

**FOOD SAFETY AND
INSPECTION SERVICE**

**2006 FSIS
NATIONAL RESIDUE
PROGRAM DATA**

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

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PREFACE

The “2006 Food Safety and Inspection Service (FSIS) National Residue Program Data” publication (the “Red Book”) explains FSIS’ chemical residue sampling plans and presents National Residue Program (NRP) testing results by calendar year. [For those reading this electronically, this document has been commonly known as the “Red Book” because the covers of the printed versions are red.] In addition, the following appendices are included for the convenience of the reader: Appendix I, *Analytical Methods*; Appendix II, *Statistical Table*; and Appendix III, *Summary of Scheduled Sampling Data from 2003 to 2005*.

CONTACTS AND COMMENTS

The Residue Branch (RB), Zoonotic Diseases and Residue Surveillance Division (ZDRSD), Office of Public Health Science, FSIS, USDA, coordinated this effort and is responsible for the publication of this material. Questions about FSIS NRP should be directed to the USDA, FSIS, ZDRSD; 343 Aerospace Center; 1400 Independence Avenue, SW; Washington, DC 20250-3700, telephone (202) 690-2683, or fax (202) 690-6565.

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USDA/FSIS/OPHS/ZDRSD

INTRODUCTION

The Food Safety and Inspection Service (FSIS), the U.S. Department of Agriculture's public health regulatory agency, works with the Environmental Protection Agency (EPA) and the Department of Health and Human Services' Food and Drug Administration (FDA), to control veterinary drug, pesticide, and environmental contaminant residues in meat, poultry, and egg products. Residue control is a cooperative effort. EPA* and FDA** have statutory authority for establishing residue tolerances or action levels, and FSIS, through the National Residue Program (NRP) tests animal tissues and egg products to verify that tolerances or action levels are not violated.

FDA, under the Federal Food, Drug, and Cosmetic Act, establishes tolerances or action levels for veterinary drugs, food additives, and unavoidable environmental contaminants. EPA, through the Federal Insecticide, Fungicide and Rodenticide Act (as modified by the Food Quality Protection Act), sets tolerance levels for registered pesticides. For cancelled pesticides, action levels (similar to tolerances, but less formal) are established by FDA based on recommendations that EPA published in the Federal Register. FDA and EPA also have the authority to ensure compliance with established tolerances or action levels.

FSIS collects samples of meat, poultry, and egg products at inspected establishments and analyzes the samples at FSIS laboratories for chemical residue of veterinary drugs, pesticides, and environmental contaminants. Laboratory findings that exceed established tolerances and action levels are shared with FDA and EPA. This authority is provided under the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act. FSIS regulations are published in Title 9 of the Code of Federal Regulations (9 CFR), chapter III.

Since 1967, FSIS has administered the NRP to collect data on chemical residues in domestic and imported meat, poultry, and egg products. 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.

With the implementation of the Hazard Analysis and Critical Control Points (HACCP) inspection system, another important component of the NRP is to provide verification of residue control in HACCP systems. 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 veterinary drugs and pesticides in food animals. In 1999, the NRP was modified to make residue evaluation more consistent with risk assessment principles.

* Tolerance levels established by EPA are published in Title 40 CFR.

** Tolerance levels established by FDA are published in Title 21 CFR.

The NRP includes a variety of sampling plans to identify violative levels of chemical residues and to reduce the consumers' exposure to chemical contaminants. The range of chemical compounds evaluated for inclusion in the various NRP sampling plans is comprehensive. It includes approved (legal) and unapproved (illegal) veterinary drugs, pesticides that may appear in meat, poultry, and egg products, and other xenobiotic and naturally occurring compounds that may pose a potential human health hazard.

A violation in a production class (food animal or egg product) occurs when a chemical residue is detected and the residue is in excess of an established tolerance or action level. The collection of samples is either scheduled from Headquarters (scheduled sampling) or initiated by the inspector-in-charge (inspector generated sampling). In scheduled sampling, samples are collected from healthy appearing animals and the findings provide exposure assessment data. The majority of the NRP sampling is conducted under inspector generated sampling. These samples are collected in establishments from suspect animals; their carcasses are retained and condemned if a violative level of chemical residue is found. FSIS notifies FDA of the violation and assists in obtaining the names of producers and, in the case of food animal products, other parties involved in offering the animals for sale.

FDA and cooperating state agencies will follow-up on known violators with educational visits. If a problem is not corrected, subsequent FDA visits could result in enforcement action, including prosecution. FSIS posts a Repeat Violator List on its agency's web site, listing the names and addresses of parties FDA has determined are responsible for more than one veterinary drug, pesticide, or other chemical residue violation in a 12-month period. The list provides helpful information to processors and producers working to avoid illegal levels of residues, serves as a deterrent for violators, and enables FSIS to make better use of resources.

Data gathered in the NRP is used to verify the safety of meat, poultry, and egg products in the United States. The program helps FSIS, FDA, and EPA enforce Federal laws and regulations, and assists in the design of programs to enhance the nation's residue control programs.

SAMPLING PLANS OF THE NATIONAL RESIDUE PROGRAM

The National Residue Program (NRP) consists of two primary sampling plans: domestic and import. These plans are further divided to facilitate the management of chemical residues such as veterinary drugs, pesticides, and environmental contaminants in food animals and egg products. The domestic sampling plan includes scheduled sampling and inspector generated sampling. The import reinspection sampling plan is separated into normal sampling, increased sampling, and intensified sampling.

DOMESTIC SAMPLING PLAN

Scheduled Sampling

Scheduled sampling plans consist of the random sampling of tissue from healthy appearing food animals. Scheduled sampling plans are generated from FSIS Headquarters using the FSIS Form 10,210-3. The development of scheduled sampling plans is a process that proceeds in the following manner: 1) determine which compounds are of food safety concern; 2) use algorithms to rank the selected compounds; 3) pair these compounds with appropriate production classes; and 4) establish sample sizes. The Surveillance Advisory Team (SAT) at their annual meeting determines the compound/production class pairs. The FSIS Residue Branch staff determines the sample sizes by employing statistical analysis techniques to calculate sample numbers. In the 2006 NRP, FSIS started using sample sizes of either 230 or 300 animals for each compound/production class pair. Statistically, applying sampling rates of 230 and 300 per production class population assures a 90 percent and 95 percent probability, respectively, to detect residue violations if the violation rate in the population is equal to or greater than one percent. Residue Branch has adopted a sample size of 300 as a public health standard. This sample size and resulting violation data are used to verify two different types of process control. The first is to verify that industry's process controls meet this public health standard for the compound/production class pairs being tested. The second is to verify that the establishments' HACCP plans are in control. Finally, reviews and final adjustments to these sampling plans are made by FSIS Senior Management, FSIS laboratories staff, FDA, and EPA. The following types of assessments are currently being scheduled:

Exposure Assessments

Exposure Assessments are used:

- By FSIS, FDA, and EPA to determine the prevalence of residues in the Nation's meat, poultry, and egg products;
- By FSIS to condemn carcasses with violative levels of residue;
- By FDA to regulate producers when a sample contains violative levels of residues;
- By industry to retain product until the sample has been tested; and
- By industry to recall product that was not retained while the sample was tested, and found to contain violative levels of residue.

Exploratory Assessments

Exploratory Assessments are designed by Residue Branch:

- To reinvestigate animal populations from ongoing or previous exposure assessments if the violation rate is confirmed at 1 percent or greater;
- To investigate animal populations when the compounds in question have no established tolerances; and
- To respond to intelligence reports from the field.

All products are FSIS retained and subject to condemnation.

Inspector Generated Sampling

Inspector generated sampling is conducted by in-plant Public Health Veterinarians (PHVs) using FSIS Form 10,000-2. This occurs when the in-plant PHV suspects that an animal may have violative level of chemical residues. Currently, inspector generated sampling targets *individual suspect animals* and *suspect populations of animals*. When an inspector generated sample is collected, the carcass is held pending the results of laboratory testing and if a carcass is found to contain violative levels of residues the carcass is condemned.

Sampling for individual suspect animals

The in-plant inspector selects a carcass for sampling based on professional judgment and public health criteria developed by FSIS. These criteria include but are not limited to the following: animal disease signs and symptoms; producer history; or results from random scheduled sampling. Some samples are screened in the plant by the Inspector In Charge (IIC) and verified when necessary by a PHV. Other samples are sent directly to the laboratory for analysis. For example, if the IIC suspects the misuse of either an antibiotic or sulfonamide drug in an animal, then he or she can perform one of the following in-plant screening tests: Fast Antimicrobial Screening Test (FAST) or Swab Test On Premises (STOP). If the result of a screening test is positive, then the sample is sent to an FSIS laboratory

for confirmation. If the IIC does not have FAST or STOP capability, the sample can be sent directly to the FSIS laboratory for testing.

Sampling for suspect animal populations

Sampling for suspect animal populations is generally directed by an FSIS regulation, directive (e.g., FSIS Directive 10,800.1), or notice (e.g., show animals and bob veal).

IMPORT REINSPECTION SAMPLING PLAN

Imported meat, poultry, and egg products are sampled at U.S. ports of entry to detect chemical residues. Port-of-Entry Reinspection is a monitoring program conducted to verify the equivalence of inspection systems in exporting countries. The chemical residue sampling program is one of several Types Of Inspection (TOI) conducted during FSIS reinspection of imported products. All imported products are subject to reinspection and one or more TOIs are conducted on every lot of product before it enters the United States. The following are the three levels of chemical residue reinspection:

- Normal sampling, which is defined as random sampling from a lot;
- Increased sampling, which is defined as above the normal sampling as the result of an Agency management decision; and
- Intensified sampling, which is defined as occurring when a previous sample for a TOI failed to meet U.S. requirements.

For both normal and increased sampling, the lot is not required to be retained pending laboratory results; however, the importer may choose to retain the lot pending the laboratory results. The lot is subject to recall if it is not retained and is found to contain violative levels of residue. For intensified sampling, the lot must be retained pending laboratory results. The data obtained from laboratory analysis are entered into the Automated Import Information System (AIIS), an FSIS database that is designed to generate reinspection assignments, receive and store results, and compile histories for the performance of foreign establishments certified by the inspection system in the exporting country.

ESTIMATED LIVESTOCK, POULTRY, AND EGG PRODUCT CONSUMPTION DATA

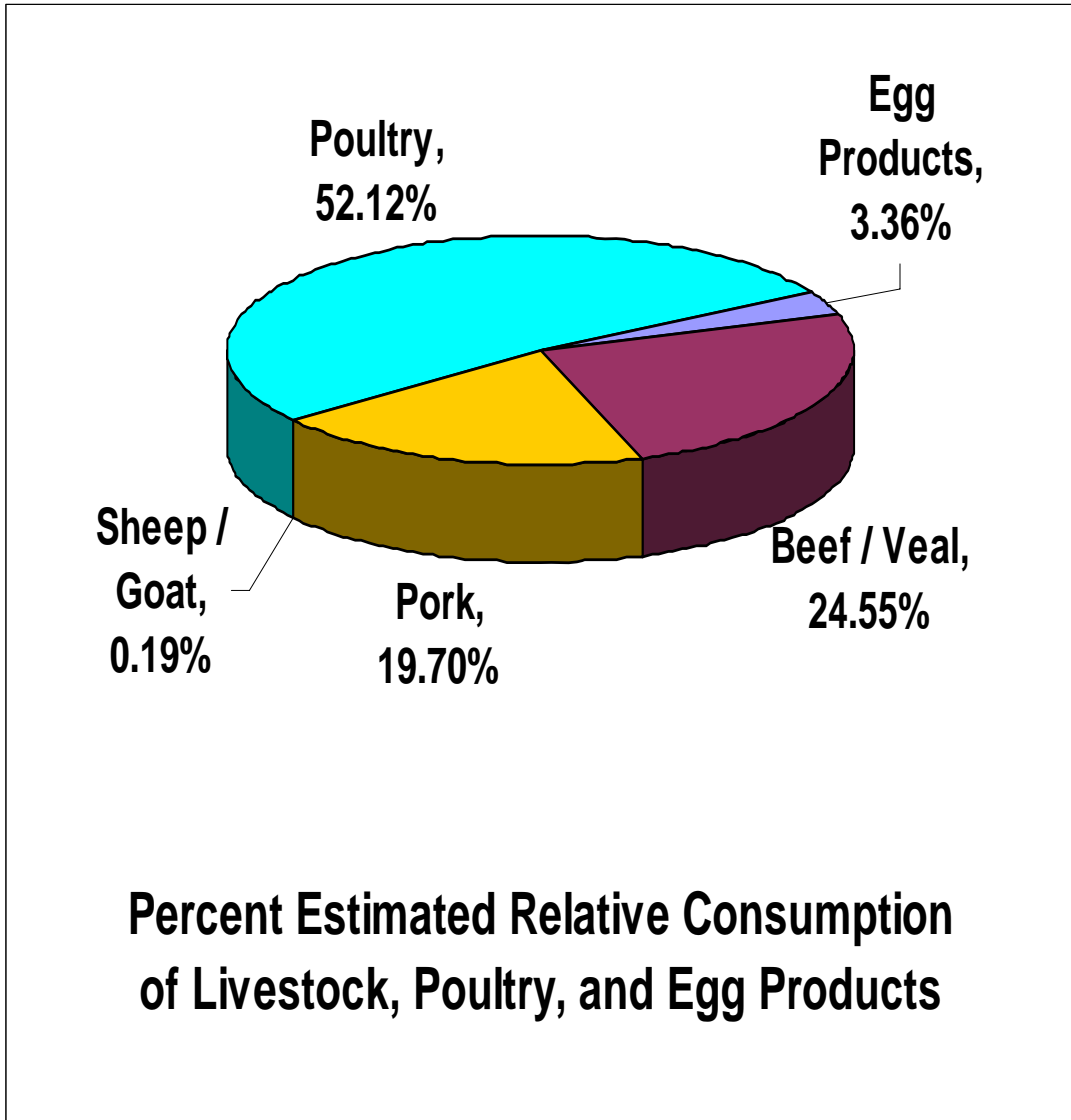
Table 1 and Chart 1 present, *2006 Consumption Data*, including the number of head slaughtered or pounds of eggs processed, pounds per animal (dressed weight), total pounds (dressed weight), and the percent estimated relative consumption of domestic and exported product for each production class.

Table 1
2006 Consumption Data

| Production Class | Number of Head Slaughtered ^A | Pounds per Animal (dressed weight) ^B | Total Pounds (dressed weight) | Percent Estimated Relative Consumption |
|--|---|---|-------------------------------|--|
| Bulls | 528,266 | 914 | 482,835,124 | 0.455 |
| Beef cows | 2,989,010 | 622 | 1,859,164,220 | 1.753 |
| Dairy cows | 2,366,281 | 622 | 1,471,826,782 | 1.388 |
| Heifers | 9,813,470 | 767 | 7,526,931,490 | 7.099 |
| Steers | 17,462,162 | 833 | 14,545,980,946 | 13.719 |
| Bob veal | 206,266 | 75 | 15,469,950 | 0.015 |
| Formula-fed veal | 465,270 | 245 | 113,991,150 | 0.108 |
| Non-formula-fed veal | 8,716 | 350 | 3,050,600 | 0.003 |
| Heavy calves | 27,943 | 400 | 11,177,200 | 0.011 |
| SUBTOTAL, CATTLE | 33,867,384 | | 26,030,427,462 | 24.550 |
| Market hogs | 99,346,502 | 198 | 19,670,607,396 | 18.552 |
| Roaster pigs | 789,959 | 70 | 55,297,130 | 0.052 |
| Boars/Stags | 399,629 | 227 | 90,715,783 | 0.086 |
| Sows | 3,460,066 | 309 | 1,069,160,394 | 1.008 |
| SUBTOTAL, SWINE | 103,996,156 | | 20,885,780,703 | 19.698 |
| Sheep | 115,243 | 67 | 7,721,281 | 0.007 |
| Lambs | 2,419,751 | 70 | 169,382,570 | 0.160 |
| Goats | 569,319 | 50 | 28,465,950 | 0.027 |
| SUBTOTAL, OVINE | 3,104,313 | | 205,569,801 | 0.194 |
| Horses | 104,433 | 500 | 52,216,500 | 0.049 |
| Bison | 42,506 | 610 | 25,928,660 | 0.024 |
| TOTAL, ALL LIVESTOCK | 141,114,792 | | 47,199,923,126 | 44.516 |
| Young chickens | 8,901,364,574 | Not reported | 47,177,232,242 | 44.495 |
| Mature chickens | 131,490,164 | Not reported | 736,344,918 | 0.694 |
| Young turkeys | 252,383,910 | Not reported | 7,066,749,480 | 6.665 |
| Mature turkeys | 3,412,675 | Not reported | 85,316,875 | 0.080 |
| Ducks | 28,026,675 | Not reported | 190,581,390 | 0.180 |
| Geese | 153,837 | Not reported | 1,999,881 | 0.002 |
| Other fowl (includes squab) | 1,338,642 | Not reported | 2,543,420 | 0.002 |
| SUBTOTAL, POULTRY | 9,318,170,477 | | 55,260,768,206 | 52.119 |
| Rabbits | 310,093 | Not reported | 1,581,474 | 0.001 |
| Egg products | Not applicable | Not applicable | 3,566,786,000 | 3.364 |
| GRAND TOTAL in POUNDS, ALL PRODUCTION CLASSES | | | 106,029,058,806 | 100 |

(A) Number of heads is obtained from the Animal Disposition Reporting System (ADRS). (B) Average dressed weights are obtained from the publication: "Livestock Slaughter," National Agricultural Statistics Service (NASS), March 2006. In instances when the average weight is not available, an average weight based on previous calendar year's data was imputed. (C) For Fiscal Year 2006

Chart 1
2006 Consumption Data*



*FSIS employs techniques and principles from the field of risk assessment to determine the relative public health concerns represented by the results from the scheduled sampling plan-exposure assessments. The information on the residue levels detected in the scheduled sampling plan is combined with consumption data to estimate exposure.

$$\text{Exposure} = \text{Consumption Data} \times \text{Residue Levels}$$

DEFINITIONS OF FSIS PRODUCTION CLASSES

- Beef cows are mature female cattle bred for muscle development, ordinarily having given birth to one or more calves.
- Boars are mature swine showing male sexual characteristics.
- Bulls are mature, uncastrated male cattle.
- Calves/veal definitions are under FSIS review.
- Dairy cows are mature female cattle bred for milk production, ordinarily having given birth to one or more calves.
- Ducks are birds of both sexes and any age.
- Egg products are yolks, whites, or whole eggs after breaking and are processed as dried, frozen, or liquid.
- Geese are birds of both sexes and any age.
- Goats are animals of both sexes and any age.
- Heifers are young, female cattle that have not yet given birth to a calf.
- Horses¹ are animals of both sexes and any age.
- Lambs are generally defined as sheep younger than 14 months and having a break joint in at least one leg.
- Market hogs are swine usually marketed near six months of age and 200 to 300 pounds live weight.
- Mature chickens are adult female birds, usually more than 10 months of age.
- Mature turkeys are birds of both sexes and usually more than 15 months of age.
- Other livestock include bison, deer, elk, etc.
- Other poultry include ratites (typically ostriches, emus and rheas), guineas, squabs (young, unfledged pigeons), adult pigeons, pheasants, grouse, partridge, quail, etc.
- Rabbits are any of several lagomorph mammals of both sexes and any age.
- Roaster pigs are animals of both sexes and any age that are marketed with the carcass unsplitted and with the head on.
- Sheep are mature animals of both sexes.
- Sows are mature female swine ordinarily having given birth to one or more litters.
- Stags are male swine castrated after they have reached sexual maturity.
- Steers are male cattle castrated before sexual maturity.
- Young chickens include: broilers/fryers birds of both sexes that are usually less than 10 weeks of age; roasters, birds of both sexes usually less than 12 weeks of age; and capons, surgically castrated male birds usually less than 8 months of age.
- Young turkeys include fryer/roaster birds that are of both sexes and usually less than 12 weeks of age, and include turkeys that are birds of both sexes usually less than 6 months of age.

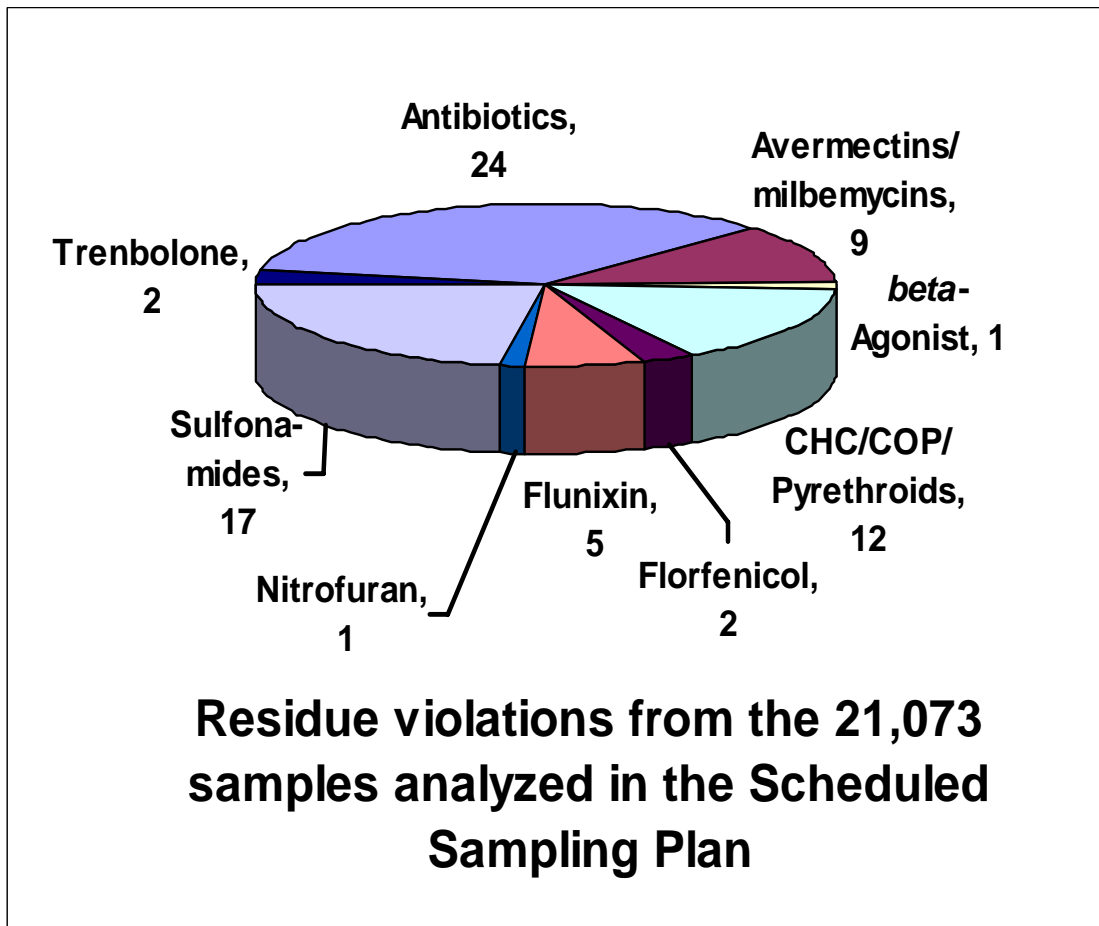
¹ Horses were under federal inspection by FSIS from January 2006 to December 2006.

SUMMARY OF DOMESTIC DATA

SCHEDULED SAMPLING – Exposure Assessments

Nineteen (19) compound classes of veterinary drugs and pesticides comprised of approximately 80 compounds were analyzed. Of the 21,073 samples analyzed, 73 chemical residue violations were found. The residue violations consisted of 24 antibiotics, nine (9) avermectins/milbemycins, one (1) *beta*-agonist, twelve (12) chlorinated hydrocarbons/chlorinated organophosphates/pyrethroids, two (2) florfenicol, five (5) flunixin, one (1) nitrofurantoin, seventeen (17) sulfonamides and two (2) trenbolone. There were no residue violations in the testing of arsenic, chloramphenicol, melengestrol acetate, nitroimidazoles, phenylbutazone, thyreostats, and zeranol.

Chart 2
Residue Violations
2006 Scheduled Sampling Plan



SCHEDULED SAMPLING – Exploratory Assessments

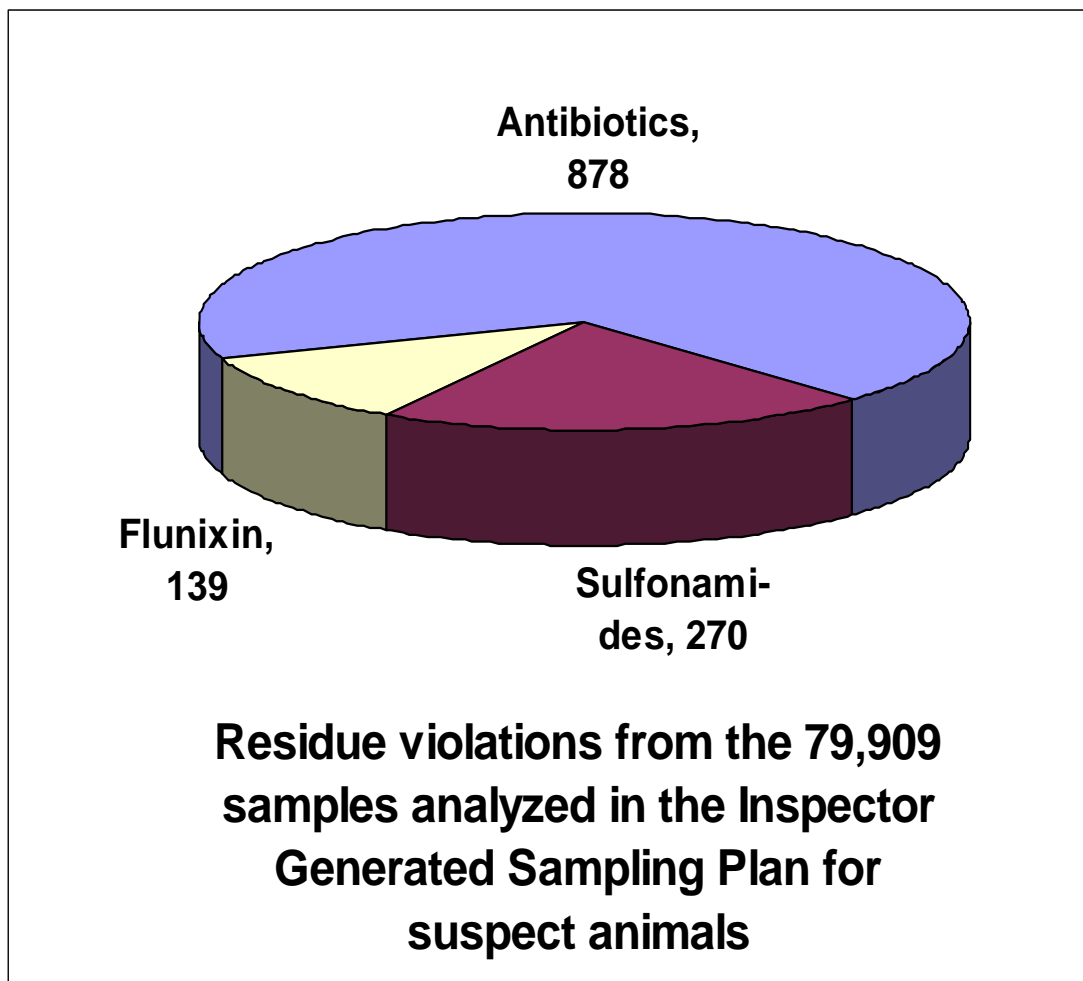
Environmental contaminants:

Lead and Cadmium – Lead and Cadmium testing was conducted on 324 mature chickens. The results of the analyses are reported on pages 59-64.

INSPECTOR GENERATED SAMPLING – Sampling for individual suspect animals

Sixteen compound classes (16) of veterinary drugs and pesticides comprised of approximately 80 compounds were analyzed. Of the 79,909 samples analyzed, 1,287 chemical violations were found. The number of residue violations for each compound or compound class is presented in Chart 3. The residue violations consisted of 878 antibiotics, 139 flunixin, and 270 sulfonamides. No violations were found in the testing for avermectins/milbemycins, *beta*-agonists, chloramphenicol, chlorinated hydrocarbons/chlorinated organophosphates, florfenicol, flunixin, melengestrol acetate, nitroimidazoles, phenylbutaone, and thyreostats.

**Chart 3
Residue Violations
2006 Inspector Generated Sampling Plan-suspect animals**



INSPECTOR GENERATED SAMPLING – Sampling for suspect animals populations

Bob veal – The FAST was used to screen 3,941 veal for antibiotics and sulfonamides. The total bob veal tested included both testing of a suspect population and testing of suspect animals. Of the animals tested, FSIS laboratory confirmed 158 violations in 148 animals. The residue violations consisted of nine (9) gentamycin, 95 neomycin, 14 oxytetracycline, 13 penicillin, three (3) tetracycline, one (1) tilmicosin, one (1) tylosin, seven (7) sulfadimethoxine, 10 sulfamethazine , four (4) sulfamethoxazole, one (1) flunixin.

Show animals – FSIS conducted analyses for *clenbuterol*, *salbutamol*, and *cimaterol* (*beta-Agonists*) on two (2) bovine, 11 steers, three (3) heifers, 10 lambs, nine (9) market hogs, and no violations were found. No violations were found in nine (9) market hogs tested for antibiotics and sulfonamides and (1) market hog tested for ractopamine.

NUMBER OF SAMPLES TESTED BY PRODUCTION AND COMPOUND CLASSES FOR SCHEDULED AND INSPECTOR GENERATED SAMPLING PLANS

NUMBER OF SAMPLES TESTED BY PRODUCTION CLASS

Table 2, *Number of Samples Tested by Production Class*, presents the number of animals tested under scheduled and inspector generated sampling plans for each production class.

Table 2
Number of Samples Tested by Production Class
2006 Domestic Sampling Plan

| Production Class | Number of samples tested under Scheduled-exposure assessment | Number of samples tested under Scheduled-exploratory assessment | Number of samples tested under Inspector Generated-suspect animals | Number of samples tested under Inspector Generated-suspect populations |
|-------------------------|---|--|---|---|
| Beef cows | 1,592 | 0 | 5,024 | 0 |
| Boars/Stags | 551 | 0 | 7 | 0 |
| Bob veal | 802 | 0 | 3,949 ¹ | 3,941 ¹ |
| Bovine ² | 0 | 0 | 447 | 2 |
| Bulls | 1,160 | 0 | 604 | 0 |
| Dairy cows | 2,330 | 0 | 57,759 | 0 |
| Formula-fed veal | 2,500 | 0 | 373 | 0 |
| Goats | 451 | 0 | 49 | 0 |
| Heavy calves | 1,080 | 0 | 665 | 0 |
| Heifers | 2,206 | 0 | 1,755 | 3 |
| Horses | 506 | 0 | 79 | 0 |
| Lambs | 544 | 0 | 333 | 10 |
| Market hogs | 859 | 0 | 4,081 | 19 |
| Mature chickens | 297 | 648 | 0 | 0 |

¹ The total analyzed includes both testing of suspect population and testing of suspect animals

² Bovine refers to cattle production classes

Table 2 - continued
Number of Samples Tested by Production Class
2006 Domestic Sampling Plan

| Production Class | Number of samples tested under Scheduled-exposure assessment | Number of samples tested under Scheduled-exploratory assessment | Number of samples tested under Inspector Generated-suspect animals | Number of samples tested under Inspector Generated-suspect populations |
|-------------------------|---|--|---|---|
| Mature sheep | 457 | 0 | 96 | 0 |
| Mature turkeys | 261 | 0 | 0 | 0 |
| Non-formula-fed veal | 1,534 | 0 | 96 | 0 |
| Ostrich | 0 | 0 | 15 | 0 |
| Roaster pigs | 552 | 0 | 109 | 0 |
| Sows | 586 | 0 | 1,219 | 0 |
| Steers | 932 | 0 | 3,235 | 11 |
| Young chickens | 944 | 0 | 2 | 0 |
| Young turkeys | 929 | 0 | 12 | 0 |
| Total | 21,073 | 648 | 79,909 | 3,986 |

NUMBER OF SAMPLES TESTED BY COMPOUND CLASS

Table 3, *Number of Samples Tested by Compound Class*, presents the number of tests performed under scheduled and inspector generated sampling plans sampling for each compound class.

Table 3
Number of Samples Tested by Compound Class
2006 Domestic Sampling Plan

| Compound Class | Number of samples tested under Scheduled-exposure assessment | Number of samples tested under Scheduled-exploratory assessment | Number of samples tested under Inspector Generated-suspect animals | Number of samples tested under Inspector Generated-suspect populations |
|--|---|--|---|---|
| Antibiotics (7-plate bioassay) | 3,556 | 0 | 0 | 0 |
| Antibiotics and Sulfonamides | 0 | 0 | 6,734 | 9 |
| Antibiotics, Sulfonamides, and Flunixin [◇] | 0 | 0 | 73,042 | 3,941 |
| Arsenic | 947 | 0 | 0 | 0 |
| Avermectins/milbemycins | 2,275 | 0 | 2 | 0 |
| Berenil | 0 | 0 | 0 | 0 |
| <i>beta</i> -Agonists (clenbuterol, cimaterol, and salbutamol) | 939 | 0 | 58 | 35 |
| <i>beta</i> -Agonists (ractopamine) | 462 | 0 | 17 | 1 |
| Cadmium | 0 | 324 | 0 | 0 |
| CHC's/COP's/Pyrethroids | 2,645 | 0 | 1 | 0 |
| Chloramphenicol | 1,037 | 0 | 1 | 0 |
| Florfenicol | 348 | 0 | 1 | 0 |
| Flunixin | 1,044 | 0 | 15 | 0 |
| Lead | 0 | 324 | 0 | 0 |

◇ In the Inspector Generated Sampling plan, samples that are found to be FAST positive in the plant are further analyzed for flunixin (a non-steroidal anti-inflammatory compound) in the laboratory.

Table 3 - continued
Number of Samples Tested by Compound Class
2006 Domestic Sampling Plan

| Compound Class | Number of samples tested under Scheduled-exposure assessment | Number of samples tested under Scheduled-exploratory assessment | Number of samples tested under Inspector Generated-suspect animals | Number of samples tested under Inspector Generated-suspect populations |
|-----------------------|---|--|---|---|
| Melengestrol acetate | 329 | 0 | 13 | 0 |
| Nitrofurans | 863 | 0 | 0 | 0 |
| Nitroimidazoles | 337 | 0 | 1 | 0 |
| Phenylbutazone | 2,172 | 0 | 13 | 0 |
| Sulfonamides | 3,008 | 0 | 10 | 0 |
| Thyreostats | 291 | 0 | 1 | 0 |
| Trenbolone | 497 | 0 | 0 | 0 |
| Zeranol | 323 | 0 | 0 | 0 |
| Total | 21,073 | 648 | 79,909 | 3,986 |

SUMMARY OF IMPORT DATA

The United States imported approximately 3,838,749,956 pounds of fresh and processed meat, poultry, and egg products. These products were imported from 27 of the 33 countries eligible for exportation to the United States. The import testing program included analysis of 50 chemical residues from 9 compound classes of veterinary drugs and pesticides. Four (4) violations were found in the 4,320 reported results.

NORMAL

Nine (9) compound classes of veterinary drugs and pesticides were tested. From these nine compound classes approximately 50 residues were analyzed. Four (4) violations for avermectins were found in the 4,254 samples analyzed.

INTENSIFIED

Five (5) compound classes of veterinary drugs and pesticides were tested. From these four compound classes approximately 40 residues were analyzed. No violations were found in the 66 samples analyzed.

DOMESTIC SAMPLING RESULTS

SCHEDULED SAMPLING – EXPOSURE ASSESSMENTS (CONDENSED AND REFORMATTED RESULTS)

Domestic scheduled sampling condensed and reformatted results are presented in two tables (a and b) for each compound class tested unless there is only one compound in the class, then the second table is not necessary. The first table states the total number of animals analyzed (or the number of composite samples in the case of poultry), the number of non-violative positives (compounds detected at a level equal to or below the established tolerance), the number of violations, and the percent violations, for each compound class. Since analyses for multiple compounds can be performed on the same sample, one sample (one animal or a composite from one poultry flock) could have more than one violation. The second table presents the specific compounds that were detected within the compound class. The data on violations reported here should not be summed across either production class or analysis with the intent of arriving at a single value to represent the percentage occurrence of violations over all the species that were tested using a given analysis. This mathematical operation will not produce a statistically valid estimate, given the sample design in use. Care must be taken when making statistical inferences from these data.

ANTIBIOTICS (7-plate bioassay)

FSIS analyzed 3,556 samples for antibiotic residues. Twenty four (24) violations were detected in 24 animals from several production classes. The residue violations consisted of eight (8) gentamicin, fourteen (14) neomycin, one (1) oxytetracycline, and one (1) penicillin. Table 4a, *Antibiotics*, presents the results of the testing by production class. Table 4b, *Specific Antibiotic Violative Residues*, presents the specific antibiotics detected.

Table 4a
Antibiotics
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Beef cows | 326 | 0 | 0 | 0 | (0,1.13) |
| Boars/stags | 267 | 13 | 0 | 0 | (0,1.37) |
| Bob veal | 278 | 23 | 11 | 3.9 | (1.99,6.97) |

Table 4a - continued
Antibiotics
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Dairy cows | 310 | 7 | 4 | 1.3 | (0.35,3.27) |
| Formula-fed veal | 323 | 33 | 0 | 0 | (0,1.14) |
| Heavy calves | 220 | 6 | 3 | 1.4 | (0.28,3.93) |
| Heifers | 323 | 2 | 0 | 0 | (0,1.14) |
| Horses | 112 | 0 | 0 | 0 | (0,3.24) |
| Non-formula-fed veal | 200 | 11 | 6 | 3.0 | (1.11,6.42) |
| Roaster pigs | 241 | 50 | 0 | 0 | (0,1.52) |
| Sows | 300 | 9 | 0 | 0 | (0,1.22) |
| Young chickens | 330 | 0 | 0 | 0 | (0,1.11) |
| Young turkeys | 326 | 19 | 0 | 0 | (0,1.13) |
| Total | 3,556 | 173 | 24 | | |

Table 4b
Specific Antibiotic Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Antibiotic Compounds | | | | Total |
|-------------------------|-----------------------------|-----------------|------------------------|-------------------|--------------|
| | Gentamicin | Neomycin | Oxytetracycline | Penicillin | |
| Bob veal | 1 | 9 | 1 | 0 | 11 |
| Dairy cows | 3 | 0 | 0 | 1 | 4 |
| Heavy calves | 1 | 2 | 0 | 0 | 3 |
| Non-formula-fed veal | 3 | 3 | 0 | 0 | 6 |
| Total | 8 | 14 | 1 | 1 | 24 |

ARSENIC

FSIS analyzed 947 samples for Arsenic. Zero (0) violations were detected. Table 5a, *Arsenic*, presents the results of the testing by production class.

Table 5a
Arsenic
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Market hogs | 301 | 1 | 0 | 0 | (0,1.22) |
| Mature chickens | 297 | 1 | 0 | 0 | (0,1.23) |
| Young chickens | 349 | 102 | 0 | 0 | (0,1.05) |
| Total | 947 | 104 | 0 | | |

AVERMECTINS (IVERMECTIN and DORAMECTIN) and MILBEMYCINS (MOXIDECTIN)

FSIS analyzed 2,275 samples for avermectin and milbemycin residues. Nine (9) violations were detected. The residue violations consisted of one (1) doramectin, three (3) ivermectin, and five (5) moxidectin. Table 6a, *Avermectins and Milbemycins*, presents the results of the testing by production class. Table 6b, *Specific Avermectin and Milbemycin Violative Residues*, presents the specific avermectins and milbemycins detected.

Table 6a
Avermectins and Milbemycins
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Bulls | 309 | 7 | 0 | 0 | (0,1.19) |
| Goats | 240 | 0 | 6 | 2.5 | (0.92,5.36) |
| Heavy calves | 234 | 5 | 0 | 0 | (0,1.56) |
| Heifers | 321 | 2 | 0 | 0 | (0,1.14) |
| Horses | 113 | 0 | 0 | 0 | (0,3.21) |
| Lambs | 323 | 5 | 1 | 0.3 | (0.01,1.71) |
| Mature sheep | 249 | 8 | 1 | 0.4 | (0.01,2.22) |
| Non-formula-fed veal | 173 | 9 | 1 | 0.6 | (0.01,3.18) |
| Steers | 313 | 0 | 0 | 0 | (0,1.17) |
| Total | 2,275 | 36 | 9 | | |

Table 6b
Specific Avermectin and Milbemycin Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Avermectin and Milbemycin Compounds | | | Total |
|----------------------|-------------------------------------|------------|------------|----------|
| | Doramectin | Ivermectin | Moxidectin | |
| Goats | 0 | 1 | 5 | 6 |
| Lambs | 1 | 0 | 0 | 1 |
| Mature sheep | 0 | 1 | 0 | 1 |
| Non-formula-fed veal | 0 | 1 | 0 | 1 |
| Total | 1 | 3 | 5 | 9 |

***beta* –AGONISTS (clenbuterol, cimaterol, and salbutamol)**

FSIS analyzed 943 samples for *beta*-agonists (clenbuterol, cimaterol, and salbutamol) residues. One (1) salbutamol violation and zero (0) non-violative positives were detected. Table 7a, *beta*-Agonists, presents the results of the testing by production class. Table 7b, *Specific beta*-Agonists Violative Residues, presents the specific *beta*-agonists detected.

Table 7a
***beta*-Agonists (clenbuterol, cimaterol, and salbutamol)**
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|----------------------|--------------------|-----------------------------------|----------------------|--------------------|-------------------------|
| Bob veal | 224 | 0 | 0 | 0 | (0,1.63) |
| Formula-fed veal | 247 | 0 | 0 | 0 | (0,1.48) |
| Heifers | 293 | 0 | 0 | 0 | (0,1.23) |
| Non-formula-fed veal | 175 | 0 | 1 | 0.6 | (0.01,3.14) |
| Total | 939 | 0 | 1 | | |

Table 7b
Specific *beta*-Agonists Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | <i>beta</i>-Agonist Compounds | Total |
|-------------------------|--------------------------------------|--------------|
| | Salbutamol | |
| Non-formula-fed veal | 1 | 1 |
| Total | 1 | 1 |

***beta* –AGONISTS (ractopamine)**

FSIS analyzed 458 samples for ractopamine residues and zero (0) violations were detected. Table 8a, *beta*-Agonists (ractopamine), presents the results of the testing by production class

Table 8a
***beta*-Agonists (ractopamine)**
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Formula-fed veal | 257 | 0 | 0 | 0 | (0,1.43) |
| Heifers | 4 | 4 | 0 | 0 | (0,95.7) |
| Non-formula-fed veal | 201 | 0 | 0 | 0 | (0,1.82) |
| Total | 462 | 0 | 0 | 0 | |

CHLORAMPHENICOL

FSIS analyzed 1,037 samples for chloramphenicol and zero (0) violations were detected. Table 9a, *Chloramphenicol*, presents the results of the testing by production class

Table 9a
Chloramphenicol
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Dairy cows | 254 | 0 | 0 | 0 | (0,1.44) |
| Formula-fed veal | 252 | 0 | 0 | 0 | (0,1.45) |
| Young chickens | 265 | 0 | 0 | 0 | (0,1.38) |
| Young turkeys | 266 | 0 | 0 | 0 | (0,1.38) |
| Total | 1,037 | 0 | 0 | | |

CHLORINATED HYDROCARBONS, CHLORINATED ORGANOPHOSPHATES, and PYRETHROIDS

FSIS analyzed 2,645 samples for chlorinated hydrocarbons and chlorinated organophosphates. Samples with chromatograms containing peaks with retention times in the pyrethroid area were further analyzed using an ad hoc method for pyrethroids. Twelve (12) violations were detected. The residue violations consisted of one (1) dieldrin, three (3) hexachlorobenzenes (HCB), three (3) polybrominated biphenyl (PBB), three (3) polybrominated diphenyl ethers (PBDE), one (1) halowax, and one (1) permethrin. Table 10a, *Chlorinated Hydrocarbons, Chlorinated Organophosphates, and Pyrethroids* presents the results of the testing by production class. Table 10b, *Specific Chlorinated Hydrocarbons, Chlorinated Organophosphates, and Pyrethroids* presents the specific chlorinated hydrocarbons, chlorinated organophosphates, and pyrethroids detected.

Table 10a
Chlorinated Hydrocarbons, Chlorinated Organophosphates, and Pyrethroids
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Beef cows | 314 | 5 | 0 | 0 | (0,1.17) |
| Boars/Stags | 284 | 9 | 6 | 2.1 | (0.78,4.54) |
| Dairy cows | 304 | 16 | 2 | 0.7 | (0.08,2.36) |
| Goats | 211 | 2 | 0 | 0 | (0,1.73) |
| Heifers | 333 | 4 | 0 | 0 | (0,1.1) |
| Horses | 281 | 1 | 1 | 0.4 | (0.01,1.97) |
| Lambs | 221 | 6 | 0 | 0 | (0,1.66) |
| Mature sheep | 208 | 16 | 1 | 0.5 | (0.01,2.65) |
| Non-formula-fed veal | 203 | 8 | 0 | 0 | (0,1.8) |
| Sows | 286 | 8 | 2 | 0.7 | (0.08,2.5) |
| Total | 2,645 | 75 | 12 | | |

Table 10b
Specific Chlorinated Hydrocarbons, Chlorinated Organophosphates, and
Pyrethroid Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Chlorinated Hydrocarbons, Chlorinated Organophosphates, Pyrethroid Compounds | | | | | | Total |
|------------------|--|----------|----------|----------|----------|------------|-----------|
| | Diel-drin | Halo-wax | HCB | PBB | PBDE | Permethrin | |
| Boars/stags | 0 | 1 | 3 | 1 | 1 | 0 | 6 |
| Dairy cows | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| Horses | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Mature sheep | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Sows | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| Total | 1 | 1 | 4 | 3 | 2 | 1 | 12 |

FLORFENICOL

FSIS analyzed 348 samples for florfenicol residues and two (2) violations were detected. Table 11a, *Florfenicol*, present the results of the testing by production class.

Table 11a
Florfenicol
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|----------------------|--------------------|-----------------------------------|----------------------|--------------------|-------------------------|
| Dairy cows | 270 | 0 | 0 | 0 | (0,1.36) |
| Non-formula fed veal | 78 | 0 | 2 | 2.6 | (0.31,8.96) |
| Total | 348 | 0 | 2 | | |

FLUNIXIN

FSIS analyzed 1,044 samples for flunixin residues and five (5) violations were detected. Table 12a, *Flunixin*, present the results of the testing by production class.

Table 12a
Flunixin
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Beef cows | 306 | 0 | 0 | 0 | (0,1.2) |
| Bulls | 232 | 0 | 1 | 0.4 | (0.01,2.38) |
| Dairy cows | 292 | 3 | 4 | 1.4 | (0.37,3.47) |
| Heavy calves | 214 | 0 | 0 | 0 | (0,1.71) |
| Total | 1,044 | 3 | 5 | | |

MELENGESTROL ACETATE (MGA)

FSIS analyzed 329 heifer samples for MGA residues; zero (0) violations and 15 non-violative positives were found. The 95th confidence interval for percent violations is: 0, 1.11.

NITROFURANS

FSIS analyzed 863 samples for nitrofurans (furazolidone and furaltadone) residues and one (1) violation was detected. Table 13a, *Nitrofurans*, presents the results of the testing by production class. Table 13b, *Specific Nitrofurans Violative Residues*, presents the specific nitrofurans detected.

Table 13a
Nitrofurans
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Dairy cows | 285 | 0 | 1 | 0.4 | (0.01,1.94) |
| Formula-fed veal | 257 | 0 | 0 | 0 | (0,1.43) |
| Heifers | 321 | 0 | 0 | 0 | (0,1.14) |
| Total | 863 | 0 | 1 | | |

Table 13b
Specific Nitrofurans Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Nitrofuran Compounds | Total |
|-------------------------|-----------------------------|--------------|
| | Furazolidone | |
| Dairy cows | 1 | 1 |
| Total | 1 | 1 |

NITROIMIDAZOLES

FSIS analyzed 337 young turkey samples for nitroimidazoles (hydroxyipronidazole and hydroxydimetridazole) residues; zero (0) violations and zero (0) non-violative residues were detected. The 95th confidence interval for percent violations is: 0, 1.09.

PHENYLBUTAZONE

FSIS analyzed 2,172 samples for phenylbutazone residues using ELISA; zero (0) violations and zero (0) non-violative residues were detected. Table 14a, *Phenylbutazone*, present the results of the testing by production class

Table 14a
Phenylbutazone
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Beef cows | 329 | 0 | 0 | 0 | (0,1.11) |
| Bulls | 322 | 0 | 0 | 0 | (0,1.14) |
| Dairy cows | 298 | 0 | 0 | 0 | (0,1.23) |
| Formula-fed veal | 265 | 0 | 0 | 0 | (0,1.38) |
| Heavy calves | 190 | 0 | 0 | 0 | (0,1.92) |
| Heifers | 282 | 0 | 0 | 0 | (0,1.3) |
| Non-formula-fed veal | 165 | 0 | 0 | 0 | (0,2.21) |
| Steers | 321 | 0 | 0 | 0 | (0,1.14) |
| Total | 2,172 | 0 | 0 | | |

SULFONAMIDES

FSIS analyzed 3,008 samples for sulfonamides. Seventeen (17) violations were detected in seventeen (17) animals from several production classes. The chemical residue violations consisted of three (3) sulfadimethoxine, and fourteen (14) sulfamethazine. Table 15a, *Sulfonamides*, presents the results of the testing by production class. Table 15b, *Specific Sulfonamides Violative Residues*, presents the specific sulfonamides detected.

Table 15a
Sulfonamides
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|-------------------------|---------------------------|--|-----------------------------|---------------------------|--------------------------------|
| Beef cows | 317 | 0 | 0 | 0 | (0,1.16) |
| Bob veal | 300 | 1 | 3 | 1.0 | (0.21,2.89) |
| Bulls | 297 | 0 | 0 | 0 | (0,1.23) |
| Dairy cows | 317 | 0 | 3 | 0.9 | (0.2,2.74) |
| Formula-fed veal | 253 | 0 | 0 | 0 | (0,1.45) |
| Heavy calves | 222 | 0 | 1 | 0.4 | (0.01,2.48) |
| Market hogs | 267 | 0 | 1 | 0.4 | (0.01,2.07) |
| Mature turkeys | 261 | 1 | 0 | 0 | (0,1.4) |
| Non-formula-fed veal | 165 | 0 | 0 | 0 | (0,2.21) |
| Roaster pigs | 311 | 3 | 8 | 2.6 | (1.12,5.01) |
| Steers | 298 | 0 | 1 | 0.3 | (0.01,1.86) |
| Total | 3,008 | 5 | 17 | | |

Table 15b
Specific Sulfonamide Violative Residues
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Sulfonamide Compounds | | Total |
|------------------|-----------------------|----------------|-----------|
| | Sulfadimethoxine | Sulfamethazine | |
| Bob veal | 1 | 2 | 3 |
| Dairy cows | 1 | 2 | 3 |
| Heavy calves | 0 | 1 | 1 |
| Market hogs | 0 | 1 | 1 |
| Roaster pigs | 1 | 7 | 8 |
| Steers | 0 | 1 | 1 |
| Total | 3 | 14 | 17 |

THYREOSTATS

FSIS analyzed 291 market hogs samples for 2-thiouracil, 6-methyl-2-thiouracil, 6-propyl-2-thiouracil, 2-mercapto-1-methylimidazole (tapazole), 6-phenyl-2-thiouracil, and 2-mercaptobenzimidazole residues; zero (0) violations and zero (0) non-violative positives were detected. The 95th confidence interval for percent violations is: 0, 1.26.

TRENBOLONE

FSIS analyzed 497 samples for trenbolone residues and two (2) violations were detected. Table 16a, *Trenbolone*, present the results of the testing by production class

Table 16a
Trenbolone
2006 FSIS Domestic Scheduled Sampling Results

| Production Class | Number of Analyses | Number of non-violative positives | Number of violations | Percent violations | 95% Confidence Interval |
|----------------------|--------------------|-----------------------------------|----------------------|--------------------|-------------------------|
| Formula-fed veal | 323 | 0 | 0 | 0 | (0,1.14) |
| Non-formula-fed veal | 174 | 0 | 2 | 1.1 | (0.14,4.09) |
| Total | 497 | 0 | 2 | | |

ZERANOL

FSIS analyzed 323 formula-fed veal samples for zeranol residues; zero (0) violations and zero (0) non-violative positives were detected. The 95th confidence interval for percent violations is: 0, 1.14.