

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

## PHASE I - GENERATING AND RANKING LIST OF CANDIDATE COMPOUNDS

### LIST OF CANDIDATE COMPOUNDS

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

### PHASE II - SELECTING DRUGS FOR INCLUSION IN THE 2001 NRP

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

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

#### --Antibiotics:

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

#### --Other Veterinary Drugs:

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<sup>1</sup> 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  
*tilimicosin/tylosin* - differentiated by mass spectrometry

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

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

### PHASE III - IDENTIFYING THE COMPOUND/PRODUCT CLASS PAIRS

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

### PHASE IV - ALLOCATION OF SAMPLING RESOURCES

#### ALLOCATION OF SAMPLING RESOURCES AMONG DIFFERENT PRODUCTION CLASSES

##### EGG PRODUCTS

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

##### ANIMAL PRODUCT CLASSES

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

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

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

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

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

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

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

#### **ALLOCATION OF SAMPLES AMONG DIFFERENT COUNTRIES**

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

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

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

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

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

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

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

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

This is indicated in the column labeled “Unadjusted Number of Samples ( $U_{C/S}$ ),” in Tables 5.17 to 5.23 (except 5.17b and 5.21b).

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

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

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

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

**Notes:**

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

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

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