozolin[6]	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.05 0.05 0.05 0.05 0.1 0.05 0.05 Whl	0.05 0.05 0.05 0.05 0.1 0.05	0.05 0.05 0.05 0.05 0.1 0.05			40 CFR 180.380
Zeta-cypermethrin	Cattle Goats Hogs Horses Poultry Sheep Eggs	1.0 1.0 1.0 1.0 0.05 1.0 0.05 Whl	1.0 1.0 1.0 1.0 0.05 1.0	0.05 0.05 0.05 0.05 0.05 0.05			40 CFR 180.418

1. Action level
2. All tissues of poultry excluding kidney
3. Excluding liver and kidney
4. Excluding kidney
5. Excluding liver
6. Time limit (11-30-08)

Whl = Whole eggs

Appendix IV
Analytical Methods

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 Immunosorbent Assay

GC -- Gas Chromatography

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.

Minimum Reportable Level – The lowest level at which the analytical result is reported.

MS -- Mass Spectrometry

NA -- Not Applicable

ppb -- Parts per billion

ppm -- Parts per million

SIM -- Selected-Ion Monitoring Mode

TBD -- To Be Determined

Table AIV
Analytical Methods
2004 National Residue Program

Compound Class	Compound	Analytical Method			Minimum Proficiency Level [a]		
		Screen	Determinative (quantitative)	Confirmatory (identification)	Screen	Determinative (quantitative)	Confirmatory (identification)
Antibiotics	Carbadox		GC-ECD	TBD		15 ppb	TBD
	Chloramphenicol		GC	GC-MS		0.30 ppb	0.30 ppb
	Florfenicol		HPLC	GC-MS		1.9 ppm (L)	1.9 ppm (L)
Antibiotics : beta-Lactams	Penicillin	7-Plate Bioassay	Bioassay			0.01 ppm	
Antibiotics : Tetracyclines	Chlortetracycline	7-Plate Bioassay	Bioassay	HPLC (chemistry)	0.5 ppm	0.08 ppm	
	Oxytetracycline						
	Tetracycline						
Antibiotics: Macrolides	Clindamycin	7-Plate Bioassay		MS			0.1 ppm
	Erythromycin		Bioassay			0.05 ppm	0.1 ppm
	Lincomycin						0.1 ppm
	Pirlimycin						0.1 ppm
	Tilmicosin		HPLC- Ion Pairing			300 ppb (M) 600 ppb (L,K)	600 ppb
	Tylosin		Bioassay			0.2 ppm	0.1 ppm
Antibiotics: Aminoglycosides	Amikacin	7-Plate Bioassay		MS			1.0 ppm (L,K), 0.4 ppm (M)
	Apramycin						0.4 ppm (K) 0.1 ppm (L,M)
	Dihydrostreptomycin		Bioassay				0.4 ppm (L,K,M)
	Gentamicin		Bioassay			0.15 ppm	0.1 ppm (K,M)
	Hygromycin						1.0 ppm (L,K) 0.4 ppm (M)
	Kanamycin						4.0 ppm(L), 2.0 ppm (K), 0.4 ppm (M)
	Neomycin		Bioassay			0.25 ppm	0.1ppm (K,M)
	Spectinomycin					10.0 ppm	1.0 ppm (L) 0.4 ppm (K) 0.25 ppm (M)
	Streptomycin		Bioassay			0.1 ppm	0.4 ppm (L,K,M)
	Tobramycin						1.0 ppm (L) 0.1 ppm (K,M)

Table AIV – *continued*
Analytical Methods
2004 National Residue Program

Compound Class	Compound	Analytical Method			Minimum Proficiency Level [a]		
		Screen	Determinative (quantitative)	Confirmatory (identification)	Screen	Determinative (quantitative)	Confirmatory (identification)
Arsenicals	Arsenicals		AA	AA		0.2 ppm	0.2 ppm
Avermectins	Ivermectin, Doramectin, Moxidectin		HPLC	APCI/LC/MS		7.5 ppb	25 ppb
beta -Agonists	Cimaterol	ELISA			6 ppb		
	Clenbuterol	ELISA		LC-MS-MS	3 ppb		TBD
	Ractopamine		HPLC	LC/MS		1 ppb	1 ppb
	Salbutamol	ELISA			3 ppb		
Hormones, synthetic	DES		GC-MS	GC-MS		0.5 ppb	1.0 ppb
	Zeranol		GC-MS	GC-MS		0.5 ppb	1.0 ppb
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	Phenylbutazone	ELISA		LC-MS-MS	50 ppb		50 ppb
	Flunixin	ELISA	HPLC	LC/MS	50 ppb	31.3 ppb	125 ppb
Steroids	Melengesterol Acetate		GC	LC/MS		5 ppb	12.5 ppb
Sulfonamides	Sulfapyridine		TLC	GC-MS		0.05 ppm	0.05 ppm
	Sulfadiazine						
	Sulfathiazole						
	Sulfamerazine						
	Sulfamethazine						
	Sulfachloropyridazine						
	Sulfamethoxypryridazine						
	Sulfaquinoxaline						
	Sulfadimethoxine						
	Sulfaethoxypyridazine						
	Sulfaphenazole						

Table AIV – *continued*
Analytical Methods
2004 National Residue Program

Compound Class	Compound	Analytical Method			Minimum Proficiency Level [a]		
		Screen	Determinative (quantitative)	Confirmatory (identification)	Screen	Determinative (quantitative)	Confirmatory (identification)
Sulfonamides	Sulfatroxazole		TLC	GC-MS		0.05 ppm	0.05 ppm
	Sulfisoxazole						
	Sulfadoxine						
CHCs/COPs/PCBs	Aldrin		GPC with GC-EC	GC-MS		0.10 ppm	
	alpha-BHC					0.10 ppm	0.01 ppm
	Captan				0.04 ppm		
	Carbophenothion				0.06 ppm		
	Chlorfenvinphos					0.06 ppm	
	Chlorpyrifos					0.10 ppm	
	cis-chlordane					0.30 ppm	
	Coumaphos-O					0.20 ppm	
	Coumaphos-S					0.20 ppm	
	Dieldrin					0.10 ppm	0.01 ppm
	Endosulfan I				0.01 ppm		
	Endosulfan II					0.06 ppm	
	Endrin					0.10 ppm	0.03 ppm
	HCB					0.10 ppm	0.01 ppm
	Heptachlor epoxide					0.10 ppm	0.10 ppm
	Heptacholr					0.10 ppm	0.01 ppm
	Kepone				0.06 ppm		
	Lindane					0.10 ppm	0.01 ppm
	Linuron				0.50 ppm		
	Methoxychlor					0.50 ppm	0.15 ppm
	Mirex					0.10 ppm	

Table AIV – *continued*
Analytical Methods
2004 National Residue Program

Compound Class	Compound	Analytical Method			Minimum Proficiency Level [a]		
		Screen	Determinative (quantitative)	Confirmatory (identification)	Screen	Determinative (quantitative)	Confirmatory (identification)
CHCs/COPs/PCBs (continued)	Nonchlor		GPC with GC-EC	GC-MS		0.15 ppm	
	o,p'-DDT				0.15 ppm		
	Oxychlordane					0.06 ppm	0.1 ppm
	p,p'-DDE					0.10 ppm	0.02 ppm
	p,p'-DDT					0.15 ppm	0.04 ppm
	p,p'-TDE					0.15 ppm	0.04 ppm
	PCB 1260					0.50 ppm	
	PCB 1254					0.50 ppm	
	Phosalone				0.02 ppm		
	Ronnel					0.06 ppm	
	Stirofos					0.06 ppm	
	Toxaphene					1.00 ppm	
	trans-chlordane					0.30 ppm	

a Minimum Proficiency Level: The lowest amount of individual residue or sample component that FSIS requires its laboratories to reliably detect, quantify, or confirm. This is usually the lowest amount for which the method used by FSIS laboratories has been validated.

Key:
L = Liver
K = Kidney
M = Muscle
AA = Atomic Absorption Spectroscopy
CHCs = Chlorinated hydrocarbons
COPs = Chlorinated organophosphates
PCBs = Polychlorinated biphenyls
GC = Gas Chromatoraphy
MS = Mass Spectroscopy
GPC = Gel Permeation Chromatography
TLC = Thin Layer Chromatography

Table AIV – *continued*
Analytical Methods
2004 National Residue Program

ECD = Electron Capture Detection
ELISA = Enzyme Linked Immunosorbent Assay
ppm = parts per million
ppb = parts per billion
APCI = Atmospheric Pressure Chemical Ionization
HPLC = High Performance Liquid Chromatography
TBD = To be determined

Appendix V
Statistical Table

Table V, S*tatistical Table,* indicates the number of samples required to ensure detection of a violation that affects a given percentage of the sampled population.

Table A V
Statistical Table
2004 FSIS National Residue Program

Percentage Violative in Sampled Population	**Probability of Detection (Percent)**			
	90	95	99	99.9
	Samples Required			
10	22	29	44	66
5	45	59	90	135
1	230	299	459	688
0.5	460	598	919	1,379
0.1	2,302	2,995	4,603	6,905
0.05	4,605	5,990	9,209	13,813