CODEX ALIMENTARIUS
INTERNATIONAL FOOD STANDARDS

Food and Agriculture Organization of the United Nations
World Health Organization

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MAXIMUM RESIDUE LIMITS (MRLs) AND RISK MANAGEMENT RECOMMENDATIONS (RMRs) FOR RESIDUES OF VETERINARY DRUGS IN FOODS

CAC/MRL 2-2015

Updated as at the 38th Session of the Codex Alimentarius Commission (July 2015)

Maximum Residue Limits (MRL)

Abamectin
Albendazole
Amoxicillin
Avylamycin
Azaperone
Benzylpenicillin/Procaine benzylpenicillin
Carazolol
Ceftiofur
Chlortetracycline/Oxytetracycline/Tetracycline
Clenbuterol
Closantel
Colistin
Cyfluthrin
Cyhalothrin
Cypermethrin and alpha-cypermethrin
Danofloxacin
Deltamethrin
Derquantel
Dexamethasone
Diclazuril
Dicyclanil
Dihydrostreptomycin/Streptomycin
Diminazene
Doramectin
Emamectin benzoate
Eprinomectin
Erythromycin
Estradiol-17beta
Febantel/Fenbendazole/Oxfendazole
Fluazuron
Flubendazole
Flumequine
Gentamicin
Imidocarb
Isometamidium
Ivermectin
Levamisole
Lincomycin
Melengestrol acetate
Monensin
Monepantel
Moxidectin
Narasin
Neomycin
Nicarbazin
Phoxim
Pirlimycin
Porcine somatotropin
Progesterone
Ractopamine
Sarafloxacin
Spectinomycin
Spiramycin
Sulfadimidine
Testosterone
Thiabendazole
Tilmicosin
Trenbolone acetate
Trichlorfon (Metrifonate)
Triclabendazole
Tylosin
Zeranol

Risk Management Recommendations (RMR) for Residues of Veterinary Drugs

Carbadox
Chloramphenicol
Chloropromazine
Dimetridazole
Furazolidone
Ipronidazole
Malachite Green
Metronidazole
Nitrofural
Olaquindox
Ronidazole
Stilbens

MAXIMUM RESIDUE LIMITS (MRLs) FOR RESIDUES OF VETERINARY DRUGS IN FOODS

ABAMECTIN (anthelmintic agent)

JECFA Evaluation: 45 (1995); 47 (1996)

Acceptable Daily Intake : 0-2 µg/kg body weight (1997) Established for the sum of abamectin and (Z)-8,9 isomer by the 1997 JMPR.

Residue Definition: Avermectin B1a.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Liver	100	26th (2003)	
Cattle	Kidney	50	26th (2003)	
Cattle	Fat	100	26th (2003)	

ALBENDAZOLE (anthelmintic agent)

JECFA Evaluation: 34 (1989)

Acceptable Daily Intake: 0-50 µg/kg body weight (34th JECFA, 1989).

Residue Definition: Except milk, 2-aminosulfone metabolite; Milk, not yet identified.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Not specified	Muscle	100	20th (1993)	
Not specified	Liver	5000	20th (1993)	
Not specified	Kidney	5000	20th (1993)	
Not specified	Fat	100	20th (1993)	
Not specified	Milk (µg/l)	100	20th (1993)	

AMOXICILLIN (antimicrobial agent)

JECFA Evaluation: 75 (2011)

Acceptable Daily Intake: 0-0.07 µg/kg body weight on the basis of microbiological effects (75th JECFA, 2011).

Estimated Dietary Exposure The 75th JECFA (2001) did not calculate an EDI for amoxicillin owing to the small number of quantifiable residue data points. Using the model diet of 300 g muscle, 100 g live, 50 g kidney, 50 g fat and 1.5 liter of milk with the MRLs recommended, the theoretical maximum daily intake (TMDI) is 31 µg/person, which represents 74% of the upper bound of the ADI.

Residue Definition: Amoxicillin

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	50	35th (2012)	
Cattle	Liver	50	35th (2012)	
Cattle	Kidney	50	35th (2012)	
Cattle	Fat	50	35th (2012)	
Cattle	Milk	4	35th (2012)	
Sheep	Muscle	50	35th (2012)	
Sheep	Liver	50	35th (2012)	
Sheep	Kidney	50	35th (2012)	
Sheep	Fat	50	35th (2012)	
Sheep	Milk	4	35th (2012)	
Pigs	Muscle	50	35th (2012)	
Pigs	Liver	50	35th (2012)	
Pigs	Kidney	50	35th (2012)	
Pigs	Fat/Skin	50	35th (2012)	

AVILAMYCIN (antimicrobial agent)

JECFA Evaluation: 70 (2008)

Acceptable Daily Intake: 0-2 mg/kg body weight on the basis of a NOAEL of 150 mg avilamycin activity/kg body weight per day and a safety factor of 100 and rounding to one significant figure (70th JECFA, 2008).

Residue Definition: Dichloroisoeverninic acid (DIA).

Species	Tissue	MRL (µg/kg)	CAC	Notes
Pigs	Muscle	200	32nd (2009)	
Pigs	Liver	300	32nd (2009)	
Pigs	Kidney	200	32nd (2009)	
Pigs	Fat/Skin	200	32nd (2009)	
Chicken	Muscle	200	32nd (2009)	
Chicken	Liver	300	32nd (2009)	
Chicken	Kidney	200	32nd (2009)	
Chicken	Fat/Skin	200	32nd (2009)	
Turkey	Muscle	200	32nd (2009)	
Turkey	Liver	300	32nd (2009)	
Turkey	Kidney	200	32nd (2009)	
Turkey	Fat/Skin	200	32nd (2009)	
Rabbits	Muscle	200	32nd (2009)	
Rabbits	Liver	300	32nd (2009)	
Rabbits	Kidney	200	32nd (2009)	
Rabbits	Fat/Skin	200	32nd (2009)	

AZAPERONE (tranquilizing agent)

JECFA Evaluation: 38 (1991); 43 (1994); 50 (1998); 52 (1999)

Acceptable Daily Intake: 0-6 µg/kg body weight (50th JECFA, 1998).

Residue Definition: Sum of azaperone and azaperol.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	60	23rd (1999)	
Pig	Liver	100	23rd (1999)	
Pig	Kidney	100	23rd (1999)	
Pig	Fat	60	23rd (1999)	

BENZYLPENICILLIN/PROCAINE BENZYLPENICILLIN (antimicrobial agent)

JECFA Evaluation: 36 (1990); 50 (1998)

Acceptable Daily Intake: 30 µg-penicillin/person/day (50th JECFA, 1998). Residues of benzylpenicillin and procaine benzylpenicillin should be kept below this level.

Residue Definition: Benzylpenicillin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	50	23rd (1999)	
Cattle	Liver	50	23rd (1999)	
Cattle	Kidney	50	23rd (1999)	
Cattle	Milk (µg/l)	4	23rd (1999)	
Chicken	Muscle	50	23rd (1999)	Applies to procaine benzylpenicillin only.
Chicken	Liver	50	23rd (1999)	Applies to procaine benzylpenicillin only.
Chicken	Kidney	50	23rd (1999)	Applies to procaine benzylpenicillin only.
Pig	Muscle	50	23rd (1999)	
Pig	Liver	50	23rd (1999)	
Pig	Kidney	50	23rd (1999)	

CARAZOLOL (beta-adreniceptor-blocking agent)

JECFA Evaluation: 38 (1991); 43 (1994); 52 (1999)

Acceptable Daily Intake: 0-0.1 µg/kg body weight (43rd JECFA, 1994). ADI based on the acute pharmacological effects of carazolol.

Residue Definition: Carazolol**.**

Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	5	26th (2003)	The concentration at the injection site two hours after treatment may result in an intake that exceeds the acute RfD and therefore, an appropriate withdrawal period should be applied.
Pig	Liver	25	26th (2003)	
Pig	Kidney	25	26th (2003)	
Pig	Fat/Skin	5	26th (2003)	The concentration at the injection site two hours after treatment may result in an intake that exceeds the acute RfD and therefore, an appropriate withdrawal period should be applied.

CEFTIOFUR (antimicrobial agent)

JECFA Evaluation: 45 (1995); 48 (1997)

Acceptable Daily Intake: 0-50 µg/kg body weight (45th JECFA, 1995).

Residue Definition: Desfuroylceftiofur.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1000	23rd (1999)	
Cattle	Liver	2000	23rd (1999)	
Cattle	Kidney	6000	23rd (1999)	
Cattle	Fat	2000	23rd (1999)	
Cattle	Milk (µg/l)	100	23rd (1999)	
Pig	Muscle	1000	23rd (1999)	
Pig	Liver	2000	23rd (1999)	
Pig	Kidney	6000	23rd (1999)	
Pig	Fat	2000	23rd (1999)	

CHLORTETRACYCLINE/OXYTETRACYCLINE/TETRACYCLINE (antimicrobial agent)

JECFA Evaluation: 45 (1995); 47 (1996); 50 (1998); 58 (2002)

Acceptable Daily Intake: 0-30 µg/kg body weight (50th JECFA, 1998). Group ADI for chlortetracycline, oxytetracycline and tetracycline.

Residue Definition: Parent drugs, singly or in combination.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	26th (2003)	
Cattle	Liver	600	26th (2003)	
Cattle	Kidney	1200	26th (2003)	
Cattle	Milk (µg/l)	100	26th (2003)	
Fish	Muscle	200	26th (2003)	Applies only to oxytetracycline.
Giant prawn (*Paeneus monodon*)	Muscle	200	26th (2003)	Applies only to oxytetracycline.
Pig	Muscle	200	26th (2003)	
Pig	Liver	600	26th (2003)	
Pig	Kidney	1200	26th (2003)	
Poultry	Muscle	200	26th (2003)	
Poultry	Liver	600	26th (2003)	
Poultry	Kidney	1200	26th (2003)	
Poultry	Eggs	400	26th (2003)	
Sheep	Muscle	200	26th (2003)	
Sheep	Liver	600	26th (2003)	
Sheep	Kidney	1200	26th (2003)	
Sheep	Milk (µg/l)	100	26th (2003)	

CLENBUTEROL (adrenoceptor agonist)

JECFA Evaluation: 47 (1996)

Acceptable Daily Intake: 0-0.004 µg/kg body weight (47th JECFA, 1996).

Residue Definition: Clenbuterol.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	0.2	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Cattle	Liver	0.6	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Cattle	Kidney	0.6	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Cattle	Fat	0.2	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Cattle	Milk (µg/l)	0.05	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Horse	Muscle	0.2	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Horse	Liver	0.6	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Horse	Kidney	0.6	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.
Horse	Fat	0.2	26th (2003)	Due to the potential abuse of this drug, the MRLs are recommended only when associated with a nationally approved therapeutic use, such as tocolysis or as an adjunt therapy in respiratory diseases.

CLOSANTEL (anthelmintic agent)

JECFA Evaluation: 36 (1990); 40 (1992)

Acceptable Daily Intake: 0-30 µg/kg body weight (40th JECFA, 1992).

Residue Definition: Closantel.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1000	20th (1993)	
Cattle	Liver	1000	20th (1993)	
Cattle	Kidney	3000	20th (1993)	
Cattle	Fat	3000	20th (1993)	
Sheep	Muscle	1500	20th (1993)	
Sheep	Liver	1500	20th (1993)	
Sheep	Kidney	5000	20th (1993)	
Sheep	Fat	2000	20th (1993)	

COLISTIN (antimicrobial agent)

JECFA Evaluation: 66 (2006)

Acceptable Daily Intake: 0-7 µg/kg body weight (66th JECFA, 2006).

Residue Definition: Sum of colistin A and colistin B.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	150	31st (2008)	
Cattle	Liver	150	31st (2008)	
Cattle	Kidney	200	31st (2008)	
Cattle	Fat	150	31st (2008)	
Cattle	Milk	50	31st (2008)	
Sheep	Muscle	150	31st (2008)	
Sheep	Liver	150	31st (2008)	
Sheep	Kidney	200	31st (2008)	
Sheep	Fat	150	31st (2008)	
Sheep	Milk	50	31st (2008)	
Goat	Muscle	150	31st (2008)	
Goat	Liver	150	31st (2008)	
Goat	Kidney	200	31st (2008)	
Goat	Fat	150	31st (2008)	
Pig	Muscle	150	31st (2008)	
Pig	Liver	150	31st (2008)	
Pig	Kidney	200	31st (2008)	
Pig	Fat	150	31st (2008)	The MRL includes skin + fat
Chicken	Muscle	150	31st (2008)	
Chicken	Liver	150	31st (2008)	
Chicken	Kidney	200	31st (2008)	
Chicken	Fat	150	31st (2008)	The MRL includes skin + fat
Chicken	Eggs	300	31st (2008)	
Turkey	Muscle	150	31st (2008)	
Turkey	Liver	150	31st (2008)	
Turkey	Kidney	200	31st (2008)	
Turkey	Fat	150	31st (2008)	The MRL includes skin + fat
Rabbit	Muscle	150	31st (2008)	
Rabbit	Liver	150	31st (2008)	
Rabbit	Kidney	200	31st (2008)	
Rabbit	Fat	150	31st (2008)	

CYFLUTHRIN (insecticide)

JECFA Evaluation: 48 (1997)
Acceptable Daily Intake: 0-20 µg/kg body weight (48th JECFA, 1997).
Residue Definition: Cyfluthrin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	26th (2003)	
Cattle	Liver	20	26th (2003)	
Cattle	Kidney	20	26th (2003)	
Cattle	Fat	200	26th (2003)	
Cattle	Milk (µg/l)	40	26th (2003)	

CYHALOTHRIN (insecticide)

JECFA Evaluation: 54 (2000); 58 (2002); 62 (2004)
Acceptable Daily Intake: 0-5 µg/kg body weight (62nd JECFA, 2004).
Residue Definition: Cyhalothrin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	28th (2005)	
Cattle	Liver	20	28th (2005)	
Cattle	Kidney	20	28th (2005)	
Cattle	Fat	400	28th (2005)	
Cattle	Milk	30	28th (2005)	
Pig	Muscle	20	28th (2005)	
Pig	Liver	20	28th (2005)	
Pig	Kidney	20	28th (2005)	
Pig	Fat	400	28th (2005)	
Sheep	Muscle	20	28th (2005)	
Sheep	Liver	50	28th (2005)	
Sheep	Kidney	20	28th (2005)	
Sheep	Fat	400	28th (2005)	

CYPERMETHRIN AND ALPHA-CYPERMETHRIN (insecticide)

JECFA Evaluation: 62 (2004)

Acceptable Daily Intake: JECFA established a common ADI of 0-20 µg/kg bw for both cypermethrin and alpha-cypermethrin (62nd JECFA, 2004)..

Residue Definition: Total of cypermethrin residues (resulting from the use of cypermethrin or alpha-cypermethrin as veterinary drugs).

Species	Tissue	MRLs(µg/kg)	CAC	Note
Cattle	Muscle	50	29th (2006)	
Cattle	Liver	50	29th (2006)	
Cattle	Kidney	50	29th (2006)	
Cattle	Fat	1000	29th (2006)	
Cattle	Milk	100	29th (2006)	
Sheep	Muscle	50	29th (2006)	
Sheep	Liver	50	29th (2006)	
Sheep	Kidney	50	29th (2006)	
Sheep	Fat	1000	29th (2006)	

DANOFLOXACIN (antimicrobial agent)

JECFA Evaluation: 48 (1997)

Acceptable Daily Intake: 0-20 µg/kg body weight (48th JECFA, 1997).

Residue Definition: Danofloxacin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	24th (2001)	
Cattle	Liver	400	24th (2001)	
Cattle	Kidney	400	24th (2001)	
Cattle	Fat	100	24th (2001)	
Chicken	Muscle	200	24th (2001)	
Chicken	Liver	400	24th (2001)	
Chicken	Kidney	400	24th (2001)	
Chicken	Fat	100	24th (2001)	Fat/skin in normal proportion.
Pig	Muscle	100	24th (2001)	
Pig	Liver	50	24th (2001)	
Pig	Kidney	200	24th (2001)	
Pig	Fat	100	24th (2001)	

DELTAMETHRIN (insecticide)

JECFA Evaluation: 52 (1999); 60 (2003)

Acceptable Daily Intake: 0-10 µg/kg body weight (1982). Established by the 1982 JMPR.

Residue Definition: Deltamethrin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	30	26th (2003)	
Cattle	Liver	50	26th (2003)	
Cattle	Kidney	50	26th (2003)	
Cattle	Fat	500	26th (2003)	
Cattle	Milk	30	26th (2003)	
Chicken	Muscle	30	26th (2003)	
Chicken	Liver	50	26th (2003)	
Chicken	Kidney	50	26th (2003)	
Chicken	Fat	500	26th (2003)	
Chicken	Eggs	30	26th (2003)	
Salmon	Muscle	30	26th (2003)	
Sheep	Muscle	30	26th (2003)	
Sheep	Liver	50	26th (2003)	
Sheep	Kidney	50	26th (2003)	
Sheep	Fat	500	26th (2003)	

DERQUANTEL (anthelmintic agent)

JECFA Evaluation: 75 (2011); 78 (2013)

Acceptable Daily Intake: 0-0.3 µg/kg body weight on the basis of a lowest-observed-adverse-effect level (LOAEL) of 0.1 mg/kg body weight per day for acute clinical observations in dogs, consistent with antagonistic activity on the nicotinic acetylcholine receptors. A safety factor of 300 was applied to the LOAEL (75th JECFA, 2011).

Estimated Dietary Exposure: There were insufficient data to calculate an EDI, and the TMDI approach was used. Using the model diet and the MT:TR approach, these MRLs result in an estimated dietary exposure of 6.8 µg/person, which represents approximately 38% of the upper bound of the ADI (78th JECFA, 2013).

Residue Definition: Derquantel.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	0.3	38th (2015)	
Sheep	Liver	0.8	38th (2015)	
Sheep	Kidney	0.4	38th (2015)	
Sheep	Fat	7.0	38th (2015)	

DEXAMETHASONE (glucocorticosteroid)

JECFA Evaluation: 70 (2008)
Acceptable Daily Intake: 0-0.015 µg/kg body weight (42nd JECFA, 1995).
Residue Definition: Dexamethasone.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1.0	32nd (2009)	
Cattle	Liver	2.0	32nd (2009)	
Cattle	Kidney	1.0	32nd (2009)	
Cattle	Milk (µg/l)	0.3	32nd (2009)	
Pig	Muscle	1.0	32nd (2009)	
Pig	Liver	2.0	32nd (2009)	
Pig	Kidney	1.0	32nd (2009)	
Horses	Muscle	1.0	32nd (2009)	
Horses	Liver	2.0	32nd (2009)	
Horses	Kidney	1.0	32nd (2009)	

DICLAZURIL (antiprotozoal agent)

JECFA Evaluation: 45 (1995); 50 (1998)
Acceptable Daily Intake: 0-30 µg/kg body weight (50th JECFA, 1998).
Residue Definition: Diclazuril.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Poultry	Muscle	500	23rd (1999)	
Poultry	Liver	3000	23rd (1999)	
Poultry	Kidney	2000	23rd (1999)	
Poultry	Fat/Skin	1000	23rd (1999)	
Rabbit	Muscle	500	23rd (1999)	
Rabbit	Liver	3000	23rd (1999)	
Rabbit	Kidney	2000	23rd (1999)	
Rabbit	Fat	1000	23rd (1999)	
Sheep	Muscle	500	23rd (1999)	
Sheep	Liver	3000	23rd (1999)	
Sheep	Kidney	2000	23rd (1999)	
Sheep	Fat	1000	23rd (1999)	

DICYCLANIL (insecticide)

JECFA Evaluation: 54 (2000); 60 (2003)

Acceptable Daily Intake: 0-7 µg/kg body weigh (54th JECFA, 2000).

Residue Definition: Dicyclanil.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	150	28th (2005)	
Sheep	Liver	125	28th (2005)	
Sheep	Kidney	125	28th (2005)	
Sheep	Fat	200	28th (2005)	

DIHYDROSTREPTOMYCIN/STREPTOMYCIN (antimicrobial agent)

JECFA Evaluation: 43 (1994); 48 (1997); 52 (1999); 58 (2002)

Acceptable Daily Intake: 0-50 µg/kg body weight (48th JECFA, 1997). Group ADI for combined residues of dihydrostreptomycin and streptomycin.

Residue Definition: Sum of dihydrostreptomycin and streptomycin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	600	24th (2001)	
Cattle	Liver	600	24th (2001)	
Cattle	Kidney	1000	24th (2001)	
Cattle	Fat	600	24th (2001)	
Cattle	Milk	200	26th (2003)	
Chicken	Muscle	600	24th (2001)	
Chicken	Liver	600	24th (2001)	
Chicken	Kidney	1000	24th (2001)	
Chicken	Fat	600	24th (2001)	
Pig	Muscle	600	24th (2001)	
Pig	Liver	600	24th (2001)	
Pig	Kidney	1000	24th (2001)	
Pig	Fat	600	24th (2001)	
Sheep	Muscle	600	24th (2001)	
Sheep	Liver	600	24th (2001)	
Sheep	Kidney	1000	24th (2001)	
Sheep	Fat	600	24th (2001)	
Sheep	Milk	200	26th (2003)	

DIMINAZENE (trypanocide)

JECFA Evaluation: 34 (1989); 42 (1994)
Acceptable Daily Intake: 0-100 µg/kg body weight (42nd JECFA, 1994).
Residue Definition: Diminazene.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	22nd (1997)	
Cattle	Liver	12000	22nd (1997)	
Cattle	Kidney	6000	22nd (1997)	
Cattle	Milk (µg/l)	150	22nd (1997)	Limit of quantitation of the analytical method.

DORAMECTIN (anthelmintic agent)

JECFA Evaluation: 45 (1995); 52 (1999); 58 (2002); 62 (2004)
Acceptable Daily Intake: 0-1 µg/kg body weight (58th JECFA, 2002).
Residue Definition: Doramectin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	22nd (1997)	High concentration of residues at the injection site over a 35 day period after subcutaneous or intramuscular administration of the drug at the recommended dose.
Cattle	Liver	100	22nd (1997)	
Cattle	Kidney	30	22nd (1997)	
Cattle	Fat	150	22nd (1997)	High concentration of residues at the injection site over a 35 day period after subcutaneous or intramuscular administration of the drug at the recommended dose
Cattle	Milk	15	29th (2006)	Depending on the route and/or time of administration the use of doramectin in dairy cows may result in extended withdrawal periods in milk. This may be addressed in national/regional regulatory programmes.
Pig	Muscle	5	24th (2001)	
Pig	Liver	100	24th (2001)	
Pig	Kidney	30	24th (2001)	
Pig	Fat	150	24th (2001)	

EMAMECTIN BENZOATE (antiparasitic agent)

JECFA Evaluation: 78 (2013)

Acceptable Daily Intake: ADI of 0–0.5 µg/kg body weight established by the Joint FAO/WHO Meeting on Pesticide Residues (JMPR) in 2011, based on an overall no-observed-adverse effect level (NOAEL) of 0.25 mg/kg body weight per day for neurotoxicity from 14- and 53-week studies in dogs, supported by an overall NOAEL of 0.25 mg/kg body weight per day from 1- and 2-year studies in rats. An uncertainty factor of 500 was applied to the NOAEL, which includes an additional uncertainty factor of 5 to account for the steep dose–response curve and irreversible histopathological effects in neural tissues at the lowest-observed-adverse-effect level (LOAEL) in dogs, as used by JMPR and confirmed by the current Committee (78th JECFA, 2013).

Estimated Dietary Exposure: 11 µg/person per day, which represents approximately 37% of the upper bound of the ADI (78th JECFA, 2013).

Residue Definition: Emamectin B1a.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Salmon	Muscle	100	38th (2015)	
Salmon	Fillet	100	38th (2015)	Muscle plus skin in natural proportion
Trout	Muscle	100	38th (2015)	
Trout	Fillet	100	38th (2015)	Muscle plus skin in natural proportion

EPRINOMECTIN (anthelmintic agent)

JECFA Evaluation: 50 (1998)

Acceptable Daily Intake: 0-10 µg/kg body weight (50th JECFA, 1998).

Residue Definition: Eprinomectin B1a.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	26th (2003)	
Cattle	Liver	2000	26th (2003)	
Cattle	Kidney	300	26th (2003)	
Cattle	Fat	250	26th (2003)	
Cattle	Milk (µg/l)	20	26th (2003)	

ERYTHROMYCIN (antimicrobial agent)

JECFA Evaluation: 66 (2006)

Acceptable Daily Intake: 0-0.7 µg/kg body weight (66th JECFA, 2006).

Residue Definition: Erythromycin A

Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	100	31st (2008)	
Chicken	Liver	100	31st (2008)	
Chicken	Kidney	100	31st (2008)	
Chicken	Fat	100	31st (2008)	The MRL includes skin + fat
Chicken	Eggs	50	31st (2008)	
Turkey	Muscle	100	31st (2008)	
Turkey	Liver	100	31st (2008)	
Turkey	Kidney	100	31st (2008)	
Turkey	Fat	100	31st (2008)	The MRL includes skin + fat

ESTRADIOL-17BETA (production aid)

JECFA Evaluation: 25 (1981); 32 (1987); 52 (1999)

Acceptable Daily Intake: unnecessary (32nd JECFA, 1987); 0-0.05 µg/kg body weight (52nd JECFA, 1999).

Residue Definition: Estradiol-17beta.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Liver	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Kidney	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Fat	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.

FEBANTEL/FENBENDAZOLE/OXFENDAZOLE (anthelmintic agent)

JECFA Evaluation: 38 (1991); 45 (1995); 50 (1998)

Acceptable Daily Intake: 0-7 µg/kg body weight (50th JECFA, 1998). Group ADI

Residue Definition: Sum of fenbendazole, oxfendazole and oxfendazole sulphone, expressed as oxfendazole sulphone equivalents.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	23rd (1999)	
Cattle	Liver	500	23rd (1999)	
Cattle	Kidney	100	23rd (1999)	
Cattle	Fat	100	23rd (1999)	
Cattle	Milk (µg/l)	100	23rd (1999)	
Goat	Muscle	100	23rd (1999)	
Goat	Liver	500	23rd (1999)	
Goat	Kidney	100	23rd (1999)	
Goat	Fat	100	23rd (1999)	
Horse	Muscle	100	23rd (1999)	
Horse	Liver	500	23rd (1999)	
Horse	Kidney	100	23rd (1999)	
Horse	Fat	100	23rd (1999)	
Pig	Muscle	100	23rd (1999)	
Pig	Liver	500	23rd (1999)	
Pig	Kidney	100	23rd (1999)	
Pig	Fat	100	23rd (1999)	
Sheep	Muscle	100	23rd (1999)	
Sheep	Liver	500	23rd (1999)	
Sheep	Kidney	100	23rd (1999)	
Sheep	Fat	100	23rd (1999)	
Sheep	Milk (µg/l)	100	23rd (1999)	

FLUAZURON (insecticide)

JECFA Evaluation: 48 (1997)

Acceptable Daily Intake: 0-40 µg/kg body weight (48th JECFA, 1997).

Residue Definition: Fluazuron.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	23rd (1999)	
Cattle	Liver	500	23rd (1999)	
Cattle	Kidney	500	23rd (1999)	
Cattle	Fat	7000	23rd (1999)	

FLUBENDAZOLE (anthelmintic agent)

JECFA Evaluation: 40 (1992)
Acceptable Daily Intake: 0-12 µg/kg body weight (40th JECFA, 1992).
Residue Definition: Flubendazole.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	10	21st (1995)	
Pig	Liver	10	21st (1995)	
Poultry	Muscle	200	21st (1995)	
Poultry	Liver	500	21st (1995)	
Poultry	Eggs	400	21st (1995)	

FLUMEQUINE (antimicrobial agent)

JECFA Evaluation: 42 (1994); 48 (1997); 54 (2000); 60 (2002); 62 (2004); 66 (2006)
Acceptable Daily Intake: 0-30 µg/kg body weight (62nd JECFA, 2004).
Residue Definition: Flumequine.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	28th (2005)	
Cattle	Liver	500	28th (2005)	
Cattle	Kidney	3000	28th (2005)	
Cattle	Fat	1000	28th (2005)	
Chicken	Muscle	500	28th (2005)	
Chicken	Liver	500	28th (2005)	
Chicken	Kidney	3000	28th (2005)	
Chicken	Fat	1000	28th (2005)	
Pig	Muscle	500	28th (2005)	
Pig	Liver	500	28th (2005)	
Pig	Kidney	3000	28th (2005)	
Pig	Fat	1000	28th (2005)	
Sheep	Muscle	500	28th (2005)	
Sheep	Liver	500	28th (2005)	
Sheep	Kidney	3000	28th (2005)	
Sheep	Fat	1000	28th (2005)	
Trout	Muscle	500	28th (2005)	Muscle including normal proportion of skin

GENTAMICIN (antimicrobial agent)

JECFA Evaluation: 43 (1994); 48 (1997); 50 (1998)
Acceptable Daily Intake: 0-20 µg/kg body weight (50th JECFA, 1998).
Residue Definition: Gentamicin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	24th (2001)	
Cattle	Liver	2000	24th (2001)	
Cattle	Kidney	5000	24th (2001)	
Cattle	Fat	100	24th (2001)	
Cattle	Milk (µg/l)	200	24th (2001)	
Pig	Muscle	100	24th (2001)	
Pig	Liver	2000	24th (2001)	
Pig	Kidney	5000	24th (2001)	
Pig	Fat	100	24th (2001)	

IMIDOCARB (antiprotozoal agent)

JECFA Evaluation: 50 (1998); 60 (2003)
Acceptable Daily Intake: 0-10 µg/kg body weight (50th JECFA, 1998).
Residue Definition: Imidocarb.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	300	28th (2005)	
Cattle	Liver	1500	28th (2005)	
Cattle	Kidney	2000	28th (2005)	
Cattle	Fat	50	28th (2005)	
Cattle	Milk	50	28th (2005)	

ISOMETAMIDIUM (trypanocide)

JECFA Evaluation: 34 (1989); 40 (1992)
Acceptable Daily Intake: 0-100 µg/kg body weight (40th JECFA, 1992).
Residue Definition: Isometamidium.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	21st (1995)	
Cattle	Liver	500	21st (1995)	
Cattle	Kidney	1000	21st (1995)	
Cattle	Fat	100	21st (1995)	
Cattle	Milk (µg/l)	100	21st (1995)	

IVERMECTIN (anthelmintic agent)

JECFA Evaluation: 36 (1990); 40 (1992); 54 (2000); 58 (2002)
Acceptable Daily Intake: 0-1 µg/kg body weight (40th JECFA, 1992).
Residue Definition: 22,23-Dihydroavermectin B1a (H2B1a).

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Liver	100	20th (1993)	
Cattle	Fat	40	20th (1993)	
Cattle	Milk	10	26th (2003)	
Pig	Liver	15	20th (1993)	
Pig	Fat	20	20th (1993)	
Sheep	Liver	15	20th (1993)	
Sheep	Fat	20	20th (1993)	

LEVAMISOLE (anthelmintic agent)

JECFA Evaluation: 36 (1990); 42 (1994)
Acceptable Daily Intake: 0-6 µg/kg body weight (42nd JECFA, 1994).
Residue Definition: Levamisole.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	22nd (1997)	
Cattle	Liver	100	22nd (1997)	
Cattle	Kidney	10	22nd (1997)	
Cattle	Fat	10	22nd (1997)	
Pig	Muscle	10	22nd (1997)	
Pig	Liver	100	22nd (1997)	
Pig	Kidney	10	22nd (1997)	
Pig	Fat	10	22nd (1997)	
Poultry	Muscle	10	22nd (1997)	
Poultry	Liver	100	22nd (1997)	
Poultry	Kidney	10	22nd (1997)	
Poultry	Fat	10	22nd (1997)	
Sheep	Muscle	10	22nd (1997)	
Sheep	Liver	100	22nd (1997)	
Sheep	Kidney	10	22nd (1997)	
Sheep	Fat	10	22nd (1997)	

LINCOMYCIN (antimicrobial agent)

JECFA Evaluation: 54 (2000); 58 (2002); 62 (2004)
Acceptable Daily Intake: 0-30 µg/kg body weight (54th JECFA, 2000).
Residue Definition: Lincomycin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Milk	150	26th (2003)	
Chicken	Muscle	200	26th (2003)	
Chicken	Liver	500	26th (2003)	
Chicken	Kidney	500	26th (2003)	
Chicken	Fat	100	26th (2003)	Additional MRL for skin with adhering fat of 300 µg/kg.
Pig	Muscle	200	26th (2003)	
Pig	Liver	500	26th (2003)	
Pig	Kidney	1500	26th (2003)	
Pig	Fat	100	26th (2003)	Additional MRL for skin with adhering fat of 300 µg/kg.

MELENGESTROL ACETATE (production aid)

JECFA Evaluation: 54 (2000); 58 (2002); 62 (2004); 66 (2006) 70 (2008)
Acceptable Daily Intake: 0-0.03 µg/kg body weight (54th JECFA, 2000).
Residue Definition: Melengestrol acetate.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1	32nd (2009)	
Cattle	Liver	10	32nd (2009)	
Cattle	Kidney	2	32nd (2009)	
Cattle	Fat	18	32nd (2009)	

MONENSIN (antimicrobial agent)

JECFA Evaluation: 70 (2008); 75 (2011)

Acceptable Daily Intake: 0–10 µg/kg body weight on the basis of a NOAEL of 1.14 mg/kg body weight per day and a safety factor of 100 and rounding to one significant figure (70th JECFA, 2008).

Estimated Dietary Exposure: Using the revised MRL, the theoretical maximum daily intake (TMDI) from the 70th JECFA was recalculated, resulting in a value of 481 µg/person, which represents 80% of the upper bound of the ADI (75thJECFA, 2011).

Residue Definition: Monensin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	32nd (2009)	
Cattle	Liver	100	35th (2012)	
Cattle	Kidney	10	32nd (2009)	
Cattle	Fat	100	32nd (2009)	
Cattle	Milk	2	32nd (2009)	
Sheep	Muscle	10	32nd (2009)	
Sheep	Liver	20	32nd (2009)	
Sheep	Kidney	10	32nd (2009)	
Sheep	Fat	100	32nd (2009)	
Goats	Muscle	10	32nd (2009)	
Goats	Liver	20	32nd (2009)	
Goats	Kidney	10	32nd (2009)	
Goats	Fat	100	32nd (2009)	
Chicken	Muscle	10	32nd (2009)	
Chicken	Liver	10	32nd (2009)	
Chicken	Kidney	10	32nd (2009)	
Chicken	Fat	100	32nd (2009)	
Turkey	Muscle	10	32nd (2009)	
Turkey	Liver	10	32nd (2009)	
Turkey	Kidney	10	32nd (2009)	
Turkey	Fat	100	32nd (2009)	
Quail	Muscle	10	32nd (2009)	
Quail	Liver	10	32nd (2009)	
Quail	Kidney	10	32nd (2009)	
Quail	Fat	100	32nd (2009)	

MONEPANTEL (anthelmintic agent)

JECFA Evaluation: 75 (2011); 78 (2013)

Acceptable Daily Intake: 0-20 µg/kg body weight on the basis of a no-observed-adverse-effect level (NOAEL) of 1.8 mg/kg body weight per day considering liver effects in mice, and a safety factor of 100, with rounding to one significant figure (75th JECFA, 2011).

Estimated Dietary Exposure: Using the model diet and marker residue to total residue ratios of 1.00 for muscle and 0.66 for fat, liver and kidney, and applying a correction factor of 0.94 to account for the mass difference between monepantel sulfone (the marker residue) and monepantel, the EDI is 446 µg/person per day, which represents approximately 37% of the upper bound of the ADI (78th JECFA, 2013).

Residue Definition: Monepantel sulfone, expressed as monepantel.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	500	38th (2015)	
Sheep	Liver	7000	38th (2015)	
Sheep	Kidney	1700	38th (2015)	
Sheep	Fat	13000	38th (2015)	

MOXIDECTIN (anthelmintic agent)

JECFA Evaluation: 45 (1995); 47 (1996); 48 (1998); 50 (1998)

Acceptable Daily Intake: 0-2 µg/kg body weight (45th JECFA, 1995).

Residue Definition: Moxidectin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	22nd (1997)	Very high concentration and great variation in the level of residues at the injection site in cattle over a 49 day period after dosing.
Cattle	Liver	100	22nd (1997)	
Cattle	Kidney	50	22nd (1997)	
Cattle	Fat	500	22nd (1997)	
Deer	Muscle	20	23rd (1999)	
Deer	Liver	100	23rd (1999)	
Deer	Kidney	50	23rd (1999)	
Deer	Fat	500	23rd (1999)	
Sheep	Muscle	50	22nd (1997)	
Sheep	Liver	100	22nd (1997)	
Sheep	Kidney	50	22nd (1997)	
Sheep	Fat	500	22nd (1997)	

NARASIN (antimicrobial agent)

JECFA Evaluation: 70 (2008); 75 (2011)

Acceptable Daily Intake: 0-5 µg/kg body weight on the basis of a NOAEL of 0.5 mg/kg body weight per day and a safety factor of 100 (70th JECFA, 2008).

Residue Definition: Narasin A.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	15	35th (2012)	
Cattle	Liver	50	35th (2012)	
Cattle	Kidney	15	35th (2012)	
Cattle	Fat	50	35th (2012)	
Chicken	Muscle	15	32nd (2009)	
Chicken	Liver	50	32nd (2009)	
Chicken	Kidney	15	32nd (2009)	
Chicken	Fat	50	32nd (2009)	
Pig	Muscle	15	34th (2011)	
Pig	Liver	50	34th (2011)	
Pig	Kidney	15	34th (2011)	
Pig	Fat	50	34th (2011)	

NEOMYCIN (antimicrobial agent)

JECFA Evaluation: 43 (1994); 47 (1996); 52 (1999); 58 (2002); 60 (2003)

Acceptable Daily Intake: 0-60 µg/kg body weight (47th JECFA, 1996).

Residue Definition: Neomycin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	23rd (1999)	
Cattle	Liver	500	28th (2005)	
Cattle	Kidney	10000	28th (2005)	
Cattle	Fat	500	23rd (1999)	
Cattle	Milk	1500	28th (2005)	
Chicken	Muscle	500	23rd (1999)	
Chicken	Liver	500	23rd (1999)	
Chicken	Kidney	10000	23rd (1999)	
Chicken	Fat	500	23rd (1999)	
Chicken	Eggs	500	23rd (1999)	
Duck	Muscle	500	23rd (1999)	
Duck	Liver	500	23rd (1999)	
Duck	Kidney	10000	23rd (1999)	
Duck	Fat	500	23rd (1999)	
Goat	Muscle	500	23rd (1999)	
Goat	Liver	500	23rd (1999)	
Goat	Kidney	10000	23rd (1999)	
Goat	Fat	500	23rd (1999)	
Pig	Muscle	500	23rd (1999)	
Pig	Liver	500	23rd (1999)	
Pig	Kidney	10000	23rd (1999)	
Pig	Fat	500	23rd (1999)	
Sheep	Muscle	500	23rd (1999)	
Sheep	Liver	500	23rd (1999)	
Sheep	Kidney	10000	23rd (1999)	
Sheep	Fat	500	23rd (1999)	
Turkey	Muscle	500	23rd (1999)	
Turkey	Liver	500	23rd (1999)	
Turkey	Kidney	10000	23rd (1999)	
Turkey	Fat	500	23rd (1999)	

NICARBAZIN (antiprotozoal agent)

JECFA Evaluation: 50 (1998)
Acceptable Daily Intake: 0-400 µg/kg body weight (50th JECFA, 1998).
Residue Definition: N,N'-bis(4-nitropheyl)urea.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	200	23rd (1999)	Broilers.
Chicken	Liver	200	23rd (1999)	Broilers.
Chicken	Kidney	200	23rd (1999)	Broilers.
Chicken	Fat/Skin	200	23rd (1999)	Broilers.

PHOXIM (insecticide)

JECFA Evaluation: 52 (1999); 62 (2004)
Acceptable Daily Intake: 0-4 µg/kg body weight (52nd JECFA, 1999).
Residue Definition: Phoxim

Species	Tissue	MRL (µg/kg)	CAC	Notes
Goat	Muscle	50	26th (2003)	
Goat	Liver	50	26th (2003)	
Goat	Kidney	50	26th (2003)	
Goat	Fat	400	26th (2003)	
Pig	Muscle	50	26th (2003)	
Pig	Liver	50	26th (2003)	
Pig	Kidney	50	26th (2003)	
Pig	Fat	400	26th (2003)	
Sheep	Muscle	50	26th (2003)	
Sheep	Liver	50	26th (2003)	
Sheep	Kidney	50	26th (2003)	
Sheep	Fat	400	26th (2003)	

PIRLIMYCIN (antimicrobial agent)

JECFA Evaluation: 62 (2004)

Acceptable Daily Intake: 0-8 µg/kg bw (62nd JECFA, 2004).

Residue Definition: Pirlimycin.

Species	Tissue	MRLs (µg/kg)	CAC	Note
Cattle	Muscle	100	29th (2006)	
Cattle	Liver	1000	29th (2006)	
Cattle	Kidney	400	29th (2006)	
Cattle	Fat	100	29th (2006)	
Cattle	Milk	200	29th (2006)	JECFA evaluated the effect of pirlimycin residues on starter cultures and for this reason recommended an MRL of 100 µg/kg of milk. Codex Members may therefore adapt national/regional MRLs in order to address this technological aspect for trade of fresh liquid milk intended for processing using starter culture.

PORCINE SOMATOTROPIN (production aid)

JECFA Evaluation: 52 (1999)

Acceptable Daily Intake: Not Specified (52nd JECFA, 1999).

Residue Definition: Not applicable.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	not specified	26th (2003)	
Pig	Liver	not specified	26th (2003)	
Pig	Kidney	not specified	26th (2003)	
Pig	Fat	not specified	26th (2003)	

PROGESTERONE (production aid)

JECFA Evaluation: 25 (1981); 32 (1987); 52 (1999)
Acceptable Daily Intake: 0-30 µg/kg body weight (52nd JECFA, 1999).
Residue Definition: Progesterone.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21st (2005)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Liver	unnecessary	21st (2005)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Kidney	unnecessary	21st (2005)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Fat	unnecessary	21st (2005)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health

RACTOPAMINE (production aid)

JECFA Evaluation: 40 (1992); 62 (2004); 66 (2006)
Acceptable Daily Intake: 0-1 µg/kg body weight (66th JECFA, 2006).
Residue Definition: Ractopamine.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	35th (2012)	
Cattle	Liver	40	35th (2012)	
Cattle	Kidney	90	35th (2012)	
Cattle	Fat	10	35th (2012)	
Pig	Muscle	10	35th (2012)	
Pig	Liver	40	35th (2012)	
Pig	Kidney	90	35th (2012)	
Pig	Fat	10	35th (2012)	The MRL includes skin + fat

SARAFLOXACIN (antimicrobial agent)

JECFA Evaluation: 50 (1998)
Acceptable Daily Intake: 0-0.3 µg/kg body weight (50th JECFA, 1998).
Residue Definition: Sarafloxacin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	10	24th (2001)	
Chicken	Liver	80	24th (2001)	
Chicken	Kidney	80	24th (2001)	
Chicken	Fat	20	24th (2001)	
Turkey	Muscle	10	24th (2001)	
Turkey	Liver	80	24th (2001)	
Turkey	Kidney	80	24th (2001)	
Turkey	Fat	20	24th (2001)	

SPECTINOMYCIN (antimicrobial agent)

JECFA Evaluation: 42 (1994); 50 (1998)
Acceptable Daily Intake: 0-40 µg/kg body weight (42nd JECFA, 1994).
Residue Definition: Spectinomycin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	23rd (1999)	
Cattle	Liver	2000	23rd (1999)	
Cattle	Kidney	5000	23rd (1999)	
Cattle	Fat	2000	23rd (1999)	
Cattle	Milk (µg/l)	200	23rd (1999)	
Chicken	Muscle	500	23rd (1999)	
Chicken	Liver	2000	23rd (1999)	
Chicken	Kidney	5000	23rd (1999)	
Chicken	Fat	2000	23rd (1999)	
Chicken	Eggs	2000	23rd (1999)	
Pig	Muscle	500	23rd (1999)	
Pig	Liver	2000	23rd (1999)	
Pig	Kidney	5000	23rd (1999)	
Pig	Fat	2000	23rd (1999)	
Sheep	Muscle	500	23rd (1999)	
Sheep	Liver	2000	23rd (1999)	
Sheep	Kidney	5000	23rd (1999)	
Sheep	Fat	2000	23rd (1999)	

SPIRAMYCIN (antimicrobial agent)

JECFA Evaluation: 38 (1991); 43 (1994); 47 (1996); 48 (1997)

Acceptable Daily Intake: 0-50 µg/kg body weight (43rd JECFA, 1994).

Residue Definition: Cattle and chickens, sum of spiramycin and neospiramycin; Pigs, spiramycin equivalents (antimicrobially active residues).

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	22nd (1997)	
Cattle	Liver	600	22nd (1997)	
Cattle	Kidney	300	22nd (1997)	
Cattle	Fat	300	22nd (1997)	
Cattle	Milk (µg/l)	200	22nd (1997)	
Chicken	Muscle	200	22nd (1997)	
Chicken	Liver	600	22nd (1997)	
Chicken	Kidney	800	22nd (1997)	
Chicken	Fat	300	22nd (1997)	
Pig	Muscle	200	22nd (1997)	
Pig	Liver	600	22nd (1997)	
Pig	Kidney	300	22nd (1997)	
Pig	Fat	300	22nd (1997)	

SULFADIMIDINE (antimicrobial agent)

JECFA Evaluation: 34 (1989); 38 (1991); 42 (1994)

Acceptable Daily Intake: 0-50 µg/kg body weight (42nd JECFA, 1994).

Residue Definition: Sulfadimidine.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Milk (µg/l)	25	21st (1995)	
Not specified	Muscle	100	21st (1995)	
Not specified	Liver	100	21st (1995)	
Not specified	Kidney	100	21st (1995)	
Not specified	Fat	100	21st (1995)	

TESTOSTERONE (production aid)

JECFA Evaluation: 25 (1981); 32 (1987); 52 (1999)

Acceptable Daily Intake: 0-2 µg/kg body weight (52nd JECFA, 1999).

Residue Definition: Testosterone.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Liver	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Kidney	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.
Cattle	Fat	unnecessary	21st (1995)	Residues resulting from the use of this substances as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health.

THIABENDAZOLE (anthelmintic agent)

JECFA Evaluation: 40 (1992); 48 (1997); 58 (2002)

Acceptable Daily Intake: 0-100 µg/kg body weight (40th JECFA, 1992).

Residue Definition: Sum of thiabendazole and 5-hydroxythiabendazole.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Cattle	Liver	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Cattle	Kidney	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Cattle	Fat	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Cattle	Milk (µg/l)	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Goat	Muscle	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Goat	Liver	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Goat	Kidney	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Goat	Fat	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Goat	Milk (µg/l)	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Pig	Muscle	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Pig	Liver	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Pig	Kidney	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Pig	Fat	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Sheep	Muscle	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.

Sheep	Liver	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Sheep	Kidney	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Sheep	Fat	100	21st (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.

TILMICOSIN (antimicrobial agent)

JECFA Evaluation: 47 (1996); 54 (2000); 70 (2008)

Acceptable Daily Intake: 0-40 µg/kg body weight (47th JECFA, 1996).

Residue Definition: Tilmicosin.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	23rd (1999)	
Cattle	Liver	1000	23rd (1999)	
Cattle	Kidney	300	23rd (1999)	
Cattle	Fat	100	23rd (1999)	
Chicken	Muscle	150	34th (2011)	
Chicken	Liver	2400	34th (2011)	
Chicken	Kidney	600	34th (2011)	
Chicken	Skin/Fat	250	34th (2011)	
Pig	Muscle	100	23rd (1999)	
Pig	Liver	1500	23rd (1999)	
Pig	Kidney	1000	23rd (1999)	
Pig	Fat	100	23rd (1999)	
Sheep	Muscle	100	23rd (1999)	
Sheep	Liver	1000	23rd (1999)	
Sheep	Kidney	300	23rd (1999)	
Sheep	Fat	100	23rd (1999)	
Turkey	Muscle	100	34th (2011)	
Turkey	Kidney	1200	34th (2011)	
Turkey	Liver	1400	34th (2011)	
Turkey	Skin/Fat	250	34th (2011)	

TRENBOLONE ACETATE (growth promoter)

JECFA Evaluation: 26 (1982); 27 (1983); 32 (1987); 34 (1989)

Acceptable Daily Intake: 0-0.02 µg/kg body weight (34th JECFA, 1989).

Residue Definition: Cattle muscle, beta-Trenbolone; Cattle liver, alpha-Trenbolone.

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	2	21st (1995)	
Cattle	Liver	10	21st (1995)	

TRICHLORFON (Metrifonate) (insecticide)

JECFA Evaluation: 54 (2000); 60 (2003); 66 (2006)

Acceptable Daily Intake: 0-2 µg/kg bw (60th JECFA, 2003)

Residue Definition: JECFA confirmed the MRL for cows's milk and the guidance levels for muscle, liver, kidney and fat of cattle recommended at the 54th meeting (WHO TRS 900, 2001)

Species	Tissue	MRLs (µg/kg)	CAC	Notes
Cattle	Milk	50	29th (2006)	

TRICLABENDAZOLE (anthelmintic agent)

JECFA Evaluation: 40 (1992); 66 (2006); 70 (2008)

Acceptable Daily Intake: 0-3 µg/kg body weight (40th JECFA, 1993).

Residue Definition: Ketotriclabnedazole

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	250	32nd (2009)	
Cattle	Liver	850	32nd (2009)	
Cattle	Kidney	400	32nd (2009)	
Cattle	Fat	100	32nd (2009)	
Sheep	Muscle	200	32nd (2009)	
Sheep	Liver	300	32nd (2009)	
Sheep	Kidney	200	32nd (2009)	
Sheep	Fat	100	32nd (2009)	

TYLOSIN (antimicrobial agent)

JECFA Evaluation: 70 (2008)

Acceptable Daily Intake : 0-30 µg/kg body weight based on a microbiological end-point derived from in vitro MIC susceptibility testing and faecal binding data (MICcalc = 1.698) (70th JECFA, 2008).

Residue Definition: Tylosin A.

Species	Tissue	MRLs (µg/kg)	CAC	Notes
Cattle	Muscle	100	32nd (2009)	
Cattle	Liver	100	32nd (2009)	
Cattle	Kidney	100	32nd (2009)	
Cattle	Fat	100	32nd (2009)	
Cattle	Milk	100	32nd (2009)	
Pig	Muscle	100	32nd (2009)	
Pig	Liver	100	32nd (2009)	
Pig	Kidney	100	32nd (2009)	
Pig	Fat	100	32nd (2009)	
Chicken	Muscle	100	32nd (2009)	
Chicken	Liver	100	32nd (2009)	
Chicken	Kidney	100	32nd (2009)	
Chicken	Fat/Skin	100	32nd (2009)	
Chicken	Eggs	300	32nd (2009)	

ZERANOL (growth promoter)

JECFA Evaluation: 26 (1982); 27 (1983); 32 (1987)

Acceptable Daily Intake : 0-0.5 µg/kg body weight (32nd JECFA, 1987).

Residue Definition: Zeranol**.**

Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	2	21st (1995)	
Cattle	Liver	10	21st (1995)	

RISK MANAGEMENT RECOMMENDATIONS (RMRs) FOR RESIDUES OF VETERINARY DRUGS

CARBADOX (growth promoter)

JECFA evaluation: 36th (1990) and 60th (2003) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions on the available scientific information, there is no safe level of residues of carbadox or its metabolites in food that represents an acceptable risk to consumers. For this reason, competent authorities should prevent residues of carbadox in food. This can be accomplished by not using carbadox in food producing animals.

CHLORAMPHENICOL (antimicrobial agent)

JECFA evaluation: 12th (1968), 32nd (1987), 42nd (1994) and 62nd (2004) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions on the available scientific information, there is no safe level of residues of chloramphenicol or its metabolites in food that represents an acceptable risk to consumers. For this reason, competent authorities should prevent residues of chloramphenicol in food. This can be accomplished by not using chloramphenicol in food producing animals.

CHLORPROMAZINE (tranquilliser agent)

JECFA evaluation: 38th (1991) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of chlorpromazine or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of chlorpromazine in food. This can be accomplished by not using chlorpromazine in food producing animals.

DIMETRIDAZOLE (antiprotozoal agent)

JECFA evaluation: 34th (1989) JECFA

CAC38 (2015)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of dimetridazole or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of dimetridazole in food. This can be accomplished by not using dimetridazole in food producing animals.

FURAZOLIDONE (antimicrobial agent)

JECFA evaluation: 40th (1992) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions on the available scientific information, there is no safe level of residues of furazolidone or its metabolites in food that represents an acceptable risk to consumers. For this reason, competent authorities should prevent residues of furazolidone in food. This can be accomplished by not using furazolidone in food producing animals.

IPRONIDAZOLE (antiprotozoal agent)

JECFA evaluation: 34th (1989) JECFA

CAC38 (2015)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of ipronidazole or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of ipronidazole in food. This can be accomplished by not using ipronidazole in food producing animals.

MALACHITE GREEN (antifungal and antiprotozoal agent)

JECFA evaluation: 70th (2008) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions on the available scientific information, there is no safe level of residues of malachite green or its metabolites in food that represents an acceptable risk to consumers. For this reason, competent authorities should prevent residues of malachite green in food. This can be accomplished by not using malachite green in food producing animals.

METRONIDAZOLE (antiprotozoal agent)

JECFA evaluation: 34th (1989) JECFA

CAC38 (2015)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of metronidazole or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of metronidazole in food. This can be accomplished by not using metronidazole in food producing animals.

NITROFURAL (antimicrobial agent)

JECFA evaluation: 40th (1992) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of nitrofural or its metabolites[1] in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of nitrofural in food. This can be accomplished by not using nitrofural in food producing animals.

[1] Semicarbazide is not a unique indicator of nitrofural use and low levels can be associated with other legitimate sources.

OLAQUINDOX (antibacterial agent)

JECFA evaluation: 36th (1990) and 42nd (1994) JECFA

CAC37 (2014)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of olaquindox or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of olaquindox in food. This can be accomplished by not using olaquindox in food producing animals.

RONIDAZOLE (antiprotozoal agent)

JECFA evaluation: 34th (1989) and 42nd (1994) JECFA

CAC38 (2015)

Recommended risk management measures

In view of the JECFA conclusions, although insufficient data were available or there was a lack of data to establish a safe level of residues of ronidazole or its metabolites in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of ronidazole in food. This can be accomplished by not using ronidazole in food producing animals.

STILBENES (growth promoter)

JECFA evaluation: 5th (1960) JECFA

IARC evaluation: monograph 100A (2012)

CAC37 (2014)

Recommended risk management measures

In view of the available scientific information, there is no safe level of residues of stilbenes or their metabolites in food that represents an acceptable risk to consumers. For this reason, competent authorities should prevent residues of stilbenes in food. This can be accomplished by not using stilbenes in food producing animals.