

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

INTRODUCTION

This appendix provides information on the residue limits (tolerances) for veterinary drugs, food additives and unavoidable contaminants in meat, poultry, and egg products, as of March 9, 2001. These tolerances, which are set by the Food and Drug Administration (FDA), are applied by the Food Safety and Inspection Service (FSIS) in its regulatory programs. The official source of these tolerances is Title 21 of the Code of Federal Regulations (CFR): those for animal drugs are found in Title 21, Part 556 (21 CFR 556); those for food additives are found in 21 CFR 172.140; and those for unavoidable contaminants are found in 21 CFR 109.30. This appendix supplies the relevant citation for each tolerance.

FSIS does not permit concentrations of residues in meat and poultry that exceed the tolerances or action levels published in the CFR or the Federal Register. This appendix supplies the relevant citation for each tolerance and action level.

The tolerances and action levels in poultry, meat and egg products by production class are listed alphabetically by compound. 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.

Unless otherwise indicated, "meat by-products" include kidney and liver.

**Table AIV
Residue Limits for Veterinary Drugs Food Additives, and Unavoidable Contaminants**

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
2-Acetylamino-5-nitrothiazole	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 ¹	21 CFR 556.20
Aklomide	Cattle Goat Hogs Horse Poultry Sheep Eggs	3	4.5		4.5			21 CFR 556.30
Albendazole	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.05 0.05		0.2 0.25			21 CFR 556.34
Amoxicillin	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.01	21 CFR 556.38
Ampicillin	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.01 0.01	21 CFR 556.40
Amprolium	Cattle Goat Hogs Horse Poultry Sheep Eggs	2.0 4 ^w , 8 ^y	0.5 0.5		0.5 1 ^{6, 14}	0.5 1 ⁶		21 CFR 556.50

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Apramycin	Cattle					0.1		21 CFR 556.52
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								
Arsenic	Cattle		0.5	0.5	2	2		21 CFR 556.60
	Goat							
	Hogs		0.5	2				
	Horse							
	Poultry ⁶							
Sheep	0.5 ^w							
Eggs								
Bacitracin	Cattle						0.5	21 CFR 556.70
	Goat						0.5	
	Hogs						0.5 ^{3,6}	
	Horse							
	Poultry							
Sheep								
Eggs	0.5 ^w							
Buquinolate	Cattle		0.1		0.4	0.4		21 CFR 556.90
	Goat							
	Hogs							
	Horse	0.4						
	Poultry							
Sheep								
Eggs	0.5 ^y , 0.2 ^w							
Carbadox	Cattle				0.03			21 CFR 556.100
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								
Cephapirin	Cattle						0.1	21 CFR 556.115
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Chlorhexidine	Cattle						0	21 CFR 556.120
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Chlortetracycline ¹⁷	Cattle	12	2		6	12		21 CFR 556.150
	Goat							
	Hogs	12	2		6	12		
	Horse							
	Poultry	12	2		6	12		
	Sheep	12	2		6	12		
Eggs	0.4 ^w							
Clopidol	Cattle		0.2		1.5	3	0.2	21 CFR 556.160
	Goat		0.2		1.5	3		
	Hogs							
	Horse							
	Poultry		5		15	15 ⁶		
	Sheep		0.2		1.5	3		
Eggs								
Clorsulon	Cattle		0.1					21 CFR 556.163
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Cloxacillin	Cattle						0.01	21 CFR 556.165
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Colistimethate	Cattle							21 CFR 556.167
	Goat							
	Hogs							
	Horse							
	Poultry ⁴							
	Sheep							
Eggs								

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Decoquinatate	Cattle	2	1	2	2	2		21 CFR 556.170
	Goat	2	1	1	1	2		
	Hogs							
	Horse							
	Poultry ⁵	2	1	2	2	2		
	Sheep							
	Eggs							
Dichlorvos	Cattle						0.1	21 CFR 556.180
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
	Eggs							
Dihydro-streptomycin	Cattle	0.5	0.5	0.5	0.5	2.0		21 CFR 556.200
	Goat							
	Hogs	0.5	0.5	0.5	0.5	2.0		
	Horse							
	Poultry							
	Sheep							
	Eggs							
3,5-Dinitrobenzamide	Cattle							21 CFR 556.220
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep						0 ⁵	
	Eggs							
Doramectin	Cattle		0.03		0.1			21 CFR 556.225
	Goat							
	Hogs				0.16			
	Horse							
	Poultry							
	Sheep							
	Eggs							
Enrofloxacin	Cattle				0.1 ⁷			21 CFR 556.228
	Goat							
	Hogs							
	Horse							
	Poultry		0.3 ⁶					
	Sheep							
	Eggs							

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Eprinomectin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.1		4.8			21 CFR 556.227
Erythromycin	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.025 ^w					0.1 0.1 0.125 ⁶	21 CFR 556.230
Estradiol benzoate & related esters ⁸	Cattle Goat Hogs Horse Poultry Sheep Eggs	480 600	120 120		240 600	360 600		21 CFR 556.240
Ethopabate	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.5		1.5	1.5		21 CFR 556.260
Ethoxyquin	Cattle Goat Hogs Horse Poultry Sheep Eggs	5 5 5 5 3 5 0.5 ^w	0.5 0.5 0.5 0.5 0.5 0.5		3			21 CFR 172.140
Famphur	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.1	0.1	0.1				21 CFR 556.273

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Fenbendazole	Cattle Goat Hogs ⁹ Horse Poultry Sheep Eggs				0.8 0.8			21 CFR 556.275
Fenprostalene	Cattle ⁹ Goat Hogs Horse Poultry Sheep Eggs							21 CFR 556.277
Florfenicol	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.3		3.7			21 CFR 556.283
Flunixin meglumine	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.025		0.125			21 CFR 556.286
Furazolidone	Cattle Goat Hogs Horse Poultry Sheep Eggs						0	21 CFR 556.290
Gentamicin sulfate	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.4	0.1		0.3	0.4	0.1 ⁶	21 CFR 556.300

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Halofuginone hydrobromide	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.16 ⁵ , 0.13 ¹			21 CFR 556.308
Haloxon	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1	21 CFR 556.310
Hygromycin B	Cattle Goat Hogs Horse Poultry Sheep Eggs	0 ^w					0 0	21 CFR 556.330
Ivermectin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.01 0.02		0.1, 0.015 ^B 0.02 0.03			21 CFR 556.344
Lasalocid	Cattle Goat Hogs Horse Poultry Sheep ⁹ Eggs	0.3 ⁵			0.7 0.7 ^R			21 CFR 556.347
Levamisole hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1 0.1	21 CFR 556.350

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Lincomycin	Cattle Goat Hogs Horse Poultry ^{5,9} Sheep Eggs		0.1		0.6			21 CFR 556.360
Maduramicin ammonium	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.38 ⁵						21 CFR 556.375
Melengestrol acetate	Cattle Goat Hogs Horse Poultry Sheep Eggs	0.025						21 CFR 556.380
Metoserpate hydrochloride	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.02 ⁵	21 CFR 556.410
Monensin	Cattle Goat Hogs Horse Poultry ⁹ Sheep Eggs						0.05 0.05	21 CFR 556.420
Morantel tartrate	Cattle Goat Hogs Horse Poultry Sheep Eggs				0.7 ¹⁰ 0.7 ¹⁰			21 CFR 556.425

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Moxidectin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.05		0.2			21 CFR 556.426
Narasin	Cattle Goat Hogs Horse Poultry ^{5,9} Sheep Eggs							21 CFR 556.428
Neomycin	Cattle Goat Hogs Horse Poultry ¹ Sheep Eggs	7.2 7.2 7.2 7.2 ^{SF} 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 7.2		21 CFR 556.430
Nequinatate	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 ⁵	21 CFR 556.440
Nicarbazin	Cattle Goat Hogs Horse Poultry ⁵ Sheep Eggs	4	4		4	4		21 CFR 556.445
Novobiocin	Cattle Goat Hogs Horse Poultry Sheep Eggs						1 1	21 CFR 556.460

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Nystatin	Cattle	0					0	21 CFR 556.470
	Goat						0	
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Oleandomycin	Cattle						0.15	21 CFR 556.480
	Goat						0.15 ⁶	
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Ormetoprim	Cattle						0.1	21 CFR 556.490
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Oxfendazole	Cattle				0.8			21 CFR 556.495
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Oxytetracycline ¹⁷	Cattle	12	2		6	12		21 CFR 556.500
	Goat	12	2		6	12		
	Hogs	12	2		6	12		
	Horse	12	2		6	12		
	Poultry ⁶	12	2		6	12		
	Sheep	12	2		6	12		
Eggs								
PCB's	Cattle	3 ¹¹						21 CFR 109.30
	Goat	3 ¹¹						
	Hogs	3 ¹¹						
	Horse	3 ¹¹						
	Poultry	3 ¹¹						
	Sheep	3 ¹¹						
Eggs	3 ¹¹							

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Penicillin	Cattle						0.05	21 CFR 556.510
	Goat						0	
	Hogs						0 ^{3,5} , 0.01 ¹	
	Horse						0	
	Poultry							
	Sheep							
Eggs								
Pirlimycin	Cattle				0.5			21 CFR 556.515
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep							
Eggs								
Progesterone	Cattle	12 ¹⁶	3 ¹⁶		6 ¹⁶	9 ¹⁶		21 CFR 556.540
	Goat							
	Hogs							
	Horse							
	Poultry							
	Sheep	15 ¹⁶	3 ¹⁶		15 ¹⁶	15 ¹⁶		
Eggs								
Pyrantel tartrate	Cattle							21 CFR 556.560
	Goat							
	Hogs		1		10	10		
	Horse							
	Poultry							
	Sheep							
Eggs								
Robenidine hydrochloride	Cattle							21 CFR 556.580
	Goat							
	Hogs							
	Horse							
	Poultry	0.2 ^{5,SF}					0.1 ⁵	
	Sheep							
Eggs								
Sarafloxacin	Cattle							21 CFR 556.594
	Goat							
	Hogs							
	Horse							
	Poultry ^{6,9}							
	Sheep							
Eggs								

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Spectinomycin	Cattle Goat Hogs Horse Poultry Sheep Eggs		0.25			4	0.1 ⁶	21 CFR 556.600
Streptomycin	Cattle Goat Hogs Horse Poultry ⁵ 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
Sulfabromomethazine sodium	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1	21 CFR 556.620
Sulfachloropyrazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0 ⁵	21 CFR 556.625
Sulfachlorpyridazine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1	21 CFR 556.630
Sulfadimethoxine	Cattle Goat Hogs Horse Poultry Sheep Eggs						0.1 0.1	21 CFR 556.640

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Sulfaethoxy-pyridazine	Cattle						0.1	21 CFR 556.650
	Goat						0	
	Hogs							
	Horse							
	Poultry							
	Sheep							
Sulfamethazine	Cattle						0.1	21 CFR 556.670
	Goat						0.1	
	Hogs						0.1 ⁶	
	Horse							
	Poultry							
	Sheep							
Sulfanitran	Cattle							21 CFR 556.680
	Goat							
	Hogs							
	Horse						0 ⁵	
	Poultry							
	Sheep							
Sulfaquinoxaline	Cattle						0.1	21 CFR 556.685
	Goat							
	Hogs							
	Horse						0.1 ⁶	
	Poultry							
	Sheep							
Sulfathiazole	Cattle							21 CFR 556.690
	Goat						0.1	
	Hogs							
	Horse							
	Poultry							
	Sheep							
Sulfomyxin	Cattle							21 CFR 556.700
	Goat							
	Hogs							
	Horse						0 ⁶	
	Poultry							
	Sheep							

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Testosterone propionate	Cattle ¹²	0.0026	0.00064		0.0013	0.0019		21 CFR 556.710
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								
Tetracycline ¹⁷	Cattle ¹³	12	2		6	12		21 CFR 556.720
	Goat	12	2		6	12		
	Hogs	12	2		6	12		
	Horse	12	2		6	12		
	Poultry ⁶	12	2		6	12		
Sheep	12	2		6	12			
Eggs								
Thiabendazole	Cattle						0.1	21 CFR 556.730
	Goat						0.1	
	Hogs						0.1	
	Horse						0.1 ¹⁴	
	Poultry							
Sheep								
Eggs								
Tiamulin	Cattle				0.6 ¹⁵			21 CFR 556.738
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								
Tilmicosin	Cattle		0.1		1.2			21 CFR 556.735
	Goat				7.5			
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								
Trenbolone	Cattle ⁹							21 CFR 556.739
	Goat							
	Hogs							
	Horse							
	Poultry							
Sheep								
Eggs								

Table AIV - continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Tripeleennamine	Cattle						0.2	21 CFR 556.741
	Goat							
	Hogs							
	Horse							
	Poultry							
Tylosin	Sheep							21 CFR 556.740
	Eggs							
	Cattle	0.2	0.2		0.2	0.2		
	Goat							
	Hogs	0.2	0.2		0.2	0.2		
Virginiamycin	Horse							21 CFR 556.750
	Poultry ^{6,9}							
	Sheep							
	Eggs							
	Cattle ⁹	0.4	0.1		0.3	0.4		
Zeranol	Goat							21 CFR 556.760
	Hogs							
	Horse							
	Poultry							
	Sheep						0	
Zoalene	Eggs							21 CFR 556.770
	Cattle							
	Goat							
	Hogs							
	Horse							
Poultry	Sheep							21 CFR 556.770
	Eggs							
	Cattle	2 ⁵	3 ⁶		6 ⁵ , 3 ¹	6 ⁵		
	Goat							
	Hogs							

Footnotes:

1. Turkey
2. Marker residue: albendazole 2-aminosulfone
3. Pheasants and quail
4. No tolerance required
5. Chicken

Table AIV - *continued*
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants

6. Chicken and turkey
 7. Marker residue: desethylene ciprofloxacin
 8. Concentration in parts per trillion (ppt)
 9. No tolerance required
 10. Marker residue: N-methyl-1,3-propanediamine
 11. Action level
 12. Heifers; no residues are permitted at concentrations above these, which represent the levels naturally present in untreated animals
 13. Calves
 14. Pheasants
 15. Marker residue: 8-alpha-hydroxymutilin
 16. Concentration in parts per billion (ppb)
 17. Tolerances are for the sum of all approved tetracycline residues (i.e., tetracycline, chlortetracycline, and oxytetracycline)
- B: American bison
- S: Chicken skin
- SF: Skin with adhering fat
- R: Rabbit
- W: Whole egg
- Y: Egg yolk