2003 FSIS National Residue Program

FOOD SAFETY AND INSPECTION SERVICE

2003 FSIS NATIONAL RESIDUE PROGRAM

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TABLE OF CONTENTS

Preface	iv
Contacts and Comments	iv
Acknowledgements	iv

Section 1	Introduction to the FSIS National Residue Program	1
Section 2	Components of the FSIS National Residue Program	3
Section 3	Planning the 2003 FSIS National Residue Program: Introduction	8
Section 4	Planning the 2003 FSIS Domestic Monitoring Plan: Veterinary Drugs	10
Section 5	Planning the 2003 FSIS Import Monitoring Plan: Veterinary Drugs	43
Section 6	Planning the 2003 FSIS Domestic Monitoring Plan: Pesticides	74
Section 7	Planning the 2003 FSIS NRP Import Monitoring Plan: Pesticides	100
Section 8	Planning the 2003 FSIS Domestic Monitoring Plan and Special Projects, and Import Monitoring Plan: Environmental Contaminants	109
Section 9	The 2003 FSIS National Residue Program: Domestic Monitoring Plan and Special Projects and Import Monitoring Plan	111
Section 10	Adjustments to the 2003 FSIS National Residue Program	128
Appendix I	Tissues Required for Analysis, 2003 FSIS National Residue Program	AI-1
Appendix II	U.S. Residue Limits for Veterinary Drugs and Unavoidable Contaminants in Meat, Poultry, and Egg Products	AII-1
Appendix III	U.S. Residue Limits for Pesticides in Meat, Poultry, and Egg Products	AIII-1
Appendix IV	Analytical Methods, 2003 FSIS National Residue Program	AIV-1

PREFACE

Welcome to the 2003 "Blue Book." This book presents the 2003 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 2003. 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 2003 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 2003 FSIS NRP.

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

The staff of the Residue Branch, Food Animal Sciences Division, Office of Public Health and Science, FSIS, hope that you will find this *2003 National Residue Program* to be every bit as useful and informative as it has been in past years. We would like to thank all of our predecessors for providing us with tables and information that they developed and that we continue to use.

CONTACTS AND COMMENTS

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. INTRODUCTION TO THE FSIS NATIONAL RESIDUE PROGRAM

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

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

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

When violative residues are detected in food-producing animals submitted for slaughter, FSIS notifies the producer and other parties involved in offering these animals for sale. Product found to contain violative levels of residues is considered adulterated and is subject to condemnation. If the product has been distributed into commerce, it may be subject to 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. Until September 4, 2001, FSIS also subjected these parties to follow-up enforcement testing until compliance was demonstrated. On September 5, 2001, this policy was discontinued and a new policy was implemented: FSIS will now post, on its website, the names and addresses of parties that FDA has determined are responsible for the repeated sale of livestock or poultry containing violative levels of chemical residues. FSIS believes that this new policy will act as a more effective deterrent against residue violations, 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. COMPONENTS OF THE FSIS NATIONAL RESIDUE PROGRAM

DOMESTIC RESIDUE SAMPLING PROGRAM

The Food Safety and Inspection Service (FSIS) National Residue Program (NRP) provides a variety of sampling plans to verify and 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 NRP also collects and uses national data on chemical residues to support risk assessment, enforcement, and educational activities. All residue data is collected and stored in the Microbiological and Residue Computer Information System (MARCIS). Detailed information on violations is immediately transferred to the Residue Violation Information System (RVIS), which facilitates regulatory follow-up on violations and tracking of residue violators by both FSIS and FDA.

Components of the NRP for domestically produced products include:

- Monitoring Plan – the scheduled random sampling of specified animal populations at time of slaughter to provide information about the occurrence of residue violations, typically on an annual, national basis.[1] Monitoring information is obtained through a statistically based random selection of specimens from animals that that have passed inspection and therefore been permitted entry into the food supply. Generally, production classes are sampled at one of four levels (460 samples/year, 300 samples/year, 230 samples/year, or 90 samples/year). The probability of detecting a violation varies positively with the number of samples analyzed and the true violation rate of the production class being tested. Since samples are taken from animals that appear normal and healthy at the time of slaughter, the carcass is not retained after sampling.

  Since the primary concern of Monitoring is violations, the compounds considered for Monitoring generally have established safe limits--tolerances or action levels. Compounds are chosen for Monitoring using the formal selection procedures described in 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 marketing animals with violative concentrations of residues. Thus, the Monitoring Plan not only gathers information, but also assists in deterring practices that lead to violative residues.

- Surveillance Plan – sampling is designed to investigate and control the occurrence of residue violations in animal populations. Surveillance consists of random sampling designed to distinguish components of livestock, poultry, and egg products in which residue problems exist, measure the

[1] Occasionally, Monitoring Plan results do not provide an annual, national violation rate. For example: area Monitoring may be conducted where a localized potential problem appears (thus the results are annual but not national); certain residues may be sampled for less than 12 months, because of laboratory scheduling requirements and/or resource constraints, or occasionally to target sampling towards higher usage periods (thus the results are national but not annual); for certain new slaughter classes (e.g., roaster pigs, bison, and ratites), FSIS has not yet generated complete, statistically valid sampling frames (thus the results may be annual and national, but with some additional uncertainty due to the incomplete sampling frames); or any combination of the above. In Table 9.1, footnotes are used to designate Monitoring Plan sampling that does not provide an annual, national violation rate.

extent of problems, and 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.

FSIS currently conducts Surveillance Sampling for sulfonamides in market hogs using the Sulfa-on-Site (SOS) Test.

- Exploratory Projects – conducted for a variety of reasons, but these activities, whatever their objectives, have in common the fact that test results normally are not used to take regulatory action or to trigger follow-up Enforcement testing. Exploratory Projects generally sample animals that have passed USDA inspection.

  Exploratory projects generally fall within either of two categories:

  Studies of the occurrence of residues for which no safe limits (i.e., tolerances or action levels) have been established.

  There are many chemicals (e.g., trace metals, industrial chemicals, and mycotoxins) that may be inadvertently present in animals yet have no established safe concentrations. Their consistent presence in food (and the resulting need for a tolerance or action level to protect public health) has not been established. FSIS may conduct studies to develop information on the frequency and concentrations at which such residues occur.

  These studies may be nationwide or limited to specific geographic areas. Sample collection may be random and statistically based, or biased to obtain "worst case" information. The results are given to either the Food and Drug Administration (FDA) or the Environmental Protection Agency (EPA), which have responsibility for establishing tolerances for contaminants in food under the Federal Food, Drug and Cosmetic Act. Exploratory programs planned on a limited scale may be expanded if preliminary results cause greater concern and make the acquisition of comprehensive information more urgent.

  Other projects as appropriate.

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

It is important to emphasize the differences between the types of samples collected under the Monitoring Plan, as compared with those collected under Enforcement Testing. Since Monitoring is designed to obtain information on the prevalence of residue violations in the U.S. food supply, Monitoring samples are collected only from animals that pass USDA inspection and are permitted entry into the food supply,

i.e., only from animals that appear normal and healthy at time of slaughter. By contrast, since Enforcement Testing is designed to prevent violative product from entering the food supply, it is targeted towards animals that do not appear to be normal or healthy, or which show abnormal postmortem signs, or which are suspicious based on herd history. Enforcement Testing occasionally also includes samples from animals that have already been condemned by FSIS based on postmortem inspection.

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

Finally, all samples collected under the Monitoring Plan are submitted directly to an FSIS laboratory for testing. By contrast, Enforcement Testing makes extensive use of rapid on-site screening tests. Because FSIS in-plant veterinarians are required to subject all carcasses for which there is a suspicion of a residue violation to Enforcement Testing, many such tests are performed, typically between 100,000 and 200,000 annually. However, it is not practical for FSIS to carry out expensive and time-consuming laboratory tests on this number of Enforcement samples each year. Therefore, to perform such a large number of tests efficiently, carcasses are first pre-screened on-site by FSIS veterinarians using rapid screening tests, where such tests are available. In this way, only those samples that test positive by a screening test (again, where such tests are available) are sent to an FSIS laboratory for follow-up testing. If an FSIS veterinarian suspects that a carcass may contain a violative level of a residue for which there is no official FSIS screening method (see below), a sample taken from that carcass is sent directly to an official laboratory for testing.

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

FSIS currently employs the following on-site rapid screening tests (as of 2001, CAST, or Calf Antibiotic and Sulfonamide Test, which had been used for several years to test bob veal calves, has been replaced by FAST, because of the latter's superior speed and sensitivity):

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

- STOP, for Swab Test on Premises, was implemented in 1979 to detect the presence of antibiotic residues in kidney tissues. Originally developed for testing dairy cows, STOP is now approved for use in all species. While STOP is not designed to detect sulfonamides, it can register a positive at high concentrations. Additionally, producers will often use antibiotics in combination with sulfonamides. For these two reasons, the FSIS laboratory tests STOP positive samples for sulfonamides as well as antibiotics.

- FAST, for Fast Antimicrobial Screen Test, detects both antibiotic and sulfonamide drug residues in kidney tissues. At this time, it has been approved for use in bovine animals only. It has proved to be a suitable replacement for CAST and STOP in this species, as it is both quicker and more sensitive. Though also capable of detecting sulfonamides, FAST is significantly less sensitive than the SOS test. FAST was implemented in bovine pilot plants in 1995. Its use was extended to approximately 50 of the largest cow and bob veal slaughtering plants in 1996, and it is currently employed in almost all plants that conduct bovine slaughter.

IMPORT RESIDUE SAMPLING PROGRAM

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

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

After a foreign country is determined to have an equivalent system of inspection and becomes eligible to export product to the U.S., FSIS relies on the country's national inspection authorities to certify that establishments meet all applicable standards and are authorized to export to the U.S. FSIS performs periodic audits of the foreign inspection systems. The frequency and extent of audits depend on the country’s performance history, including the results from previous plant reviews and product reinspection at the port-of-entry. If a country does not maintain an inspection system equivalent to the U.S. system, it is not permitted to export product to the U.S.

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

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

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

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

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

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

The first ten shipments of egg products from individual foreign establishments are subjected to 100 percent reinspection, to establish a history of compliance for each product category. This level is reduced 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. PLANNING THE 2003 FSIS NATIONAL RESIDUE PROGRAM: INTRODUCTION

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 2003 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)[1], which is comprised of members from the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the Centers for Disease Control and Prevention (CDC), the Animal and Plant Health Inspection Service (APHIS), the Agricultural Marketing Service (AMS), the Agricultural Research Service (ARS), and FSIS. This interagency committee identifies the priority public health compounds of concern, and provides FSIS with detailed information about each compound. FSIS then combines this information with its historical data on compound violation rates to develop the domestic Monitoring Plan, and 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.

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

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

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

Finally, 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. PLANNING THE 2003 FSIS DOMESTIC MONITORING PLAN: VETERINARY DRUGS

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate veterinary drugs of concern selected by members of the Surveillance Advisory Team (SAT) 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), as well as phenylbutazone, have been **bolded**.

--*Antibiotics:*[1]

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

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[1] It can be seen that many of the compounds detected by the FSIS Bioassay (see footnote 2) are also listed separately. This was done because, even though these compounds could be detected by the Bioassay, FSIS also wished to consider the merits of implementing individual chemical methodologies (generally High Performance Liquid Chromatography [HPLC]) for their analysis. Compounds were considered for individual chemical analysis in cases where their established tolerances were based on the chemical methodologies, and thus analysis by such a methodology would be necessary to determine when a finding represented a violation.

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

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

tilmicosin/tylosin - differentiated by mass spectrometry

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

--*Other Veterinary Drugs:*

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

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

- Levamisole (anthelmintic)
- Morantel and pyrantel (anthelmintic)
- Nicarbazin (coccidiostat)
- **Nitrofurans (incl. furazolidone, nitrofurazone) (antimicrobial)**
- **Nitromidazoles in FSIS MRM (dimetridazole, ipronidazole) (antiprotozoals)**
- **Ronidazole (nitroimidazole) (antimicrobial)**
- Etodolac (nonsteroidal anti-inflammatory drug [NSAID])
- Flunixin (NSAID)
- **Phenylbutazone (NSAID)**
- Dipyrone (NSAID)
- Sulfonamides in FSIS MRM (incl. sulfapyridine, sulfadiazine, sulfathiazole, sulfamerazine, sulfamethazine, 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

FDA has advised FSIS that it is particularly important to include phenylbutazone, and drugs banned from extralabel use under AMDUCA, since they are of high public health concern, in the FSIS NRP. Therefore, these drugs are not evaluated for inclusion using the ranking formula presented below. Instead, all drugs in this category 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 4.2b, Drugs Banned from Extarlabel 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:

X FSIS Historical Testing Information on Violations
X Regulatory Concern
X Lack of FSIS Testing Information on Violations
X Withdrawal Time
X Impact on New and Existing Human Disease
X Relative Number of Animals Treated
X 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, 2003 Domestic Residue Program*."

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

COMPOUND RANKING

Background

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

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

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

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

The first criterion evaluated in Table 4.1, “FSIS Historical Testing Information on Violations," is based on the percent of tested carcasses found to have residues in excess of the tolerance or action level, from FSIS random sampling programs of animals entering the food supply. Specifically, compounds were scored by two methods: (a) the maximum violation rate seen in any production class (averaged over 1992 - 2001); and (b) the maximum, for any class, of the violation rate (again, averaged over 1992 - 2001), but weighted by the size of the production class. The final score for each drug was assigned based on the highest of these two scores.[4] Therefore, it can be seen from Equation (4.1) that the violation rate scores assigned in Table 4.1 represent a rough overall estimate of *relative* risk per unit of consumption.[5] However, for the many candidate compounds or compound classes of concern that have never been included in the FSIS NRP, data on violation rates is not available. It was therefore necessary to generate an estimate of the overall violation rate for each these untested compounds and compound classes.

Estimating the Violation Rate

"Regulatory Concern," "Withdrawal Time," and "Relative Number of Animals Treated" were chosen as scoring categories because it was expected that each of these would be positively correlated with the violation rate. Therefore, they might serve as predictors of violations in those compounds or compound

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

[5] While some consideration was given to the size of the production class in scoring "FSIS Historical Testing Information on Violations," no systematic weighting was applied to the scores in this category based upon consumption. Hence, the scores assigned to this category represent relative risk *per unit of consumption*, rather than relative risk. To obtain values for relative risk, the scores in this category must be multiplied by the consumption data for each individual production class. This calculation is implemented subsequently, in Phase IV, using Equation (4.6); the results are presented in Table 4.5.

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.

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

Table 4.1 lists 14 compounds or compound classes for which current, reliable data were available to score the category "FSIS Historical Testing Information on Violations," and 49 compounds or compound classes for which they were not. Of the 14 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, or banned entirely. In other words, their Regulatory Concern scores are not based on misuse, and are therefore not predictive of the violation rate. 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 "FSIS Historical Testing Information on Violations" for the 49 compounds for which this information is not available. The following equation was derived:

$$Vp = 0.14(R*N) + 1.15 \qquad (4.2)$$

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

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

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

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

The model represented by Equation (4.2) was significant, with an overall model p-value of 0.01, and an R^2 value of 0.53, accounting for 53 percent of the variability in the data.

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

Rating the Veterinary Drugs According to Relative Public Health Concern

As indicated above, the score for "FSIS Historical Testing Information on Violations," combines information on residue levels and toxicity, and thus represents a rough overall estimate of the relative risk per unit of consumption for each drug or drug class. Although this score, once multiplied by relative consumption data for each production class, would conform most closely to a purely risk-based ranking, FSIS believes that additional attributes should also be considered in the ranking. Thus, the ranking according to relative public health concern incorporates, as modifiers, the remaining scoring categories presented in Table 4.1:

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

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

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

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

The use of modifiers presents an element of arbitrariness, as there are no fundamentally "correct" assumptions for the appropriate weight that should be given to each. The approach of FSIS was to consider several alternative sets of weighting factors, and assess the robustness of the final ranking. In Table 4.1, the drugs are rated for relative public health concern by combining the scoring categories

presented in Equation (4.3), above, using the weighting formula shown in the last column. In this formula, the score for "FSIS Historical Testing Information on Violations" has been multiplied by a weighted average of the modifiers for "Acute or Chronic Toxicity Concerns" and "Impact on New and Existing Human Disease." These last two categories were combined because they both represent the negative potential public health effects associated with the use of a compound or compound class. The product of the above categories was then multiplied by a modifier for "Lack of FSIS Testing Information on Violations." Note that various formulas were considered, differing principally in the relative weights given to "Acute or Chronic Toxicity Concerns" versus "Impact on New and Existing Human Disease," and in the magnitude of the modifier for "Lack of FSIS Testing Information on Violations." FSIS chose the selected formula, based on a consensus about the relative importance of each modifier, and of how much each modifier should be allowed to alter the underlying risk-based score, "V," in Equation (4.4), below. The value of the selected mathematical formula is that it formalizes the basis of FSIS's judgement. This enables others to observe and understand the adjustments that were made, and it ensures consistency in how these adjustments were applied across a wide range of compounds. Equation (4.4) summarizes the way final adjustments were made.

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

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

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

The 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 precisely comparable. However, as a result of the normalization the scores for the pesticides and veterinary drugs are comparable in magnitude, thus enabling at least a rough comparison to be made across these two very different categories of compounds.

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

[6] See footnote 5.

PHASE II - SELECTING DRUGS FOR INCLUSION IN THE 2003 NRP

Following the completion of the ranking of the veterinary drugs, FSIS (1) used these rankings to select those compounds and compound classes that should be included in the 2003 NRP, based purely on their relative public health concern and (2) determined which of these compounds and compound classes actually could be included in the 2003 NRP, based on the availability of laboratory resources.

The consensus of FSIS and FDA was that those compounds and compound classes ranked 24th or higher (out of a total of 52) represented a potential public health concern sufficient to justify their inclusion in the 2003 NRP. In addition, FDA expressed an interest in having FSIS perform limited testing on one compound that did not fall within this group of 24 (veterinary tranquilizers, ranked 49th, in market hogs).

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 practical 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 2003 Monitoring Plan:

--*Antibiotics:*

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

--*Other Veterinary Drugs:*

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

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[7]See footnote 2.

[8]See footnote 3.

Thus, in the 2003 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 2003 Monitoring Plan. For each highly ranked compound or compound class that was not included in the 2003 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 2003 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 2003 NRP are designated by a "●." Those C/PC pairs that are of regulatory concern, but that could not be included in the 2003 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).

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.

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

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

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

In Table 4.5, *Veterinary Drug Compound/Production Class Pairs, Sorted by Sampling Priority Score, "Full Resource" Sampling*, the calculation shown in Equation (4.6) has been carried out for the antibiotics, arsenicals, avermectins, and sulfonamides, for each production class in which the specified drug might appear (as indicated in Table 4.6). The C/PC pairs were sorted by their sampling priority scores, and roughly divided into quartiles. Initially, C/PC pairs in the first 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: >29.00 = 460 samples; 2.51 – 29.00 = 300 samples; 0.14 - 2.50 = 230 samples; < 0.14 = 90 samples. These priority scores were combined with historical violation rate information for each individual C/PC pair, and information on laboratory sampling capacity to select, for each pairing, from among four different sampling options: very high regulatory concern (460 analyses/year); high regulatory concern (300 analyses/year); moderate regulatory concern (230 samples/year); low regulatory concern (90 samples/year).[9] Thus the larger sample sizes, which provide the greater chance of detecting violations, are directed towards those C/PC pairs that have been identified as representing higher levels of relative public health concern. Statistically, if 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%.

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

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

- Market hogs are swine usually marketed near six months of age and 200 to 300 pounds live weight.
- Boars are mature swine showing male sexual characteristics.
- Stags are male swine castrated after they have reached sexual maturity.
- Sows are mature female swine.
- Sheep 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 4.3 also 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 on animals (and egg products) presented for slaughter (or processing) in federally inspected establishments, during calendar year 2001, were employed as a surrogate for consumption. The production data for calves was collected, collated and reported by FSIS, using the Automated Data Reporting System. The production data for all other production classes, including egg products, was 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*.

Note that individual data were not available for ratites and squab, which fall under the “other fowl” category. Ratites comprise the preponderance of this category. Thus, for simplicity, the value for the other fowl category was used to represent the value for ratites in Tables 4.3 and 4.4.

ADJUSTING RELATIVE SAMPLING NUMBERS

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

As described above, FSIS used "FSIS Historical Testing Information on Violations" as a critical factor in ranking the various drugs and drug classes according to their relative public health concern. Because this information is available for each production class individually, it can also be used to further refine the relative priority of sampling each C/PC pair. Table 4.6, *Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling*, lists the number of analyses assigned to each C/PC pair in Table 4.5. It also lists, for the period 1/1/92 - 12/31/01, 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:

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 $\geq$ 0.50%, but < 0.70%: +1 level.
3. At least 300 samples tested over the 10-year period, violation rate $\geq$ 0.70%: +2 levels.
4. At least 300 samples tested over the 10-year period, violation rate = 0.00%: -1 level.
5. The maximum number of samples to be scheduled for testing is 460.

The three exceptions to this are:

1. Geese, bisons, ratites and rabbits are not scheduled for more than 90 samples per analysis. Because very few geese, bisons, ratites and rabbits are produced, and because virtually all of them are slaughtered by a very limited number of establishments, collecting a larger number of samples would present an unfair burden to these establishments.
2. Horses are not scheduled for more than 230 samples per analysis. Because very few horses are slaughtered and virtually all horses are slaughtered by a very limited number of establishments, collecting a larger number of sample would present an unfair burden to these establishments.
3. As explained above, squab are automatically assigned 45 samples for each analysis performed.

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

Adjusting for laboratory capacity

Following this, it was necessary to make a final set of adjustments to match the total sampling numbers for each compound class with the analytical capabilities of the FSIS laboratories.

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

For avermectins, FSIS laboratory capacity was slightly less than the proposed number of samples. To accommodate this discrepancy, the one production class that qualified for a sampling level of 460 was reduced to 300.

For sulfonamides, FSIS laboratory capacity was less than the proposed number of samples. To accommodate this discrepancy, all 460-sample production classes were reduced to 300 samples, all 300-sample production classes were reduced to 230 samples, and selected 230-sample production classes were reduced to 90 samples. This enabled FSIS to avoid eliminating any production classes of concern from sulfonamide sampling, while maintaining an adequate level of data quality for the most important production classes.

For the arsenicals, a decision was made to increase the number of analyses in young chickens from 460 to 1200, to obtain a more accurate characterization of arsenical violations in this production class. The basis for this decision was that: (a) the violation rate for arsenicals in young chickens between 1992 - 2001 has averaged 0.33%, which is relatively high; and (b) young chickens are the largest production class (constituting an estimated 36%, by weight, of total domestic consumption of meat, poultry and egg products), and violations in young chickens thus represent a relatively larger public exposure than violations in smaller production classes.

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

"LIMITED RESOURCE" SAMPLING

The 2003 NRP includes a number of compounds for which FSIS has only recently begun to sample. In monitoring for these compounds, FSIS was most concerned with obtaining information on their occurrence in particular production classes where it was suspected they might be of concern. To enable FSIS to sample this entire range of compounds, it was necessary to limit the number of samples taken per compound. In apportioning this "limited resource" sampling among the production classes of concern, it was particularly important to ensure that a sufficient number of samples was taken from each production class analyzed. If too few samples were taken from a production class, and no violations were detected, it would be difficult to interpret such a result (the interpretation could not be informed by data from earlier sampling, because no such sampling exists). With a small number of samples, the lack of a detected violation might mean that the true violation rate was very low, or it might mean that the true violation rate was high but that too few samples were taken to detect a violation. Thus, where possible, a minimum of 300 analyses was to be carried out in each production class sampled. This yields a 95% chance of detecting a violation, if the true violation rate were 1%. However, because of laboratory resource limitations, it was not always possible to sample at this level.

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

Chloramphenicol is of concern in dairy cows, formula-fed veal, non-formula-fed veal, bob veal, and ratites. The analytical capacity for chloramphenicol in 2003 is 900 samples, and the FSIS method for chloramphenicol does not work in ratites. FSIS will thus conduct 300 analyses for chloramphenicol in each of these three bovine production classes.

DES is of concern in formula-fed veal, steers, and heifers. Zeranol is of concern in formula-fed veal, heavy calves, and non-formula-fed veal. The analytical capacity for DES/zeranol in 2003 is 300 samples, and the top priority production class for both compounds is formula-fed veal. FSIS will thus conduct 300 analyses for DES/zeranol in formula-fed veal.

Flunixin is of concern in dairy cows and horses. The analytical capacity for domestic scheduled sampling of flunixin in 2003 is 460 samples, and the top priority production class is dairy cows. Thus, FSIS will conduct 300 analyses for flunixin in dairy cows, and 160 analyses for flunixin in horses.

MGA is of concern in heifers, steers, formula-fed veal, and non-formula-fed veal. The analytical capacity for MGA in 2003 is 300 samples, and the top priority production class is heifers. FSIS will thus conduct 300 analyses for MGA in heifers.

Ractopamine is of concern in heifers, steers, market hogs, roaster pigs, and young turkeys. The analytical capacity for domestic sampling of ractopamine in 2003 is 530 samples, and the two top priority production classes are market hogs and steers. FSIS will conduct 300 analyses for ractopamine in market hogs, and 230 in steers.

The above information is presented in tabular format at the end of Section 9 in Table 9.1, *Detailed Sampling Plan, 2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*, Table 9.2, *Summary, 2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects*, and in Table 9.6, *Combined Summary, 2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects and Import Monitoring Plan*.

NOTE ON SEASONALITY

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

SCORING KEY FOR VETERINARY DRUGS
2003 FSIS DOMESTIC RESIDUE PROGRAM

FSIS Historical Testing Information on Violations (1/1/92 - 12/31/01)

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 1992 - 2001, 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

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 (1/1/92 - 12/31/01); or FSIS has included this compound within its program only between 6 and 10 years ago (1/1/92 - 12/31/96), 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 (1/1/97 - 12/31/01), 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
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regula-tory Concern (CVM) (R)	With-drawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Con-cerns (CVM) (T)	Lack of Testing Info. on Viola-tions (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Those antibiotics quantitated by the FSIS Bioassay MRM	4	4	4	4	3.422	4	3	4	1	15.0
Amikacin (aminoglycoside)	NT	3	4	2	2.002	2.002	3	2	4	5.2
Apramycin (aminoglycoside)	NT	4	4	2	2.286	2.286	3	2	4	5.9
Kanamycin (aminoglycoside)	NT	3	4	2	2.002	2.002	3	2	4	5.2
Spectinomycin (aminoglycoside)	NA-D, M	4	4	3	2.854	2.854	3	2	4	7.4
Streptomycin (aminoglycoside)	NA-D	4	4	3	2.854	2.854	3	2	4	7.4
Amoxicillin (beta-lactam)	NT	3	2	2	2.002	2.002	3	4	4	8.6
Ampicillin (beta-lactam)	NT	3	2	2	2.002	2.002	3	4	4	8.6
Cloxacillin (beta-lactam)	NT	3	2	2	2.002	2.002	3	4	4	8.6
Hetacillin (beta-lactam)	NT	2	2	2	1.718	1.718	3	4	4	7.4
Ticarcillin (beta-lactam)	NT	2	2	2	1.718	1.718	3	4	4	7.4
Ceftiofur (cefalosporin)	NT	3	2	3	2.428	2.428	4	2	4	7.0
Cefazolin (synthetic cefalosporin)	NT	3	2	2	2.002	2.002	3	2	4	5.2
Florfenicol (chloramphen. deriv.)	NT	3	4	4	2.854	2.854	3	3	4	9.8
Thiamphenicol (chloramphen. deriv.)	NT	3	2	1	1.576	1.576	3	3	4	5.4
Fluoroquinolones	1	4	3	3	2.854	1	4	2	3	**7.8**
Clindamycin (lincosamide)	NA-Q	2	2	2	1.718	1.718	3	3	4	5.9
Lincomycin (lincosamide)	NA-Q	2	2	2	1.718	1.718	3	3	4	5.9
Pirlimycin (lincosamide)	NA-Q	3	4	3	2.428	2.428	4	2	4	7.0
Oleandomycin (macrolide)	NA-Q	2	2	2	1.718	1.718	3	3	4	5.9
Spiramycin (macrolide)	NA-Q	2	3	2	1.718	1.718	3	2	4	4.4
Tilmicosin (macrolide)	1	4	4	3	2.854	1	3	3	3	3.3
Tylosin (macrolide)	NA-D	3	3	2	2.002	2.002	3	2	1	4.5
Colistin (polypeptide antibiotic)	NT	1	1	2	1.434	1.434	1	3	4	4.1

Table 4.1 - *Continued*
Scoring Table for Veterinary Drugs
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regula-tory Concern (CVM) (R)	With-drawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Con-cerns (CVM) (T)	Lack of Testing Info. on Viola-tions (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Virginiamycin	NT	1	1	3	1.576	1.576	3	1	4	2.7
Amprolium (coccidiostat)	NT	4	2	2	2.286	2.286	3	2	4	5.9
Arsenicals (detected as As)	3	4	2	4	3.422	3	3	2	1	6.8
Avermectins in FSIS MRM (incl. doramectin, ivermectin, moxidectin) (antiparasitics)	3	3	4	4	2.854	3	2	3	1	8.3
Eprinomectin (avermectin)	NT	2	2	3	2.002	2.002	2	2	4	4.6
Benzimidazoles (anthelmintic)	1	1	3	2	1.434	1	1	2	4	2.0
Berenil (antiprotozoal, Histomonas)	NA-G, Mx	4	4	1	1.718	1.718	2	3	4	5.4
Carbadox (antimicrobial)	3 [NA-O]	4	4	3	2.854	3	3	4	2	11.8
Ractopamine (beta agonist)	NA-O [NT]	4	2	3	2.854	2.854	2	3	3	8.6
Clorsulon (anthelmintic, Trematodes)	NT	2	3	2	1.718	1.718	2	2	4	4.0
Dexamethasone (glucocorticoid)	NA-O	4	2	2	2.286	2.286	1	3	3	6.3
Methyl prednisone (glucocorticoid)	NT	4	2	2	2.286	2.286	1	3	4	6.6
Prednisone (glucocorticoid)	NT	2	2	1	1.434	1.434	1	3	4	4.1
Halofuginone (antiprotozoal, coccidiostat)	2	1	2	2	1.434	2	2	2	2	4.2
Hormones, naturally-occurring	NT	2	1	4	2.286	2.286	2	2	4	5.3
MGA (hormone, synthetic)	NA-O	3	1	4	2.854	2.854	3	3	3	9.4
Trenbolone (hormone, synthetic)	NT	4	1	3	2.854	2.854	3	3	4	9.8
Zeranol (hormone, synthetic)	NT	3	1	3	2.428	2.428	3	3	4	8.4
Lasalocid (coccidiostat)	NT	2	1	3	2.002	2.002	3	2	4	5.2
Levamisole (anthelmintic, Nematodes)	3 [2]	3	3	2	2.002	3	1	1	3	3.3
Morantel and pyrantel (anthelmintic)	1	1	1	2	1.434	1	2	1	3	1.4
Nicarbazin (coccidiostat)	NA-O [1]	2	2	1	1.434	1.434	2	1	4	2.1
Etodolac (NSAID)	NT	3	2	1	1.576	1.576	1	3	4	4.5

Table 4.1 - *Continued*
Scoring Table for Veterinary Drugs
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND/COMPOUND CLASS	Historical Testing Info. on Violations (FSIS) (V)	Regula-tory Concern (CVM) (R)	With-drawal Time (CVM) (W)	Relative Number of Animals Treated (CVM) (N)	Predicted V = (0.19437* R*N) + 0.84625	Predicted V, Except When Actual V is Available	Impact New & Existing Human Disease (CDC) (D)	Acute or Chronic Toxicity Con-cerns (CVM) (T)	Lack of Testing Info. on Viola-tions (FSIS) (L)	Relative Public Health Concern Score = V*[(D+3*T)/4] *{1+[(L-1)*0.05]}
Dipyrone (NSAID)	NT	4	3	1	1.718	1.576	1	4	4	5.9
Sulfonamides (antimicrobials, some are coccidiostats)	4	4	3	4	3.422	4	3	3	1	12.0
Sulfanitran (antibacterial, coccidiostat)	NT	4	3	4	3.422	3.422	3	3	4	11.8
Thyreostats (incl. thiouracil)	NT	4	3	1	1.718	1.718	2	4	4	6.9
Veterinary tranquilizers	NT	4	2	2	2.286	2.286	1	1	4	2.6

Key:
MRM = multiresidue method
NT = not tested by FSIS (1/1/92 - 12/31/01)
NA = compound has been tested by FSIS (1/1/92 - 12/31/01), but the information is not applicable
NA-C = compound is of concern in several prouction classes, but testing has been carried out in only one
NA-D = detected and quantitated, but not uniquely identified, i.e., method cannot distinguish between this compound and one or more other compounds
NA-G = testing carried out in limited geographical area only, and thus does not necessarily represent overall national violation rate, e.g., sampling for berenil in Puerto Rico
NA-M = problem with analytical methodology
NA-Mx = new information indicates that testing was not carried out in the correct matrix, e.g., berenil testing carried out in plasma rather than serum)
NA-N = new information since previous testing, suggesting that the results of this testing may not be representative of the current situation
NA-Q = detected but not quantitated by method
NA-O = data is preliminary, because useable data on this compound (i.e., data not subject to any of the various problems listed immediately above) has been collected for only one year
FSIS = scores in this column supplied by FSIS
CVM = scores in this column supplied by CVM
CDC = scores in this column supplied by CDC
Numbers in parentheses are estimates.
[Where scores have been changed from the 2002 NRP, those from year 2002 are shown in square brackets.]

Table 4.2a
Rank and Status of Veterinary Drugs
2003 FSIS NRP, Domestic Monitoring Plan

Rank	DRUG	SCORE	STATUS IN 2003 NRP
1	**Antibiotics in FSIS Bioassay MRM** (tetracycline, oxytetracycline, chlortetracycline, beta-lactams [penicillins and cephalosporins; not differentiated within this category], streptomycin/spectinomycin [not differentiated], gentamicin, erythromycin, tilmicosin, tylosin, neomycin, flavomycin, bacitracin, hygromycin, novobiocin, lincomycin*, pirlimycin*, clindamycin*, spiramycin*, oleandomycin*) *identification by follow-up with mass spectrometry; not quantitated	**15.0**	Monitoring Plan, MRM. Domestic: all production classes except egg products. Imported: all fresh product classes.
2	**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 sheep and rabbits. Imported: all production classes.
3	Sulfanitran (antibacterial, coccidiostat)	**11.8**	NIP; no method - need to add to sulfonamide MRM, or find new method.
4	Carbadox (antimicrobial)	**11.8**	Monitoring Plan. Domestic: 460 roaster pigs. Imported: 93 fresh pork.
5	Florfenicol (chloramphenicol derivative)	**9.8**	NIP; no method. FDA is developing an MRM for chloramphenicol, florfenicol, and thiamphenicol.
6	Trenbolone (hormone, synthetic)	**9.8**	NIP; no method. Need to attempt extension of FSIS DES/zeranol method to trenbolone.
7	MGA (hormone, synthetic)	**9.4**	Monitoring Plan. Domestic: 300 heifers. Should also be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
8	Ractopamine (beta agonist)	**8.6**	Monitoring Plan. Domestic: 300 market hogs and 230 steers. Imported: 93 fresh pork.
9	Amoxicillin (beta-lactam)	**8.6**	NIP; no method - need MRM for beta-lactams.
10	Ampicillin (beta-lactam)	**8.6**	NIP; no method - need MRM for beta-lactams.
11	Cloxacillin (beta-lactam)	**8.6**	NIP; no method - need MRM for beta-lactams.
12	Zeranol (hormone, synthetic)	**8.4**	Monitoring Plan. Domestic: 360 Formula-Fed veal
13	**Avermectins in FSIS MRM** (doramectin, ivermectin, and moxidectin) (antiparasitic)	**8.3**	Monitoring Plan, MRM. Domestic: ratites and all non-avian production classes. Imported: all non-avian fresh product classes.
14	Flunixin (NSAID)	**8.3**	Monitoring Plan. Domestic: 300 dairy cows and 160 Horses.
15	Spectinomycin (aminoglycoside)	**7.4**	NIP; method not operational – ultimately need MRM for aminoglycosides.
16	Streptomycin (aminoglycoside)	**7.4**	NIP; no method - need MRM for aminoglycosides; will need bridging data to use chemical method on streptomycin.
17	Hetacillin (beta-lactam)	**7.4**	NIP; no method - need MRM for beta-lactams.
18	Ticarcillin (beta-lactam)	**7.4**	NIP; no method - need MRM for beta-lactams.
19	Ceftiofur (cefalosporin)	**7.0**	NIP; no method - need MRM for beta-lactams.
20	Pirlimycin (lincosamide)	**7.0**	NIP; method needs improvement.

Table 4.2a - *Continued*
Rank and Status for Veterinary Drugs
2003 FSIS NRP, Domestic Monitoring Plan

Rank	DRUG	SCORE	STATUS IN 2003 NRP
21	Thyreostats (incl. thiouracil)	**6.9**	NIP; laboratory resources not available.
22	Arsenicals (detected as As)	**6.8**	Monitoring Plan. Domestic: beef cows, goats, all porcine production classes, and all avian production classes (including egg products) except ratites and squab. Imported: All avian production classes. Fresh goat and pork. Processed pork and beef/pork.
23	Methyl prednisone (glucocorticoid)	**6.6**	NIP; no method, but should be analyzable by extension of FSIS DES/zeranol method.
24	Dexamethasone (glucocorticoid)	**6.3**	NIP; laboratory resources not available.
BASED ON CONSULTATION WITH FDA, CDC, AND OTHER AGENCIES, COMPOUNDS BELOW THIS POINT WERE NOT CONSIDERED TO REPRESENT A BROAD POTENTIAL PUBLIC HEALTH RISK. HOWEVER, SOME OF THESE MAY BE SAMPLED ON A SPECIFIC, AS-NEEDED BASIS. NONE OF THE COMPOUNDS ON THE FOLLOWING PAGE WAS SELECTED FOR INCLUSION IN THE 2003 FSIS NATIONAL RESIDUE PROGRAM (NRP).			
25	Amprolium (coccidiostat)	**5.9**	NIP; low priority.
26	Apramycin (aminoglycoside)	**5.9**	NIP; no method,. low priority
27	Clindamycin (lincosamide)	**5.9**	NIP; no method, low priority
28	Lincomycin (lincosamide)	**5.9**	NIP; no method, low priority.
29	Oleandomycin (macrolide)	**5.9**	NIP; no method, low priority.
30	Dipyrone (NSAID)	**5.9**	NIP; no method. Priority may increase in future, and ARS is developing an MRM for veterinary tranquilizers and NSAID's.
31	Berenil (antiprotozoal)	**5.4**	NIP; scored as low priority, but priority may increase because of recent FDA concerns about misuse in dairy cattle. FSIS method available, but for plasma only. Need to review NADA method for liver.
32	Thiamphenicol (chloramphenicol derivative)	**5.4**	NIP; no method. FDA is developing an MRM for chloramphenicol, florfenicol, and thiamphenicol.
33	**Hormones, naturally-occurring** (17-estradiol, testosterone, and progesterone)	**5.3**	NIP; no method, low priority, but should be analyzable by extension of FSIS DES/zeranol method.
34	Amikacin (aminoglycoside)	**5.2**	NIP; no method - need MRM for aminoglycosides.
35	Cefazolin (synthetic cefalosporin)	**5.2**	NIP; no method - need MRM for beta-lactams.
36	Kanamycin (aminoglycoside)	**5.2**	NIP; no method - need MRM for aminoglycosides.
37	Lasalocid (coccidiostat)	**5.2**	NIP; Official FSIS Method available, low priority.
38	Eprinomectin (avermectin)	**4.6**	NIP; no method, low priority.
39	Tylosin (macrolide)	**4.5**	NIP; no method, low priority.
40	Etodolac (NSAID)	**4.5**	NIP; no method, low priority.
41	Spiramycin (macrolide)	**4.4**	NIP; low priority.
42	Halofuginone (antiprotozoal, coccidiostat)	**4.2**	NIP; Official FSIS Method available, low priority.
43	Colistin (polypeptide antibiotic)	**4.1**	NIP; no method, low priority.
44	Prednisone (glucocorticoid)	**4.1**	NIP; no method, low priority, but should be analyzable by extension of FSIS DES/zeranol method, or by adoption of Swiss MRM.
45	Clorsulon (anthelmintic)	**4.0**	NIP; Official FSIS Method available, low priority.
46	Tilmicosin (macrolide)	**3.3**	NIP; laboratory resources not available.
47	Levamisole (anthelmintic)	**3.3**	NIP; Official FSIS Method available, low priority.
48	Virginiamycin	**2.7**	NIP; no method, low priority.

Table 4.2a - *Continued*
Rank and Status for Veterinary Drugs
2003 FSIS NRP, Domestic Monitoring Plan

Rank	DRUG	SCORE	STATUS IN 2003 NRP
49	**Veterinary tranquilizers** (azaperone and its metabolite azaperol, xylazine, haloperidol, acetopromazine, propionylpromazine, and chlorpromazine)	**2.6**	NIP; screening method available. Low score, but FDA indicates interest in applying this method to dairy cows, market hogs, and ratites. ARS is developing an MRM for veterinary tranquilizers and NSAID's.
50	Nicarbazin (coccidiostat)	**2.1**	NIP; no method, low priority.
51	**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; Official FSIS Method available, low priority.
52	Morantel and pyrantel (anthelmintic)	**1.4**	NIP; Official FSIS Method available, low priority.

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

Key:
CHC/COP = Chlorinated hydrocarbon/chlorinated organophosphate.
MRM = Multiresidue method.
NIP = Not included in 2002 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 4.2b
Drugs banned from Extralabel use under AMDUCA*
2003 FSIS NRP, Domestic Monitoring Plan

1	Chloramphenicol	--	Monitoring Plan. Domestic: 300 each, dairy cows, formula-fed veal, and non-formula-fed veal. Imported: 90 fresh veal. FDA is developing an MRM for chloramphenicol, florfenicol, and thiamphenicol.
2	**Nitrofurans** (incl. furazolidone and nitrofurazone) (antimicrobial)	--	NIP; no viable method available.
3	**Fluoroquinolones in FSIS MRM** (ciprofloxacin, desethyleneciprofloxacin, danofloxacin, difloxacin, enrofloxacin, marbofloxacin, orbifloxacin, sarafloxacin)	--	Monitoring Plan, MRM. Imported: 8 fresh chicken, turkey, and other fowl.
4	**Clenbuterol and other unapproved beta agonists** (growth promotants)**	--	Monitoring Plan. Domestic: 300 each, market hogs and steers; 230 formula-fed veal. By eyeball screen followed by confirmatory method performed by FDA-NCTR. Need to test eyeball screen to officially extend to other beta agonists, and install NCTR confirmatory MRM for beta agonists.
5	Ronidazole (nitroimidazole) (antimicrobial)	--	NIP; may be able to add to MRM for nitroimidazoles.
6	**Nitromidazoles in FSIS MRM** (dimetridazole and ipronidazole) (antiprotozoal)	--	NIP; laboratory resources not available.
7	Avoparcin (glycopeptide)	--	NIP; no method.
8	Vancomycin (glycopeptide)	--	NIP; no method,
9	DES (hormone, synthetic)	--	Monitoring Plan. Domestic: 360 Formula-Fed veal
10	Phenylbutazone (NSAID)	--	Monitoring Plan, as part of the CHC/COP MRM. Domestic: all production classes except roaster pigs. Imported: all product classes except processed veal, processed mutton/lamb, and processed other fowl. An ELISA method in kidney is being implemented in the FSIS MWL.

*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.

Table 4.3
Production Classes to be Considered for Each Veterinary Drug/Drug Class
2003 FSIS NRP, Domestic Monitoring Plan

Est. Rel. % Dom. Cons.	DRUG->	Anti-biotics	Sulfon-amides	MGA	Racto-pamine	Zer-anol	Aver-mecs.	Flu-nixin	Arsen-icals	Chlor-fenicol.	Pheny-lbute.	DES	Clen-buterol
	DRUG SCORE->	15.0	12.0	9.4	8.6	8.4	8.3	8.3	6.8	--	--	--	--
0.033	Horses	●	●				●	●			●		
0.650	Bulls	●	●				●				●		
1.939	Beef cows	●	●				●		●		●		
1.923	Dairy cows	●	●				●	●		●	●		
9.811	Heifers	●	●	●	○		●				●	○	
16.026	Steers	●	●	○	●		●				●	○	●
0.036	Bob veal	●	●				●			○	⭘		
0.237	Formula-fed veal	●	●	○		●	●			●	⭘	●	●
0.011	Non-formula-fed veal	●	●	○		○	●			●	⭘		
0.022	Heavy calves	●	●			○	●				●		
0.014	Bison	●	●				●				⭘		
0.010	Sheep	●					●				⭘		
0.244	Lambs	●	●				●				⭘		
0.033	Goats	●	●				●		●		⭘		
21.129	Market hogs	●	●		●		●		●		⭘		●
0.013	Roaster pigs	●	●		○		●		●		●		
0.084	Boars/Stags	●	●				●		●		●		
1.117	Sows	●	●				●		●		●		
36.726	Young chickens	●	●						●		⭘		
0.606	Mature chickens	●	●						●		⭘		
6.476	Young turkeys	●	●		○				●		⭘		
0.057	Mature turkeys	●	●						●		⭘		
0.146	Ducks	●	●						●		⭘		
0.002	Geese	●	●						●		⭘		
>>0.01	Squab	●	●								⭘		
0.010	Ratites	●	●				●			○	⭘		
0.002	Rabbits	●					○				⭘		
2.724	Egg products	○	●						●		⭘		

Key:

Est. Rel. % Dom. Cons. = Estimated relative percent of domestic consumption, calendar year 2001. 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 2003 FSIS NRP.

○ = Of potential regulatory concern, but could not be sampled under the 2003 FSIS NRP because of laboratory resource constraints or methodological limitations.

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

Table 4.4
Estimated Relative Consumption, Domestically Produced Meat, Poultry, and Egg Products
2003 FSIS NRP, Domestic Monitoring Plan

PRODUCTION CLASS	NUMBER HEAD SLAUGHTERED	LBS./ ANIMAL, DRESSED WT.	TOTAL LBS., DRESSED WT.	EST. RELATIVE CONSUMPTION
Bulls	620,000	893	553,660,000	0.650%
Beef cows	3,092,000	[534]	1,651,128,000	1.939%
Dairy cows	2,582,000	[634]	1,636,988,000	1.923%
Heifers	11,379,000	734	8,352,186,000	9.811%
Steers	17,097,000	798	13,643,406,000	16.026%
Bob veal	404,546	[75]	30,340,950	0.036%
Formula-fed veal	823,775	[245]	201,824,875	0.237%
Non-formula-fed veal	25,787	[350]	9,025,450	0.011%
Heavy calves	46,630	[400]	18,652,000	0.022%
SUBTOTAL, CATTLE	**36,070,738**		**26,097,211,275**	**30.654%**
Market hogs	93,201,000	193	17,987,793,000	21.129%
Roaster pigs	[160,000]	70	11,200,000	0.013%
Boars/Stags	318,000	226	71,868,000	0.084%
Sows	3,009,000	316	950,844,000	1.117%
SUBTOTAL, SWINE	**96,688,000**		**19,021,705,000**	**22.343%**
Sheep	144,000	62	8,928,000	0.010%
Lambs	2,921,000	71	207,391,000	0.244%
SUBTOTAL, OVINE	**3,065,000**		**216,319,000**	**0.254%**
Goats	560,310	50	28,015,500	0.033%
Horses	56,332	500	28,166,000	0.033%
Bison	19,483	610	11,884,630	0.014%
TOTAL, ALL LIVESTOCK	**135,823,738**		**45,335,235,275**	**53.252%**
Young chickens			31,265,809,000	36.726%
Mature chickens			515,796,000	0.606%
Young turkeys			5,512,988,000	6.476%
Mature turkeys			48,712,000	0.057%
Ducks			124,141,000	0.146%
Geese			1,972,001	0.002%
Other fowl (includes ratites)			8,215,000	0.010%
SUBTOTAL, POULTRY	**0**		**37,477,633,001**	**44.022%**
Rabbits			1,353,923	0.002%
Egg products			2,319,322,000	2.724%
GRAND TOTAL, ALL PRODUCTION CLASSES			**85,133,544,199**	**100.000%**

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 2001 (CY '01), with the exception of the numbers for 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 '01 NASS figures for number of head slaughtered were multiplied by CY '01 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 '01, 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 will in turn be used to estimate relative exposures to chemical residues). This was estimated by assuming that the relative amount of each production class consumed would be approximately proportional to the total poundage (based on dressed weight) of each production class presented for slaughter 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
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	UNADJ. # SAMPLES
1	Antibiotics	15.00	Young chickens	36.726	550.884	460
2	Sulfonamides	12.00	Young chickens	36.726	440.707	460
3	Antibiotics	15.00	Market hogs	21.129	316.934	460
4	Sulfonamides	12.00	Market hogs	21.129	253.547	460
5	Arsenicals	6.75	Young chickens	36.726	247.898	460
6	Antibiotics	15.00	Steers	16.026	240.388	460
7	Sulfonamides	12.00	Steers	16.026	192.311	460
8	Avermectins	8.25	Market hogs	21.129	174.314	460
9	Antibiotics	15.00	Heifers	9.811	147.160	460
10	Arsenicals	6.75	Market hogs	21.129	142.620	460
11	Avermectins	8.25	Steers	16.026	132.214	460
12	Sulfonamides	12.00	Heifers	9.811	117.728	460
13	Antibiotics	15.00	Young turkeys	6.476	97.135	460
14	Avermectins	8.25	Heifers	9.811	80.938	460
15	Sulfonamides	12.00	Young turkeys	6.476	77.708	460
16	Arsenicals	6.75	Young turkeys	6.476	43.711	460
17	Sulfonamides	12.00	Egg products	2.724	32.692	460
18	Antibiotics	15.00	Beef cows	1.939	29.092	460
19	Antibiotics	15.00	Dairy cows	1.923	28.843	300
20	Sulfonamides	12.00	Beef cows	1.939	23.273	300
21	Sulfonamides	12.00	Dairy cows	1.923	23.074	300
22	Arsenicals	6.75	Egg products	2.724	18.389	300
23	Antibiotics	15.00	Sows	1.117	16.753	300
24	Avermectins	8.25	Beef cows	1.939	16.001	300
25	Avermectins	8.25	Dairy cows	1.923	15.863	300
26	Sulfonamides	12.00	Sows	1.117	13.403	300
27	Arsenicals	6.75	Beef cows	1.939	13.091	300
28	Antibiotics	15.00	Bulls	0.650	9.755	300
29	Avermectins	8.25	Sows	1.117	9.214	300
30	Antibiotics	15.00	Mature chickens	0.606	9.088	300
31	Sulfonamides	12.00	Bulls	0.650	7.804	300
32	Arsenicals	6.75	Sows	1.117	7.539	300
33	Sulfonamides	12.00	Mature chickens	0.606	7.270	300
34	Avermectins	8.25	Bulls	0.650	5.365	300
35	Arsenicals	6.75	Mature chickens	0.606	4.090	300
36	Antibiotics	15.00	Lambs	0.244	3.654	300
37	Antibiotics	15.00	Formula-fed veal	0.237	3.556	300
38	Sulfonamides	12.00	Lambs	0.244	2.923	300
39	Sulfonamides	12.00	Formula-fed veal	0.237	2.845	300
40	Antibiotics	15.00	Ducks	0.146	2.187	230

Table 4.5 - *Continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	UNADJ. # SAMPLES
41	Avermectins	8.25	Lambs	0.244	2.010	230
42	Avermectins	8.25	Formula-fed veal	0.237	1.956	230
43	Sulfonamides	12.00	Ducks	0.146	1.750	230
44	Antibiotics	15.00	Boars/Stags	0.084	1.266	230
45	Sulfonamides	12.00	Boars/Stags	0.084	1.013	230
46	Arsenicals	6.75	Ducks	0.146	0.984	230
47	Antibiotics	15.00	Mature turkeys	0.057	0.858	230
48	Avermectins	8.25	Boars/Stags	0.084	0.696	230
49	Sulfonamides	12.00	Mature turkeys	0.057	0.687	230
50	Arsenicals	6.75	Boars/Stags	0.084	0.570	230
51	Antibiotics	15.00	Bob veal	0.036	0.535	230
52	Antibiotics	15.00	Horses	0.033	0.496	230
53	Antibiotics	15.00	Goats	0.033	0.494	230
54	Sulfonamides	12.00	Bob veal	0.036	0.428	230
55	Sulfonamides	12.00	Horses	0.033	0.397	230
56	Sulfonamides	12.00	Goats	0.033	0.395	230
57	Arsenicals	6.75	Mature turkeys	0.057	0.386	230
58	Antibiotics	15.00	Heavy calves	0.022	0.329	230
59	Avermectins	8.25	Bob veal	0.036	0.294	230
60	Avermectins	8.25	Horses	0.033	0.273	230
61	Avermectins	8.25	Goats	0.033	0.271	230
62	Sulfonamides	12.00	Heavy calves	0.022	0.263	230
63	Arsenicals	6.75	Goats	0.033	0.222	230
64	Antibiotics	15.00	Bison	0.014	0.209	230
65	Antibiotics	15.00	Roaster pigs	0.013	0.197	230
66	Avermectins	8.25	Heavy calves	0.022	0.181	230
67	Sulfonamides	12.00	Bison	0.014	0.168	230
68	Antibiotics	15.00	Non-formula-fed veal	0.011	0.159	230
69	Sulfonamides	12.00	Roaster pigs	0.013	0.158	230
70	Antibiotics	15.00	Sheep	0.010	0.157	230
71	Antibiotics	15.00	Ratites	0.010	0.145	230
72	Sulfonamides	12.00	Non-formula-fed veal	0.011	0.127	90
73	Sulfonamides	12.00	Ratites	0.010	0.116	90
74	Avermectins	8.25	Bison	0.014	0.115	90
75	Avermectins	8.25	Roaster pigs	0.013	0.109	90
76	Arsenicals	6.75	Roaster pigs	0.013	0.089	90
77	Avermectins	8.25	Non-formula-fed veal	0.011	0.087	90
78	Avermectins	8.25	Sheep	0.010	0.087	90

Table 4.5 - *Continued*
Veterinary Drug Compound/Production Class Pairs,
Sorted by Sampling Priority Score, "Full-Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND CLASS	COMPOUND PRIORITY RATING (P)	PRODUCTION CLASS	EST. RELATIVE % DOMESTIC CONSUMPTION (D)	C/PC PAIR PRIORITY SCORE (P x D)	UNADJ. # SAMPLES
79	Avermectins	8.25	Ratites	0.010	0.080	90
80	Antibiotics	15.00	Geese	0.002	0.035	90
81	Sulfonamides	12.00	Geese	0.002	0.028	90
82	Antibiotics	15.00	Rabbits	0.002	0.024	90
83	Arsenicals	6.75	Geese	0.002	0.016	90
84	Avermectins	8.25	Rabbits	0.002	0.013	90

Table 4.6
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND CLASS	PRODUCTION CLASS	PRIORITY SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Antibiotics	Young chickens	550.884	4288	0.02	460		460	MAX 300	300
Antibiotics	Market hogs	316.934	4449	0.47	460		460	MAX 300	300
Antibiotics	Steers	240.388	3629	0.03	460		460	MAX 300	300
Antibiotics	Heifers	147.160	3301	0.06	460		460	MAX 300	300
Antibiotics	Young turkeys	97.135	4333	0.18	460		460	MAX 300	300
Antibiotics	Beef cows	29.092	4167	0.12	460		460	MAX 300	300
Antibiotics	Dairy cows	28.843	4582	0.48	300		300		300
Antibiotics	Sows	16.753	4186	0.45	300		300		300
Antibiotics	Bulls	9.755	2524	0.00	300	-1	230		230
Antibiotics	Mature chickens	9.088	3237	0.03	300		300		300
Antibiotics	Lambs	3.654	3857	0.21	300		300		300
Antibiotics	Formula-fed veal	3.556	5209	0.44	300		300		300
Antibiotics	Ducks	2.187	3557	0.11	230		230		230
Antibiotics	Boars/Stags	1.266	2947	0.24	230		230		230
Antibiotics	Mature turkeys	0.858	1855	0.11	230		230		230
Antibiotics	Bob veal	0.535	4243	1.27	230	+2	460	MAX 300	300
Antibiotics	Horses	0.496	2505	6.91	230	NO ADJ	230		230
Antibiotics	Goats	0.494	2802	0.07	230		230		230
Antibiotics	Heavy calves	0.329	3071	0.39	230		230		230
Antibiotics	Bison	0.209	39	0.00	230	+1	300	MAX 90	90
Antibiotics	Roaster pigs	0.197	374	1.60	230	+2	460	MAX 300	300
Antibiotics	Non-formula-fed veal	0.159	2749	0.55	230	+1	300		300
Antibiotics	Sheep	0.157	2491	0.04	230		230		230
Antibiotics	Ratites	0.145	91	0.00	230	+1	300	MAX 90	90
Antibiotics	Geese	0.035	139	0.00	90	NO ADJ	90		90
Antibiotics	Rabbits	0.024	1322	3.18	90	NO ADJ	90		90
Antibiotics	Squab		27	0.00	45	NO ADJ	45		45
TOTAL # SAMPLES					**7545**		**8145**		**6445**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND CLASS	PRODUCTION CLASS	PRIORITY SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Avermectins	Market hogs	174.314	2841	0.00	460	-1	300		300
Avermectins	Steers	132.214	3795	0.03	460		460	MAX 300	300
Avermectins	Heifers	80.938	2755	0.00	460	-1	300		300
Avermectins	Beef cows	16.001	3205	0.22	300		300		300
Avermectins	Dairy cows	15.863	2886	0.10	300		300		300
Avermectins	Sows	9.214	2284	0.00	300	-1	230		230
Avermectins	Bulls	5.365	2227	0.27	300		300		300
Avermectins	Lambs	2.010	2596	0.08	230		230		230
Avermectins	Formula-fed veal	1.956	2759	0.00	230	-1	90		90
Avermectins	Boars/Stags	0.696	1440	0.00	230	-1	90		90
Avermectins	Bob veal	0.294	371	0.00	230	-1	90		90
Avermectins	Horses	0.273	1560	0.64	230	NO ADJ	230		230
Avermectins	Goats	0.271	2948	0.61	230	+1	300		300
Avermectins	Heavy calves	0.181	2595	0.27	230		230		230
Avermectins	Bison	0.115	33	0.00	90	+1	230	MAX 90	90
Avermectins	Roaster pigs	0.109	240	0.00	90	+1	230		230
Avermectins	Non-formula-fed veal	0.087	1855	0.32	90		90		90
Avermectins	Sheep	0.087	1711	0.18	90		90		90
Avermectins	Ratites	0.080	82	0.00	90	+1	230	MAX 90	90
Avermectins	Rabbits	0.013	469	0.00	90	-1	0		0
TOTAL # SAMPLES					**4730**		**4320**		**3880**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND CLASS	PRODUCTION CLASS	PRIORITY SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Sulfonamides	Young chickens	440.707	3924	0.10	460		460	-1	300
Sulfonamides	Market hogs	253.547	7604	0.72	460	+2	460	-1	300
Sulfonamides	Steers	192.311	3149	0.16	460		460	-1	300
Sulfonamides	Heifers	117.728	2908	0.03	460		460	-1	300
Sulfonamides	Young turkeys	77.708	3949	0.20	460		460	-1	300
Sulfonamides	Egg products	32.692	425	0.00	460	-1	300	-1	230
Sulfonamides	Beef cows	23.273	3799	0.16	300		300	-1	230
Sulfonamides	Dairy cows	23.074	3232	0.28	300		300	-1	230
Sulfonamides	Sows	13.403	4527	0.64	300	+1	460	-1	300
Sulfonamides	Bulls	7.804	2677	0.11	300		300	-1	300
Sulfonamides	Mature chickens	7.270	3009	0.00	300	-1	230	-1	90
Sulfonamides	Lambs	2.923	2907	0.14	300		300	-1	230
Sulfonamides	Formula-fed veal	2.845	3951	0.23	300		300	-1	230
Sulfonamides	Ducks	1.750	2795	0.04	230		230	-1	90
Sulfonamides	Boars/Stags	1.013	3204	0.69	230	+1	300	-1	230
Sulfonamides	Mature turkeys	0.687	1981	0.40	230		230		230
Sulfonamides	Bob veal	0.428	4216	0.78	230	+2	300	-1	230
Sulfonamides	Horses	0.397	1553	0.32	230		230		230
Sulfonamides	Goats	0.395	2554	0.23	230		230		230
Sulfonamides	Heavy calves	0.263	2870	0.17	230		230		230
Sulfonamides	Bison	0.168	33	0.00	230	+1	300	MAX 90	90
Sulfonamides	Roaster pigs	0.158	303	0.99	230	+2	460	-1	300
Sulfonamides	Non-formula-fed veal	0.127	2739	0.69	90	+1	230		230
Sulfonamides	Ratites	0.116	79	0.00	90	+1	230	MAX 90	90
Sulfonamides	Geese	0.028	147	0.68	90	NO ADJ	90	-1	90
Sulfonamides	Squab		30	0.00	45	NO ADJ	45	-1	45
TOTAL # SAMPLES					**7245**		**7895**		**5655**

Table 4.6 - *Continued*
Adjusted Number of Analyses for Each Veterinary Drug Compound/Production Class Pair, "Full Resource" Sampling
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND CLASS	PRODUCTION CLASS	PRIORITY SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
Arsenicals	Young chickens	247.898	4547	0.33	460		460	+740	1200
Arsenicals	Market hogs	142.620	2505	0.00	460	-1	300		300
Arsenicals	Young turkeys	43.711	2557	0.23	460		460		460
Arsenicals	Egg products	18.389	425	0.00	300	-1	230		230
Arsenicals	Beef cows	13.091	778	0.13	300		300		300
Arsenicals	Sows	7.539	1382	0.00	300	-1	230		230
Arsenicals	Mature chickens	4.090	1379	0.00	300	-1	230		230
Arsenicals	Ducks	0.984	587	0.68	230	+1	300		300
Arsenicals	Boars/Stags	0.570	867	0.00	230	-1	90		90
Arsenicals	Mature turkeys	0.386	571	0.00	230	-1	90		90
Arsenicals	Goats	0.222	1228	0.33	230		230		230
Arsenicals	Roaster pigs	0.089	281	0.00	90	+1	230		230
Arsenicals	Geese	0.016	0	NT	90	NO ADJ	90		90
TOTAL # SAMPLES					**3680**		**3240**		**3980**

Key:
#SAMP. = Total number of samples analyzed by the FSIS Monitoring Plan (i.e., random sampling only), 1/1/92 - 12/31/01.
%VIOL. = Percent violative, i.e., the percent of samples with residue concentrations exceeding the tolerance or action level (or, for a drug whose use was not permitted in the production class in which it was detected, the percent of samples with any detectable residue).
UNADJ.# = Unadjusted number of samples, obtained from last column of Table 4.7.
INITIAL ADJ.# = Number of samples proposed following adjustment for historical violation rate information or lack of testing information.
FINAL ADJ.# = Finalized sample numbers, obtained following any adjustments needed to match sample volume to laboratory capacity.
NT = Not Tested.
+1 level, +2 levels, -1 level = There are four different sampling levels: 90, 230, 300 and 460. Sampling levels were increased or decreased (e.g., changed from 300 samples to 230 samples) based on the rules described in Section 4.
NO ADJ = As explained in Section 4, the number of samples taken from geese and squab are limited to 90 and 45 per compound class per year, respectively.

SECTION 5. PLANNING THE 2003 FSIS IMPORT MONITORING PLAN: VETERINARY DRUGS

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate veterinary drugs of concern selected by members of the Surveillance Advisory Team (SAT) for the import 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 2003 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 2003 NRP. FSIS and FDA decided that those compounds and compound classes ranked 24th or higher represented a potential public health concern sufficient to justify their inclusion in the 2003 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 was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Where the laboratory resources were limited, FSIS decided that more resources should be used to test domestic products since imported products have been inspected previously by the importing country. Based on these considerations, the following compounds will be included in the 2003 FSIS Import Monitoring Plan.

--Antibiotics:

- Those antibiotics quantitated by the FSIS Bioassay multiresidue method (MRM) and associated follow-up methodologies [1] [tetracycline, oxytetracycline, chlortetracycline, beta-lactams (penicillins and cephalosporins; not differentiated within this category), gentamicin, streptomycin/spectinomycin

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

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

--Banned Drugs

- Chloramphenicol

The 2003, FSIS Import Monitoring Plan will employ 6 methodologies and analyze for over 50 veterinary drugs. Three of these are single-compound methodologies, and three 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 2003 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 2003 NRP are designated by a "●." Those compound/product class pairs that are of potential public health concern, but that are not included in the 2003 NRP because of laboratory resource constraints, are marked with a "○." Since all product classes will be sampled by the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP) method (see Section 7), and since this method also detects phenylbutazone, the latter, by default, will be sampled in all product classes. However, phenylbutazone is not of regulatory concern in all product classes. Those product classes in which phenylbutazone will be sampled, but where it is not of regulatory concern, are designated by a "**O**."

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

ALLOCATION OF SAMPLING RESOURCES 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

$$\text{Relative Sampling Priority} = (P_C) \times \text{Drug Score} \qquad (5.2)$$

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

Starting this year, 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 of fresh goat would be taken for each analysis, eight from each country.

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

ALLOCATION OF SAMPLES AMONG DIFFERENT COUNTRIES

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

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

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

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

For major product classes, the number of samples was allocated to each country depending upon the relative amount of product imported from that country. Table 5.3, *Estimated Annual 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.*

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

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

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

This is indicated in the column labeled "Unadjusted Number of Samples ($U_{C/S}$)," in Tables 5.17 to 5.23 (except 5.20b and 5.23b).

After determining the number of samples required from each country, each country with less than eight samples was assigned a minimum of eight samples. This is indicated in the column labeled "Adjustment #1" in Tables 5.17 to 5.23 (except 5.20b and 5.23b). The results of this adjustment are in the column labeled "Initial Adj #." If the total number of samples for a compound/product class resulted in more than the total number of samples allocated to that compound/product class pair, then a second adjustment had to be made, so that the total number of samples would be within an allocated number. This adjustment was made only to those countries from which greater than eight samples were to be taken. This was accomplished using the following equations:

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

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 5.17 to 5.23 (except 5.20b and 5.23b) in the column labeled "Final Adj.#."

Notes:

Because of limited laboratory resource the following sample allocation was made:

300 samples for antibiotics and sulfonamides in fresh beef
230 samples for avermectins in fresh beef
24 samples for chloramphenicol in fresh veal and 90 samples for chloramphenicol in fresh beef
90 samples for ractopamine in fresh pork.

Since the U.S. imports processed pork from fourteen countries, the adjusted number of samples tested for arsenicals were adjusted from 90 to 112, i.e. 8 samples/country.

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

Table 5.1
Product Classes Considered for Each Drug/Drug Class
2003 FSIS NRP, Import Monitoring Plan

DRUG→	Anti-biotics	Arsenicals	Avermec-tins	Clora-mphenicol	Fluoro-quin-olones	Racto-pamine	Sulfo-namides	Phenyl-butazone
Beef, fresh	●		●	●	○		●	●
Beef, processed			○				●	●
Beef/Pork, processed		●	○				●	●
Chicken, fresh	●	●			●		●	⭘
Chicken, processed		●			○		●	⭘
Eggs, processed	○	●					●	⭘
Goat, fresh	●						●	●
Lamb/Mutton, fresh	●		●				●	●
Lamb/Mutton, processed			○				●	●
Other Fowl, fresh	●	●					●	⭘
Other Fowl, processed	●	●					●	⭘
Pork, fresh	●		●			●	●	●
Pork, processed		●	○				●	●
Turkey, fresh	●	●			○		●	⭘
Turkey, processed		●			○		●	⭘
Veal, fresh	●		●	●	○		●	●
Veal, processed			○				●	●

Key
● = Compound/product class sampled in the 2002 FSIS Import Monitoring Plan
○ = Compound/product class pair of regulatory concern but not included in the plan because of lab resources
⭘ = Since all product classes will be sampled by the CHC/COP method (see Section 7), and since this method also detects phenylbutazone, the latter, by default, will be sampled in all product classes. However, phenylbutazone is not of regulatory concern in all product classes. Those product classes in which phenylbutazone will be sampled, but where it is NOT of regulatory concern.

Table 5.2
Estimated Annual Amount (in lbs.) of Product Imported
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	PRODUCT IMPORTED IN POUNDS	% PRODUCT IMPORTED
Beef, fresh	2,244,027,602	59.01
Beef, processed	207,765,434	5.46
Pork, fresh	793,938,366	20.88
Pork, processed	218,236,183	5.74
Beef/Pork, processed	3,139,969	0.08
Veal, fresh	52,719,320	1.39
Veal, processed	25,369	0.0007
Lamb/Mutton, fresh	145,744,211	3.83
Lamb/Mutton, processed	309,893	0.008
Horsemeat, Fresh	105,889	0.0028
Goat, fresh	12,538,652	0.33
Chicken, fresh	27,674,262	0.73
Chicken, processed	68,731,530	1.81
Turkey, fresh	1,207,413	0.032
Turkey, processed	8,146,132	0.21
Other Fowl, fresh	1,105,210	0.03
Other Fowl, processed	2,600,341	0.07
Varied combination, processed	4,612,833	0.12
Eggs, processed	10,353,300	0.27
Total/country	**3,802,981,909**	

Table 5.3
Estimated Annual Amount (in lbs.) of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Argentina	Australia	Austria	Belgium	Brazil	Canada
Beef, fresh	4,800,135	882,954,573				886,414,191
Beef, processed	50,199,018	1,981,562			86,552,873	53,839,249
Pork, fresh		29,971				708,893,543
Pork, processed			129,889	7,439,312		141,902,874
Beef/Pork, processed		8,993	81			3,109,222
Veal, fresh		11,988,226				19,292,999
Veal, processed						22,016
Lamb/Mutton, fresh		102,210,082				789,659
Lamb/Mutton, processed		110,417				148,618
Horsemeat, Fresh						105,889
Goat, fresh		11,175,697				140
Chicken, fresh						27,674,262
Chicken, processed						66,469,471
Turkey, fresh						1,207,413
Turkey, processed						7,008,714
Other Fowl, fresh						968,789
Other Fowl, processed						2,543,891
Varied combination, processed		50,556				4,480,408
Eggs, processed						10,353,300
Total/country	**54,999,153**	**1,010,510,077**	**129,970**	**7,439,312**	**86,552,873**	**1,935,224,648**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Costa Rica	Croatia	Denmark	Finland	France	Germany
Beef, fresh	21,840,927					
Beef, processed	5,610	67,920			111,571	
Pork, fresh			81,316,925	2,439,052		
Pork, processed		209,389	31,665,320		366,523	723,983
Beef/Pork, processed					3,313	
Veal, fresh						
Veal, processed					3,353	
Lamb/Mutton, fresh						
Lamb/Mutton, processed					455	
Horsemeat, Fresh						
Goat, fresh						
Chicken, fresh						
Chicken, processed					36,003	
Turkey, fresh						
Turkey, processed						
Other Fowl, fresh					113,785	
Other Fowl, processed					56,444	
Varied combination, processed					21,033	
Eggs, processed						
Total/country	**21,846,537**	**277,309**	**112,982,245**	**2,439,052**	**712,480**	**723,983**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Honduras	Hong Kong	Hungary	Iceland	Ireland	Israel
Beef, fresh	1,153,637					
Beef, processed						
Pork, fresh					372,624	
Pork, processed			3,887,394			
Beef/Pork, processed						
Veal, fresh						
Veal, processed						
Lamb/Mutton, fresh				107,657		
Lamb/Mutton, processed						
Horsemeat, Fresh						
Goat, fresh						
Chicken, fresh						
Chicken, processed		19,174				1,347,979
Turkey, fresh						
Turkey, processed		74,874				611,184
Other Fowl, fresh						
Other Fowl, processed						6
Varied combination, processed						
Eggs, processed						
Total/country	**1,153,637**	**94,048**	**3,887,394**	**107,657**	**372,624**	**1,959,169**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Italy	Mexico	Netherlands	New Zealand	Nicaragua	Poland
Beef, fresh		8,071,272		390,156,135	29,965,886	
Beef, processed	5,225	6,871,642		2,378,687		
Pork, fresh		146,470				
Pork, processed	5,440,792	177,793	10,396,823			15,229,233
Beef/Pork, processed			18,360			
Veal, fresh				21,438,095		
Veal, processed						
Lamb/Mutton, fresh				42,292,743		
Lamb/Mutton, processed				50,403		
Horsemeat, Fresh						
Goat, fresh				1,362,815		
Chicken, fresh						
Chicken, processed		858,903				
Turkey, fresh						
Turkey, processed		451,360				
Other Fowl, fresh				22,636		
Other Fowl, processed						
Varied combination, processed				60,836		
Eggs, processed						
Total/country	**5,446,017**	**16,577,440**	**10,415,183**	**457,762,350**	**29,965,886**	**15,229,233**

Table 5.3 - *Continued*
Estimated Annual Amount (in lbs.) of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Spain	Sweden	Switzerland	Northern Ireland	Uruguay
Beef, fresh					18,670,846
Beef, processed			2,955		5,749,122
Pork, fresh		739,781			
Pork, processed	661,098			5,760	
Beef/Pork, processed					
Veal, fresh					
Veal, processed					
Lamb/Mutton, fresh					344,070
Lamb/Mutton, processed					
Horsemeat, Fresh					
Goat, fresh					
Chicken, fresh					
Chicken, processed					
Turkey, fresh					
Turkey, processed					
Other Fowl, fresh					
Other Fowl, processed					
Varied combination, processed					
Eggs, processed					
Total/country	**661,098**	**739,781**	**2,955**	**5,760**	**24,764,038**

Table 5.4
Relative Annual Amount of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Argentina	Australia	Austria	Belgium	Brazil	Canada
Beef, fresh	0.21	39.35	-	-	-	39.50
Beef, processed	24.16	0.95	-	-	41.66	25.91
Pork, fresh		0.00	-	-	-	89.29
Pork, processed		-	0.06	3.41	-	65.02
Beef/Pork, processed		0.29	0.003	-	-	99.02
Veal, fresh		22.74	-	-	-	36.60
Veal, processed		-	-	-	-	86.78
Lamb/Mutton, fresh		70.13	-	-	-	0.54
Lamb/Mutton, processed		35.63	-	-	-	47.96
Horsemeat, Fresh		-	-	-	-	100.00
Goat, fresh		89.13	-	-	-	0.00
Chicken, fresh		-	-	-	-	100.00
Chicken, processed		-	-	-	-	96.71
Turkey, fresh		-	-	-	-	100.00
Turkey, processed		-	-	-	-	86.04
Other Fowl, fresh		-	-	-	-	87.66
Other Fowl, processed		-	-	-	-	97.83
Varied combination, processed		1.10	-	-	-	97.13
Eggs, processed	-	-	-	-	-	100.00

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Costa Rica	Croatia	Denmark	Finland	France	Germany
Beef, fresh	0.97	-	-	-	-	-
Beef, processed	0.003	0.03	-	-	0.05	-
Pork, fresh	-	-	10.24	0.31	-	-
Pork, processed	-	0.10	14.51	-	0.17	0.33
Beef/Pork, processed	-	-	-	-	0.11	-
Veal, fresh	-	-	-	-	-	-
Veal, processed	-	-	-	-	13.22	-
Lamb/Mutton, fresh	-	-	-	-	-	-
Lamb/Mutton, processed	-	-	-	-	0.15	-
Horsemeat, Fresh	-	-	-	-	-	-
Goat, fresh	-	-	-	-	-	-
Chicken, fresh	-	-	-	-	-	-
Chicken, processed	-	-	-	-	0.05	-
Turkey, fresh	-	-	-	-	-	-
Turkey, processed	-	-	-	-	-	-
Other Fowl, fresh	-	-	-	-	10.30	-
Other Fowl, processed	-	-	-	-	2.17	-
Varied combination, processed	-	-	-	-	0.46	-
Eggs, processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Honduras	Hong Kong	Hungary	Iceland	Ireland	Israel
Beef, fresh	0.05	-	-	-	-	-
Beef, processed	-	-	-	-	-	-
Pork, fresh	-	-	-	-	0.05	-
Pork, processed	-	-	1.78	-	-	-
Beef/Pork, processed	-	-	-	-	-	-
Veal, fresh	-	-	-	-	-	-
Veal, processed	-	-	-	-	-	-
Lamb/Mutton, fresh	-	-	-	0.07	-	-
Lamb/Mutton, processed	-	-	-	-	-	-
Horsemeat, Fresh	-	-	-	-	-	-
Goat, fresh	-	-	-	-	-	-
Chicken, fresh	-	-	-	-	-	-
Chicken, processed	-	0.03	-	-	-	1.96
Turkey, fresh	-	-	-	-	-	-
Turkey, processed	-	0.92	-	-	-	7.50
Other Fowl, fresh	-	-	-	-	-	-
Other Fowl, processed	-	-	-	-	-	0.00
Varied combination, processed	-	-	-	-	-	-
Eggs, processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Italy	Mexico	Netherlands	New Zealand	Nicaragua	Poland
Beef, fresh	-	0.36	-	17.39	1.34	-
Beef, processed	0.00	3.31	-	1.14	-	-
Pork, fresh	-	0.02	-	-	-	-
Pork, processed	2.49	0.08	4.76	-	-	6.98
Beef/Pork, processed	-	-	0.58	-	-	-
Veal, fresh	-	-	-	40.66	-	-
Veal, processed	-	-	-	-	-	-
Lamb/Mutton, fresh	-	-	-	29.02	-	-
Lamb/Mutton, processed	-	-	-	16.26	-	-
Horsemeat, Fresh	-	-	-	-	-	-
Goat, fresh	-	-	-	10.87	-	-
Chicken, fresh	-	-	-	-	-	-
Chicken, processed	-	1.25	-	-	-	-
Turkey, fresh	-	-	-	-	-	-
Turkey, processed	-	5.54	-	-	-	-
Other Fowl, fresh	-	-	-	2.05	-	-
Other Fowl, processed	-	-	-	-	-	-
Varied combination, processed	-	-	-	1.32	-	-
Eggs, processed	-	-	-	-	-	-

Table 5.4 - *Continued*
Relative Annual Amount of Product Imported/Country
2003 FSIS NRP, Import Monitoring Plan

PRODUCT CLASS	Spain	Sweden	Switzerland	Northern Ireland	Uruguay
Beef, fresh	-	-			0.83
Beef, processed	-	-	0.001	-	2.77
Pork, fresh	-	0.09	-	-	-
Pork, processed	0.30	-	-	0.003	-
Beef/Pork, processed	-	-	-	-	-
Veal, fresh	-	-	-	-	-
Veal, processed	-	-	-	-	-
Lamb/Mutton, fresh	-	-	-	-	0.24
Lamb/Mutton, processed	-	-	-	-	-
Horsemeat, Fresh	-	-	-	-	-
Goat, fresh	-	-	-	-	-
Chicken, fresh	-	-	-	-	-
Chicken, processed	-	-	-	-	-
Turkey, fresh	-	-	-	-	-
Turkey, processed	-	-	-	-	-
Other Fowl, fresh	-	-	-	-	-
Other Fowl, processed	-	-	-	-	-
Varied combination, processed	-	-	-	-	-
Eggs, processed	-	-	-	-	-

Table 5.5
Number of Drug Samples/Product Class
2003 FSIS NRP, Import Monitoring Plan

No. Countries	Product Class	Drug	Percent Product	Drug Score	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
9	Beef, fresh	Antibiotics	59.01	15.00	885.11	460	300	300
9	Beef, fresh	Sulfonamides	59.01	12.00	708.08	460	300	300
9	Beef, fresh	Avermectins.	59.01	8.30	489.76	300	230	231
7	Pork, fresh	Antibiotics	20.88	15.00	313.15	300	300	300
7	Pork, fresh	Sulfonamides	20.88	12.00	250.52	300	300	300
7	Pork, fresh	Ractopamine	20.88	8.60	179.54	300	90	93
7	Pork, fresh	Avermectins.	20.88	8.30	173.28	300	300	300
7	Pork, fresh	Arsenicals	20.88	6.80	141.96	300	300	300
13	Pork, processed	Sulfonamides	5.74	12.00	68.86	230	230	83
12	Beef, processed	Sulfonamides	5.46	12.00	65.56	230	230	111
4	Lamb/Mutton, fresh	Antibiotics	3.83	15.00	57.49	90	90	90
4	Lamb/Mutton, fresh	Sulfonamides	3.83	12.00	45.99	90	90	90
13	Pork, processed	Arsenicals	5.74	6.80	39.02	90	112	72
5	Lamb/Mutton, fresh	Avermectins.	3.83	8.30	31.81	90	90	90
5	Chicken, processed	Sulfonamides	1.81	12.00	21.69	90	90	24
3	Veal, fresh	Antibiotics	1.39	15.00	20.79	90	90	90
3	Veal, fresh	Sulfonamides	1.39	12.00	16.64	90	90	90
5	Chicken, processed	Arsenicals	1.81	6.80	12.29	90	90	24
3	Veal, fresh	Avermectins.	1.39	8.30	11.51	90	90	53
1	Chicken, fresh	Antibiotics	0.73	15.00	10.92	90	8	8
1	Chicken, fresh	Sulfonamides	0.73	12.00	8.73	90	8	8

Table 5.5 - *Continued*
Number of Drug Samples/Product Class
2003 FSIS NRP, Import Monitoring Plan

No. Countries	Product Class	Drug	Percent Product	Drug Score	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
1	Chicken, fresh	Arsenicals	0.73	6.80	4.95	90	8	8
3	Goat, fresh	Antibiotics	0.33	15.00	4.95	90	24	24
3	Goat, fresh	Sulfonamides	0.33	12.00	3.96	90	24	24
3	Goat, fresh	Avermectins.	0.33	8.30	2.74	90	24	24
4	Turkey, processed	Sulfonamides	0.21	12.00	2.57	90	32	16
3	Goat, fresh	Arsenicals	0.33	6.80	2.24	90	24	24
4	Turkey, processed	Arsenicals	0.21	6.80	1.46	90	32	16
4	Varied combination, processed	Sulfonamides	0.12	12.00	1.46	90	32	32
5	Beef/Pork, processed	Sulfonamides	0.08	12.00	0.99	90	40	24
3	Other Fowl, processed	Sulfonamides	0.07	12.00	0.82	90	24	8
5	Beef/Pork, processed	Arsenicals	0.08	6.80	0.56	90	40	24
1	Turkey, fresh	Antibiotics	0.03	15.00	0.48	90	8	8
3	Other Fowl, processed	Arsenicals	0.07	6.80	0.46	90	24	8
3	Other Fowl, fresh	Antibiotics	0.03	15.00	0.44	90	24	24
1	Turkey, fresh	Sulfonamides	0.03	12.00	0.38	90	8	8
3	Other Fowl, fresh	Sulfonamides	0.03	12.00	0.35	90	24	24
1	Turkey, fresh	Arsenicals	0.03	6.80	0.22	90	8	8
3	Other Fowl, fresh	Arsenicals	0.03	6.80	0.20	90	24	24
4	Lamb/Mutton, processed	Sulfonamides	0.01	12.00	0.10	90	32	8
1	Horsemeat, Fresh	Antibiotics	0.003	15.00	0.04	90	8	8
1	Horse, Fresh	Sulfonamides	0.003	12.00	0.03	90	8	8

Table 5.5 - *Continued*
Number of Drug Samples/Product Class
2003 FSIS NRP, Import Monitoring Plan

No. Countries	Product Class	Drug	Percent Product	Drug Score	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
1	Horse, Fresh	Avermectins.	0.003	8.30	0.02	90	8	8
2	Veal, processed	Sulfonamides	0.001	12.00	0.01	90	16	8
9	Beef, fresh	Chloramphenicol				90	90	91
3	Veal, fresh	Chloramphenicol				24	24	24
Total						**6354**	**4038**	**3440**

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 CHC's/COP's. [See Section 7.]

Table 5.6
Number of Samples/Product Class - Goat, Fresh
2003 FSIS NRP, Import Monitoring Plan

GOAT, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	89.13	8	8
Canada	0.001	8	8
New Zealand	10.87	8	8
Total			**24**
GOAT, FRESH/ ARSENICALS			
Australia	89.13	8	8
Canada	0.001	8	8
New Zealand	10.87	8	8
Total			**24**
GOAT, FRESH/ AVERMECTINS			
Australia	89.13	8	8
Canada	0.001	8	8
New Zealand	10.87	8	8
Total		**24**	**24**
GOAT, FRESH/ SULFONAMIDES			
Australia	89.13	8	8
Canada	0.001	8	8
New Zealand	10.87	8	8
Total		**24**	**24**

Table 5.7
Number of Samples/Product Class – Varied Combination, Processed
2003 FSIS Import Monitoring Plan

VARIED COMBINATION, PROCESSED, SULFONAMIDES	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	1.10	8	8
Canada	97.13	8	8
France	0.46	8	8
New Zealand	1.32	8	8
Total		**24**	**32**

Table 5.8
Number of Samples/Product Class - Chicken, Fresh
2003 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 5.9
Number of Samples/Product Class - Turkey, Fresh
2003 FSIS NRP, Import Monitoring Plan

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

Table 5.10
Number of Samples/Product Class - Lamb/Mutton, Processed
2003 FSIS NRP, Import Monitoring Plan

LAMB/MUTTON, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	35.63	8	0[1]
Canada	47.96	8	0[1]
France	0.15	8	0[1]
New Zealand	16.26	8	8
Total		**32**	**8**

Table 5.11
Number of Samples/Product Class - Turkey, Processed
2003 FSIS Import Monitoring Plan

TURKEY, PROCESSED/ ARSENICALS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	86.04	8	0[1]
Hong Kong	0.92	8	0[1]
Israel	7.50	8	8
Mexico	5.54	8	8
Total		**32**	**16**
TURKEY, PROCESSED/SULFONAMIDES			
Canada	86.04	8	0[1]
Hong Kong	0.92	8	0[1]
Israel	7.50	8	8
Mexico	5.54	8	8
Total		**32**	**16**

Table 5.12
Number of Samples/Product Class – Horse, Fresh
2003 FSIS NRP, Import Monitoring Plan

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

Table 5.13
Number of Samples/Product Class - Veal, Processed
2003 FSIS NRP, Import Monitoring Plan

VEAL, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	86.80	8	0[1]
France	23.20	8	8
Total		**16**	**8**

Table 5.14
Number of Samples/Product Class - Other, Fowl, Processed
2003 FSIS NRP, Import Monitoring Plan

OTHER, FOWL, PROCESSED/ARSENICALS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	97.83	8	0[1]
France	2.17	8	0[1]
Israel	0.0002	8	8
Total		**24**	**8**
OTHER, FOWL, PROCESSED/SULFONAMIDES			
Canada	97.83	8	0[1]
Israel	2.17	8	0[1]
France	0.0002	8	8
Total		**24**	**8**

Table 5.15
Number of Samples/Product Class - Other, Fowl, Fresh
2003 FSIS NRP, Import Monitoring Plan

OTHER FOWL, FRESH/ ANTIBIOTICS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	87.66	8	8
France	10.30	8	8
New Zealand	2.05	8	8
Total		**24**	**24**
OTHER FOWL, FRESH/ ARSENICALS			
Canada	87.66	8	8
France	10.30	8	8
New Zealand	2.05	8	8
Total		**24**	**24**
OTHER FOWL, FRESH/ SULFONAMIDES			
Canada	87.66	8	8
France	10.30	8	8
New Zealand	2.05	8	8
Total		**24**	**24**

Table 5.16
Number of Samples/Product Class - Beef/Pork, Processed
2003 FSIS NRP, Import Monitoring Plan

BEEF, PORK, PROCESSED/ARSENICALS	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	0.29	8	0[1]
Austria	0.001	8	8
Canada	99.02	8	0[1]
France	0.11	8	8
Netherlands	0.58	8	8
Total		**40**	**24**
BEEF, PORK, PROCESSED/SULFONAMIDES			
Australia	0.29	8	0[1]
Austria	0.001	8	8
Canada	99.02	8	0[1]
France	0.11	8	8
Netherlands	0.58	8	8
Total		**40**	**24**

Table 5.17
Number of Samples/Product Class - Beef, Processed
2003 FSIS NRP, Import Monitoring Plan

BEEF, PROCESSED/ SULFONAMIDES	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = $230P_{C/C}$)/100)	ADJUST. #1 (MIN. 8 SAMPLES/ COUNTRY)	INITIAL ADJ. NUMBER	ADJUST. # 2	FINAL NUMBER OF SAMPLES
Argentina	24.16	56		56	42	0[1]
Australia	0.95	2	8	8		0[1]
Brazil	41.66	96		96	71	71
Canada	25.91	60		60	45	0[1]
Costa Rica	0.001	0	8	8		0[1]
Croatia	0.03	0	8	8		8
France	0.05	0	8	8		8
Italy	0.001	0	8	8		8
Mexico	3.31	8	8	8		8
New Zealand	1.14	3	8	8		0[1]
Switzerland	0.001	0	8	8		0[1]
Uruguay	2.77	6	8	8		8
Total		**231**		**284**		**111**

Table 5.18
Number of Samples/Product Class - Chicken, Processed
2003 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	96.71	87		88	58	0[1]
France	0.05	0	8	8		8
Hong Kong	0.03	0	8	8		0[1]
Israel	1.96	2	8	8		8
Mexico	1.25	1	8	8		8
Total		**90**		**120**		**24**
CHICKEN, PROCESSED/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100**				
Canada	96.71	87		88	58	0[1]
France	0.05	0	8	8		8
Hong Kong	0.03	0	8	8		0[1]
Israel	1.96	2	8	8		8
Mexico	1.25	1	8	8		8
Total		**90**		**120**		**24**

Table 5.19
Number of Samples/Product Class - Beef, Fresh
2003 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 #
Argentina	0.21	1	8	8		8
Australia	39.35	118		118	103	103
Canada	39.50	119		119	104	104
Costa Rica	0.97	3	8	8		8
Honduras	0.05	0	8	8		8
Mexico	0.36	1	8	8		8
New Zealand	17.39	52		52	45	45
Nicaragua	1.34	4	8	8		8
Uruguay	0.83	2	8	8		8
Total		**300**		**337**		**300**

Table 5.19 - *Continued*
Number of Samples/Product Class - Beef, Fresh
2003 FSIS NRP, Import Monitoring Plan

BEEF, FRESH/ AVERMECTINS	**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 ADJ #**
Argentina	0.21	0	8	8		8
Australia	39.35	91		91	75	75
Canada	39.50	91		91	75	75
Costa Rica	0.97	2	8	8		8
Honduras	0.05	0	8	8		8
Mexico	0.36	1	8	8		8
New Zealand	17.39	40		40	33	33
Nicaragua	1.34	3	8	8		8
Uruguay	0.83	2	8	8		8
Total		**230**		**270**		**231**
BEEF, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 300*(($P_{C/C}$)/100)**				
Argentina	0.21	1	8	8		8
Australia	39.35	118		118	103	103
Canada	39.50	119		119	104	104
Costa Rica	0.97	3	8	8		8
Honduras	0.05	0	8	8		8
Mexico	0.36	1	8	8		8
New Zealand	17.39	52		52	45	45
Nicaragua	1.34	4	8	8		8
Uruguay	0.83	2	8	8		8
Total		**300**		**337**		**300**
BEEF, FRESH/ chloramphenicol		**UNADJUSTED NUMBER OF SAMPLES (U) = 90*((PC/C)/100)**				
Argentina	0.2100	0	8	8		8
Australia	39.35	35		35	17	17
Canada	39.5	36		36	18	18
Costa Rica	0.97	1	8	8		8
Honduras	0.05	0	8	8		8
Mexico	0.36	0	8	8		8
New Zealand	17.39	16		16	8	8
Nicaragua	1.34	1	8	8		8
Uruguay	0.83	1	8	8		8
Total		**90**		**135**		**91**

Table 5.20a
Number of Samples/Product Class - Veal, Fresh
2003 FSIS NRP, Import Monitoring Plan

VEAL, FRESH/ ANTIBIOTICS	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	22.74	20		20	20	20
Canada	36.60	33		33	33	33
New Zealand	40.66	37		37	37	37
Total		**90**		**90**		**90**
VEAL, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =90*[($P_{C/C}$)/100]**				
Australia	22.74	20		20	20	20
Canada	36.60	33		33	33	33
New Zealand	40.66	37		37	37	0[2]
Total		**90**		**90**		**53**
VEAL, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =90*[($P_{C/C}$)/100]**				
Australia	22.74	20		20	20	20
Canada	36.60	33		33	33	33
New Zealand	40.66	37		37	37	37
Total		**90**		**90**		**90**

Table 5.20b
Number of Samples/Product Class - Veal, Fresh
2003 FSIS NRP, Import Monitoring Plan

VEAL, FRESH/ CHLORAMPHENICOL	PERCENT PRODUCT	FINAL NUMBER OF SAMPLES
Australia	22.74	8
Canada	36.60	8
New Zealand	40.66	8
Total		**24**

Table 5.21
Number of Samples/Product Class - Pork, Fresh
2003 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.#**
Australia	0.004	0	8	8		8
Canada	89.29	268		268	233	228
Denmark	10.24	31		31	27	32
Finland	0.31	1	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**300**		**339**		**300**
PORK, FRESH/ ARSENICALS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) =300 * ($P_{C/C}$)/100)**				
Australia	0.004	0	8	8		8
Canada	89.29	268		268	233	228
Denmark	10.24	31		31	27	32
Finland	0.31	1	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**300**		**339**		**300**
PORK, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) =300 * ($P_{C/C}$)/100**				
Australia	0.004	0	8	8		8
Canada	89.29	268		268	233	228
Denmark	10.24	31		31	27	32
Finland	0.31	1	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**300**		**339**		**300**
PORK, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 300*(($P_{C/C}$)/100**				
Australia	0.004	0	8	8		8
Canada	89.29	268		268	233	228
Denmark	10.24	31		31	27	32
Finland	0.31	1	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**300**		**339**		**300**

Table 5.21 - *Continued*
Number of Samples/Product Class - Pork, Fresh
2003 FSIS NRP, Import Monitoring Plan

PORK, FRESH/ RACTOPAMINE	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	0.004	0	8	8		8
Canada	89.29	80		80	45	45
Denmark	10.24	9		9	5	8
Finland	0.31	0	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**89**		**129**		**93**

Table 5.22
Number of Samples/Product Class - Lamb/Mutton, Fresh
2003 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	70.13	63		63	47	47
Canada	0.54	0	8	8		8
Iceland	0.07	0	8	8		8
New Zealand	29.02	26	8	26	19	19
Uruguay	0.24	0	8	8		8
Total		**89**		**113**		**90**
LAMB/MUTTON, FRESH/ AVERMECTINS		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)**				
Australia	70.13	63		63	47	47
Canada	0.54	0	8	8		8
Iceland	0.07	0	8	8		8
New Zealand	29.02	26	8	26	19	19
Uruguay	0.24	0	8	8		8
Total		**89**		**113**		**90**
LAMB/MUTTON, FRESH/ SULFONAMIDES		**UNADJUSTED NUMBER OF SAMPLES ($U_{C/S}$) = 90*(($P_{C/C}$)/100)**				
Australia	70.13	63		63	47	47
Canada	0.54	0	8	8		8
Iceland	0.07	0	8	8		8
New Zealand	29.02	26	8	26	19	19
Uruguay	0.24	0	8	8		8
Total		**89**		**113**		**90**

Table 5.23a
Number of Samples/Product Class - Pork, Processed
2003 FSIS NRP, Import Monitoring Plan

PORK, 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.#	ADJUST. # 2	FINAL ADJ.#
Austria	0.06	0	8	8		8
Belgium	3.41	8	8	8		0[1]
Canada	65.02	150		150	107	0[1]
Croatia	0.10	0	8	8		8
Denmark	14.51	33		33	23	0[1]
France	0.17	0	8	8		8
Germany	0.33	1	8	8		8
Hungary	1.78	4	8	8		8
Italy	2.49	6	8	8		8
Mexico	0.08	0	8	8		0[1]
Netherlands	4.76	11		11	8	8
Poland	6.98	16		16	11	11
Spain	0.30	1	8	8		8
Northern Ireland	0.003	0	8	8		8
Total		**230**		**290**		**83**

Table 5.23b
Number of Samples/Product Class - Pork, Processed
2003 FSIS NRP, Import Monitoring Plan

PORK, PROCESSED/ ARSENICALS	PERCENT PRODUCT	INITIAL NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Austria	0.06	8	8
Belgium	3.41	8	0[1]
Canada	65.02	8	0[1]
Croatia	0.10	8	0[1]
Denmark	14.51	8	0[1]
France	0.17	8	8
Germany	0.33	8	8
Hungary	1.78	8	8
Italy	2.49	8	8
Mexico	0.08	8	0[1]
Netherlands	4.76	8	8
Poland	6.98	8	8
Spain	0.30	8	8
Northern Ireland	0.003	8	8
Total		**112**	**72**

[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.

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

SECTION 6. PLANNING THE 2003 FSIS DOMESTIC MONITORING PLAN: PESTICIDES

PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

LIST OF CANDIDATE COMPOUNDS

The candidate pesticides of concern selected by the Environmental Protection Agency (EPA) members of the Surveillance Advisory Team (SAT) 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

Background

Repeating Equation (4.1), we have:

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

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

compound classes. However, unlike the case with veterinary drugs (see Section 4), FSIS does not have historical data on a sufficient range of different pesticide compounds or compound classes to predict violation scores (and thus risk per unit of consumption) using a regression equation. Therefore, a somewhat different approach (although related to that used for the veterinary drugs) was necessary to estimate the "Risk Per Unit of Consumption" term.

Rating the Pesticides According to Relative Public Health Concern

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

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

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

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

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

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

the adjustments that were made, and it ensures consistency in how these adjustments were applied across a wide range of compounds.

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

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

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

The formulas used here for the pesticides, and in Chapter 6 for the veterinary drugs, 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 precisely comparable. However, because of the normalization the scores for the pesticides and veterinary drugs are comparable in magnitude, thus enabling at least a rough comparison to be made across these two very different categories of compounds.

In Table 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 2003 NRP

Following the completion of the ranking of the pesticides, the SAT (1) used these rankings to select those compounds and compound classes that should be included in the 2003 NRP, based purely on their relative public health concern and (2) determined which of these compounds and compound classes actually could be included in the 2003 NRP, based on the availability of laboratory resources.

The consensus of the SAT participants was that those compounds and compound classes ranked fifteenth or higher represented a potential public health concern sufficient to justify their inclusion in the 2003 FSIS National Residue Program (NRP).

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

HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor epoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, 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 2003 Monitoring Plan is provided in Table 6.2. For each highly ranked compound or compound class that was not scheduled for inclusion in the 2003 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 2003 NRP due to methodological limitations. FSIS will apply methodology capable of capturing chlorinated hydrocarbons and chlorinated and non-chlorinated organophospates 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 PCB's) are environmental contaminants to which any animal may be exposed. *For these two reasons, FSIS judged it prudent to sample for CHC's and COP's in all production classes.* FSIS also wishes to continue sampling for these compounds in all production classes as a means of monitoring for the occurrence of accidental contamination incidents.

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

Since only the CHC/COP compound class will be included in the 2003 NRP, this phase is relatively straightforward. FSIS has sufficient analytical capability to implement CHC/COP analysis in all production classes. To establish a relative sampling priority for each C/PC pair, the ranking score for the CHC/COP's (as calculated in Table 6.1) was multiplied by the estimated relative percent of domestic consumption for each production class (presented in Table 4.4). This is identical 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 of this are presented in Table 6.3, *Pesticide Compound/Production Class Pairs, Sorted by Sampling Priority Score, with Adjusted Number of Analyses*. As described in Section 3, above, these sampling levels provide varying probabilities of detecting residue violations. Thus the larger sample sizes, which provide the greater chance of detecting violations, are directed towards those C/PC pairs that have been identified as representing higher levels of relative public health concern.

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

ADJUSTING RELATIVE SAMPLING NUMBERS

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

Extensive FSIS historical testing information on violations, subdivided by production class, is available for the CHC/COP compound class. This information has been used to further refine the relative priority of sampling each C/PC pair. Table 6.3 lists, for the period 1/1/92 -12/31/01, 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.

The three exceptions to this system are:

1. Geese are not scheduled for more than 90 samples. Sampling destroys the entire goose carcass. Because very few geese are produced, and because virtually all geese are slaughtered by a very limited number of establishments, collecting a larger number of samples would present an unfair burden to these establishments.
2. As explained above, squab are automatically assigned 45 samples for each analysis performed.
3. Because the use of the CHC/COP method to test for phenylbutazone did not start until recently, FSIS has limited data on the occurrence of this drug in the production classes of interest. Therefore, all production classes for which phenylbutazone was designated as of potential concern (in Table 4.3, with a "●") were assigned a minimum of 300 samples.

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

Adjusting for laboratory capacity

Following this, it was necessary to make a final set of adjustments to match the total sampling numbers for CHC's/COP's with the analytical capabilities of the FSIS laboratories. For CHC's/COP's, FSIS laboratory capacity is less than the proposed number of samples. To accommodate this discrepancy, all 460-sample production classes were reduced to 300 samples (except for young chickens, which are the largest production class and thus represent the highest potential exposure), and all 300-sample production classes were reduced to 230 samples. This enabled FSIS to avoid eliminating any production classes of concern from CHC/COP sampling, while maintaining an adequate level of data quality for the most important production classes.

SCORING KEY FOR PESTICIDES
2003 FSIS DOMESTIC RESIDUE PROGRAM

FSIS Historical Testing Information on Violations (1/1/92 - 12/31/01)

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 1992 - 2001, 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

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 (1/1/92 - 12/31/01); or FSIS has included this compound within its program only between 6 and 10 years ago (1/1/92 - 12/31/96), 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 (1/1/97 - 12/31/01), but in fewer than 75% of the production classes of interest; or the only testing was between 6 and 10 years ago, where FSIS has analyzed at least 75% of production classes of interest for at least 2 of these 5 years, with a total of at least 500 samples per production class during this 5-year period and, in the case of a multi-residue method, the method used covers all compounds of interest 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.

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

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

Pre-Slaughter Interval

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

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

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

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

1 = No direct dermal application or premise treatment permitted.

Bioconcentration Factor

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

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

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

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

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

Endocrine Disruption

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

4 = Likely.

3 = Suspected.

NT = Not yet tested.

Toxicity

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

4 = Cholinesterase inhibitor, carcinogen, or low RfD.

3 = Medium RfD.

2 = High RfD.

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

Table 6.1
Scoring Table for Pesticides
2003 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)	1	3	1	4	3	4	3	***12.1***
Carbamates in FSIS Carbamate MRM (aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, carbofuran 3-hydroxy)	NA	4	4	2	3	4	4	***16.1***
Carbamates NOT in FSIS Carbamate MRM (carbaryl 5,6-dihydroxy, chlorpropham, propham, thiobencarb, 4-chlorobenzylmethylsulfone,4-chlorobenzylmethylsulfone sulfoxide)	NT	4	1	3	NV	4	4	***13.8***
CHC's and COP's in FSIS CHC/COP MRM (HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor epoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, 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)	1	3	4	4	3	4	3	***15.4***
Triazines in FSIS Triazine MRM (atrazine, simazine, propazine, terbuthylazine)	1	4	2	3	4	4	3	***14.3***
Triazines NOT in FSIS Triazine MRM (atrazine chloro metabolites, metribuzin, metribuzin DADK, metribuzin DA, metribuzin DK, amitraz, amitraz 2,4-DMA metabs., desdiethyl simazine, desethyl simazine, simazine chloro metabs.)	NT	4	4	3	4	4	4	***17.3***
1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)-1-ethanol	NT	3	4	4	NV	4	4	***16.1***
1,1-(2,2-dichloroethylidene)bis(4-methoxybenzene)	NT	3	4	4	NV	4	4	***16.1***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2003 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}*
1,1,3,3,-tetrakis(2-methyl-2-phenylpropyl)-1,3-dihydroxydistannoxane	NT	2	1	4	NV	3	4	***7.8***
1-methoxy-4-(1,2,2,2-tetrachloroethyl)benzene)	NT	3	4	4	NV	4	4	***16.1***
1-methyl cyromazine	NT	3	4	2	NV	4	4	***13.8***
2-((2-ethyl-6-methylphenyl)-amino)-1-propanol	NT	3	1	3	3	4	4	***11.5***
2-(1-hydroxyethyl)-6-ethylaniline	NT	4	1	3	3	4	4	***13.8***
2-(4-((6-chloro-2-benzoxazolyl)oxy)phenoxy)propanoic acid	NT	3	1	4	NV	4	4	***12.7***
2,3-dihydro-3,3-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
2003 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
2003 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	3	4	2	NV	3	4	***10.4***
Cyhalothrin, lambda-	NT	3	4	2	NV	4	4	***13.8***
Cyhexatin	NT	2	1	2	NV	4	4	***8.1***
Cyromazine	NT	3	4	2	NV	4	4	***13.8***
Dalapon	NT	2	2	2	NV	3	4	***6.9***
Dialifor	NT	3	1	4	NV	4	4	***12.7***
Dialifor oxon	NT	3	1	4	NV	4	4	***12.7***
Dicamba	NT	3	2	3	NV	4	4	***12.7***
Dicyclohexyltin oxide	NT	2	1	2	NV	4	4	***8.1***
Difenoconazole	NT	3	1	4	NV	3	4	***9.5***
Difenzoquat	NT	1	1	1	NV	4	4	***4.6***
Diflubenzuron	NT	3	4	4	NV	2	4	***8.1***
Dimethenamid	NT	2	1	1	NT	2	4	***3.5***
Dimethipin	NT	1	1	1	NV	3	4	***3.5***
Dioxathion	NT	3	1	3	NV	4	4	***11.5***
Diphenamid	NT	3	1	1	NV	3	4	***6.9***
Diphenamid, 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***
Etridiazole .	NT	3	1	4	NV	3	4	***9.5***
ETU	NT	3	1	2	3	4	4	***10.4***
Fenarimol	NT	1	1	4	NV	3	4	***6.0***
Fenarimol metabolite B	NT	1	1	4	NV	3	4	***6.0***
Fenarimol metabolite C	NT	1	1	4	NV	3	4	***6.0***
Fenbuconazole	NT	3	1	4	NT	3	4	***9.5***
Fenbutatin Oxide	NT	2	1	4	NV	3	4	***7.8***
Fenoxaprop ethyl	NT	3	1	4	NV	4	4	***12.7***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2003 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}*
Fenpropathrin	NT	2	1	1	NV	3	4	***5.2***
Fenridazon	NT	2	1	2	NV	3	4	***6.0***
Fipronil	NT	3	4	4	NV	4	4	***16.1***
Fluazifop-butyl	NT	3	1	2	NV	3	4	***7.8***
Fludioxanil	NT	1	1	4	NT	1	4	***2.0***
Flufenacet (thiafluamide)	NT	3	1	4	NT	3	4	***9.5***
Fluridone	NT	2	1	2	NV	3	4	***6.0***
Fluroxypyr	NT	2	1	1	NT	2	4	***3.5***
Fluthiacet-Methyl (CGA-248757)	NT	1	1	1	NT	1	4	***1.2***
Flutolanil	NT	2	1	4	NV	2	4	***5.2***
Fluvalinate	NT	3	1	4	NV	3	4	***9.5***
Glufosinate-Ammonium	NT	1	2	1	NV	3	4	***4.3***
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	3	4	4	NV	4	4	***16.1***
Imidacloprid	NT	3	1	1	NV	3	4	***6.9***
IN-A3928	NT	3	1	2	NV	3	4	***7.8***
IN-B2838	NT	3	1	2	NV	3	4	***7.8***
Indoxacarb (DPX-MP062)	NT		1		NT		4	**--**
IN-T3935	NT	3	1	2	NV	3	4	***7.8***
IN-T3936	NT	3	1	2	NV	3	4	***7.8***
IN-T3937	NT	3	1	2	NV	3	4	***7.8***
Iprodione	NT	3	1	3	NV	4	4	***11.5***
Iprodione isomer	NT	3	1	3	NV	4	4	***11.5***
Iprodione metabolite	NT	3	1	3	NV	4	4	***11.5***
Iprodione metabolite 2	NT	3	1	3	NV	4	4	***11.5***
Isoxaflutole	NT	4	1	3	NT	3	4	***10.4***
Kresoxim-methyl	NT	4	1	4	NT	3	4	***11.2***
Maleic hydrazide	NT	3	1	4	NV	1	4	***3.2***
Mancozeb	NT	3	1	2	3	4	4	***10.4***
Maneb	NT	3	1	2	3	4	4	***10.4***
MB 45950	NT	3	4	4	NV	4	4	***16.1***
MB 46136	NT	3	4	4	NV	3	4	***12.1***
MB 46513	NT	3	4	4	NV	4	4	***16.1***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2003 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}*
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	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite 1,2,4-triazole	NT	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite CGA 118244	NT	3	1	3	NV	4	4	***11.5***
Propiconazole metabolite CGA 91305	NT	3	1	3	NV	4	4	***11.5***
Propyzamide	NT	3	1	4	NV	3	4	***9.5***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2003 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}*
Prosulfuron	NT	1	1	3	NV	3	4	***5.2***
Pymetrozine	NT	1	1	1	NT	1	4	***1.2***
Pyrazon	NT	3	1	1	NV	4	4	***9.2***
Pyrazon metabolite A	NT	3	1	2	NV	4	4	***10.4***
Pyrazon metabolite B	NT	3	1	2	NV	4	4	***10.4***
Pyrethrin I	NT	2	4	4	NV	3	4	***10.4***
Pyridaben	NT	2	1	2	NV	4	4	***8.1***
Pyriproxifen	NT	1	1	4	NT	1	4	***2.0***
Quinclorac	NT	2	1	2	NV	2	4	***4.0***
Quizalofop-ethyl	NT	3	1	2	NV	4	4	***10.4***
SD 31723	NT	2	1	4	NV	3	4	***7.8***
SD 33608	NT	2	1	4	NV	3	4	***7.8***
SD 54597	NT	3	4	3	NV	3	4	***11.2***
Sethoxydim	NT	2	1	2	NV	2	4	***4.0***
Sethoxydim hydroxylate sulfone	NT	2	1	2	NV	2	4	***4.0***
Sethoxydim sulfoxide	NT	2	1	2	NV	2	4	***4.0***
Sodium acifluorfen	NT	3	1	2	NV	3	4	***7.8***
Spinosad	NT	1	1	4	NT	1	4	***2.0***
Sulfosulfuron	NT	2	1	1	NT	2	4	***3.5***
TCP=3,5,6-trichloro-2-pyridinol	NT	3	2	1	NV	4	4	***10.4***
Tebuconazole	NT	3	1	2	NV	3	4	***7.8***
Tebufenozide	NT	3	1	4	NV	3	4	***9.5***
Tebuthiuron	NT	2	1	2	NV	3	4	***6.0***
Teflubenzuron	NT		1		NT		4	**--**
Terbacil	NT	1	1	1	NV	3	4	***3.5***
Tetradifon	NT	1	1	2	NV	4	4	***5.8***
Thidiazuron	NT	2	1	2	NV	4	4	***8.1***
Thiophanate methyl	NT	3	1	2	NV	4	4	***10.4***
THPI	NT	3	1	4	NV	4	4	***12.7***
Tralkoxydim	NT	2	1	2	NT	2	4	***4.0***
Triadimefon	NT	3	1	4	NV	4	4	***12.7***
Triadimefon metabolite KWG 1323	NT	3	1	4	NV	4	4	***12.7***
Triadimefon metabolite KWG 1342	NT	3	1	4	NV	4	4	***12.7***
Triadimefon metabolite KWG 1732	NT	3	1	4	NV	4	4	***12.7***
Triadimenol (for metabolites see triadimefon)	NT	3	1	4	NV	4	4	***12.7***
Triasulfuron	NT	1	1	1	NV	3	4	***3.5***
Triclopyr	NT	3	2	1	NV	4	4	***10.4***
Triflumazole	NT	3	1	4	NV	3	4	***9.5***

Table 6.1 – *Continued*
Scoring Table for Pesticides
2003 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}*
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 (1/1/92 - 12/31/01)
NA = Compound has been tested by FSIS (1/1/92 - 12/31/01), 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
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
1	**COP's and OP's NOT in FSIS CHC/COP MRM** (azinphos-methyl, azinphos-methyl oxon, chlorpyrifos, coumaphos, coumaphos oxon, diazinon, diazinon oxon, diazinon met G-27550, dichlorvos, dimethoate, dimethoate oxon, dioxathion, ethion, ethion monooxon, fenthion, fenthion oxon, fenthion oxon sulfone, fenthion oxon sulfoxide, fenthion sulfone, fenthion sulfoxide, malathion, malathion oxon, naled, phosmet, phosmet oxon, pirimiphos-methyl, trichlorfon, tetrachlorvinphos, tetrachlorvinphos-4 metabolites, acephate, methamidophos, chlorpyrifos-methyl, fenamiphos, fenamiphos sulfoxide, fenamiphos sulfone, fenamiphos sulfoxide desisopropyl, fenamiphos sulfone desisopropyl, isofenphos, isofenphos oxon, isofenphos desisopropyl, isofenphos oxon desisopropyl, methidathion, ODM, parathion (ethyl), parathion oxon, parathion methyl, parathion methyl oxon, phorate, phorate oxon, phorate oxon sulfone, phorate oxon sulfoxide, phorate sulfone, phorate sulfoxide, profenofos, sulprofos, sulprofos oxon, sulprofos oxon sulfone, sulprofos oxon sulfoxide, sulprofos sulfone, sulprofos sulfoxide, tribufos (DEF))	**18.4**	NIP; need regulatory method.
2	**Triazines NOT in FSIS Triazine MRM** (atrazine chloro metabolites, metribuzin, metribuzin DADK, metribuzin DA, metribuzin DK, amitraz, amitraz 2,4-DMA metabs., desdiethyl simazine, desethyl simazine, simazine chloro metabs.)	**17.3**	NIP; need regulatory method.
3	**Carbamates in FSIS Carbamate MRM** (aldicarb, aldicarb sulfoxide, aldicarb sulfone, carbaryl, carbofuran, carbofuran 3-hydroxy)	**16.1**	NIP; need to adjust sample-handling procedures to prevent degradation.
4	1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)-1-ethanol	**16.1**	NIP; need regulatory method.
5	1,1-(2,2-dichloroethylidene)bis(4-methoxybenzene)	**16.1**	NIP; need regulatory method.
6	1-methoxy-4-(1,2,2,2-tetrachloroethyl)benzene)	**16.1**	NIP; need regulatory method.
7	3-(1-(2,4-dichlorophenyl)-2-(1H-imidazole-1-yl)ethoxy)-1,2-propane diol	**16.1**	NIP; need regulatory method.
8	Fipronil	**16.1**	NIP; need regulatory method.
9	Imazalil	**16.1**	NIP; need regulatory method.
10	MB 45950	**16.1**	NIP; need regulatory method.
11	MB 46513	**16.1**	NIP; need regulatory method.
12	Methoxychlor olefin	**16.1**	NIP; need regulatory method.
13	**CHC's and COP's in FSIS CHC/COP MRM** (HCB, alpha-BHC, lindane, heptachlor, dieldrin, aldrin, endrin, ronnel, linuron, oxychlordane, chlorpyrifos, nonachlor, heptachlor epoxide A, heptachlor expoxide B, endosulfan I, endosulfan I sulfate, endosulfan II, trans-chlordane, cis-chlordane, chlorfenvinphos, p,p'-DDE, p, p'-TDE, o,p'-DDT, p,p'-DDT, carbophenothion, captan, 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 roaster pigs. Import residue plan, all import production classes.
14	**Synthetic Pyrethrins in FSIS Synthetic Pyrethrin MRM** (cypermethrin, cis-permethrin, trans-permethrin, fenvalerate, zeta-cypermethrin)	**15.4**	NIP; laboratory resources not available.
15	Arsanilic acid	**15.0**	NIP; laboratory resources not available.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
BASED ON CONSULTATION WITH EPA AND OTHER AGENCIES, COMPOUNDS BELOW THIS POINT WERE NOT CONSIDERED TO REPRESENT A BROAD POTENTIAL PUBLIC HEALTH RISK. HOWEVER, SOME OF THESE MAY BE SAMPLED ON A SPECIFIC, AS-NEEDED BASIS.			
16	**Triazines in FSIS Triazine MRM** (atrazine, simazine, propazine, terbuthylazine)	**14.3**	NIP; low priority, method available.
17	**Carbamates NOT in FSIS Carbamate MRM** (carbaryl 5,6-dihydroxy, chlorpropham, propham, thiobencarb, 4-chlorobenzylmethylsulfone,4-chlorobenzylmethylsulfone sulfoxide)	**13.8**	NIP; low priority.
18	1-methyl cyromazine	**13.8**	NIP; low priority.
19	2-(1-hydroxyethyl)-6-ethylaniline	**13.8**	NIP; low priority.
20	2,6-diethylaniline	**13.8**	NIP; low priority.
21	Alachlor	**13.8**	NIP; low priority, method available.
22	Cacodylic acid	**13.8**	NIP; low priority.
23	CP 101394	**13.8**	NIP; low priority.
24	CP 108064	**13.8**	NIP; low priority.
25	CP 108065	**13.8**	NIP; low priority.
26	CP 108267	**13.8**	NIP; low priority.
27	CP 51214	**13.8**	NIP; low priority.
28	Cyhalothrin, lambda-	**13.8**	NIP; low priority.
29	Cyromazine	**13.8**	NIP; low priority, method available.
30	Phosalone oxon	**13.8**	NIP; low priority.
31	PP 890	**13.8**	NIP; low priority.
32	2-(4-((6-chloro-2-benzoxazolyl)oxy)phenoxy)propanoic acid	**12.7**	NIP; low priority.
33	2-carboxyisopropyl-4-(2,4-dichloro)-5-isopropoxyphenyl)-1,3,4-oxadiazolin-5-one	**12.7**	NIP; low priority.
34	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.
35	3-(3,4-dichlorophenyl)-1-methoxyurea	**12.7**	NIP; low priority.
36	3,4-dichloroaniline	**12.7**	NIP; low priority.
37	3,4-dichlorophenylurea	**12.7**	NIP; low priority.
38	6-chloro-2,3-dihydro-benzoxazol-2-one	**12.7**	NIP; low priority.
39	Bifenthrin	**12.7**	NIP; low priority.
40	Bifenthrin, 4'-hydroxy	**12.7**	NIP; low priority.
41	Bis(trichloromethyl)disulfide	**12.7**	NIP; low priority.
42	Captan epoxide	**12.7**	NIP; low priority.
43	Cyclanilide	**12.7**	NIP; low priority.
44	Dialifor	**12.7**	NIP; low priority.
45	Dialifor oxon	**12.7**	NIP; low priority.
46	Dicamba	**12.7**	NIP; low priority.
47	Diuron	**12.7**	NIP; low priority.
48	Fenoxaprop ethyl	**12.7**	NIP; low priority.
49	N-(3,4-dichlorophenyl)-N'-methylurea	**12.7**	NIP; low priority.
50	Oxadiazon	**12.7**	NIP; low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
51	Oxyfluorfen	**12.7**	NIP; low priority.
52	THPI	**12.7**	NIP; low priority.
53	Triadimefon	**12.7**	NIP; low priority.
54	Triadimefon metabolite KWG 1323	**12.7**	NIP; low priority.
55	Triadimefon metabolite KWG 1342	**12.7**	NIP; low priority.
56	Triadimefon metabolite KWG 1732	**12.7**	NIP; low priority.
57	Triadimenol (for metabolites see triadimefon)	**12.7**	NIP; low priority.
58	**Benzimidazole Pesticides in FSIS Benzimidazole MRM** (5-hydroxythiabendazole, benomyl (as carbendazim), thiabendazole)	**12.1**	NIP; low priority, method available.
59	MB 46136	**12.1**	NIP; low priority.
60	Octyl bicycloheptene dicarboximide (MGK-264)	**12.1**	NIP; low priority.
61	2-((2-ethyl-6-methylphenyl)-amino)-1-propanol	**11.5**	NIP; low priority.
62	4-(2-ethyl-6-methylphenyl)-2-hydroxy-5-methyl-3-morpholinone	**11.5**	NIP; low priority.
63	Dioxathion	**11.5**	NIP; low priority.
64	Iprodione	**11.5**	NIP; low priority.
65	Iprodione isomer	**11.5**	NIP; low priority.
66	Iprodione metabolite	**11.5**	NIP; low priority.
67	Iprodione metabolite 2	**11.5**	NIP; low priority.
68	Metolachlor	**11.5**	NIP; low priority.
69	Propiconazole	**11.5**	NIP; low priority.
70	Propiconazole metabolite 1,2,4-triazole	**11.5**	NIP; low priority.
71	Propiconazole metabolite CGA 118244	**11.5**	NIP; low priority.
72	Propiconazole metabolite CGA 91305	**11.5**	NIP; low priority.
73	Esfenvalerate	**11.2**	NIP; low priority.
74	Kresoxim-methyl	**11.2**	NIP; low priority.
75	SD 54597	**11.2**	NIP; low priority.
76	2-aminobenzimidazole	**10.4**	NIP; low priority.
77	6-methyl-2,3-quinoxalinedithiol	**10.4**	NIP; low priority.
78	Abamectin	**10.4**	NIP; low priority.
79	Abamectin delta 8,9 geometric isomer	**10.4**	NIP; low priority.
80	Allophanate	**10.4**	NIP; low priority.
81	Carboxin	**10.4**	NIP; low priority.
82	Carboxin sulfoxide	**10.4**	NIP; low priority.
83	Cyfluthrin	**10.4**	NIP; low priority.
84	Ethalfluralin	**10.4**	NIP; low priority.
85	ETU	**10.4**	NIP; low priority.
86	Isoxaflutole	**10.4**	NIP; low priority.
87	Mancozeb	**10.4**	NIP; low priority.
88	Maneb	**10.4**	NIP; low priority.
89	Metiram	**10.4**	NIP; low priority.
90	Piperonyl butoxide	**10.4**	NIP; low priority.
91	Pyrazon metabolite A	**10.4**	NIP; low priority.
92	Pyrazon metabolite B	**10.4**	NIP; low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
93	Pyrethrin I	**10.4**	NIP; low priority.
94	Quizalofop-ethyl	**10.4**	NIP; low priority.
95	TCP=3,5,6-trichloro-2-pyridinol	**10.4**	NIP; low priority.
96	Thiophanate methyl	**10.4**	NIP; low priority.
97	Triclopyr	**10.4**	NIP; low priority.
98	3-carboxy-5-ethoxy-1,2,4-thiadiazole	**9.5**	NIP; low priority.
99	4-chloro-2-trifluoromethylaniline	**9.5**	NIP; low priority.
100	Chlorobenzilate	**9.5**	NIP; low priority.
101	Difenoconazole	**9.5**	NIP; low priority.
102	Etridiazole .	**9.5**	NIP; low priority.
103	Fenbuconazole	**9.5**	NIP; low priority.
104	Flufenacet (thiafluamide)	**9.5**	NIP; low priority.
105	Fluvalinate	**9.5**	NIP; low priority.
106	Methyl 3,5-dichlorobenzoate	**9.5**	NIP; low priority.
107	N-(4-chloro-2-trifluoromethylphenyl)-propoxyacetamide	**9.5**	NIP; low priority.
108	Propyzamide	**9.5**	NIP; low priority.
109	Tebufenozide	**9.5**	NIP; low priority.
110	Triflumazole	**9.5**	NIP; low priority.
111	3-(2-chloro-4-hydroxyphenyl)-6-(2-chlorophenyl)-1,2,4,5-tetrazine	**9.2**	NIP; low priority.
112	Bromoxynil	**9.2**	NIP; low priority.
113	Clofentezine	**9.2**	NIP; low priority.
114	Mepiquat chloride	**9.2**	NIP; low priority.
115	Norfluraxon, desmethyl-	**9.2**	NIP; low priority.
116	Norflurazon	**9.2**	NIP; low priority.
117	Oxythioquinox	**9.2**	NIP; low priority.
118	Paraquat dichloride	**9.2**	NIP; low priority.
119	Pyrazon	**9.2**	NIP; low priority.
120	Diphenylamine	**8.6**	NIP; low priority.
121	4-hydrocythidiazuron	**8.1**	NIP; low priority.
122	Buprofezin	**8.1**	NIP; low priority.
123	Cyclohexylstannoic acid	**8.1**	NIP; low priority.
124	Cyhexatin	**8.1**	NIP; low priority.
125	Dicyclohexyltin oxide	**8.1**	NIP; low priority.
126	Diflubenzuron	**8.1**	NIP; low priority.
127	Dipropyl isocinchomerate	**8.1**	NIP; low priority.
128	N-phenylurea	**8.1**	NIP; low priority.
129	PB-9	**8.1**	NIP; low priority.
130	Pyridaben	**8.1**	NIP; low priority.
131	Thidiazuron	**8.1**	NIP; low priority.
132	Triphenyltin hydroxide	**8.1**	NIP; low priority.
133	1,1,3,3,-tetrakis(2-methyl-2-phenylpropyl)-1,3-dihydroxydistannoxane	**7.8**	NIP; low priority.
134	2-amino-n-isopropylbenzamide	**7.8**	NIP; low priority.
135	Acifluorfen, amino analog	**7.8**	NIP; low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
136	Bentazon, 6-hydroxy bentazon, 8-hydroxy bentazon	**7.8**	NIP; low priority.
137	Chlorsulfuron	**7.8**	NIP; low priority.
138	Chlorsulfuron, 5-hydroxy-	**7.8**	NIP; low priority.
139	Emamectin	**7.8**	NIP; low priority.
140	Fenbutatin Oxide	**7.8**	NIP; low priority.
141	Fluazifop-butyl	**7.8**	NIP; low priority.
142	Hexazinone	**7.8**	NIP; low priority.
143	IN-A3928	**7.8**	NIP; low priority.
144	IN-B2838	**7.8**	NIP; low priority.
145	IN-T3935	**7.8**	NIP; low priority.
146	IN-T3936	**7.8**	NIP; low priority.
147	IN-T3937	**7.8**	NIP; low priority.
148	Propargite	**7.8**	NIP; low priority.
149	Propargite	**7.8**	NIP; low priority.
150	SD 31723	**7.8**	NIP; low priority.
151	SD 33608	**7.8**	NIP; low priority.
152	Sodium acifluorfen	**7.8**	NIP; low priority.
153	Tebuconazole	**7.8**	NIP; low priority.
154	6-chloronicotinic acid	**6.9**	NIP; low priority.
155	Benoxacor	**6.9**	NIP; low priority.
156	CGA 150829	**6.9**	NIP; low priority.
157	CGA 171683	**6.9**	NIP; low priority.
158	Dalapon	**6.9**	NIP; low priority.
159	Diphenamid	**6.9**	NIP; low priority.
160	Diphenamid, desmethyl	**6.9**	NIP; low priority.
161	Diquat dibromide	**6.9**	NIP; low priority.
162	Imidacloprid	**6.9**	NIP; low priority.
163	Nicotine	**6.9**	NIP; low priority.
164	NTN33823	**6.9**	NIP; low priority.
165	NTN35884	**6.9**	NIP; low priority.
166	PB-7	**6.9**	NIP; low priority.
167	Primisulfuron-methyl	**6.9**	NIP; low priority.
168	Propanil	**6.9**	NIP; low priority.
169	WAK4103	**6.9**	NIP; low priority.
170	6-chloropicolinic acid	**6.0**	NIP; low priority.
171	Fenarimol	**6.0**	NIP; low priority.
172	Fenarimol metabolite B	**6.0**	NIP; low priority.
173	Fenarimol metabolite C	**6.0**	NIP; low priority.
174	Fenridazon	**6.0**	NIP; low priority.
175	Fluridone	**6.0**	NIP; low priority.
176	Nitrapyrin	**6.0**	NIP; low priority.
177	Tebuthiuron	**6.0**	NIP; low priority.
178	Chlorfenapyr	**5.8**	NIP; low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
179	Tetradifon	**5.8**	NIP; low priority.
180	2,4-D	**5.2**	NIP; low priority.
181	Dodine	**5.2**	NIP; low priority.
182	Fenpropathrin	**5.2**	NIP; low priority.
183	Flutolanil	**5.2**	NIP; low priority.
184	Myclobutanil, myclobutanil alcohol metabolite, myclobutanol dihydroxy metabolite	**5.2**	NIP; low priority.
185	Prosulfuron	**5.2**	NIP; low priority.
186	Difenzoquat	**4.6**	NIP; low priority.
187	Ethephon	**4.6**	NIP; low priority.
188	MCPA	**4.6**	NIP; low priority.
189	Methoprene	**4.6**	NIP; low priority.
190	2,5-dichloro-4-methoxyphenol	**4.3**	NIP; low priority.
191	Chloroneb	**4.3**	NIP; low priority.
192	Chloroneb, hydroxy-	**4.3**	NIP; low priority.
193	Clofencet	**4.3**	NIP; low priority.
194	Glufosinate-Ammonium	**4.3**	NIP; low priority.
195	HOE-061517	**4.3**	NIP; low priority.
196	HOE-099730	**4.3**	NIP; low priority.
197	2,3-dihydro-3,3-dimethyl-2-oxo-5-benzofuranyl methyl sulfonate	**4.0**	NIP; low priority.
198	2-hydroxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methyl sulfonate	**4.0**	NIP; low priority.
199	Butylamine, sec-	**4.0**	NIP; low priority.
200	Compound 125670	**4.0**	NIP; low priority.
201	Ethofumesate	**4.0**	NIP; low priority.
202	Quinclorac	**4.0**	NIP; low priority.
203	Sethoxydim	**4.0**	NIP; low priority.
204	Sethoxydim hydroxylate sulfone	**4.0**	NIP; low priority.
205	Sethoxydim sulfoxide	**4.0**	NIP; low priority.
206	Tralkoxydim	**4.0**	NIP; low priority.
207	3-t-butyl-5-chloro-6-hydroxymethyluracil	**3.5**	NIP; low priority.
208	6-chloro-2,3-dihydro-3,3,7-trimethyl-5H-oxazolo(3,2a)pyrimidin-5-one	**3.5**	NIP; low priority.
209	6-chloro-2,3-dihydro-7-hydroxymethyl-3,3-dimethyl-5H-oxazolo(3,2-a)pyrimidin-5-one	**3.5**	NIP; low priority.
210	Azoxystrobin	**3.5**	NIP; low priority.
211	Azoxystrobin Z isomer	**3.5**	NIP; low priority.
212	CGA 161149	**3.5**	NIP; low priority.
213	CGA 195654	**3.5**	NIP; low priority.
214	Cloprop	**3.5**	NIP; low priority.
215	Dimethenamid	**3.5**	NIP; low priority.
216	Dimethipin	**3.5**	NIP; low priority.
217	Fluroxypyr	**3.5**	NIP; low priority.
218	Sulfosulfuron	**3.5**	NIP; low priority.
219	Terbacil	**3.5**	NIP; low priority.

Table 6.2 – *Continued*
Rank and Status for Pesticides
2003 FSIS NRP, Domestic Monitoring Plan

RANK	COMPOUND/COMPOUND CLASS	SCORE	STATUS IN 2002 NRP
220	Triasulfuron	**3.5**	NIP; low priority.
221	Maleic hydrazide	**3.2**	NIP; low priority.
222	Clopyralid	**2.9**	NIP; low priority.
223	Halosulfuron	**2.9**	NIP; low priority.
224	Picloram	**2.9**	NIP; low priority.
225	Clethodim	**2.6**	NIP; low priority.
226	Glyphosate-Trimesium	**2.3**	NIP; low priority.
227	Metsulfuron Methyl	**2.3**	NIP; low priority.
228	Carfentrazone Ethyl	**2.0**	NIP; low priority.
229	Fludioxanil	**2.0**	NIP; low priority.
230	Pyriproxifen	**2.0**	NIP; low priority.
231	Spinosad	**2.0**	NIP; low priority.
232	Aminomethylphosphonic acid	**1.4**	NIP; low priority.
233	Glyphosate	**1.4**	NIP; low priority.
234	Bensulfuron methyl ester	**1.2**	NIP; low priority.
235	Fluthiacet-Methyl (CGA-248757)	**1.2**	NIP; low priority.
236	Pymetrozine	**1.2**	NIP; low priority.
237	Indoxacarb (DPX-MP062)	**--**	NIP; low priority.
238	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
2003 FSIS NRP, Domestic Monitoring Plan

COMPOUND CLASS	PRODUCTION CLASS	PRIORITY SCORE	# SAMP.	%VIOL.	UNADJ. #	ADJUST-MENT	INITIAL ADJ.#	ADJUST-MENT	FINAL ADJ.#
CHC's/COP's	Young chickens	587.610	3892	0.03	460		460		460
CHC's/COP's	Market hogs	338.063	7368	0.03	460		460	-1	300
CHC's/COP's	Steers	256.414	4002	0.05	460		460	-1	300
CHC's/COP's	Heifers	156.971	3960	0.03	460		460	-1	300
CHC's/COP's	Young turkeys	103.611	4043	0.00	460	-1	300	-1	230
CHC's/COP's	Egg products	43.589	665	0.00	460	-1	300	-1	230
CHC's/COP's	Beef cows	31.031	4079	0.07	460		460	-1	300
CHC's/COP's	Dairy cows	30.766	3841	0.03	460		460	-1	300
CHC's/COP's	Sows	17.870	3891	0.10	300		300	-1	230
CHC's/COP's	Bulls	10.405	3312	0.12	300		300	-1	230
CHC's/COP's	Mature chickens	9.694	3125	0.00	300	-1	230		230
CHC's/COP's	Lambs	3.898	4204	0.05	300		300	-1	230
CHC's/COP's	Formula-fed veal	3.793	3568	0.00	300	-1	230		230
CHC's/COP's	Ducks	2.333	2697	0.00	230	-1	230		230
CHC's/COP's	Boars/Stags	1.351	3279	0.27	230	+1	300	-1	230
CHC's/COP's	Mature turkeys	0.915	1728	0.06	230		230		230
CHC's/COP's	Bob veal	0.570	1849	0.11	230		230		230
CHC's/COP's	Horses	0.529	3496	0.46	230	+1	300	-1	230
CHC's/COP's	Goats	0.527	3866	0.34	230	+1	300	-1	230
CHC's/COP's	Heavy calves	0.351	3295	0.21	230		230		230
CHC's/COP's	Bison	0.223	43	0.00	230	+1	300	MAX 90	90
CHC's/COP's	Roaster pigs	0.210	NT	NT	230	+1	300	-1	230
CHC's/COP's	Non-formula-fed veal	0.170	2744	0.15	230		230		230
CHC's/COP's	Sheep	0.168	3214	0.06	230		230		230
CHC's/COP's	Ratites	0.154	89	0.00	230	+1	300	MAX 90	90
CHC's/COP's	Geese	0.037	180	0.00	90	NO ADJ	90		90
CHC's/COP's	Rabbits	0.025	945	0.11	90		90		90
CHC's/COP's	Squab	---	33	0.00	45	NO ADJ	45		45
TOTAL # SAMPLES					**8165**		**8125**		**6275**

Key: #SAMP. = Total number of samples analyzed by the FSIS Monitoring Plan and/or Special Projects (i.e., random sampling only), 1/1/92 - 12/31/01.
%VIOL. = Percent violative, i.e., the percent of samples with residue concentrations exceeding the tolerance or action level (or, for a drug whose use was not permitted in the production class in which it was detected, the percent of samples with any detectable residue).
UNADJ. # = Unadjusted number of samples, obtained using cutoff values established for Table 4.5.
INITIAL ADJ.# = Number of samples proposed following adjustment for historical violation rate information or lack of testing information.
FINAL ADJ.# = Final sample numbers, obtained following any adjustments needed to match sample volume to laboratory capacity.
+1 level = Increase by one sampling level, e.g., from 300 to 460 (refer to text, Chapter 6, for explanation).
Note: Adjustments for laboratory capacity (2nd adjustment column): All 460-sample production classes (except for young chickens, which are the largest production class and thus represent the highest potential exposure) were reduced to 300 samples; all 300-sample production classes were reduced to 230 samples.

SECTION 7. PLANNING THE 2003 FSIS IMPORT MONITORING PLAN: PESTICIDES

PHASE I - GENERATING AND RANKING 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 2003 IMPORT MONITORING PLAN

The list of high priority compounds chosen for the Import Monitoring Plan by the Surveillance Advisory Team (SAT) was the same as that for the domestic plan. Once the high-priority compounds and compound classes had been identified, FSIS applied non-public health considerations to determine which compounds FSIS should sample. The principal non-public health factor was the availability of laboratory resources, especially the availability of appropriate analytical methods within the FSIS laboratories. Based on these constraints, only the chlorinated hydrocarbon/chlorinated organophosphate (CHC/COP)[1] compound class can be included in the NRP. The compounds that can be identified by this multiresidue method are listed in Section 6, Phase II, p 76.

PHASE III - IDENTIFYING THE COMPOUND/PRODUCT CLASS PAIRS

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

PHASE IV - ALLOCATION OF SAMPLING RESOURCES

ALLOCATION OF SAMPLING RESOURCES AMONG DIFFERENT 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 egg product category for egg products, the first ten shipments from individual foreign establishments are subjected to 100 % reinspection. If the egg product is in compliance the rate of

[1]Phenylbutazone is also detected by this method.

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 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."

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

Allocation of Samples among Different Countries

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

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

As stated above, if the amount of an import product class was less than 1%, eight samples per compound/compound class were taken from each country. The relative amounts of fresh chicken, fresh goat, processed beef/pork, fresh and processed turkey, other fresh and processed fowl, processed varied combination, processed lamb/mutton, and processed veal was less than 1%. 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 - 7.11.

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

For major product classes, the number of samples was allocated to each country depending upon the relative amount of product imported from that country. Table 5.3, *Estimated Annual Amount (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 7.12 to 7.18.

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

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

where,

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

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 7.11 - 7.18, in the column labeled "Final Adj.#."

Table 7.1
Number of Pesticide Samples/Product Class
2003 FSIS NRP, Import Monitoring Plan

No. Countries	Product	Pesticide	Pesticide Score	Percent Product	Relative Sampling Priority	Number of Samples	Adjusted Number of Samples	Final Number of Samples
9	Beef, fresh	CHC's/COP's	16	59.01	944.11	460	460	459
7	Pork, fresh	CHC's/COP's	16	20.88	334.03	300	300	300
14	Pork, processed	CHC's/COP's	16	5.74	91.82	230	230	83
12	Beef, processed	CHC's/COP's	16	5.46	87.41	230	231	95
5	Lamb/Mutton, fresh	CHC's/COP's	16	3.83	61.32	230	89	90
3	Veal, fresh	CHC's/COP's	16	1.39	22.18	90	90	90
5	Chicken, processed	CHC's/COP's	16	1.81	28.92	90	90	24
1	Chicken, fresh	CHC's/COP's	16	0.73	11.64	90	8	8
3	Goat, fresh	CHC's/COP's	16	0.33	5.28	90	24	24
4	Turkey, processed	CHC's/COP's	16	0.21	3.43	90	32	16
4	Varied combination, processed	CHC's/COP's	16	0.12	1.94	90	90	32
1	Horsemeat, Fresh	CHC's/COP's	16	0.003	0.04	90	8	8
3	Other Fowl, processed	CHC's/COP's	16	0.07	1.09	90	24	8
5	Beef/Pork, processed	CHC's/COP's	16	0.08	1.32	90	40	24
1	Turkey, fresh	CHC's/COP's	16	0.03	0.51	90	8	8
3	Other Fowl, fresh	CHC's/COP's	16	0.03	0.46	90	24	24
4	Lamb/Mutton, processed	CHC's/COP's	16	0.01	0.13	90	32	8
2	Veal, processed	CHC's/COP's	16	0.0007	0.01	90	16	8
Total						**2570**	**1746**	**1309**

Table 7.2
Number of Samples/Product Class - Chicken, Fresh
2003 FSIS NRP, Import Monitoring Plan

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

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

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

Table 7.4
Number of Samples/Product Class - Turkey, Processed
2003 FSIS NRP, Import Monitoring Plan

TURKEY, PROCESSED/ CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	86.04	8	0[1]
Hong Kong	0.92	8	0
Israel	7.50	8	8
Mexico	5.54	8	8
Total		**32**	**24**

Table 7.5
Number of Samples/Product Class - Other Fowl, Fresh
2003 FSIS NRP, Import Monitoring Plan

OTHER FOWL, FRESH/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	87.66	8	8
France	10.30	8	8
New Zealand	2.05	8	8
Total		**24**	**24**

Table 7.6
Number of Samples/Product Class - Other Fowl, Processed
2003 FSIS NRP, Import Monitoring Plan

OTHER, FOWL, PROCESSED/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	97.83	8	0[1]
France	2.17	8	0
Israel	0.00	8	8
Total		**24**	**8**

Table 7.7
Number of Samples/Product Class - Veal, Processed
2003 FSIS NRP, Import Monitoring Plan

VEAL, PROCESSED/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Canada	86.80	8	0[1]
France	23.20	8	8
Total		**16**	**8**

Table 7.8
Number of Samples/Product Class - Beef/Pork, Processed
2003 FSIS NRP, Import Monitoring Plan

BEEF/PORK, PROCESSED/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	0.29	8	0[1]
Austria	0.001	8	8
Canada	99.02	8	0[1]
France	0.11	8	8
Netherlands	0.58	8	8
Total		**40**	**24**

Table 7.9
Number of Samples/Product Class - Lamb/Mutton, Processed
2003 FSIS NRP, Import Monitoring Plan

LAMB/MUTTON, PROCESSED/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	35.63	8	0[1]
Canada	47.96	8	0[1]
France	0.15	8	8
New Zealand	16.26	8	0[1]
Total		**32**	**8**

Table 7.10
Number of Samples /Product Class - Goat, Fresh
2003 Import Residue Plan

GOAT, FRESH/CHC's/COP's	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	89.13	8	8
Canada	0.001	8	8
New Zealand	10.87	8	8
Total		**24**	**24**

Table 7.11
Number of Samples/Product Class – Horse, Fresh
2003 FSIS NRP, Import Monitoring Plan

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

Table 7.12
Number of Samples /Product Class - Varied Combination, Processed
2003 FSIS NRP, Import Monitoring Plan

VARIED COMBINATION, PROCESSED/CHC'S/COP'S	PERCENT PRODUCT	UNADJUSTED NUMBER OF SAMPLES	FINAL NUMBER OF SAMPLES
Australia	0.77	8	8
Canada	97.19	8	8
Croatia	0.36	8	8
France	0.54	8	8
New Zealand	1.13	8	8
Total		**40**	**40**

Table 7.13
Number of Samples/Product Class - Beef, Fresh
2003 FSIS NRP, Import Monitoring Plan

BEEF, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U) = 460*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Argentina	0.21	1	8	8		8
Australia	39.35	181		181	168	168
Canada	39.50	182		182	169	169
CostaRica	0.97	4	8	8		8
Honduras	0.05	0	8	8		8
Mexico	0.36	2	8	8		8
New Zealand	17.39	80		80	74	74
Nicaragua	1.34	6	8	8		8
Uruguay	0.83	4	8	8		8
Total		**460**		**491**		**459**

Table 7.14
Number of Samples /Product Class - Lamb/Mutton, Fresh
2003 FSIS NRP, Import Monitoring Plan

LAMB/ MUTTON, FRESH/ CHC's/COP's	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	70.13	63		63	64	47
Canada	0.54	0	8	8		8
Iceland	0.07	0	8	8		8
New Zealand	29.02	26	8	26	26	19
Uruguay	0.24	0	8	8		8
Total		**89**		**113**	**90**	**90**

Table 7.15
Number of Samples/Product Class - Pork, Processed
2003 FSIS NRP, Import Monitoring Plan

PORK, PROCESSED/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =300*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Austria	0.06	0	8	8		8
Belgium	3.41	8	8	8		0[1]
Canada	65.02	150		150	107	0[1]
Croatia	0.10	0	8	8		8
Denmark	14.51	33		33	23	0[1]
France	0.17	0	8	8		8
Germany	0.33	1	8	8		8
Hungary	1.78	4	8	8		8
Italy	2.49	6	8	8		8
Mexico	0.08	0	8	8	8	0[1]
Netherlands	4.76	11		11	11	8
Poland	6.98	16		16		11
Spain	0.30	1	8	8		8
Northern Ireland	0.002	0	8	8		8
Total		**230**		**290**		**83**

Table 7.16
Number of Samples /Product Class - Veal, Fresh
2003 FSIS NRP, Import Monitoring Plan

VEAL, FRESH/ CHC's/COP's	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	22.74	20		20	20	20
Canada	36.60	33		33	33	34
New Zealand	40.66	37		37	37	36
Total		**90**		**90**		**90**

Table 7.17
Number of Samples /Product Class - Pork, Fresh
2003 FSIS NRP, Import Monitoring Plan

PORK, FRESH/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =300*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Australia	0.004	0	8	8		8
Canada	89.29	268		268	3	228
Denmark	10.24	31		31	1	32
Finland	0.31	1	8	8		8
Ireland	0.05	0	8	8		8
Mexico	0.02	0	8	8		8
Sweden	0.09	0	8	8		8
Total		**300**		**339**		**300**

Table 7.18
Number of Samples/Product Class - Chicken, Processed
2003 FSIS NRP, Import Monitoring Plan

CHICKEN, PROCESSED/ CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES (U)= 90*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST.# 2	FINAL ADJ.#
Canada	96.71	87		88	58	0[1]
France	0.05	0	8	8		8
Hong Kong	0.03	0	8	8		0
Israel	1.96	2	8	8		8
Mexico	1.25	1	8	8		8
Total		**90**		**120**		**32**

Table 7.19
Number of Samples /Product Class - Beef, Processed
2003 FSIS NRP, Import Monitoring Plan

BEEF, PROCESSED CHC's/COP's	PERCENT PRODUCT ($P_{C/C}$)	UNADJUSTED NUMBER OF SAMPLES ($U_{c/s}$) =300*[($P_{C/C}$)/100]	ADJUSTMENT #1 (8 MINIMUM/ COUNTRY)	INITIAL ADJ.#	ADJUST. # 2	FINAL ADJ.#
Argentina	24.16	56		56	42	0[1]
Australia	0.95	2	8	8		0[1]
Brazil	41.66	96		96	71	71
Canada	25.91	60		60	45	0[1]
CostaRica	0.001	0	8	8		0[1]
Croatia	0.03	0	8	8		0[1]
France	0.05	0	8	8		8
Italy	0.001	0	8	8		8
Mexico	3.31	8	8	8		0[1]
New Zealand	1.14	3	8	8		0[1]
Switzerland	0.001	0	8	8		8
Uruguay	2.77	6	8	8		0[1]
Total		**231**		**284**		**95**

[1] [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 8. PLANNING THE 2003 FSIS DOMESTIC MONITORING PLAN AND EXPLORATORY PROJECTS, AND IMPORT MONITORING PLAN: ENVIRONMENTAL CONTAMINANTS

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

--*Environmental Contaminants:*

X dioxins
X heavy metals
X mycotoxins

--*Processing Contaminants:*

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

Of these, two compound classes were identified by the Surveillance Advisory Team as meriting inclusion in the NRP.

The first set of compounds was the dioxins. FSIS is conducting an Exploratory Project to survey dioxin compounds in each of the major domestic bovine, porcine, and poultry production classes (steers/heifers, market hogs, young chickens, and young turkeys). This survey started in 2002, and is expected to be completed by 2003. Samples will be collected by FSIS inspectors, and shipped for analysis to the Red River Valley Agricultural Research Center of the Agricultural Research Service, in Fargo, ND. The goal of this survey is to collect information about dioxin in domestically produced meat and poultry in a statistically valid manner. Information gathered from the survey will help FSIS begin to understand factors that might contribute to dioxin levels in meat and poultry. The planned sample numbers are given in Table 8.1.

The second set of compounds was the heavy metals, particularly lead. Suggested projects included a baseline study for levels of heavy metals in meat and poultry, and projects to analyze for lead in raw meat products used in baby food, and in baby food containing vegetable root material. Nevertheless, heavy metals will not be included in the 2003 NRP, as FSIS does not have the resources necessary to implement a heavy metals survey at this time.

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
Number of Samples/Product Class, Dioxins Survey
2003 FSIS NRP, Domestic Exploratory Project

PRODUCTION CLASS	NUMBER OF SAMPLES
Steers/heifers	136
Market hogs	136
Young chickens	144
Young turkeys	84
Total	**500**

SECTION 9. THE 2003 FSIS NATIONAL RESIDUE PROGRAM: DOMESTIC MONITORING PLAN AND EXPLORATORY PROJECTS, AND IMPORT 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 residue sampling plans) and compound/product class pairs (import residue sampling plan) that are founded on a public health-based prioritization process. These systems each incorporate a structured planning process that employs risk assessment formulas and uses the best available data to develop relative rankings within these formulas. These systems do not, and were not intended to, generate formal absolute estimates of risk that can be interpreted in an actuarial sense. Nevertheless, their relative risk-based rankings are sufficient to develop sound and internally consistent allocations of sampling resources. These rankings help FSIS to manage the public health concerns presented by a comprehensive range of veterinary drugs and pesticides in the egg product, meat, and poultry production classes for which FSIS has regulatory authority.

The final domestic sampling plan for veterinary drugs and pesticides in all production classes is listed in Table 9.1, *Detailed Sampling Plan, 2003 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 - Monitoring, 'modified Monitoring' (modifications designated in footnotes), or 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 9.2, *Summary, 2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects.*

The final detailed import plan sample numbers for all compounds (veterinary drugs and pesticides), in all product classes and all countries, are listed in Table 9.3, *Summary, 2003 FSIS NRP, Import Monitoring Plan*. The summary of the total number of samples per compound per production class is listed in Table 9.4 *Number of Compounds/Product Class, 2003 FSIS NRP, Import Monitoring Plan.* In Table 9.5, *Number of Samples/Country/Product Class, 2003 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 9.6, *Combined Summary, 2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects and Import Monitoring Plan*.

Table 9.1 - *Continued*
Detailed Sampling Plan
2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Antibiotics by Bioassay	MWL	Market hogs	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Dairy cows	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Formula-fed veal	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Young chickens	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Steers	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Heifers	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Young turkeys	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Bob veal	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Horses	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Beef cows	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Sows	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Lambs	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Roaster pigs	**300**	Monitoring Plan[1]
Antibiotics by Bioassay	MWL	Bison	**90**	Monitoring Plan[1]
Antibiotics by Bioassay	MWL	Ratites	**90**	Monitoring Plan[1]
Antibiotics by Bioassay	MWL	Rabbits	**90**	Monitoring Plan
Antibiotics by Bioassay	MWL	Bulls	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Mature chickens	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Ducks	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Boars/stags	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Mature turkeys	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Goats	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Heavy calves	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Sheep	**230**	Monitoring Plan
Antibiotics by Bioassay	MWL	Non-formula-fed veal	**300**	Monitoring Plan
Antibiotics by Bioassay	MWL	Geese	**90**	Monitoring Plan
Antibiotics by Bioassay	MWL	Squab	**45**	Monitoring Plan[1]
Total Antibiotics by Bioassay	**MWL**		**6445**	

[1]Sampling frame is incomplete, and therefore the data may not be fully representative of the sampled population.

Table 9.1 - *Continued*
Detailed Sampling Plan
2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Avermectins	EL	Steers	**300**	Monitoring Plan
Avermectins	EL	Horses	**230**	Monitoring Plan
Avermectins	EL	Market hogs	**300**	Monitoring Plan
Avermectins	EL	Heifers	**300**	Monitoring Plan
Avermectins	EL	Dairy cows	**300**	Monitoring Plan
Avermectins	EL	Beef cows	**300**	Monitoring Plan
Avermectins	EL	Bulls	**300**	Monitoring Plan
Avermectins	EL	Lambs	**230**	Monitoring Plan
Avermectins	EL	Goats	**300**	Monitoring Plan
Avermectins	EL	Sows	**230**	Monitoring Plan
Avermectins	EL	Formula-fed veal	**90**	Monitoring Plan
Avermectins	EL	Bob veal	**90**	Monitoring Plan
Avermectins	EL	Heavy calves	**230**	Monitoring Plan
Avermectins	EL	Roaster pigs	**230**	Monitoring Plan[1]
Avermectins	EL	Bison	**90**	Monitoring Plan[1]
Avermectins	EL	Ratites	**90**	Monitoring Plan[1]
Avermectins	EL	Non-formula-fed veal	**90**	Monitoring Plan
Avermectins	EL	Rabbits	**0**	Monitoring Plan
Avermectins	EL	Boars/stags	**90**	Monitoring Plan
Avermectins	EL	Sheep	**90**	Monitoring Plan
Total Avermectins	**EL**		**3880**	
Arsenicals	EL	Young chickens	**1200**	Monitoring Plan
Arsenicals	EL	Young turkeys	**460**	Monitoring Plan
Arsenicals	EL	Egg products	**230**	Monitoring Plan
Arsenicals	EL	Market hogs	**300**	Monitoring Plan
Arsenicals	EL	Beef cows	**300**	Monitoring Plan
Arsenicals	EL	Goats	**230**	Monitoring Plan
Arsenicals	EL	Sows	**230**	Monitoring Plan
Arsenicals	EL	Mature chickens	**230**	Monitoring Plan
Arsenicals	EL	Ducks	**300**	Monitoring Plan
Arsenicals	EL	Roaster pigs	**230**	Monitoring Plan[1]
Arsenicals	EL	Boars/stags	**90**	Monitoring Plan
Arsenicals	EL	Mature turkeys	**90**	Monitoring Plan
Arsenicals	EL	Geese	**90**	Monitoring Plan
Total Arsenicals	**EL**		**3980**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2003 FSIS NRP, Monitoring Plan and Exploratory Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Sulfonamides	MWL or EL	Young chickens	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Market hogs	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Steers	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Heifers	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Young turkeys	**300**	Monitoring Plan
Sulfonamides	EL	Egg products	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Dairy cows	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Beef cows	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Sows	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Bulls	**300**	Monitoring Plan
Sulfonamides	MWL or EL	Mature chickens	**90**	Monitoring Plan
Sulfonamides	MWL or EL	Lambs	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Formula-fed veal	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Boars/stags	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Mature turkeys	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Bob veal	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Roaster pigs	**300**	Monitoring Plan[1]
Sulfonamides	MWL or EL	Bison	**90**	Monitoring Plan[1]
Sulfonamides	MWL or EL	Ducks	**90**	Monitoring Plan
Sulfonamides	MWL or EL	Goats	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Horses	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Heavy calves	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Ratites	**90**	Monitoring Plan[1]
Sulfonamides	MWL or EL	Non-formula-fed veal	**230**	Monitoring Plan
Sulfonamides	MWL or EL	Geese	**90**	Monitoring Plan
Sulfonamides	MWL or EL	Squab	**45**	Monitoring Plan[1]
Total Sulfonamides	**MWL + EL**		**5655**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2003 FSIS NRP, Monitoring Plan and Exploratory Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
CHC's/COP's/Phenylbutazone	WL	Young chickens	460	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Market hogs	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Steers	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Heifers	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Young turkeys	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Egg products	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Dairy cows	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Beef cows	300	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Sows	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bulls	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Mature chickens	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Roaster pigs	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Lambs	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Formula-fed veal	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Ducks	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Boars/stags	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Mature turkeys	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Goats	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bob veal	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Horses	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Heavy calves	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Bison	90	Monitoring Plan[1]
CHC's/COP's/Phenylbutazone	WL	Sheep	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Ratites	90	Monitoring Plan[1]
CHC's/COP's/Phenylbutazone	WL	Non-formula-fed veal	230	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Geese	90	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Rabbits	90	Monitoring Plan
CHC's/COP's/Phenylbutazone	WL	Squab	45	Monitoring Plan[1]
Total CHC's/COP's/Phenylbutazone	**WL**		**6275**	

Table 9.1 - *Continued*
Detailed Sampling Plan
2003 FSIS NRP, Monitoring Plan and Exploratory Projects

ANALYSIS	LAB	PROD. CLASS	#SAMP.	TYPE
Chloramphenicol	EL	Dairy cows	300	Monitoring Plan
Chloramphenicol	EL	Formula-fed veal	300	Monitoring Plan
Chloramphenicol	EL	Non-formula-fed veal	300	Monitoring Plan
Total Chloramphenicol	**EL**		**900**	
Clenbuterol and other beta agonists*	WL+FDA	Formula-fed veal	230	Monitoring Plan[2]
Clenbuterol and other beta agonists*	WL+FDA	Market hogs	300	Monitoring Plan[2]
Clenbuterol and other beta agonists*	WL+FDA	Steers	300	Monitoring Plan[2]
Clenbuterol and other beta ags. *	**WL+FDA**		**830**	
DES/zeranol	MWL	Formula-fed veal	360	Monitoring Plan
Total DES/zeranol	**MWL**		**360**	
Dioxins	ARS-RRVARC	Steers/heifers	136	Monitoring Plan
Dioxins	ARS-RRVARC	Market hogs	136	Monitoring Plan
Dioxins	ARS-RRVARC	Young chickens	144	Monitoring Plan
Dioxins	ARS-RRVARC	Young turkeys	84	Monitoring Plan
Total Dioxins	**ARS-RRVARC**		**500**	
Flunixin	MWL	Dairy cows	300	Monitoring Plan[2]
Flunixin	MWL	Horses	160	Monitoring Plan[2]
Total Flunixin	**MWL**		**460**	
MGA (melengesterol acetate)	MWL	Heifers	300	Monitoring Plan[2]
Total MGA	**MWL**		**300**	
Ractopamine	MWL	Market hogs	300	Monitoring Plan
Ractopamine	MWL	Steers	230	Monitoring Plan
Total Ractopamine	**MWL**		**530**	

*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 only, but has also demonstrated the ability to detect other beta agonists, including fenoterol and cimaterol. If the sample is positive, WL will send an eyeball to FDA for confirmatory analysis using mass spectrometry. The FDA confirmatory method detects eight unapproved beta agonists (clenbuterol, cimaterol, fenoterol, mabuterol, salbutamol, brombuterol, and terbutaline). WL will retain the liver should additional testing be necessary.

Key:
PROD. CLASS = Production class; 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; ARS-RRVARC = Agricultural Research Service, Red River Valley Agricultural Research Center, Fargo, ND.[2]

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

Table 9.2
Summary
2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

PRODUCTION CLASS	Antibiotics	Arsenicals	Avermectins	Sulfona-mides	CHC's/COP's/phenylbute.	Dioxins
Bulls	230		300	300	230	
Beef cows	300	300	300	230	300	
Dairy cows	300		300	230	300	
Heifers	300		300	300	300	136
Steers	300		300	300	300	
Bob veal	300		90	230	230	
Formula-fed veal	300		90	230	230	
Non-formula-fed veal	300		90	230	230	
Heavy calves	230		230	230	230	
SUBTOTAL, CATTLE	**2560**	**300**	**2000**	**2280**	**2350**	**136**
Market hogs	300	300	300	300	300	136
Roaster pigs	300	230	230	300	230	
Boars/Stags	230	90	90	230	230	
Sows	300	230	230	300	230	
SUBTOTAL, SWINE	**1130**	**850**	**850**	**1130**	**990**	**136**
Sheep	230		90		230	
Lambs	300		230	230	230	
SUBTOTAL, OVINE	**530**	**0**	**320**	**230**	**460**	**0**
Goats	230	230	300	230	230	
Horses	230		230	230	230	
Bison	90		90	90	90	
SUBT., OTHER LIVESTC.	**550**	**230**	**620**	**550**	**550**	**0**
TOTAL, ALL LIVESTOCK	**4770**	**1380**	**3790**	**4190**	**4350**	**272**
Young chickens	300	1200		300	460	144
Mature chickens	300	230		90	230	
Young turkeys	300	460		300	230	84
Mature turkeys	230	90		230	230	
Ducks	230	300		90	230	
Geese	90	90		90	90	
Ratites	90		90	90	90	
Squab	45			45	45	
SUBTOTAL, POULTRY	**1585**	**2370**	**90**	**1235**	**1605**	**228**
Rabbits	90				90	
Egg products		230		230	230	
GRAND TOTAL, ALL PRODUCTION CLASSES	**6442**	**3980**	**3880**	**5655**	**6275**	**500**

Table 9.2 - *Continued*
Summary
2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects

PRODUCTION CLASS	Chloram-phenicol	Clenbuterol, and other beta agonists	DES/zeranol	Flunixin	MGA	Ractopamine
Bulls						
Beef cows						
Dairy cows	300			300		
Heifers					300	
Steers		300				230
Bob veal						
Formula-fed veal	300	230	360			
Non-formula-fed veal	300					
Heavy calves						
SUBTOTAL, CATTLE	**900**	**530**	**360**	**300**	**300**	**230**
Market hogs		300				300
Roaster pigs						
Boars/Stags						
Sows						
SUBTOTAL, SWINE	**0**	**300**	**0**	**0**	**0**	**300**
Sheep						
Lambs						
SUBTOTAL, OVINE	**0**	**0**	**0**	**0**	**0**	**0**
Goats						
Horses				160		
Bison						
SUBT., OTHER LIVESTC.	**0**	**0**	**0**	**160**	**0**	**0**
TOTAL, ALL LIVESTOCK	**900**	**830**	**360**	**460**	**300**	**530**
Young chickens						
Mature chickens						
Young turkeys						
Mature turkeys						
Ducks						
Geese						
Ratites						
Squab						
SUBTOTAL, POULTRY	**0**	**0**	**0**	**0**	**0**	**0**
Rabbits						
Egg products						
GRAND TOTAL, ALL PRODUCTION CLASSES	**900**	**830**	**360**	**460**	**300**	**530**

Table 9.3
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
Argentina	Beef, fresh	Antibiotics	8
Argentina	Beef, fresh	Avermectins	8
Argentina	Beef, fresh	Sulfonamides	8
Argentina	Beef, fresh	Chloramphenicol	8
Argentina	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Australia	Beef, fresh	CHC's/COP's/Phenylbutazone	168
Australia	Beef, fresh	Antibiotics	103
Australia	Beef, fresh	Sulfonamides	103
Australia	Beef, fresh	Avermectins	75
Australia	Lamb/Mutton, fresh	Antibiotics	47
Australia	Lamb/Mutton, fresh	Avermectins	47
Australia	Lamb/Mutton, fresh	Sulfonamides	47
Australia	Lamb/Mutton, fresh	CHC's/COP's/Phenylbutazone	47
Australia	Veal, fresh	Antibiotics	20
Australia	Veal, fresh	Arsenicals	20
Australia	Veal, fresh	Avermectins	20
Australia	Veal, fresh	CHC's/COP's/Phenylbutazone	20
Australia	Beef, fresh	Chloramphenicol	17
Australia	Goat, fresh	ANTIBIOTIC	8
Australia	Goat, fresh	Arsenicals	8
Australia	Goat, fresh	Avermectins	8
Australia	Goat, fresh	Sulfonamides	8
Australia	Pork, fresh	Antibiotics	8
Australia	Pork, fresh	Arsenicals	8
Australia	Pork, fresh	Avermectins	8
Australia	Pork, fresh	Sulfonamides	8
Australia	Pork, fresh	Ractopamine	8
Australia	Varied combination, processed	Sulfonamides	8
Australia	Veal, fresh	Chloramphenicol	8
Australia	Goat, fresh	CHC's/COP's/Phenylbutazone	8
Australia	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
Australia	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Austria	Pork, processed	Sulfonamides	8
Austria	Pork, processed	Arsenicals	8
Austria	Beef/Pork, processed	Arsenicals	8
Austria	Beef/Pork, processed	Sulfonamides	8

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
Austria	Beef/Pork, processed	CHC's/COP's/Phenylbutazone	8
Austria	Pork, processed	CHC's/COP's/Phenylbutazone	8
Brazil	Beef, processed	Sulfonamides	71
Brazil	Beef, processed	CHC's/COP's/Phenylbutazone	71
Canada	Pork, fresh	Antibiotics	228
Canada	Pork, fresh	Arsenicals	228
Canada	Pork, fresh	Avermectins	228
Canada	Pork, fresh	Sulfonamides	228
Canada	Pork, fresh	CHC's/COP's/Phenylbutazone	228
Canada	Beef, fresh	CHC's/COP's/Phenylbutazone	169
Canada	Beef, fresh	Antibiotics	104
Canada	Beef, fresh	Sulfonamides	104
Canada	Beef, fresh	Avermectins	75
Canada	Pork, fresh	Ractopamine	45
Canada	Veal, fresh	CHC's/COP's/Phenylbutazone	34
Canada	Veal, fresh	Antibiotics	33
Canada	Veal, fresh	Arsenicals	33
Canada	Veal, fresh	Avermectins	33
Canada	Beef, fresh	Chloramphenicol	18
Canada	Chicken, fresh	Antibiotics	8
Canada	Chicken, fresh	Arsenicals	8
Canada	Chicken, fresh	Sulfonamides	8
Canada	Goat, fresh	ANTIBIOTIC	8
Canada	Goat, fresh	ARSENIC	8
Canada	Goat, fresh	Avermectins	8
Canada	Goat, fresh	Sulfonamides	8
Canada	Horse, fresh	Sulfonamides	8
Canada	Horse, fresh	Avermectins	8
Canada	Horse, fresh	Antibiotics	8
Canada	Lamb/Mutton, fresh	Antibiotics	8
Canada	Lamb/Mutton, fresh	Avermectins	8
Canada	Lamb/Mutton, fresh	Sulfonamides	8
Canada	Other fowl, fresh	Antibiotics	8
Canada	Other fowl, fresh	Arsenicals	8
Canada	Other fowl, fresh	Sulfonamides	8
Canada	Turkey, fresh	Antibiotics	8
Canada	Turkey, fresh	Arsenicals	8
Canada	Turkey, fresh	Sulfonamides	8

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
Canada	Varied combination, processed	Sulfonamides	8
Canada	Veal, fresh	Chloramphenicol	8
Canada	Chicken, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Turkey, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Other fowl, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
Canada	Horse, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Lamb/Mutton, fresh	CHC's/COP's/Phenylbutazone	8
Canada	Goat, fresh	CHC's/COP's/Phenylbutazone	8
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	CHC's/COP's/Phenylbutazone	8
Croatia	Beef, processed	Sulfonamides	8
Croatia	Pork, processed	Sulfonamides	8
Croatia	Pork, processed	CHC's/COP's/Phenylbutazone	8
Denmark	Pork, fresh	Antibiotics	32
Denmark	Pork, fresh	Arsenicals	32
Denmark	Pork, fresh	Avermectins	32
Denmark	Pork, fresh	Sulfonamides	32
Denmark	Pork, fresh	CHC's/COP's/Phenylbutazone	32
Denmark	Pork, fresh	Ractopamine	8
Finland	Pork, fresh	Antibiotics	8
Finland	Pork, fresh	Arsenicals	8
Finland	Pork, fresh	Avermectins	8
Finland	Pork, fresh	Sulfonamides	8
Finland	Pork, fresh	Ractopamine	8
Finland	Pork, fresh	CHC's/COP's/Phenylbutazone	8
France	Beef, processed	Sulfonamides	8
France	Beef/Pork, processed	Arsenicals	8
France	Beef/Pork, processed	Sulfonamides	8
France	Chicken, processed	Arsenicals	8
France	Chicken, processed	Sulfonamides	8
France	Mutton/lamb, processed	Sulfonamides	8
France	Other fowl, fresh	Antibiotics	8
France	Other fowl, fresh	Arsenicals	8
France	Other fowl, fresh	Sulfonamides	8

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
France	Pork, processed	Sulfonamides	8
France	Pork, processed	Arsenicals	8
France	Varied combination, processed	Sulfonamides	8
France	Veal, processed	Sulfonamides	8
France	Other fowl, fresh	CHC's/COP's/Phenylbutazone	8
France	Other fowl, processed	CHC's/COP's/Phenylbutazone	8
France	Veal, processed	CHC's/COP's/Phenylbutazone	8
France	Beef/Pork, processed	CHC's/COP's/Phenylbutazone	8
France	Lamb/Mutton, processed	CHC's/COP's/Phenylbutazone	8
France	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
France	Pork, processed	CHC's/COP's/Phenylbutazone	8
France	Chicken, processed	CHC's/COP's/Phenylbutazone	8
France	Beef, processed	CHC's/COP's/Phenylbutazone	8
Germany	Pork, processed	Sulfonamides	8
Germany	Pork, processed	Arsenicals	8
Germany	Pork, processed	CHC's/COP's/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	CHC's/COP's/Phenylbutazone	8
Hungary	Pork, processed	Sulfonamides	8
Hungary	Pork, processed	Arsenicals	8
Hungary	Pork, processed	CHC's/COP's/Phenylbutazone	8
Iceland	Lamb/Mutton, fresh	Antibiotics	8
Iceland	Lamb/Mutton, fresh	Avermectins	8
Iceland	Lamb/Mutton, fresh	Sulfonamides	8
Iceland	Lamb/Mutton, fresh	CHC's/COP's/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	Ractopamine	8
Ireland	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Israel	Chicken, processed	Arsenicals	8
Israel	Chicken, processed	Sulfonamides	8
Israel	Other fowl, processed	Arsenicals	8
Israel	Turkey, processed	Arsenicals	8

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
Israel	Turkey, processed	Sulfonamides	8
Israel	Turkey, processed	CHC's/COP's/Phenylbutazone	8
Israel	Other fowl, processed	CHC's/COP's/Phenylbutazone	8
Israel	Chicken, processed	CHC's/COP's/Phenylbutazone	8
Italy	Beef, processed	Sulfonamides	8
Italy	Pork, processed	Sulfonamides	8
Italy	Pork, processed	Arsenicals	8
Italy	Pork, processed	CHC's/COP's/Phenylbutazone	8
Italy	Beef, processed	CHC's/COP's/Phenylbutazone	8
Mexico	Beef, fresh	Antibiotics	8
Mexico	Beef, fresh	Avermectins	8
Mexico	Beef, fresh	Sulfonamides	8
Mexico	Beef, fresh	Chloramphenicol	8
Mexico	Beef, processed	Sulfonamides	8
Mexico	Chicken, processed	Arsenicals	8
Mexico	Chicken, processed	Sulfonamides	8
Mexico	Pork, fresh	Antibiotics	8
Mexico	Pork, fresh	Arsenicals	8
Mexico	Pork, fresh	Avermectins	8
Mexico	Pork, fresh	Sulfonamides	8
Mexico	Pork, fresh	Ractopamine	8
Mexico	Turkey, processed	Arsenicals	8
Mexico	Turkey, processed	Sulfonamides	8
Mexico	Turkey, processed	CHC's/COP's/Phenylbutazone	8
Mexico	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Mexico	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Mexico	Chicken, processed	CHC's/COP's/Phenylbutazone	8
Netherlands	Beef/Pork, processed	Arsenicals	8
Netherlands	Beef/Pork, processed	Sulfonamides	8
Netherlands	Pork, processed	Sulfonamides	8
Netherlands	Pork, processed	Arsenicals	8
Netherlands	Beef/Pork, processed	CHC's/COP's/Phenylbutazone	8
Netherlands	Pork, processed	CHC's/COP's/Phenylbutazone	8
New Zealand	Beef, fresh	CHC's/COP's/Phenylbutazone	74
New Zealand	Beef, fresh	Antibiotics	45
New Zealand	Beef, fresh	Sulfonamides	45
New Zealand	Veal, fresh	Antibiotics	37
New Zealand	Veal, fresh	Arsenicals	37

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
New Zealand	Veal, fresh	CHC's/COP's/Phenylbutazone	36
New Zealand	Beef, fresh	Avermectins	33
New Zealand	Lamb/Mutton, fresh	Antibiotics	19
New Zealand	Lamb/Mutton, fresh	Avermectins	19
New Zealand	Lamb/Mutton, fresh	Sulfonamides	19
New Zealand	Lamb/Mutton, fresh	CHC's/COP's/Phenylbutazone	19
New Zealand	Beef, fresh	Chloramphenicol	8
New Zealand	Goat, fresh	ANTIBIOTIC	8
New Zealand	Goat, fresh	ARSENIC	8
New Zealand	Goat, fresh	Avermectins	8
New Zealand	Goat, fresh	Sulfonamides	8
New Zealand	Other fowl, fresh	Antibiotics	8
New Zealand	Other fowl, fresh	Arsenicals	8
New Zealand	Other fowl, fresh	Sulfonamides	8
New Zealand	Varied combination, processed	Sulfonamides	8
New Zealand	Veal, fresh	Chloramphenicol	8
New Zealand	Other fowl, fresh	CHC's/COP's/Phenylbutazone	8
New Zealand	Goat, fresh	CHC's/COP's/Phenylbutazone	8
New Zealand	Varied combination, processed	CHC's/COP's/Phenylbutazone	8
Nicaragua	Beef, fresh	Antibiotics	8
Nicaragua	Beef, fresh	Avermectins	8
Nicaragua	Beef, fresh	Sulfonamides	8
Nicaragua	Beef, fresh	Chloramphenicol	8
Nicaragua	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Northern Ireland	Pork, processed	Sulfonamides	8
Northern Ireland	Pork, processed	Arsenicals	8
Northern Ireland	Pork, processed	CHC's/COP's/Phenylbutazone	8
Poland	Pork, processed	Sulfonamides	11
Poland	Pork, processed	CHC's/COP's/Phenylbutazone	11
Poland	Pork, processed	Arsenicals	8
Spain	Pork, processed	Sulfonamides	8
Spain	Pork, processed	Arsenicals	8
Spain	Pork, processed	CHC's/COP's/Phenylbutazone	8
Sweden	Pork, fresh	Antibiotics	8
Sweden	Pork, fresh	Arsenicals	8
Sweden	Pork, fresh	Avermectins	8
Sweden	Pork, fresh	Sulfonamides	8
Sweden	Pork, fresh	Ractopamine	8

Table 9.3 - *Continued*
Summary
2003 FSIS NRP, Import Monitoring Plan

COUNTRY	Product	COMPOUND	NUMBER OF SAMPLES
Sweden	Pork, fresh	CHC's/COP's/Phenylbutazone	8
Switzerland	Beef, processed	CHC's/COP's/Phenylbutazone	8
Uruguay	Beef, fresh	Antibiotics	8
Uruguay	Beef, fresh	Avermectins	8
Uruguay	Beef, fresh	Sulfonamides	8
Uruguay	Beef, fresh	Chloramphenicol	8
Uruguay	Beef, processed	Sulfonamides	8
Uruguay	Lamb/Mutton, fresh	Antibiotics	8
Uruguay	Lamb/Mutton, fresh	Avermectins	8
Uruguay	Lamb/Mutton, fresh	Sulfonamides	8
Uruguay	Beef, fresh	CHC's/COP's/Phenylbutazone	8
Uruguay	Lamb/Mutton, fresh	CHC's/COP's/Phenylbutazone	8
Total			**4749**

Table 9.4
Number of Compounds/Production Class
2003 FSIS NRP, Import Residue Plan

Compound →	Anti-biotics	Arsen-icals	Aver-mectins	Chloram-phenicol	Racto-pamine	Sulfo-namides	CHC's/ COP's/ Phenyl-butazone	Total
Beef, fresh	300		231	91		300	459	**1381**
Beef, processed						95	111	**206**
Beef/Pork, processed		24				24	24	**72**
Chicken, fresh	8	8				8	8	**32**
Chicken, processed		24				24	24	**72**
Goat, fresh	24	24	24			24	24	**120**
Horse, fresh	8		8			8	8	**32**
Lamb/Mutton, fresh	90		90			90	90	**360**
Lamb/Mutton, processed						8	8	**16**
Other Fowl, fresh	24	24				24	24	**96**
Other Fowl, processed						8	8	**16**
Pork, fresh	300	300	300		93	300	300	**1593**
Pork, processed		72				83	83	**238**
Turkey, fresh	8	8				8	8	**32**
Turkey, processed		16				16	16	**48**
Varied combination, processed						32	32	**64**
Veal, fresh	90	90	53	24		90	90	**347**
Veal, processed						8	8	**16**
Total	**852**	**598**	**706**	**115**	**93**	**1068**	**1309**	**4741**

Table 9.5
Number of Samples/Country/Product Class
2003 FSIS NRP, Import Montoring 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, fresh	Turkey, processed	Varied combination, processed	Veal, fresh	Veal, processed	Total
Argentina	40																	**40**
Australia	466					40	188				48				16	88		**846**
Austria																		**48**
Brazil		142																**142**
Canada	470			32		32	32		32		1185		32		16	141		**2004**
Costa Rica	40																	**40**
Croatia		8										16						**24**
Denmark											168							**48**
Finland											48							**176**
France		16	24		24		16		32			24			16		16	**168**
Germany												24						**24**
Honduras	40																	**40**
Hungary												24						**24**
Iceland								32										**32**
Ireland											48							**48**
Israel					24					24				24				**72**
Italy		16										24						**40**
Mexico	40	8			24						48			24				**144**
Netherlands		24										24						**48**
New Zealand	205					40	76		32						16	118		**487**
Northern																		**40**
Nicaragua	40																	**24**
Poland												30						**30**
Spain												24						**24**
Sweden											48							**48**
Switzerland		8																**8**
Uruguay	40	8					32											**80**
Total	**1381**	**230**	**24**	**32**	**72**	**112**	**344**	**32**	**96**	**24**	**1593**	**190**	**32**	**48**	**64**	**347**	**16**	**4749**

Table 9.6
Combined Summary
2003 FSIS NRP, Domestic Monitoring Plan and Exploratory Projects and Import Monitoring Plan

LAB	ANALYSIS	**# SAMPLES SCHEDULED**	# Domestic Samples	# Imported Samples	NOTES
MWL	Antibiotics	**7297**	6445	852	Domestic: all production classes except egg products Imported: all fresh product classes
EL	Arsenicals	**4578**	3980	598	Domestic: beef cows, goats, all porcine production classes, and all avian production classes (including egg products) except ratites and squab Imported: fresh poultry, pork, and goats, and processed pork, beef/pork, chicken, and turkey
EL	Avermectins	**4586**	3880	706	Domestic: ratites and all non-avian production classes Imported: all non-avian fresh product classes
WL	CHC's/COP's/ phenylbutazone	**7584**	6275	1309	Domestic: all production classes Imported: all product classes
EL	Chloramphenicol	**1015**	900	115	Domestic: 300 each, dairy cows, formula-fed veal, and non-formula veal Imported: 91 fresh beef and 24 fresh veal
WL, FDA-NCTR	Clenbuterol and other unapproved beta agonists	**830**	830	0	Domestic: 300 each market hogs and steers 230 formula-fed veal
MWL	DES/zeranol	**360**	360	0	Domestic: 360 formula-fed veal
ARS-RRVARC	Dioxins	**500**	500	0	Domestic: 136 steers/heifers, 136 market hogs, 144 young chickens, 84 and young turkeys
MWL	Flunixin	**460**	460	0	Domestic: 300 dairy cows and 160 horses
MWL	MGA	**300**	300	0	Domestic: 300 heifers
MWL	Ractopamine	**623**	530	93	Domestic: 300 market hogs and 230 steers Imported: 93 fresh pork
EL, MWL	Sulfonamides	**6723**	5655	1068	Domestic: all production classes except sheep and rabbits Imported: all product classes
	TOTAL, ALL LABORATORIES	**34856**	**30115**	**4741**	

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
FDA-NCTR= Food and Drug Administration, National Center for Toxicology Research, Jefferson, AR

SECTION 10. ADJUSTMENTS TO THE 2002 FSIS NATIONAL RESIDUE PROGRAM

The following changes were made to the originally scheduled 2002 FSIS National Residue Program (NRP):

1. The tentatively scheduled sampling for clenbuterol, carbodox, fluoroquinolones and MGA were not implemented because of methodological problems.

2. Sampling for the Dioxin Special Project did not start until May 2002. Sampling will not be completed until April 2003.

3. Sampling for flunixin started in June 2002 and not in January 2002 as previously scheduled. Samples are currently being analyzed.

4. Starting August 1, 2002, .150 formula-fed veal were scheduled for DES/Zeranol analysis in the 2002 Domestic Monitoring Plan

APPENDIX I. TISSUES REQUIRED FOR ANALYSIS, 2003 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
Tissues Required for Analysis
2003 FSIS National Residue Program

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

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

APPENDIX II. U.S. RESIDUE LIMITS FOR VETERINARY DRUGS AND UNAVOIDABLE CONTAMINANTS 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 applies 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
2003 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
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
2003 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	0.5 2	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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Ceftiofur[10]	Cattle		1		2	8		21 CFR 556.113
	Goats		1		2	8		
	Hogs[9]							
	Horses							
	Poultry[9]							
	Sheep[9]							
	Eggs							
Cephapirin	Cattle						0.1	21 CFR 556.115
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
	Eggs							
Chlorhexidine	Cattle						0	21 CFR 556.120
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
	Eggs							
Chlortetra-cycline[11]	Cattle	12	2		6	12		21 CFR 556.150
	Goats							
	Hogs	12	2		6	12		
	Horses							
	Poultry	12	2		6	12		
	Sheep	12	2		6	12		
	Eggs						0.4	
Clopidol	Cattle		0.2		1.5	3		21 CFR 556.160
	Goats		0.2		1.5	3		
	Hogs						0.2	
	Horses							
	Poultry		5		15	15		
	Sheep		0.2		1.5	3		
	Eggs							
Clorsulon	Cattle		0.1		1			21 CFR 556.163
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
	Eggs							

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
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 Poultry5 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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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		0.1 0.16			21 CFR 556.225
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	480 600	120 120		240 600	360 600		21 CFR 556.240

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
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		3.7			21 CFR 556.283

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Flunixin meglumine	Cattle 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
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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
Narasin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.48						21 CFR 556.428
Neomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	7.2 7.2 7.2 7.2 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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
Ormetoprim	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.490

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Oxfendazole	Cattle[20] Goats Hogs Horses Poultry Sheep Eggs				0.8			21 CFR 556.495
Oxytetracycline	Cattle Goats Hogs Horses Poultry[6] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.500
PCB's[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 0	21 CFR 556.510
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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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		0.05		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
Spectinomycin	Cattle Goats Hogs Horses Poultry[12] Sheep Eggs		0.25			4	0.1	21 CFR 556.600
Streptomycin	Cattle 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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
Sulfamethazine	Cattle Goats Hogs Horses Poultry[5] Sheep Eggs						0.1 0.1 0.1	21 CFR 556.670

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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[23] Goats Hogs Horses Poultry Sheep Eggs	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710
Tetracycline[11]	Cattle[24] Goats Hogs Horses Poultry[6] Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.720

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat[1] by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Thiabendazole	Cattle Goats Hogs Horses Poultry[25] Sheep Eggs						0.1 0.1 0.1 0.1	21 CFR 556.730
Tiamulin	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.6[26]			21 CFR 556.738
Tilmicosin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		1.2 7.5			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 Sheep Eggs	0.2 0.2 0.2[6]	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
2003 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[27]	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

Table A II - *Continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2003 FSIS National Residue Program

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[20] Marker residue is fenbendazole

[21] Action levels

[22] Chicken, pheasants, and quail

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

[24] Calves

[25] Pheasants only

[26] Marker residue: 8-alphahydroxymutilin

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

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

INTRODUCTION

This Appendix provides information on the residue limits (tolerances and action levels) for pesticides in meat, poultry, and egg products, as of September 2002. 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
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Abamectin	Cattle	0.015	0.02	0.02			40 CFR 180.449
	Goats						
	Hogs						
	Horses						
	Poultry						
	Sheep						
	Eggs						
Acephate	Cattle	0.1	0.1	0.1			40 CFR 180.108
	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						
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						
Alachlor	Cattle	0.02	0.02	0.02			40 CFR 180.249
	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						
Aldicarb	Cattle	0.01	0.01	0.01			40 CFR 180.269
	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						
Aldrin	Cattle	0.3[1]					51 FR 46662
	Goats	0.3[1]					
	Hogs	0.3[1]					
	Horses	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
	Eggs						
Amitraz	Cattle	0.1	0.05	0.3			40 CFR 180.287
	Goats	0.01	0	0			
	Hogs	0.1	0.05	0.3	0.2	0.2	
	Horses	0	0	0			
	Poultry	0.01	0.01	0.05			
	Sheep	0	0	0			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 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						
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						
Benzene hexachloride	Cattle	0.3[1]					50 FR 25697
	Goats	0.3[1]					
	Hogs	0.3[1]					
	Horses	0.3[1]					
	Poultry	0.3[1]					
	Sheep	0.3[1]					
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Bifenthrin	Cattle	1.0	0.5	0.1			40 CFR 180.442
	Goats	1.0	0.5	0.1			
	Hogs	1.0	0.5	0.1			
	Horses	1.0	0.5	0.1			
	Poultry	0.05	0.05	0.05			
	Sheep	1.0	0.5	0.1			
	Eggs	0.05 Whl					
Bromoxynil	Cattle	0.1	0.1	0.1			40 CFR 180.324
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.05	0.05	0.05			
	Sheep	0.1	0.1	0.1			
	Eggs	0.05 Whl					
Buprofezin	Cattle	0.05		0.05	0.05		40 CFR 180.511
	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						
Cacodylic acid	Cattle	0.7	0.7	0.7	1.4	1.4	40 CFR 180.311
	Goats						
	Hogs						
	Horses						
	Poultry						
	Sheep						
	Eggs						
Captan	Cattle	0.05	0.05	0.05			40 CFR 180.103
	Goats						
	Hogs	0.05	0.05	0.05			
	Horses						
	Poultry						
	Sheep						
	Eggs						
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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						
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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			36.0	3.0		40 CFR 180.431
	Goats			36.0	3.0		
	Hogs						
	Horses			36.0	3.0		
	Poultry						
	Sheep			36.0	3.0		
	Eggs						
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				

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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			40 CFR 180.414
	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	0.25 Whl					
DDT & metabolites	Cattle	5.0[1]					51 FR 46658
	Goats	5.0[1]					
	Hogs	5.0[1]					
	Horses	5.0[1]					
	Poultry	5.0[1]					
	Sheep	5.0[1]					
	Eggs						
Diazinon	Cattle	0.7	0.7	0.7			40 CFR 180.153
	Goats						
	Hogs						
	Horses						
	Poultry						
	Sheep	0.7	0.7	0.7			
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

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

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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]					
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]					
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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	0.02	0.02	0.02			40 CFR 180.505
	Goats	0.02	0.02	0.02			
	Hogs	0.02	0.02	0.02			
	Horses						
	Poultry						
	Sheep	0.02	0.02	0.02			
	Eggs						
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]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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						
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]					
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]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Fenbuconazole	Cattle		0.01	0.01			40 CFR 180.480
	Goats		0.01	0.01			
	Hogs		0.01	0.01			
	Horses		0.01	0.01			
	Poultry						
	Sheep		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]					
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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					
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					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Glufosinate – ammonium	Cattle	0.05	0.05	0.1			40 CFR 180.473
	Goats	0.05	0.05	0.1			
	Hogs	0.05	0.05	0.1			
	Horses	0.05	0.05	0.1			
	Poultry	0.05	0.05	0.1			
	Sheep	0.05	0.05	0.1			
	Eggs	0.05					
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						
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Imazethapyr	Cattle			0.10			40 CFR 180.447
	Goats			0.10			
	Hogs			0.10			
	Horses			0.10			
	Poultry						
	Sheep			0.10			
	Eggs						
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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						
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						
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
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Methoxyfenozide	Cattle	0.5	0.02	0.1	0.4		40 CFR 180.544
	Goats	0.5	0.02	0.1	0.4		
	Hogs	0.1	0.02	0.02	0.1		
	Horses	0.5	0.02	0.1	0.4		
	Poultry	0.02	0.02	0.02	0.1		
	Sheep	0.5	0.02	0.1	0.4		
	Eggs	0.02					
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
2003 FSIS National Residue Program

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						
Oxadiazon	Cattle	0.01	0.01	0.01			40 CFR 180.346
	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
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
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						
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]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

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

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Propham	Cattle	0.5	0.5	0.5			40 CFR 180.319
	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	0.5 [Whl]					
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						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Quinclorac	Cattle	0.7	0.05	1.5			40 CFR 180.463
	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					
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	0.2			40 CFR 180.412
	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	2.0			
	Sheep	0.2	0.2	0.2			
	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	6.5	0.5	2.0			40 CFR 180.495
	Goats	0.6	0.04	0.2			
	Hogs	0.6	0.04	0.2			
	Horses	0.6	0.04	0.2			
	Poultry						
	Sheep	0.6	0.04	0.04			
	Eggs						
Sulfonium, trimethyl-salt with n-(phosphonomethyl)glycine	Cattle						40 CFR 180.489
	Goats						
	Hogs						
	Horses						
	Poultry			0.50			
	Sheep						
	Eggs						

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Sulfosate	Cattle	0.5	1.0	1.5		6.0	40 CFR 180.489
	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]					
Tebuconazole	Cattle			0.2			40 CFR 180.474
	Goats			0.2			
	Hogs			0.2			
	Horses			0.2			
	Poultry			0.2			
	Sheep			0.2			
	Eggs						
Tebufenozide	Cattle	0.1	0.08	0.08			40 CFR 180.482
	Goats	0.1	0.08	0.08			
	Hogs	0.1	0.08	0.08	1.0	0.02	
	Horses	0.1	0.08	0.08			
	Poultry	0.1	0.01	0.05			
	Sheep	0.1	0.08	0.08	1.0	0.02	
	Eggs	0.01 [Whl]					
Tebuthiuron	Cattle	2	2	2			40 CFR 180.390
	Goats	2	2	2			
	Hogs						
	Horses	2	2	2			
	Poultry						
	Sheep	2	2	2			
	Eggs						
Tepraloxydim	Cattle	0.15	0.20	0.20[4]		0.50	
	Goats	0.15	0.20	0.20[4]		0.50	
	Hogs	0.15	0.20	0.20[4]		0.50	
	Horses	0.15	0.20	0.20[4]		0.50	
	Poultry	0.30	0.20	0.20[5]	1.0		
	Sheep	0.15	0.20	0.20[4]		0.50	
	Eggs	0.20 [Whl]					
Terbacil	Cattle	0	0	0			40 CFR 180.209
	Goats	0	0	0			
	Hogs	0	0	0			
	Horses	0	0	0			
	Poultry						
	Sheep	0	0	0			
	Eggs						
Tetrachlorvinphos [Stirofos, Gardona]	Cattle	1.5					40 CFR 180.252
	Goats	0.5					
	Hogs	1.5					
	Horses	0.5					
	Poultry	0.75					
	Sheep	0.5					
	Eggs	0.1 [Whl]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 FSIS National Residue Program

Compound	Species	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Reference
Tetraconazole	Cattle	0.6	0.03	0.03	6.0	0.2	40 CFR 180.557
	Goats						
	Hogs						
	Horses						
	Poultry						
	Sheep						
	Eggs						
Tetradifon	Cattle		0				40 CFR 180.174
	Goats		0				
	Hogs		0				
	Horses		0				
	Poultry		0				
	Sheep		0				
	Eggs						
Thiabendazole	Cattle	0.1	0.1	0.1			40 CFR 180.242
	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	0.1 [Whl]					
Thiobencarb	Cattle	0.2	0.2	0.2			40 CFR 180.401
	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]					
Thiophanate-methyl	Cattle	0.1	0.1	0.1[3]	2.5	0.2	40 CFR 180.371
	Goats	0.1	0.1	0.1[3]	2.5	0.2	
	Hogs	0.1	0.1	0.1[3]	1.0		
	Horses	0.1	0.1	0.1[3]	1.0		
	Poultry	0.1	0.1	0.1[3]	0.2		
	Sheep	0.1	0.1	0.1[3]	2.5	0.2	
	Eggs	0.1 [Whl]					
Triadimefon	Cattle	1.0	1.0	1.0			40 CFR 180.410
	Goats	1.0	1.0	1.0			
	Hogs	0.04	0.04	0.04			
	Horses	1.0	1.0	1.0			
	Poultry	0.04	0.04	0.04			
	Sheep	1.0	1.0	1.0			
	Eggs	0.04 [Whl]					
Triadimenol	Cattle	0.1	0.1	0.1			40 CFR 180.450
	Goats	0.1	0.1	0.1			
	Hogs	0.1	0.1	0.1			
	Horses	0.1	0.1	0.1			
	Poultry	0.01	0.01	0.01			
	Sheep	0.1	0.1	0.1			
	Eggs	0.01 [Whl]					

Table A III - *Continued*
U.S. Residue Limits For Pesticides In Meat, Poultry, and Egg Products
2003 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
2003 FSIS National Residue Program

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

1. Action level
2. All tissues of poultry excluding kidney
3. Excluding liver and kidney
4. Excluding kidney
5. Excluding liver

Whl = Whole eggs

APPENDIX IV. ANALYTICAL METHODS, 2003 FSIS NATIONAL RESIDUE PROGRAM

INTRODUCTION

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

KEY TO ABBREVIATIONS

APCI -- Atmospheric Pressure Chemical Ionization

Confirm -- Confirmatory Method

Determ. -- Determinative Method

ECD -- Electron Capture Detector

ELISA -- Enzyme-Linked 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
2003 National Residue Program

Compound Class	Compound	Method Type	Methodology	Method Detection Limit	Minimum Reportable Level
Antibiotics	Carbadox	Determ.	GC-ECD	7.5 ppb	15 ppb
		Confirm.	GC-MS-SIM	NA	30 ppb
	Chloramphenicol	Determ.	GC	0.50 ppb	0.50 ppb
		Confirm.	GC-MS	0.5 ppb	0.5 ppb
	Florfenicol	Confirm.	GC-MS	1.9 ppm	1.9 ppm
	Fluoroquinolones: Enrofloxacin Ciprofloxacin Desethtylene ciprofloxacin Sarafloxacin Danofloxacin Difloxacin Marbofloxacin Orbifloxacin	Determ.	HPLC	 25 ppb 50 ppb 12.5 ppb 50 ppb 5 ppb 50 ppb 50 ppb 25 ppb	 25 ppb 50 ppb 12.5 ppb 50 ppb 5 ppb 50 ppb 50 ppb 25 ppb
	Tilmicosin	Determ.	HPLC- Ion Pairing	Muscle 300 ppb Liver and Kidney 600ppb	
		Confirm.	APCI-LC-MS	0.05 ppm	
	Antibiotics in FSIS Bioassay Method: Penicillin Chlortetracycline Tetracycline or Oxytetracycline Streptomycin Neomycin Erythromycin Gentamicin Ampicillin Nnovobiocin Spectinomycin Tylosin	Determ. .	7-plate microbiological inhibition assay	 0.01 ppm 0.01 ppm 0.08 ppm 0.1 ppm 0.25 ppm 0.05 ppm 0.15 ppm 0.01 ppm 0.25 ppm 10 ppm 0.2 ppm	 0.01 ppm 0.01 ppm 0.08 ppm 0.1 ppm 0.25 ppm 0.05 ppm 0.15 ppm 0.01 ppm 0.25 ppm 10 ppm 0.2 ppm
Arsenicals	Arsenicals	Determ.	Atomic Absorption Spectrophotometry		0.2 ppm
Avermectins	Ivermectin Doramectin Moxidectin	Determ.	HPLC	2.0 ppb	7.5 ppb
		Confirm.	APCI/LC/MS	25 ppb	

Table AIV - *continued*
Analytical Methods
2003 National Residue Program

Compound Class	Compound	Method Type	Methodology	Method Detection Limits	Minimum Reportable Level
Beta -Agonists	Ractopamine	Determ.	HPLC		Muscle 25 ppb Liver 75 ppb
		Confirm.	LC/MS	25ppb	
	Clenbuterol	Screen	ELISA	TBD	
		Confirm.	LC-MS-MS		
Chlorinated Hydrocarbons/ Chlorinated Organophosphates/ Polychlorinated biphenyls	Organohalides:	Determ.	GPC with GC-EC		
	HCB			0.10ppm	0.10ppm
	Alpha BHC			0.10ppm	0.10ppm
	Lindane			0.10ppm	0.10ppm
	Heptacholr			0.10ppm	0.10ppm
	Aldrin			0.10ppm	0.10ppm
	Ronnel			0.06ppm	0.06ppm
	Linuron			0.50ppm	0.50ppm
	Oxychlordane			0.06ppm	0.06ppm
	Chlorpyrifos			0.10ppm	0.10ppm
	Nonchlor			0.15ppm	0.15ppm
	Heptachlor epoxide			0.10ppm	0.10ppm
	Endosulfan I			0.01ppm	0.01ppm
	Ttrans-chlordane			0.30ppm	0.30ppm
	Cis-chlordane			0.30ppm	0.30ppm
	Chlorfenvinphos			0.06ppm	0.06ppm
	Dieldrin			0.10ppm	0.10ppm
	P,p'-DDE			0.10ppm	0.10ppm
	Captan			0.04ppm	0.04ppm
	Stirofos			0.06ppm	0.06ppm
	Kepone			0.06ppm	0.06ppm
	Endrin			0.10ppm	0.10ppm
	P,p'-TDE			0.15ppm	0.15ppm
	O,p'-DDT			0.15ppm	0.15ppm
	Endosulfan II			0.06ppm	0.06ppm
	P,p'-DDT			0.15ppm	0.15ppm
	Carbophenothion			0.06ppm	0.06ppm
	Mirex			0.10ppm	0.10ppm
	Methoxychlor			0.50ppm	0.50ppm
	Phosalone			0.02ppm	0.02ppm
	Coumaphos-O			0.2oppm	0.2oppm
	Coumaphos-S			0.20ppm	0.20ppm
	Toxaphene			1.00ppm	1.00ppm
	PCB 1242			0.50ppm	0.50ppm
	PCB 1248			0.50ppm	0.50ppm
	PCB 1254			0.50ppm	0.50ppm
	PCB 1260			0.50ppm	0.50ppm
		Confirm.	GC-MS	NA	NA

Table AIV - *continued*
Analytical Methods
2003 National Residue Program

Compound Class	Compound	Method Type	Methodology	Method Detection Limits	Minimum Reportable Level
Hormones, synthetic	DES Zeranol	Determ. & Confirm.	GC-MS	0.5 ppb 1.0 ppb	0.5 ppb 1.0 ppb
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	Phenylbutazone	Determ.	GPC with GC-ECD	TBD	TBD
		Confirm.	GC-MS	TBD	
Steroids	Melengesterol Acetate (MGA)	Determ.	GC	5 ppb	10 ppb
		Confirm.		NA	
Sulfonamides	Sulfapyridine Sulfadiazine Sulfathiazole Sulfamerazine Sulfamethazine Sulfachloropyridazine Sulfamethoxypryridazine Sulfaquinoxaline Sulfadimethoxine Sulfaethoxypyridazine Sulfaphenazole Sulfatroxazole Sulfisoxazole Sulfadoxine	Determ.	TLC	0.05 ppm	0.05 ppm
		Confirm.	GC-MS	NA	NA

Confirm.= Confirmatory Method
Determ. = Determinative Method
NA = Not Applicable
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
2003 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