

APPENDIX I. TISSUES REQUIRED FOR ANALYSIS, 2003 FSIS NATIONAL RESIDUE PROGRAM

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

Table A I
Tissues Required for Analysis
2003 FSIS National Residue Program

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

Key:

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

APPENDIX II. U.S. RESIDUE LIMITS FOR VETERINARY DRUGS AND UNAVOIDABLE CONTAMINANTS IN MEAT, POULTRY, AND EGG PRODUCTS

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

The tolerances and action levels for the various tissues in meat, poultry and egg products are listed alphabetically by compound in Table A II, *Residue Limits for Veterinary Drugs, and Unavoidable Contaminants*. These tolerances may be for the parent compound (the original chemical form of the compound given to the animal), or for the compound's metabolites (the chemical forms into which the compound is metabolized by the animal), or for a combination of parent plus metabolites. All tolerances are provided in units of parts per million (ppm) unless otherwise noted. Please note that this appendix has been generated for the convenience of the reader, and if any discrepancies arise between this appendix and the CFR, the values from the latter source should be used.

Table A II
Residue Limits for Veterinary Drugs, and Unavoidable Contaminants
2003 FSIS National Residue Program

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

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

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

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

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

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Cloxacillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.165
Colistimethate	Cattle Goats Hogs Horses Poultry ⁹ Sheep Eggs							21 CFR 556.167
Decoquinate	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs	2 2 2	1 1 1	2 1 2	2 1 2	2 2 2		21 CFR 556.170
Dichlorvos	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.180
Diclazuril	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs	1 ¹⁶	0.5		3			21 CFR 556.175
Dihydro-streptomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.5 0.5	0.5 0.5	0.5 0.5	0.5 0.5	2.0 2.0		21 CFR 556.200

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
3,5-Dinitrobenzamide	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.220
Doramectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.03		0.1 0.16			21 CFR 556.225
Enrofloxacin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.3		0.1 ¹³			21 CFR 556.228
Eprinomectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		4.8			21 CFR 556.227
Erythromycin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1 0.125 0.025	21 CFR 556.230
Estradiol benzoate and related esters ¹⁴	Cattle Goats Hogs Horses Poultry Sheep Eggs	480 600	120 120		240 600	360 600		21 CFR 556.240

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Ethopabate	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.5		1.5	1.5		21 CFR 556.260
Ethoxyquin	Cattle Goats Hogs Horses Poultry Sheep Eggs	5 5 5 5 3 5	0.5 0.5 0.5 0.5 0.5 0.5		3		0.5	21 CFR 172.140
Famphur	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.1	0.1	0.1				21 CFR 556.273
Fenbendazole	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.4 0.4 2 2		0.8 0.8 6 6			21 CFR 556.275
Fenprostalene	Cattle Goats Hogs Horses Poultry Sheep Eggs							21 CFR 556.277
Florfenicol	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.3		3.7			21 CFR 556.283

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Flunixin meglumine	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.025		0.125			21 CFR 556.286
Furazolidone	Cattle Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.290
Gentamicin sulfate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.4	0.1		0.3	0.4	0.1	21 CFR 556.300
Halofuginone hydrobromide	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.16,0.13			21 CFR 556.308
Haloxon	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.310
Hygromycin B	Cattle Goats Hogs Horses Poultry Sheep Eggs						0 0 0	21 CFR 556.330

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference	
Ivermectin	Cattle		0.01		0.01,			21 CFR 556.344	
	Goats				0.015 ¹⁵				
	Hogs		0.02						
	Horses				0.02				
	Poultry								
Sheep					0.03				
Eggs									
Lasalocid	Cattle	0.2 ¹⁶			0.7			21 CFR 556.347	
	Goats								
	Hogs								
	Horses					0.4			
	Poultry								
Sheep									
Eggs ⁹					0.7				
Rabbit									
Levamisole hydrochloride	Cattle						0.1	21 CFR 556.350	
	Goats						0.1		
	Hogs								
	Horses								
	Poultry								
Sheep									
Eggs							0.1		
Lincomycin	Cattle		0.1		0.6			21 CFR 556.360	
	Goats								
	Hogs								
	Horses								
	Poultry								
Sheep									
Eggs									
Maduramicin ammonium	Cattle	0.38						21 CFR 556.375	
	Goats								
	Hogs								
	Horses								
	Poultry								
Sheep									
Eggs									
Melengestrol acetate	Cattle	0.025						21 CFR 556.380	
	Goats								
	Hogs								
	Horses								
	Poultry								
Sheep									
Eggs									

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Metoserpate hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.02 ⁵	21 CFR 556.410
Monensin	Cattle Goats Hogs Horses Poultry ¹⁷ Sheep Eggs						0.05 0.05	21 CFR 556.420
Morantel tartrate ¹⁸	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.7 0.7			21 CFR 556.425
Moxidectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05		0.2			21 CFR 556.426
Narasin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.48						21 CFR 556.428
Neomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	7.2 7.2 7.2 7.2 7.2	1.2 1.2 1.2 1.2 1.2		3.6 3.6 3.6 3.6 3.6	7.2 7.2 7.2 7.2		21 CFR 556.430

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Nequinatate	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 ⁵	21 CFR 556.440
Nicarbazin	Cattle Goats Hogs Horses Poultry Sheep Eggs	4 ¹⁹	4		4	4		21 CFR 556.445
Novobiocin	Cattle Goats Hogs Horses Poultry Sheep Eggs						1 1	21 CFR 556.460
Nystatin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0					0 0	21 CFR 556.470
Oleandomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.15 0.15 ⁶	21 CFR 556.480
Ormetoprim	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.490

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Oxfendazole	Cattle ²⁰ Goats Hogs Horses Poultry Sheep Eggs				0.8			21 CFR 556.495
Oxytetracycline	Cattle Goats Hogs Horses Poultry ⁶ Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.500
PCB's ²¹	Cattle Goats Hogs Horses Poultry Sheep Eggs	3 3 3 3 3 3						21 CFR 109.30
Penicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.05 0 0 ²² ,.01 0	21 CFR 556.510
Pirlimycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.3			0.5			21 CFR 556.515
Progesterone	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.012 0.015	0.003 0.003		0.006 0.0015	0.009 0.015		21 CFR 556.540

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Pyrantel tartrate	Cattle Goats Hogs Horses Poultry Sheep Eggs		1		10	10		21 CFR 556.560
Ractopamine hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.05		0.15			21 CFR 556.570
Robenidine hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2					0.1 ⁵	21 CFR 556.580
Sarafloxacin	Cattle Goats Hogs Horses Poultry ^{5,9} Sheep Eggs							21 CFR 556.594
Spectinomycin	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs		0.25			4	0.1	21 CFR 556.600
Streptomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.5 0.5 0.5	0.5 0.5 0.5	0.5 0.5 0.5	0.5 0.5 0.5	2 2 2	0.5 0.5 0.5	21 CFR 556.610

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product(ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfabromomethazine sodium	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.620
Sulfachloropyrazine	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs						0	21 CFR 556.625
Sulfachlorpyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.630
Sulfadimethoxine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1	21 CFR 556.640
Sulfaethoxy-pyridazine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0	21 CFR 556.650
Sulfamethazine	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0.1 0.1 0.1	21 CFR 556.670

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfanitran	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs						0	21 CFR 556.680
Sulfaquinoxaline	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0.1 0.1	21 CFR 556.685
Sulfathiazole	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1	21 CFR 556.690
Sulfomyxin	Cattle Goats Hogs Horses Poultry ⁵ Sheep Eggs						0	21 CFR 556.700
Testosterone propionate	Cattle ²³ Goats Hogs Horses Poultry Sheep Eggs	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710
Tetracycline ¹¹	Cattle ²⁴ Goats Hogs Horses Poultry ⁶ Sheep Eggs	12 12 12 12	2 2 2 2		6 6 6 6	12 12 12 12		21 CFR 556.720

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Thiabendazole	Cattle Goats Hogs Horses Poultry ²⁵ Sheep Eggs						0.1 0.1 0.1 0.1	21 CFR 556.730
Tiamulin	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.6 ²⁶			21 CFR 556.738
Tilmicosin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		1.2 7.5			21 CFR 556.735
Trenbolone	Cattle ⁹ Goats Hogs Horses Poultry Sheep Eggs							21 CFR 556.739
Tripelennamine	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.2	21 CFR 556.741
Tylosin	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.2 0.2 0.2 ⁶	0.2 0.2		0.2 0.2	0.2 0.2		21 CFR 556.740

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

Compound	Species	Fat (ppm)	Meat (ppm)	Meat ¹ by-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Virginiamycin	Cattle ⁹ Goats Hogs Horses Poultry ⁹ Sheep Eggs	0.4	0.1		0.3	0.4		21 CFR 556.750
Zeranol	Cattle ⁹ Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.760
Zoalene ²⁷	Cattle Goats Hogs Horses Poultry Sheep Eggs	2 ¹²	3 ⁵		6 ¹² , 3 ²	6 ¹²		21 CFR 556.770

¹ Unless otherwise indicated meat by product includes liver and kidney

² Turkey only

³ Marker residue: albendazole 2-aminosulfone

⁴ Chicken, turkey and pheasants

⁵ Chicken and turkey

⁶ Whole egg

⁷ Egg yolk

⁸ Chicken, turkey, pheasants and quails

⁹ No tolerance required

¹⁰ Marker residue is desfuroylceftiofur

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

¹² Chicken only

¹³ Marker desethylene ciprofloxacin

¹⁴ Tolerance in parts per trillion

¹⁵ American bison and reindeer

¹⁶ Skin with adhering fat

¹⁷ Chicken, turkey, and quail

¹⁸ N-methyl-1,3-propanediamine

¹⁹ Skin

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

²⁰ Marker residue is fenbendazole

²¹ Action levels

²² Chicken, pheasants, and quail

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

²⁴ Calves

²⁵ Pheasants only

²⁶ Marker residue: 8-alpha-hydroxymutillin

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