Subpart E—Safe Levels for Extralabel Use of Drugs in Animals and Drugs Prohibited From Extralabel Use in Animals

§ 530.40 Safe levels and availability of analytical methods.

(a) In accordance with § 530.22, the following safe levels for extralabel use of an approved animal drug or human drug have been established: [Reserved]

(b) In accordance with § 530.22, the following analytical methods have been accepted by FDA: [Reserved]

§ 530.41 Drugs prohibited for extralabel use in animals.

(a) The following drugs, families of drugs, and substances are prohibited for extralabel animal and human drug uses in food-producing animals.

(1) Chloramphenicol;

(2) Clenbuterol;

(3) Diethylstilbestrol (DES);

(4) Dimetridazole;

(5) Ipronidazole;

(6) Other nitroimidazoles;

(7) Furazolidone.

(8) Nitrofurazone.

(9) Sulfonamide drugs in lactating dairy cattle (except approved use of sulfadimethoxine, sulfabromomethazine, and sulfaethoxypyridazine);

(10) Fluoroquinolones; and

(11) Glycopeptides.

(12) Phenylbutazone in female dairy cattle 20 months of age or older.

(b) The following drugs, families of drugs, and substances are prohibited for extralabel animal and human drug uses in nonfood-producing animals: [Reserved]

[62 FR 27947, May 22, 1997, as amended at 67 FR 5471, Feb. 6, 2002; 68 FR 9530, Feb. 28, 2003; 68 FR 14134, Mar. 24, 2003]

PART 556—TOLERANCES FOR RESIDUES OF NEW ANIMAL DRUGS IN FOOD

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556.346 Laidlomycin.
556.347 Lasalocid.
556.350 Levamisole hydrochloride.
556.360 Lincomycin.
556.375 Maduramicin ammonium.
556.380 Melengestrol acetate.
556.390 Methylparaben.
556.400 Methylprednisolone.
556.410 Metoserpate hydrochloride.
556.420 Monensin.
556.425 Morantel tartrate.
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556.428 Narasin.
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556.440 Nequinate.
556.445 Nicarbazin.

556.460 Novobiocin.
556.470 Nystatin.
556.480 Oleandomycin.
556.490 Ormetoprim.
556.495 Oxfendazole.
556.500 Oxytetracycline.
556.510 Penicillin.
556.513 Piperazine.
556.515 Pirlimycin.
556.520 Prednisolone.
556.530 Prednisone.
556.540 Progesterone.
556.550 Propylparaben.
556.560 Pyrantel tartrate.
556.570 Ractopamine.
556.580 Robenidine hydrochloride.
556.590 Salicylic acid.
556.592 Salinomycin.
556.597 Semduramicin.
556.600 Spectinomycin.
556.610 Streptomycin.
556.620 Sulfabromomethazine sodium.
556.625 Sodium sulfachloropyrazine monohydrate.
556.630 Sulfachlorpyridazine.
556.640 Sulfadimethoxine.
556.650 Sulfaethoxypyridazine.
556.660 Sulfamerazine.
556.670 Sulfamethazine.
556.680 Sulfanitran.
556.685 Sulfaquinoxaline.
556.690 Sulfathiazole.
556.700 Sulfomyxin.
556.710 Testosterone propionate.
556.720 Tetracycline.
556.730 Thiabendazole.
556.735 Tilmicosin.
556.738 Tiamulin.
556.739 Trenbolone.
556.740 Tylosin.
556.741 Tripelennamine.
556.750 Virginiamycin.
556.760 Zeranol.
556.770 Zoalene.

AUTHORITY: 21 U.S.C. 342, 360b, 371.

SOURCE: 40 FR 13942, Mar. 27, 1975, unless otherwise noted.

Subpart A—General Provisions

§ 556.1 General considerations; tolerances for residues of new animal drugs in food.

(a) Tolerances established in this part are based upon residues of drugs in edible products of food-producing animals treated with such drugs. Consideration of an appropriate tolerance for a drug shall result in a conclusion either that:

(1) Finite residues will be present in the edible products—in which case a finite tolerance is required; or

(2) It is not possible to determine whether finite residues will be incurred but there is reasonable expectation that they may be present—in which case a tolerance for negligible residue is required; or

(3) The drug induces cancer when ingested by man or animal or, after tests which are appropriate for the evaluation of the safety of such drug, has been shown to induce cancer in man or animal; however, such drug will not adversely affect the animals for which it is intended, and no residue of such drug will be found by prescribed methods of analysis in any edible portion of such animals after slaughter or in any food yielded by or derived from the living animal—in which case the accepted method of analysis shall be published or cited, if previously published and available elsewhere, in this part; or

(4) It may or may not be possible to determine whether finite residues will be incurred but there is no reasonable expectation that they may be present—in which case the establishment of a tolerance is not required; or

(5) The drug is such that it may be metabolized and/or assimilated in such form that any possible residue would be indistinguishable from normal tissue constituents—in which case the establishment of a tolerance is not required.

(b) No tolerance established pursuant to paragraph (a)(1) of this section will be set at any level higher than that reflected by the permitted use of the drug.

(c) Any tolerance required pursuant to this section will, in addition to the toxicological considerations, be conditioned on the availability of a practicable analytical method to determine the quantity of residue. Such method must be sensitive to and reliable at the established tolerance level or, in certain instances, may be sensitive at a higher level where such level is also deemed satisfactory and safe in light of the toxicity of the drug residue and of the unlikelihood of such residue's exceeding the tolerance.

Subpart B—Specific Tolerances for Residues of New Animal Drugs

§ 556.20 2-Acetylamino-5-nitrothiazole.

A tolerance of 0.1 part per million is established for negligible residues of 2-acetylamino-5-nitrothiazole in the edible tissues of turkeys.

§ 556.30 Aklomide.

Tolerances are established for combined residues of aklomide (2-chloro-4-nitrobenzamide) and its metabolite (4-amino-2-chlorobenzamide) in uncooked edible tissues of chickens as follows:

(a) 4.5 parts per million in liver and muscle.

(b) 3 parts per million in skin with fat.

§ 556.34 Albendazole.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of albendazole is 5 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle.* A tolerance is established for albendazole 2-aminosulfone (marker residue) in liver (target tissue) of 0.2 part per million and in muscle of 0.05 part per million.

(2) *Sheep.* A tolerance is established for albendazole 2-aminosulfone (marker residue) in liver (target tissue) of 0.25 part per million and in muscle of 0.05 part per million.

[64 FR 1504, Jan. 11, 1999]

§ 556.36 Altrenogest.

(a) *Acceptable Daily Intake (ADI).* The ADI for total residues of altrenogest is 0.04 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Swine*—(i) *Liver (the target tissue).* The tolerance for altrenogest (the marker residue) is 4 parts per billion (ppb).

(ii) *Muscle.* The tolerance for altrenogest (the marker residue) is 1 ppb.

(2) [Reserved]

[68 FR 62007, Oct. 31, 2003]

§ 556.38 Amoxicillin.

A tolerance of 0.01 part per million is established for negligible residues of amoxicillin in milk and in the uncooked edible tissues of cattle.

[49 FR 45422, Nov. 16, 1984]

§ 556.40 Ampicillin.

A tolerance of 0.01 p/m is established for negligible residues of ampicillin in the uncooked edible tissues of swine and cattle and in milk.

§ 556.50 Amprolium.

Tolerances are established as follows for residues of amprolium (1-(4-amino-2-*n*- propyl-5-pyrimidinylmethyl)-2-picolinium chloride hydrochloride):

(a) In the edible tissues and in eggs of chickens and turkeys:

(1) 1 part per million in uncooked liver and kidney.

(2) 0.5 part per million in uncooked muscle tissue.

(3) In eggs:

(i) 8 parts per million in egg yolks.

(ii) 4 parts per million in whole eggs.

(b) In the edible tissues of calves:

(1) 2.0 parts per million in uncooked fat.

(2) 0.5 part per million in uncooked muscle tissue, liver, and kidney.

(c) In the edible tissues of pheasants:

(1) 1 part per million in uncooked liver.

(2) 0.5 part per million in uncooked muscle.

[40 FR 13942, Mar. 27, 1975, as amended at 50 FR 18472, May 1, 1985]

§ 556.52 Apramycin.

A tolerance of 0.1 part per million is established for parent apramycin (marker residue) in kidney (target tissue) of swine. The acceptable daily intake (ADI) for total residues of apramycin is 25 micrograms per kilogram of body weight per day.

[62 FR 40933, July 31, 1997]

§ 556.60 Arsenic.

Tolerances for total residues of combined arsenic (calculated as As) in food are established as follows:

(a) In edible tissues and in eggs of chickens and turkeys:

(1) 0.5 part per million in uncooked muscle tissue.

(2) 2 parts per million in uncooked edible by-products.

(3) 0.5 part per million in eggs.

(b) In edible tissues of swine:

(1) 2 parts per million in uncooked liver and kidney.

(2) 0.5 part per million in uncooked muscle tissue and by-products other than liver and kidney.

§ 556.70 Bacitracin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of bacitracin is 0.05 milligram per kilogram of body weight per day.

(b) *Tolerances.* The tolerance for residues of bacitracin from zinc bacitracin or bacitracin methylene disalicylate in uncooked edible tissues of cattle, swine, chickens, turkeys, pheasants, and quail, and in milk and eggs is 0.5 part per million.

[65 FR 70791, Nov. 28, 2000]

§ 556.90 Buquinolate.

Tolerances are established for residues of buquinolate as follows:

(a) In edible tissues of chickens:

(1) 0.4 part per million in uncooked liver, kidney, and skin with fat.

(2) 0.1 part per million in uncooked muscle.

(b) In eggs:

(1) 0.5 part per million in uncooked yolk.

(2) 0.2 part per million in uncooked whole eggs.

§ 556.100 Carbadox.

A tolerance of 30 parts per billion is established for residues of quinoxaline-2-carboxylic acid (marker residue) in liver (target tissue) of swine.

[63 FR 13337, Mar. 19, 1998]

§ 556.110 Carbomycin.

A tolerance of zero is established for residues of carbomycin in the uncooked edible tissues of chickens.

§ 556.113 Ceftiofur.

(a) *Acceptable daily intake and acceptable single-dose intake*—(1) *Acceptable daily intake (ADI).* The ADI for total residues of ceftiofur is 30 micrograms per kilogram of body weight per day.

(2) *Acceptable single-dose intake (ASDI).* The ASDI total residues of ceftiofur is 0.830 milligrams per kilogram of body weight. The ASDI is the amount of total residues of ceftiofur that may safely be consumed in a single meal. The ASDI is used to derive the tolerance for residues of desfuroylceftiofur at the injection site.

(b) *Tolerances*—(1) *Poultry, and sheep.* A tolerance for residues of ceftiofur in edible tissue is not required.

(2) *Swine.* The tolerances for desfuroylceftiofur (marker residue) are:

(i) *Kidney (target tissue).* 0.25 parts per million (ppm).

(ii)*Liver.* 3 ppm.

(iii) *Muscle.* 2 ppm.

(3) *Cattle.* The tolerances for desfuroylceftiofur (marker residue) are:

(i) *Kidney (target tissue).* 8 ppm.

(ii) *Liver.* 2 ppm.

(iii)*Muscle.* 1 ppm.

(iv) *Injection site muscle.* 166 ppm.

(v) *Milk.* 0.1 ppm.

[63 FR 53579, Oct. 6, 1998, as amended at 68 FR 60296, Oct. 22, 2003; 69 FR 43892, July 23, 2004]

§ 556.115 Cephapirin.

A tolerance of 0.02 parts per million (ppm) is established for residues of cephapirin in the milk and 0.1 ppm in the uncooked edible tissues of dairy cattle.

[40 FR 57454, Dec. 10, 1975]

§ 556.120 Chlorhexidine.

A tolerance of zero is established for residues of chlorhexidine in the uncooked edible tissues of calves.

§ 556.140 Chlorobutanol.

A tolerance of zero is established for residues of chlorobutanol in milk from dairy animals.

§ 556.150 Chlortetracycline.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of tetracyclines including chlortetracycline, oxytetracycline, and tetracycline is 25 micrograms per kilogram of body weight per day.

(b) *Tolerances.* (1) Tolerances are established for the sum of tetracycline residues in tissues of beef cattle, nonlactating dairy cows, calves, swine, sheep, chickens, turkeys, and ducks, of 2 parts per million (ppm) in muscle, 6 ppm in liver, and 12 ppm in fat and kidney.

(2) A tolerance is established for residues of chlortetracycline in eggs of 0.4 ppm.

[63 FR 52158, Sept. 30, 1998, as amended at 63 FR 57246, Oct. 27, 1998]

§ 556.160 Clopidol.

Tolerances for residues of clopidol (3,5-dichloro-2,6-dimethyl-4-pyridinol) in food are established as follows:

(a) In cereal grains, vegetables, and fruits: 0.2 part per million.

(b) In chickens and turkeys:

(1) 15 parts per million in uncooked liver and kidney.

(2) 5 parts per million in uncooked muscle.

(c) In cattle, sheep, and goats:

(1) 3 parts per million in uncooked kidney.

(2) 1.5 parts per million in uncooked liver.

(3) 0.2 part per million in uncooked muscle.

(d) In swine: 0.2 part per million in uncooked edible tissues.

(e) In milk: 0.02 part per million (negligible residue).

§ 556.163 Clorsulon.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of clorsulon is 8 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Kidney (the target tissue).* The tolerance for parent clorsulon (the marker residue) is 1.0 part per million.

(ii) *Muscle.* The tolerance for parent clorsulon (the marker residue) is 0.1 part per million.

(2) [Reserved]

[66 FR 35544, July 6, 2001]

§ 556.165 Cloxacillin.

A tolerance of 0.01 part per million is established for negligible residues of cloxacillin in the uncooked edible tissues of cattle and in milk.

[40 FR 28792, July 9, 1975]

§ 556.167 Colistimethate.

A tolerance for residues of colistimethate in the edible tissues of chickens is not required.

[63 FR 13123, Mar. 18, 1998]

§ 556.169 Danofloxacin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of danofloxacin is 2.4 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for parent danofloxacin (the marker residue) is 0.2 part per million (ppm).

(ii) *Muscle.* The tolerance for parent danofloxacin (the marker residue) is 0.2 ppm.

(2) [Reserved]

[67 FR 78973, Dec. 27, 2002]

§ 556.170 Decoquinate.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of decoquinate is 75 micrograms per kilogram of body weight per day.

(b) *Tolerances.* Tolerances are established for residues of decoquinate in the uncooked, edible tissues of chickens, cattle, and goats as follows:

(1) 1 part per million (ppm) in skeletal muscle.

(2) 2 ppm in other tissues.

[64 FR 10103, Mar. 2, 1999]

§ 556.180 Dichlorvos.

A tolerance of 0.1 part per million is established for negligible residues of dichlorvos (2,2-dichlorovinyl dimethyl phosphate) in the edible tissues of swine.

§ 556.185 Diclazuril.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of diclazuril is 25 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Chickens*—(i) *Liver.* The tolerance for parent diclazuril (the marker residue) is 3 parts per million (ppm).

(ii) *Muscle.* The tolerance for parent diclazuril (the marker residue) is 0.5 ppm.

(iii) *Skin/fat.* The tolerance for parent diclazuril (the marker residue) is 1 ppm.

(2) *Turkeys*—(i) *Liver.* The tolerance for parent diclazuril (the marker residue) is 3 ppm.

(ii) *Muscle.* The tolerance for parent diclazuril (the marker residue) is 0.5 ppm.

(iii) *Skin/fat.* The tolerance for parent diclazuril (the marker residue) is 1 ppm.

[64 FR 35923, July 2, 1999. Redesignated and amended at 66 FR 62917, Dec. 4, 2001]

§ 556.200 Dihydrostreptomycin.

Tolerances are established for residues of dihydrostreptomycin in uncooked, edible tissues of cattle and swine of 2.0 parts per million (ppm) in kidney and 0.5 ppm in other tissues, and 0.125 ppm in milk.

[59 FR 41977, Aug. 16, 1994]

§ 556.220 3,5-Dinitrobenzamide.

No residues of 3,5-dinitrobenzamide may be found in the uncooked edible tissues of chickens as determined by the following method of analysis:

I. *Method of analysis—3,5-dinitrobenzamide.* A method for 3,5-dinitrobenzamide (3,5-DNBA) in chicken tissues is described with a cleanup step that removes most of the interfering materials, thus allowing uncompensated measurements to be read. The 3,5-DNBA is extracted from the sample with acetone and chloroform and prepared for chromatography by removing the aqueous phase in a separatory funnel and the solvents in a flash evaporator. The extract residue is chromatographed on alumina to remove several lipid components and residues of other drugs. The benzamide eluate is passed through a column of Dowex-50 resin, or equivalent, to remove arylamines; for example, 3-amino-5-nitrobenzamide. The 3,5-DNBA fraction is reduced, after removal of alcohol, with $TiCl_3$ in basic solution to an arylamine, presumably 3,5-diaminobenzamide. The reduced fraction is placed on another Dowex-50 column, most of the interfering substances are removed with washings of alcohol and water, and the arylamine residue is eluted with 4*N* HCl. Colorimetric measurement is made in a 100-millimeter cell at 530 millimicrons after reacting the residue with Bratton-Marshall reagents.

II. *Reagents.* A. Acetone.

B. Acetyl-(*p*- nitrophenyl)-sulfanilamide (APNPS) standard—melting point range 264 °C.–267 °C. Weigh and transfer 10 milligrams of APNPS to a 100-milliliter flask, dissolve and dilute to volume with acetone.

C. Alumina—activated F–20, 80–200 mesh, Aluminum Co. of America, or equivalent substance.

D. Ammonium sulfamate.

E. Ammonium sulfamate solution 1.25 grams of ammonium sulfamate per 100 milliliters of water. Refrigerate when not in use. Prepare fresh weekly.

F. Cation-exchange resin—Dowex 50W–X8, 200–400 mesh, Baker Analyzed Reagent, or equivalent, prepared as follows:

1. Place 500 grams of resin into a 3-liter beaker.

2. Add 2,000 milligrams of 6*N* HCl.

3. Heat and stir while on a bath at 80 °C. for 6 hours. Discontinue heating and continue stirring overnight.

4. Filter the resin on a Buchner funnel (24 cm.) fitted with Whatman No. 1 paper.

5. Wash the resin bed with four 500-milliliter portions of 6*N* HCl.

6. Wash the resin bed with 500-milliliter portions of deionized water until the effluent has a pH of 5 or higher.

7. Wash the resin bed with three 400-milliliter portions of specially denatured alcohol 3A. Drain thoroughly.

8. Make a slurry of resin in 1,250 milliliters of specially denatured alcohol 3A.

G. Chloroform.

H. Coupling reagent—0.25 gram of *N*-1-naphthyl-ethylenediamine dihydrochloride per 100 milliliters of water. Refrigerate when not in use. Prepare fresh weekly.

I. 3,5-Dinitrobenzamide (3,5-DNBA standard). Add to boiling specially denatured alcohol 3A until a saturated solution is obtained and treat with activated carbon, filtered and crystallize by cooling to room temperature. The 3,5-DNBA therefrom is treated a second time with activated carbon and then recrystallized three more times from specially denatured alcohol 3A. The third crystallization is washed with diethyl ether and dried in a vacuum desiccator, melting point range 185 °C.–186 °C.

J. Ethyl alcohol—absolute, A.C.S.

K. Eluting reagent A. The formula and volume required in procedure step V-D is dependent on the adsorptive strength of the Al_2O_3. For each lot Al_2O_3, make the following test:

1. Prepare a column (see procedure step V-D for determining formula and volume to eluting reagent A).

2. Transfer 1 milliliter of APNPS standard (100 micrograms per milliliter) in 75 milliliters of chloroform to the column.

3. Wash the column with 100 milliliters of chloroform and discard the eluate.

4. Pass through 100 milliliters of solution consisting of specially denatured alcohol 3A and ethyl alcohol 1:1 (volume to volume). Collect one 50-milliliter and five 10-milliliter portions; these make up the first, second, third, fourth, fifth, and sixth portions of eluate.

5. Place in beakers under a stream of air on a water bath (90 °C.) until the solvents are evaporated.

6. Add 10 milliliters of 4*N* HCl to each, cover with watch glasses and heat (90 °C.) for 30 minutes; cool to room temperature.

7. Add the Bratton-Marshall reagents.

8. All fractions show a slight color. Note the portion containing the first significant increase in pink color.

a. If the color increases in the second, third, or fourth portions of eluate, the formula in procedure step V-D is suitable and, depending on the portion, 45, 55, or 65 milliliters, respectively, should be used in procedure step V-D4. Thereby, the APNPS is retained on the column and the benzamides are eluted.

b. If the color increases in the first portion, the eluting strength of the reagent is too strong. Return the test, substituting 1:4 (volume to volume) in procedure step V-D4. If 1:4 (volume to volume) is too strong, rerun with ethyl alcohol in procedure step V-D. If none of these are suitable, another lot of Al_2O_3 should be used.

c. If the color increases in the fifth or sixth portion, the eluting strength of the reagent is too weak. Rerun the test, substituting in procedure step V-D4, respectively, 4:1 (volume to volume), specially denatured alcohol 3A: methyl alcohol, 4:1 (volume to volume), until a suitable formula is found. If none of these are suitable, another lot of Al_2O_3 should be used.

L. Hydrochloric acid, 4*N*. Add two volumes of water to one volume of HCl.

M. Diatomaceous earth—Hyflo Super Cel, Johns-Manville Co., or equivalent substance.

N. *N*-1-Naphthylethylenediamine dihydrochloride.

O. Sodium hydroxide solution, 10*N*. Dissolve 100 grams of sodium hydroxide in water and dilute to 25 milliliters.

P. Sodium nitrite solution—0.25 grams of sodium nitrite per 100 milliliters of water. Refrigerate when not in use. Prepare fresh weekly.

Q. Specially denatured alcohol, formula 3A–100 parts of 190-proof ethyl alcohol plus 5 parts of commercial methyl alcohol.

R. Titanium(ous) chloride–20 percent solution.

III. *Special apparatus.* A. Absorption cells—Beckman No. 75195 matched set of two cylindrical silica cells with 100 millimeter optical length, or equivalent cells.

B. Autotransformer—type 500B, or equivalent. To regulate speed of mixer.

C. Centrifuge.

D. Centrifuge tubes—50-milliliter size with glass stopper.

E. Chromatography tubes—Corning No. 38460, 20 millimeters A 400 millimeters and having a tapered 29/42 joint with coarse, fritted disc, or equivalent tubes.

F. Evaporator—vacuum, rotary, thin film.

G. Ion-exchange column—as described by Thiegs et al. in ''Determination of 3-amino-5-nitro-*o*-toluamide (ANOT) in chicken tissues'' published in ''Journal of Agricultural and Food Chemistry,'' volume 9, pages 201–204 (1961).

H. Glycerol manostat. For regulating pressure on columns: To Al_2O_3 columns, 15-inch head pressure; to ion-exchange columns, 30-inch head pressure.

I. Motor speed control. For regulating speed on 1-quart blender.

J. Volumetric flasks—50 milliliter size, actinic ware.

K. Mixer—Vortex Jr. Model K–500–1, Scientific Industries, Inc., or equivalent mixer.

L. One-quart blender.

M. Water bath (45 °C.–50° C.).

N. Water bath (90 °C.).

IV. *Standard curve.* A. 1. Weigh 100 milligrams of 3,5-DNBA and transfer to a 1-liter volumetric flask with acetone.

2. Dissolve and dilute with acetone to volume.

3. Dilute 1 milliliter to 100 milliliters.

4. Add 5.0 milliliters of water to each of six centrifuge tubes.

5. Add standard to each of the tubes to contain one of the following amounts: 0.0, 1.0, 2.0, 3.0, 5.0, and 10.0 micrograms of 3,5-DNBA.

B. Prepare each tube for colorimetric measurement as follows:

1. Place the tube in a hot water bath (90 °C.) until 5.0 milliliters remain. Cool to room temperature.

2. While mixing on Vortex mixer, or equivalent, regulated with an autotransformer, add 2 drops of $TiCl_3$ and 4 drops of 10*N* NaOH. Continue mixing until chalky-white in appearance.

3. Add 2 milliliters of HCl, mix, and allow to stand for 5 minutes.

4. Transfer to 50-milliliter volumetric flask and dilute with 4*N* HCl to 40–45 milliliters.

5. Cool to 0 °C.–5 °C. by placing in a freezer or ice bath.

6. Perform the Bratton-Marshall reaction in subdued light as follows:

a. Add 1 milliliter of sodium nitrite reagent, mix, and allow to stand for 1 minute.

b. Add 1 milliliter of ammonium sufamate reagent, mix, and allow to stand for 1 minute.

c. Add 1 milliliter of coupling reagent, mix, and allow to stand for 10 minutes.

d. Dilute to volume with 4*N* HCl.

C. Perform colorimetric measurement at 530 millimicrons as follows:

1. Fill two matched 100-millimeter cells with 4*N* HCl and place into spectrophotometer.

2. Adjust dark current.

3. Adjust to zero absorbance.

4. Replace acid in cell of sample side of compartment with standard to be measured.

5. The standard curve should be run five different times. Plot equivalent concentration in tissue versus mean absorbance at each concentration. If computer is available, a better procedure is to calculate the equation of the standard curve by means of least squares.

V. *Procedure.* A. Extraction. 1. Mince 350 grams of tissue in a 1-quart blending jar for 3 minutes. Use samples obtained from either freshly killed or quickly frozen birds. The latter should be analyzed as soon as thawed. For fibrous meats (for example, muscle, skin) put through a meat grinder before mincing.

2. Weight 100 ±0.5 grams of each replicate sample in a 150-milliliter beaker. Analyze each sample in triplicate and average the results. Reproducibility of ±10 percent between such analyses has been obtained.

3. Transfer the sample to a 1-quart blender jar. For kidney and liver tissues, make a slurry with acetone in the weighing beaker. Transfer with several rinses of acetone.

4. Blend the sample for 5 minutes with 250 milliliters of acetone and a 100-milliliter beakerful of diatomaceous earth.

5. Filter through a Buchner funnel containing a wetted Whatman No. 5 filter paper (12.5 cm.) into a 1-liter suction flask.

6. Rinse the blender jar into the funnel with three 25-milliliter portions of acetone.

7. Transfer the pulp and paper from the funnel to the aforementioned blender jar.

8. Add 250 milliliters of chloroform.

9. Blend for 3 minutes.

10. Filter through the aforementioned apparatus of procedure step V-A5. For rapid filtration of skin and blood samples, prepare funnel by adding diatomaceous earth and tamping evenly over paper to a thickness of 3 to 5 millimeters.

11. Rinse the blender jar into the funnel with three 25-milliliter rinses of chloroform.

B. Phasic separation. 1. Pour the combined filtrates into a 1-liter separatory funnel.

2. Rinse the suction flask twice with 25 milliliters of chloroform.

3. Mix the funnel contents by gently rocking and swirling for 30 seconds.

4. Let stand 10 minutes to allow phases to separate.

a. The upper (aqueous) phase (30 to 50 milliliters) is not always emulsion-free. Losses from emulsions have not been significant.

b. If an upper (aqueous) phase does not appear, add an additional 100 milliliters of chloroform and 10 milliliters of water and repeat procedure step V-B3.

5. Withdraw the lower phase into a 1-liter round-bottom flask, and discard upper phase. Withdraw nearly all of the lower phase, let stand for 2 to 3 minutes, then withdraw the remainder.

C. Evaporation. Attach the flask on a thin-film rotary evaporator connected to a vacuum supply, and place in a water bath maintained at 45 °C.–50 °C. until an oily residue remains. Do not overheat the sample or allow to go to dryness.

D. Adsorption chromatography. 1. Prepare a chromatography column using a column with calibrated etchings to indicate appropriate adsorbent and solvent levels as follows:

a. Fill tube to a depth of 60 millimeters with Al_2O_3.

b. Tap walls gently with hands.

c. Add anhydrous sodium sulfate to an additional depth of 25 millimeters.

d. Wet and wash column with 50 milliliters of chloroform.

i. During chromatography, make each addition to the tube when the liquid level has reached the top of the sodium sulfate layer.

ii. Increase the percolation rates by applying a slight air pressure to the top of the column.

2. Transfer the residue from procedure step V-C to the column with four 15-milliliter rinses of chloroform. Then rinse the walls of the tube and sodium sulfate layer with three 5-milliliter portions of chloroform. Percolation rate: 15 to 25 milliliters per minute. No color from sample should be seen in sodium sulfate layer after final rinse.

3. Wash column with 100 milliliters of chloroform. Discard eluate.

4. Add 75 milliliters of eluting reagent A and collect eluate A in a 250-milliliter beaker for cation-exchange chromatography.

a. Refer to ''Eluting reagent A'' under ''Reagents'' (II-K) for determining formula and volume.

b. Percolation rate: 8 to 12 milliliters per minute.

E. Cation-exchange chromatography—No. 1. 1. Prepare an ion-exchange column as follows:

a. Add a uniform slurry of resin to the column to obtain a 4 to 5 centimeter bed depth after settling.

i. Obtain a uniform slurry using a magnetic stirrer. To add the required amount of resin, calibrate the slurry and transfer it with a 10-milliliter pipette to deliver a reproducible volume.

ii. Increase the flow rate to 2 to 4 milliliters per minute by applying air pressure to the column. A glycerol manostat adjusted to 30 inches and attached between an air supply and column provides adequate pressure.

b. Wash the resin with 10 milliliters of eluting reagent A. Discard eluate.

2. Pass eluate A from procedure step V-D4 through the column. Collect in a 250-milliliter beaker.

3. Pass 50 milliliters of specially denatured alcohol 3A through the column. Combine with the eluate of procedure step V-E2.

F. Reduction. 1. Place the eluate A fraction from procedure step V-E3 on a hot water bath (90 °C.) and evaporate with a stream of air until 5 to 10 milliliters remain. Do not overheat the sample or allow the sample to go to dryness.

2. Transfer to centrifuge tube and rinse beaker three times with 3 milliliters of specially denatured alcohol 3A.

3. Evaporate on a hot water bath (90 °C.) under a stream of air until alcohol has evaporated. Do not overheat the sample or allow the sample to go to dryness.

4. Remove the tube from the water bath and immediately add 5.0 milliliters of water.

5. While mixing, add 2 drops of titanium chloride and 4 drops of 10*N* sodium hydroxide. Continue mixing until greyish color disappears.

a. Mix on Vortex Jr. mixer, or equivalent, regulated with autotransformer.

b. Precipitate of insoluble tissue substances and white titanium salts is present after reduction is complete.

6. Dilute to 50 milliliters with specially denatured alcohol 3A and mix.

7. Centrifuge for 5 minutes at 2,000 r.p.m.

G. Cation-exchange chromatography—No. 2. 1. Prepare resin column by procedure step V-E.

2. Pass the centrifugate of procedure step V-F7 through column. Use three rinses of specially denatured alcohol 3A, each 5 milliliters, to aid in transferring of sample.

3. Pass 50 milliliters of specially denatured alcohol 3A through the column.

4. Pass 50 milliliters of deionized water through the column.

5. Elute arylamine residue from the resin with 40 to 43 milliliters of 4*N* HCl into a 50-milliliter volumetric flask (actinic ware) for 3,5-DNBA analysis. Avoid direct sunlight. The arylamine has been found to be photosensitive.

H. Color development and measurement. 1. Cool to 0 °C.–5 °C. by placing in a freezer or ice bath.

2. Perform the Bratton-Marshall reaction in subdued light as follows:

a. Add 1 milliliter of sodium nitrite reagent, mix, and allow to stand for 1 minute.

b. Add 1 milliliter of ammonium sulfamate reagent, mix, and allow to stand for 1 minute.

c. Add 1 milliliter of coupling reagent, mix, and allow to stand for 10 minutes.

d. Dilute to volume with 4*N* HCl.

3. Perform colorimetric measurement at 530 millimicrons as follows:

a. Fill two matched 100-millimeter cells with 4*N* HCl and place into instrument.

b. Adjust dark current.

c. Adjust to zero absorbance.

d. Replace acid in cell of sample side of compartment with sample to be measured.

e. Record absorbance observed.

I. Calculations. Determine parts per billion (observed) from the standard curve.

§ 556.225 Doramectin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of doramectin is 0.75 microgram per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle.* A tolerance of 100 parts per billion is established for parent doramectin (marker residue) in liver (target tissue) and of 30 parts per billion for parent doramectin in muscle.

(2) *Swine.* A tolerance is established for parent doramectin (marker residue) in liver (target tissue) of 160 parts per billion.

[63 FR 68184, Dec. 10, 1998]

§ 556.227 Eprinomectin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of eprinomectin is 10 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle.* Tolerances are established for residues of eprinomectin B1a (marker residue) in milk of 12 parts per billion, in liver (target tissue) of 4.8 parts per million, and in muscle of 100 parts per billion.

(2) [Reserved]

[63 FR 59715, Nov. 5, 1998]

§ 556.228 Enrofloxacin.

The acceptable daily intake for enrofloxacin is 3 micrograms per kilogram of body weight per day.

(a) *Chickens and turkeys.* A tolerance of 0.3 part per million is established for residues of enrofloxacin (marker residue) in muscle (target tissue) of chickens and turkeys.

(b) *Cattle.* A tolerance of 0.1 part per million for desethylene ciprofloxacin (marker residue) has been established in liver (target tissue) of cattle.

[61 FR 56893, Nov. 5, 1996, as amended at 63 FR 49003, Sept. 14, 1998]

§ 556.230 Erythromycin.

Tolerances for residues of erythromycin in food are established as follows:

(a) 0.1 part per million in uncooked edible tissues of beef cattle and swine.

(b) Zero in milk.

(c) 0.025 part per million in uncooked eggs.

(d) 0.125 part per million (negligible residue) in uncooked edible tissues of chickens and turkeys.

[40 FR 13942, Mar. 27, 1975, as amended at 58 FR 43795, Aug. 18, 1993]

§ 556.240 Estradiol and related esters.

No residues of estradiol, resulting from the use of estradiol or any of the related esters, are permitted in excess of the following increments above the concentrations of estradiol naturally present in untreated animals:

(a) In uncooked edible tissues of heifers, steers, and calves:

(1) 120 parts per trillion for muscle.

(2) 480 parts per trillion for fat.

(3) 360 parts per trillion for kidney.

(4) 240 parts per trillion for liver.

(b) In uncooked edible tissues of lambs:

(1) 120 parts per trillion for muscle.

(2) 600 parts per trillion for fat, kidney, and liver.

[49 FR 13873, Apr. 9, 1984, as amended at 56 FR 67175, Dec. 30, 1991]

§ 556.260 Ethopabate.

Tolerance for residues of ethopabate converted to metaphenetidine are established in the edible tissues of chickens as follows:

(a) 1.5 parts per million in uncooked liver and kidney.

(b) 0.5 part per million in uncooked muscle.

§ 556.270 Ethylenediamine.

A tolerance of zero is established for residues of ethylenediamine in milk.

§ 556.273 Famphur.

Tolerances are established for residues of famphur including its oxygen analog in or on meat, fat, or meat byproducts of cattle at 0.1 part per million.

[62 FR 55161, Oct. 23, 1997]

§ 556.275 Fenbendazole.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of fenbendazole is 40 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for parent fenbendazole (the marker residue) is 0.8 part per million (ppm).

(ii) *Muscle.* The tolerance for parent fenbendazole (the marker residue) is 0.4 ppm.

(iii) *Milk.* The tolerance for fenbendazole sulfoxide metabolite (the marker residue in cattle milk) is 0.6 ppm.

(2) *Swine*—(i) *Liver (the target tissue).* The tolerance for parent fenbendazole (the marker residue) is 6 ppm.

(ii) *Muscle.* The tolerance for parent fenbendazole (the marker residue) is 2 ppm.

(3) *Turkeys*—(i) *Liver (the target tissue).* The tolerance for fenbendazole sulfone (the marker residue) is 6 ppm.

(ii) *Muscle.* The tolerance for fenbendazole sulfone (the marker residue) is 2 ppm.

(4) *Goats*—(i) *Liver (the target tissue).* The tolerance for parent fenbendazole (the marker residue) is 0.8 ppm.

(ii) *Muscle.* The tolerance for parent fenbendazole (the marker residue) is 0.4 ppm.

[65 FR 20733, Apr. 18, 2000, as amended at 65 FR 41588, July 6, 2000; 65 FR 50914, Aug. 22, 2000]

§ 556.277 Fenprostalene.

A tolerance for marker residue of fenprostalene in cattle is not needed. The safe concentrations for the total residues of fenprostalene in the uncooked edible tissues of cattle are 10 parts per billion in muscle, 20 parts per billion in liver, 30 parts per billion in kidney, 40 parts per billion in fat, and 100 parts per billion in the injection site. As used in this section ''tolerance'' refers to a concentration of a marker residue in the target tissue selected to monitor for total residues of the drug in the target animal, and ''safe concentrations'' refer to the concentrations of total residues considered safe in edible tissues.

[49 FR 26716, June 29, 1984]

§ 556.283 Florfenicol.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of florfenicol is 10 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for florfenicol amine (the marker residue) is 3.7 parts per million (ppm).

(ii) *Muscle.* The tolerance for florfenicol amine (the marker residue) is 0.3 ppm.

(2) *Swine*—(i) *Liver (the target tissue).* The tolerance for parent florfenicol (the marker residue) is 2.5 ppm.

(ii) *Muscle.* The tolerance for parent florfenicol (the marker residue) is 0.2 ppm.

[63 FR 41191, Aug. 3, 1998, as amended at 67 FR 78357, Dec. 24, 2002]

§ 556.286 Flunixin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of flunixin is 0.72 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle.* The tolerance for flunixin free acid (the marker residue) is:

(i) *Liver (the target tissue*). 125 parts per billion (ppb).

(ii) *Muscle.* 25 ppb.

(iii) *Milk*. 2 ppb.

(2) [Reserved]

(c) *Related conditions of use.* See § 522.970 of this chapter.

[63 FR 38750, July 20, 1998, as amended at 69 FR 60309, Oct. 8, 2004]

§ 556.290 Furazolidone.

A tolerance of zero is established for residues of furazolidone in the uncooked edible tissues of swine.

§ 556.300 Gentamicin sulfate.

(a) A tolerance of 0.1 part per million is established for negligible residues of gentamicin sulfate in the uncooked edible tissues of chickens and turkeys.

(b) Tolerances are established for total residues of gentamicin in edible tissues of swine as follows: 0.1 part per million in muscle, 0.3 part per million in liver, and 0.4 part per million in fat and kidney. A microbiological determinative procedure and an HPLC confirmatory procedure for gentamicin have been developed to assay gentamicin in kidney at 0.4 ppm. Since residues of gentamicin as the parent compound and total residues are equal, the marker (parent drug) residue concentration of 0.4 ppm in kidney corresponds to 0.4 ppm of total residue.

[48 FR 791, Jan. 7, 1983, as amended at 61 FR 24441, May 15, 1996]

§ 556.304 Gonadotropin.

(a) *Acceptable daily intake (ADI).* The ADI for residues of total gonadotropins (human chorionic gonadotropin and pregnant mare serum gonadotropin) is 42.25 I.U. per kilogram of body weight per day.

(b) *Tolerances.* A tolerance for residues of gonadotropin in uncooked edible tissues of cattle or of fish is not required.

[64 FR 48545, Sept. 7, 1999]

§ 556.308 Halofuginone hydrobromide.

The marker residue selected to monitor for total residues of halofuginone hydrobromide in broilers and turkeys is parent halofuginone hydrobromide and the target tissue selected is liver. A tolerance is established in broilers of 0.16 part per million and in turkeys of 0.13 part per million for parent halofuginone hydrobromide in liver. These marker residue concentrations in liver correspond to total residue concentrations of 0.3 part per million in liver. The safe concentrations for total residues of halofuginone hydrobromide in the uncooked edible tissues of broilers and turkeys are 0.1 part per million in muscle, 0.3 part per million in liver, and 0.2 part per million in skin with adhering fat. As used in this section, ‘‘tolerance’’ refers to a concentration of a marker residue in the target tissue selected to monitor for total residues of the drug in the target animal, and ‘‘safe concentrations’’ refers to the concentrations of total residues considered safe in edible tissues.

[54 FR 28052, July 5, 1989, as amended at 56 FR 8711, Mar. 1, 1991; 57 FR 21209, May 19, 1992]

§ 556.310 Haloxon.

A tolerance of 0.1 part per million is established for negligible residues of haloxon (3-chloro-7-hydroxy-4-methylcoumarin bis(2-chloroethyl) phosphate) in the edible tissues of cattle.

[40 FR 13942, Mar. 27, 1975, as amended at 45 FR 10333, Feb. 15, 1980]

§ 556.320 Hydrocortisone.

A tolerance is established for negligible residues of hydrocortisone (as hydrocortisone sodium succinate or hydrocortisone acetate) in milk at 10 parts per billion.

§ 556.330 Hygromycin B.

A tolerance of zero is established for residues of hygromycin B in or on eggs and the uncooked edible tissues of swine and poultry.

§ 556.344 Ivermectin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of ivermectin is 1 microgram per kilogram of body weight per day.

(b) *Tolerances*—(1) *Liver.* A tolerance is established for 22,23-dihydroavermectin B_1a (marker residue) in liver (target tissue) as follows:

(i) *Cattle.* 100 parts per billion.

(ii) *Swine.* 20 parts per billion.

(iii) *Sheep.* 30 parts per billion.

(iv) *Reindeer.* 15 parts per billion.

(v) *American bison.* 15 parts per billion.

(2) *Muscle.* Muscle residues are not indicative of the safety of other edible tissues. A tolerance is established for 22,23-dihydroavermectin B_1a (marker residue) in muscle as follows:

(i) *Swine.* 20 parts per billion.

(ii) *Cattle.* 10 parts per billion.

[63 FR 54352, Oct. 9, 1998, as amended at 64 FR 26671, May 17, 1999]

§ 556.346 Laidlomycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of laidlomycin is 7.5 micrograms per kilogram of body weight per day.

(b) *Tolerance.* The tolerance for parent laidlomycin (the marker residue) in the liver (the target tissue) of cattle is 0.2 part per million (ppm).

[68 FR 42590, July 18, 2003]

§ 556.347 Lasalocid.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of lasalocid is 10 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle.* The tolerance for parent lasalocid (the marker residue) in liver (the target tissue) is 0.7 part per million (ppm).

(2) *Chickens*—(i) *Skin with adhering fat (the target tissue).* The tolerance for parent lasalocid (the marker residue) is 1.2 ppm.

(ii) *Liver.* The tolerance for parent lasalocid (the marker residue) is 0.4 ppm.

(3) *Turkeys*—(i) *Liver (the target tissue).* The tolerance for parent lasalocid (the marker residue) is 0.4 ppm.

(ii) *Skin with adhering fat.* The tolerance for parent lasalocid (the marker residue) is 0.4 ppm.

(4) *Rabbits.* The tolerance for parent lasalocid (the marker residue) in liver (the target tissue) is 0.7 ppm.

(5) *Sheep.* The tolerance for parent lasalocid (the marker residue) in liver (the target tissue) is 1.0 ppm.

[66 FR 19854, Apr. 18, 2001]

§ 556.350 Levamisole hydrochloride.

A tolerance of 0.1 part per million is established for negligible residues of levamisole hydrochloride in the edible tissues of cattle, sheep, and swine.

§ 556.360 Lincomycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of lincomycin is 25 micrograms per kilogram of body weight per day.

(b) *Chickens.* A tolerance for residues of lincomycin in chickens is not required.

(c) *Swine.* Tolerances for lincomycin of 0.6 part per million in liver and 0.1 part per million in muscle are established.

[64 FR 13342, Mar. 18, 1999]

§ 556.375 Maduramicin ammonium.

A tolerance is established for residues of maduramicin ammonium in chickens as follows:

(a) A tolerance for maduramicin ammonium (marker residue) in chickens is 0.38 parts per million in fat (target tissue). A tolerance refers to the concentration of marker residues in the target tissue used to monitor for total drug residues in the target animals.

(b) The safe concentrations for total maduramicin ammonium residues in uncooked edible chicken tissues are: 0.24 parts per million in muscle; 0.72 parts per million in liver; 0.48 parts per million in skin; and 0.48 parts per million in fat. A safe concentration refers to the total residue concentration considered safe in edible tissues.

[54 FR 5229, Feb. 2, 1989]

§ 556.380 Melengestrol acetate.

A tolerance of 25 parts per billion is established for residues of the parent compound, melengestrol acetate, in fat of cattle.

[59 FR 41241, Aug. 11, 1994]

§ 556.390 Methylparaben.

A tolerance of zero is established for residues of methylparaben in milk from dairy animals.

§ 556.400 Methylprednisolone.

A tolerance is established for negligible residues of methylprednisolone in milk at 10 parts per billion.

§ 556.410 Metoserpate hydrochloride.

A tolerance of 0.02 part per million is established for negligible residues of metoserpate hydrochloride (methyl-*o*-methyl-18-epireserpate hydrochloride) in uncooked edible tissues of chickens.

§ 556.420 Monensin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of monensin is 12.5 micrograms per kilogram of body weight per day.

(b) *Tolerances.* The tolerances for residues of monensin are:

(1)*Cattle*—(i) *Edible tissues.* 0.05 part per million (ppm).

(ii) *Milk.* Not required.

(2)*Goats*—(i) *Edible tissues.* 0.05 ppm.

(ii) [Reserved]

(3) *Chickens, turkeys, and quail.* A tolerance for residues of monensin in chickens, turkeys, and quail is not required.

(c) *Related conditions of use.* See §§ 520.1448 and 558.355 of this chapter.

[64 FR 5159, Feb. 3, 1999, as amended at 69 FR 68783, Nov. 26, 2004]

§ 556.425 Morantel tartrate.

A tolerance of 0.7 part per million is established for *N*-methyl-1,3-propanediamine (MAPA, marker residue) in the liver (target tissue) of cattle and goats. A tolerance for residues of morantel tartrate in milk is not required.

[59 FR 17922, Apr. 15, 1994]

§ 556.426 Moxidectin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of moxidectin is 4 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue*). The tolerance for parent moxidectin (the marker residue) is 200 parts per billion (ppb).

(ii) *Muscle.* The tolerance for parent moxidectin (the marker residue) is 50 ppb.

(iii) *Milk.* The tolerance for parent moxidectin (the marker residue in cattle milk) is 40 ppb.

(2) [Reserved]

[65 FR 36617, June 9, 2000, as amended at 65 FR 76930, Dec. 8, 2000]

§ 556.428 Narasin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of narasin is 5 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Chickens* (*abdominal fat*). The tolerance for parent narasin (the marker residue) is 480 parts per billion.

(2) [Reserved]

[66 FR 23589, May 9, 2001]

§ 556.430 Neomycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of neomycin is 6 micrograms per kilogram of body weight per day.

(b) *Tolerances.* Tolerances are established for residues of parent neomycin in uncooked edible tissues as follows:

(1) *Cattle, swine, sheep, and goats.* 7.2 parts per million (ppm) in kidney (target tissue) and fat, 3.6 ppm in liver, and 1.2 ppm in muscle.

(2) *Turkeys.* 7.2 ppm in skin with adhearing fat, 3.6 ppm in liver, and 1.2 ppm in muscle.

(3) *Milk.* A tolerance is established for residues of parent neomycin of 0.15 ppm.

[64 FR 31498, June 11, 1999]

§ 556.440 Nequinate.

A tolerance of 0.1 part per million is established for negligible residues of nequinate in the uncooked edible tissues of chickens.

§ 556.445 Nicarbazin.

A tolerance of 4 parts per million is established for residues of nicarbazin in uncooked chicken muscle, liver, skin, and kidney.

[42 FR 56729, Oct. 28, 1977]

§ 556.460 Novobiocin.

Tolerances for residues of novobiocin are established at 0.1 part per million in milk from dairy animals and 1 part per million in the uncooked edible tissues of cattle, chickens, turkeys, and ducks.

[47 FR 18590, Apr. 30, 1982]

§ 556.470 Nystatin.

A tolerance of zero is established for residues of nystatin in or on eggs and the uncooked edible tissues of swine and poultry.

§ 556.480 Oleandomycin.

Tolerances are established for negligible residues of oleandomycin in uncooked edible tissues of chickens, turkeys, and swine at 0.15 part per million.

§ 556.490 Ormetoprim.

(a) [Reserved]

(b) *Tolerances.* A tolerance of 0.1 part per million (ppm) is established for negligible residues of ormetoprim in uncooked edible tissues of chickens, turkeys, ducks, salmonids, catfish, and chukar partridges.

[64 FR 26672, May 17, 1999]

§ 556.495 Oxfendazole.

Cattle: A tolerance is established for total oxfendazole residues in edible cattle tissues based on a marker residue concentration of 0.8 part per million (ppm) fenbendazole in the target liver tissue. A fenbendazole concentration of 0.8 ppm in liver corresponds to a total safe concentration of oxfendazole residues of 1.7 ppm in liver. The safe concentrations of total oxfendazole residues in other uncooked edible cattle tissues are: muscle, 0.84 ppm; kidney, 2.5 ppm; and fat, 3.3 ppm. A tolerance refers to the concentration of marker residue in the target tissue selected to monitor for total drug residue in the target animal. A safe concentration is the total residue considered safe in edible tissue.

[55 FR 46943, Nov. 8, 1990]

§ 556.500 Oxytetracycline.

(a) *Acceptable daily intake (ADI).* The ADI for total tetracycline residues (chlortetracycline, oxytetracycline, and tetracycline) is 25 micrograms per kilogram of body weight per day.

(b) *Beef cattle, dairy cattle, calves, swine, sheep, chickens, turkeys, finfish, and lobster.* Tolerances are established for the sum of residues of the tetracyclines including chlortetracycline, oxytetracycline, and tetracycline, in tissues and milk as follows:

(1) 2 parts per million (ppm) in muscle.

(2) 6 ppm in liver.

(3) 12 ppm in fat and kidney.

(4) 0.3 ppm in milk.

[63 FR 57246, Oct. 27, 1998, as amended at 66 FR 46370, Sept. 5, 2001; 69 FR 6557, Feb. 11, 2004]

§ 556.510 Penicillin.

Tolerances are established for residues of penicillin and the salts of penicillin in food as follows:

(a) 0.05 part per million (negligible residue) in the uncooked edible tissues of cattle.

(b) Zero in the uncooked edible tissues of chickens, pheasants, quail, swine, and sheep; in eggs; and in milk or in any processed food in which such milk has been used.

(c) 0.01 part per million in the uncooked edible tissues of turkeys.

[40 FR 13942, Mar. 27, 1975, as amended at 43 FR 32749, July 28, 1978]

§ 556.513 Piperazine.

A tolerance of 0.1 part per million piperazine base is established for edible tissues of poultry and swine.

[64 FR 23019, Apr. 29, 1999]

§ 556.515 Pirlimycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of pirlimycin is 0.01 milligrams per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for parent pirlimycin (the marker residue) is 0.5 part per million (ppm).

(ii) *Muscle.* The tolerance for parent pirlimycin (the marker residue) is 0.3 ppm.

(iii) *Milk.* The tolerance for parent pirlimycin (the marker residue in cattle milk) is 0.4 ppm.

(2) [Reserved]

[65 FR 61091, Oct. 16, 2000]

§ 556.520 Prednisolone.

A tolerance of zero is established for residues of prednisolone in milk from dairy animals.

§ 556.530 Prednisone.

A tolerance of zero is established for residues of prednisone in milk from dairy animals.

§ 556.540 Progesterone.

No residues of progesterone are permitted in excess of the following increments above the concentrations of progesterone naturally present in untreated animals:

(a) In uncooked edible tissues of steers and calves:

(1) 3 parts per billion for muscle.

(2) 12 parts per billion for fat.

(3) 9 parts per billion for kidney.

(4) 6 parts per billion for liver.

(b) In uncooked edible tissues of lambs:

(1) 3 parts per billion for muscle.

(2) 15 parts per billion for fat, kidney, and liver.

[49 FR 13873, Apr. 9, 1984]

§ 556.550 Propylparaben.

A tolerance of zero is established for residues of propylparaben in milk from dairy animals.

§ 556.560 Pyrantel tartrate.

Tolerances are established for residues of pyrantel tartrate in edible tissues of swine as follows:

(a) 10 parts per million in liver and kidney.

(b) 1 part per million in muscle.

§ 556.570 Ractopamine.

(a) *Acceptable Daily Intake (ADI).* The ADI for total residues of ractopamine hydrochloride is 1.25 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for ractopamine hydrochloride (the marker residue) is 0.09 parts per million (ppm).

(ii) *Muscle.* The tolerance for ractopamine hydrochloride (the marker residue) is 0.03 ppm.

(2) *Swine*—(i) *Liver (the target tissue).* The tolerance for ractopamine hydrochloride (the marker residue) is 0.15 ppm.

(ii) *Muscle.* The tolerance for ractopamine hydrochloride (the marker residue) is 0.05 ppm.

[68 FR 54659, Sept. 18, 2003]

§ 556.580 Robenidine hydrochloride.

Tolerances are established for residues of robenidine hydrochloride in edible tissues of chickens as follows:

(a) 0.2 part per million in skin and fat.

(b) 0.1 part per million (negligible residue) in edible tissues other than skin and fat.

§ 556.590 Salicylic acid.

A tolerance of zero is established for residues of salicylic acid in milk from dairy animals.

§ 556.592 Salinomycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of salinomycin is 0.005 milligram per kilogram of body weight per day.

(b) [Reserved]

[65 FR 70791, Nov. 28, 2000]

§ 556.597 Semduramicin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of semduramicin is 180 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Broiler chickens.* Tolerances are established for residues of parent semduramicin in uncooked edible tissues of 400 parts per billion (ppb) in liver and 130 ppb in muscle.

(2) [Reserved]

[64 FR 48296, Sept. 3, 1999]

§ 556.600 Spectinomycin.

(a) *Acceptible daily intake (ADI).* The ADI for total residues of spectinomycin is 25 micrograms per kilogram of body weight per day.

(b) *Chickens and turkeys.* A tolerance of 0.1 part per million (ppm) for negligible residues of spectinomycin in uncooked edible tissues of chickens and turkeys is established.

(c) *Cattle.* A tolerance of 4 ppm for parent spectinomycin (marker residue) in kidney (target tissue) is established. A tolerance of 0.25 ppm for parent spectinomycin in cattle muscle is established.

[63 FR 24107, May 1, 1998; 63 FR 38304, July 16, 1998]

§ 556.610 Streptomycin.

Tolerances are established for residues of streptomycin in uncooked, edible tissues of chickens, swine, and calves of 2.0 parts per million (ppm) in kidney and 0.5 ppm in other tissues.

[58 FR 47211, Sept. 8, 1993]

§ 556.620 Sulfabromomethazine sodium.

Tolerances for residues of sulfabromomethazine sodium in food are established as follows:

(a) In the uncooked edible tissues of cattle at 0.1 part per million (negligible residue).

(b) In milk at 0.01 part per million (negligible residue).

[47 FR 30244, July 13, 1982]

§ 556.625 Sodium sulfachloropyrazine monohydrate.

A tolerance of zero is established for residues of sodium sulfachloropyrazine monohydrate in the uncooked edible tissues of chickens.

§ 556.630 Sulfachlorpyridazine.

A tolerance of 0.1 part per million is established for negligible residues of sulfachlorpyridazine in uncooked edible tissues of calves and swine.

§ 556.640 Sulfadimethoxine.

(a) [Reserved]

(b) *Tolerances.* (1) A tolerance of 0.1 part per million (ppm) is established for negligible residues of sulfadimethoxine in uncooked edible tissues of chickens, turkeys, cattle, ducks, salmonids, catfish, and chukar partridges.

(2) A tolerance of 0.01 ppm is established for negligible residues of sulfadimethoxine in milk.

[64 FR 26672, May 17, 1999]

§ 556.650 Sulfaethoxypyridazine.

Tolerances for residues of sulfaethoxypyridazine in food are established as follows:

(a) Zero in the uncooked edible tissues of swine and in milk.

(b) 0.1 part per million (negligible residue) in uncooked edible tissues of cattle.

§ 556.660 Sulfamerazine.

A tolerance of zero is established for residues of sulfamerazine (N^1-[4-methyl-2-pyrimidinyl]sulfanilamide) in the uncooked edible tissues of trout.

§ 556.670 Sulfamethazine.

A tolerance of 0.1 part per million is established for negligible residues of sulfamethazine in the uncooked edible tissues of chickens, turkeys, cattle, and swine.

[47 FR 25323, June 11, 1982]

§ 556.680 Sulfanitran.

A tolerance of zero is established for residues of sulfanitran (acetyl(*p*- nitrophenyl) sulfanilamide) and its metabolites in the uncooked edible tissues of chickens.

§ 556.685 Sulfaquinoxaline.

A tolerance of 0.1 part per million is established for negligible residues of sulfaquinoxaline in the uncooked edible tissues of chickens, turkeys, calves, and cattle.

[61 FR 24443, May 15, 1996]

§ 556.690 Sulfathiazole.

A tolerance of 0.1 part per million is established for negligible residues of sulfathiazole in the uncooked edible tissues of swine.

§ 556.700 Sulfomyxin.

A tolerance of zero is established for residues of sulfomyxin (N-sulfomethyl-

polymyxin B sodium salt) in uncooked edible tissues from chickens and turkeys.

§ 556.710 Testosterone propionate.

No residues of testosterone, resulting from the use of testosterone propionate, are permitted in excess of the following increments above the concentrations of testosterone naturally present in untreated animals:

(a) In uncooked edible tissues of heifers:

(1) 0.64 part per billion in muscle.

(2) 2.6 parts per billion in fat.

(3) 1.9 parts per billion in kidney.

(4) 1.3 parts per billion in liver.

(b) [Reserved]

[52 FR 27683, July 23, 1987]

§ 556.720 Tetracycline.

(a) *Acceptable daily intake (ADI).* The ADI for total tetracycline residues (chlortetracycline, oxytetracycline, and tetracycline) is 25 micrograms per kilogram of body weight per day.

(b) *Tolerances.* Tolerances are established for the sum of tetracycline residues in tissues of calves, swine, sheep, chickens, and turkeys, of 2 parts per million (ppm) in muscle, 6 ppm in liver, and 12 ppm in fat and kidney.

[63 FR 57246, Oct. 27, 1998]

§ 556.730 Thiabendazole.

Tolerances are established at 0.1 part per million for negligible residues of thiabendazole in uncooked edible tissues of cattle, goats, sheep, pheasants, and swine, and at 0.05 part per million for negligible residues in milk.

[40 FR 13942, Mar. 27, 1975, as amended at 49 FR 29958, July 25, 1984]

§ 556.735 Tilmicosin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of tilmicosin is 25 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Cattle*—(i) *Liver (the target tissue).* The tolerance for parent tilmicosin (the marker residue) is 1.2 parts per million (ppm).

(ii) *Muscle.* The tolerance for parent tilmicosin (the marker residue) is 0.1 ppm.

(2) *Swine*—(i) *Liver (the target tissue).* The tolerance for parent tilmicosin (the marker residue) is 7.5 ppm.

(ii) *Muscle.* The tolerance for parent tilmicosin (the marker residue) is 0.1 ppm.

(3) *Sheep*—(i) *Liver (the target tissue).* The tolerance for parent tilmicosin (the marker residue) is 1.2 ppm.

(ii) *Muscle.* The tolerance for parent tilmicosin (the marker residue) is 0.1 ppm.

[64 FR 13679, Mar. 22, 1999, as amended at 67 FR 72368, Dec. 5, 2002]

§ 556.738 Tiamulin.

A tolerance of 0.6 part per million is established for 8-*alpha*-hydroxymutilin (marker compound) in liver (target tissue) of swine.

[62 FR 12086, Mar. 14, 1997]

§ 556.739 Trenbolone.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of trenbolone is 0.4 microgram per kilogram of body weight per day.

(b) *Tolerances.* A tolerance for total trenbolone residues in uncooked edible tissues of cattle is not needed.

[64 FR 18574, Apr. 15, 1999]

§ 556.740 Tylosin.

Tolerances are established for residues of tylosin in edible products of animals as follows:

(a) In chickens and turkeys: 0.2 part per million (negligible residue) in uncooked fat, muscle, liver, and kidney.

(b) In cattle: 0.2 part per million (negligible residue) in uncooked fat, muscle, liver, and kidney.

(c) In swine: 0.2 part per million (negligible residue) in uncooked fat, muscle, liver, and kidney.

(d) In milk: 0.05 part per million (negligible residue).

(e) In eggs: 0.2 part per million (negligible residue).

§ 556.741 Tripelennamine.

A tolerance of 200 parts per billion (ppb) is established for residues of tripelennamine in uncooked edible tissues of cattle and 20 ppb in milk.

[62 FR 4164, Jan. 29, 1997]

§ 556.750 Virginiamycin.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of virginiamycin is 250 micrograms per kilogram of body weight per day.

(b) *Tolerances*—(1) *Swine.* Tolerances are established for residues of virginiamycin in uncooked edible tissues of 0.4 part per million (ppm) in kidney, skin, and fat, 0.3 ppm in liver, and 0.1 ppm in muscle.

(2) *Broiler chickens and cattle.* A tolerance for residues of virginiamycin is not required.

[64 FR 48296, Sept. 3, 1999]

§ 556.760 Zeranol.

(a) *Acceptable daily intake (ADI).* The ADI for total residues of zeranol is 0.00125 milligrams per kilogram of body weight per day.

(b) *Tolerances.* The tolerances for residues of zeranol in edible tissues are:

(1) *Cattle.* A tolerance is not needed.

(2) *Sheep.* 20 parts per billion.

(c) *Related conditions of use.* See § 522.2680 of this chapter.

[40 FR 13942, Mar. 27, 1975, as amended at 54 FR 31950, Aug. 3, 1989; 67 FR 6867, Feb. 14, 2002; 70 FR 15759, Mar. 29, 2005]

§ 556.770 Zoalene.

Tolerances are established for residues of zoalene (3,5-dinitro-*o*-toluamide) and its metabolite 3-amino-5-nitro-*o*-toluamide in food as follows:

(a) In edible tissues of chickens:

(1) 6 parts per million in uncooked liver and kidney.

(2) 3 parts per million in uncooked muscle tissue.

(3) 2 parts per million in uncooked fat.

(b) In edible tissues of turkeys: 3 parts per million in uncooked muscle tissue and liver.

PART 558—NEW ANIMAL DRUGS FOR USE IN ANIMAL FEEDS

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