

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

This appendix provides information on the residue limits (tolerances) for animal drugs, food additives, and unavoidable contaminants in meat, poultry, and egg products. These tolerances, which are set by the Food and Drug Administration, are applied by the Food Safety and Inspection Service 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; those for food additives are found in Title 21, Part 172, Section 172.140; and those for unavoidable contaminants are found in, Title 21 Part 109, Section 109.30. This appendix supplies the relevant citation for each tolerance and action level.

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

The tolerances and action levels in poultry, livestock and egg products 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 or FR, the values from the latter two sources should be used.

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

Table A IV
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
2002 FSIS National Residue Program

Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat¹ 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		0.2			21 CFR 556.34
Altrenogest	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.001		0.004			21 CFR 556.36
Amoxicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.38
Ampicillin	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.01	21 CFR 556.40
Amprolium	Cattle Goats Hogs Horses Poultry Sheep Eggs	2.0	0.5		0.5	0.5		21 CFR 556.50
			0.5 ⁴		1 ⁴	1 ⁵	4 ⁶ , 8 ⁷	

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	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 ⁶	21 CFR 556.70
Bambermycin	Cattle ⁹ Goats Hogs ⁹ Horses Poultry ⁹ Sheep Eggs							
Buquinolate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.4	0.1		0.4	0.4	0.5 ⁶ , ²⁷	21 CFR 556.90
Carbadox ³⁰	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.03			21 CFR 556.100
Ceftiofur ¹⁰	Cattle Goats Hogs Horses Poultry Sheep Eggs		166		2	8		21 CFR 556.113

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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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	12	2		6	12		21 CFR 556.150
	Goats							
	Hogs	12	2		6	12		
	Horses							
	Poultry	12	2		6	12		
Sheep	12	2		6	12			
Eggs						0.4		
Clopidol ⁵	Cattle		0.2		1.5	3		21 CFR 556.160
	Goats		0.2		1.5	3		
	Hogs						0.2	
	Horses		5		15	15		
	Poultry		0.2		1.5	3		
Sheep								
Eggs								
Clorsulon	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		1			21 CFR 556.163
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

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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Danofloxacin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.2		0.2			21 CFR 556.169
Decoquinatate	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
Dihydrostreptomycin	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
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 ²⁹		0.1 ²⁹ 0.16			21 CFR 556.225

Table A IV - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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 ²⁸ Goats Hogs Horses Poultry Sheep Eggs	480 ¹⁴ 600 ¹⁴	120 ¹⁴ 120 ¹⁴		240 ¹⁴ 600 ¹⁴	360 ¹⁴ 600 ¹⁴		21 CFR 556.240
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

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Fenbendazole	Cattle		0.4		0.8			21 CFR 556.275
	Goats		0.4		0.8			
	Hogs		2		6			
	Horses							
	Poultry			2		6		
	Sheep							
Eggs								
Fenprostalene	Cattle							21 CFR 556.277
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Florfenicol ³⁰	Cattle		0.3		3.7			21 CFR 556.283
	Goats							
	Hogs		0.2		2.5			
	Horses							
	Poultry							
	Sheep							
Eggs								
Flunixin meglumine	Cattle ²⁹		0.025		0.125			21 CFR 556.286
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Furazolidone	Cattle						0	21 CFR 556.290
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Gentamicin sulfate	Cattle	0.4	0.1		0.3	0.4	0.1	21 CFR 556.300
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								
Halofuginone hydrobromide	Cattle				0.16,0.13			21 CFR 556.308
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep							
Eggs								

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
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
Ivermectin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.01 0.02		0.01, 0.015 ¹⁵ 0.02 0.03			21 CFR 556.344
Lasalocid	Cattle Goats Hogs Horses Poultry Sheep Eggs ⁹ Rabbit	0.2 ¹⁶			0.7 0.4 0.7			21 CFR 556.347
Levamisole hydrochloride	Cattle Goats Hogs Horses Poultry Sheep Eggs						0.1 0.1 0.1	21 CFR 556.350
Lincomycin	Cattle Goats Hogs Horses Poultry Sheep Eggs		0.1		0.6			21 CFR 556.360

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Maduramicin ammonium	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.38						21 CFR 556.375
Melengestrol acetate	Cattle Goats Hogs Horses Poultry Sheep Eggs	0.025						21 CFR 556.380
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

Table A IV - Continued
Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Neomycin	Cattle ²⁷	7.2	1.2		3.6	7.2		21 CFR 556.430
	Goats	7.2	1.2		3.6	7.2		
	Hogs	7.2	1.2		3.6	7.2		
	Horses							
	Poultry ²	7.2 ¹⁶	1.2		3.6			
	Sheep	7.2	1.2		3.6	7.2		
Eggs								
Nequinatate	Cattle							21 CFR 556.440
	Goats							
	Hogs							
	Horses							
	Poultry						0.1 ⁵	
	Sheep							
Eggs								
Nicarbazine	Cattle							21 CFR 556.445
	Goats							
	Hogs							
	Horses							
	Poultry ¹²	4 ¹⁹	4		4	4		
	Sheep							
Eggs								
Novobiocin	Cattle						1	21 CFR 556.460
	Goats							
	Hogs							
	Horses							
	Poultry						1	
	Sheep							
Eggs								
Nystatin	Cattle							21 CFR 556.470
	Goats							
	Hogs						0	
	Horses							
	Poultry						0	
	Sheep							
Eggs	0							
Oleandomycin	Cattle							21 CFR 556.480
	Goats							
	Hogs						0.15	
	Horses							
	Poultry						0.15 ⁶	
	Sheep							
Eggs								
Ormetoprim	Cattle							21 CFR 556.490
	Goats							
	Hogs							
	Horses							
	Poultry							
	Sheep						0.1	
Eggs								

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Compound	Production Class	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
PBB's	Cattle Goats Hogs Horses Poultry Sheep Eggs							FDA revoked, effective January 5, 1987, all action levels in meat and poultry
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 ² 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

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	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		0.03 0.05		0.09 0.15			21 CFR 556.570
Robenidine hydrochloride	Cattle Goats Hogs Horses Poultry ¹² Sheep Eggs	0.2 ¹⁶					0.1 ⁵	21 CFR 556.580
Sarafloxacin	Cattle Goats Hogs Horses Poultry ^{5,9} Sheep Eggs							21 CFR 556.594
Spectinomycin	Cattle ²⁷ 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

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	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

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Compound	Production Class	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 ²² Goats Hogs Horses Poultry Sheep Eggs	0.0026	0.0006 4		0.0013	0.0019		21 CFR 556.710
Tetracycline ¹¹	Cattle ²³ 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
Thiabendazole	Cattle Goats Hogs Horses Poultry ²⁴ Sheep Eggs						0.1 0.1 0.1 0.1	21 CFR 556.730

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Residue Limits for Veterinary Drugs, Food Additives, and Unavoidable Contaminants
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Tiamulin	Cattle Goats Hogs Horses Poultry Sheep Eggs				0.6 ²⁵			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
Virginiamycin	Cattle ⁹ Goats Hogs Horses Poultry ⁹ Sheep Eggs	0.4	0.1		0.3	0.4		21 CFR 556.750
Zeranol	Cattle ^{9,27} Goats Hogs Horses Poultry Sheep Eggs						0	21 CFR 556.760

Table A IV - Continued
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Compound	Production Class	Fat (ppm)	Meat (ppm)	Meat ¹ By-product (ppm)	Liver (ppm)	Kidney (ppm)	Edible Tissue (ppm)	Reference
Zoalene ²⁶	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 quails

¹⁸ N-methyl-1,3-propanediamine

¹⁹ Skin

²⁰ Marker residue is fenbendazole

²¹ Action levels

²² Heifers; no residues are permitted at concentrations above these, which represent the levels naturally present in untreated animals

²³ Calves

²⁴ Pheasants only

²⁵ Marker residue is 8-alpha-hydroxymutilin

²⁶ Tolerances are established for residues of zoalene (3,5-dinitro-o- toluamide) and its metabolite 3-amino-5-nitro-o-toluamide

²⁷ For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance

²⁸ For use in heifers, steers, and calves. Do not use in calves intended for reproduction or calves less than 30 days old. Do not use in calves to be processed for veal. For bob veal, formula fed veal, and non-formula fed veal there is a zero tolerance.

²⁹ For diary cows, bob veal, formula fed veal and non-formula fed veal the tolerance is zero.

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³⁰ Marker residue is quinoxaline-2carboxylic acid

³¹ Marker residue is florphenicol amine