

C O D E X A L I M E N T A R I U S

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

CX/MRL 2-2018

LIST OF ABBREVIATIONS

ADI	Acceptable Daily Intake
ARfD	Acute Reference Dose
BMD	Benchmark Dose
BMDL	Confidence Limit for BMD
bw	Body Weight
CAC	Codex Alimentarius Commission
CCPR	Codex Committee on Pesticide Residues
CCRVDF	Codex Committee on Residues of Veterinary Drugs in Foods
EDI	Estimated Daily Intake
GEADE	Global Estimated Acute Dietary Exposure
GECDE	Global Estimated Chronic Dietary Exposure
JECFA	Joint FAO/WHO Expert Committee on Food Additives
JMPR	Joint FAO/WHO Expert Meeting on Pesticide Residues
LOAEL	Lowest-Observed-Adverse-Effect Level
NOAEL	No-Observed-Adverse-Effect Level
LOQ	Limit of Quantification
mADI	Microbiological Acceptable Daily Intake
MRL	Maximum Residue Limit
RMR	Risk Management Recommendation
TMDI	Theoretical Maximum Daily Intake

Maximum Residue Limits (MRL)

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

Risk Management Recommendations (RMR) for Residues of Veterinary Drugs

Carbadox	Malachite Green
Chloramphenicol	Metronidazole
Chlorpromazine	Nitrofuraf
Dimetridazole	Olaquinox
Furazolidone	Ronidazole
Gentian Violet	Stilbens
Ipronidazole	

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 bw (1997) established for the sum of abamectin and (Z)-8,9 isomer by JMPR (1997)		
Residue Definition		Avermectin B1a		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Liver	100	26 (2003)	
Cattle	Kidney	50	26 (2003)	
Cattle	Fat	100	26 (2003)	

ALBENDAZOLE (anthelmintic agent)				
JECFA Evaluation		34 (1989)		
Acceptable Daily Intake		0-50 µg/kg bw (JECFA34)		
Residue Definition		Except milk, 2-aminosulfone metabolite; Milk, not yet identified		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Not specified	Muscle	100	20 (1993)	
Not specified	Liver	5000	20 (1993)	
Not specified	Kidney	5000	20 (1993)	
Not specified	Fat	100	20 (1993)	
Not specified	Milk (µg/l)	100	20 (1993)	

AMOXICILLIN (antimicrobial agent)				
JECFA Evaluation		75 (2011); 85 (2017)		
Microbiological Acceptable Daily Intake		0–0.002 mg/kg body weight (bw) based on the effects of amoxicillin on the intestinal microbiota		
Acute Reference Dose		0.005 mg/kg bw based on microbiological effects on the intestinal microbiota		
Estimated Chronic Dietary Exposure		0.14 µg/kg bw per day (for the general population), which represents 7% of the upper bound of the mADI		
Estimated Acute Dietary Exposure		1.4 µg/kg bw (for the general population), which represents 28% of the microbiological ARfD 1.6 µg/kg bw (for children), which represents 31% of the microbiological ARfD		
Residue Definition		Amoxicillin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	50	35 (2012)	
Cattle	Liver	50	35 (2012)	
Cattle	Kidney	50	35 (2012)	
Cattle	Fat	50	35 (2012)	
Cattle	Milk	4	35 (2012)	
Sheep	Muscle	50	35 (2012)	
Sheep	Liver	50	35 (2012)	
Sheep	Kidney	50	35 (2012)	
Sheep	Fat	50	35 (2012)	
Sheep	Milk	4	35 (2012)	
Pigs	Muscle	50	35 (2012)	
Pigs	Liver	50	35 (2012)	
Pigs	Kidney	50	35 (2012)	
Pigs	Fat/Skin	50	35 (2012)	
Finfish	Fillet	50	41 (2018)	The term “finfish” includes all fish species Muscle plus skin in natural proportion
	Muscle	50	41 (2018)	The term “finfish” includes all fish species

AMPICILLIN (antimicrobial agent)				
JECFA Evaluation		85 (2017)		
Microbiological Acceptable Daily Intake		0–0.003 mg/kg bw based on a NOAEL equivalent to 0.025 mg/kg bw per day for increase in population(s) of ampicillin-resistant bacteria in the gastrointestinal tract in humans, and using a safety factor of 10 (for the variability in the composition of the intestinal microbiota within and between individuals)		
Acute Reference Dose		0.012 mg/kg bw based on the microbiological end-point		
Estimated Chronic Dietary Exposure		0.29 µg/kg bw per day (for the general population), which represents 10% of the upper bound of the ADI		
Estimated Acute Dietary Exposure		1.9 µg/kg bw per day (for the general population), which represents 16% of the ARfD 1.7 µg/kg bw per day (for children), which represents 14% of the ARfD		
Residue Definition		Ampicillin		
Note		JECFA85 recommended an MRL of 50 µg/kg for ampicillin in finfish muscle and in finfish muscle plus skin in natural proportion, the same as that recommended for amoxicillin, because the modes of action, the physicochemical properties and the toxicological and pharmacokinetic profiles of amoxicillin and ampicillin are very similar.		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Finfish	Fillet	50	41 (2018)	The term “finfish” includes all fish species Muscle plus skin in natural proportion
	Muscle	50	41 (2018)	The term “finfish” includes all fish species

AVILAMYCIN (antimicrobial agent)				
JECFA Evaluation		70 (2008)		
Acceptable Daily Intake		0-2 mg/kg bw on the basis of a NOAEL of 150 mg avilamycin activity/kg bw per day and a safety factor of 100 and rounding to one significant figure (JECFA70)		
Residue Definition		Dichloroisoevernic acid (DIA)		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Pigs	Muscle	200	32 (2009)	
Pigs	Liver	300	32 (2009)	
Pigs	Kidney	200	32 (2009)	
Pigs	Fat/Skin	200	32 (2009)	
Chicken	Muscle	200	32 (2009)	
Chicken	Liver	300	32 (2009)	
Chicken	Kidney	200	32 (2009)	
Chicken	Fat/Skin	200	32 (2009)	
Turkey	Muscle	200	32 (2009)	
Turkey	Liver	300	32 (2009)	
Turkey	Kidney	200	32 (2009)	
Turkey	Fat/Skin	200	32 (2009)	
Rabbits	Muscle	200	32 (2009)	
Rabbits	Liver	300	32 (2009)	
Rabbits	Kidney	200	32 (2009)	
Rabbits	Fat/Skin	200	32 (2009)	

AZAPERONE (tranquilizing agent)				
JECFA Evaluation		38 (1991); 43 (1994); 50 (1998); 52 (1999)		
Acceptable Daily Intake		0-6 µg/kg bw (JECFA50)		
Residue Definition		Sum of azaperone and azaperol		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	60	23 (1999)	
Pig	Liver	100	23 (1999)	
Pig	Kidney	100	23 (1999)	
Pig	Fat	60	23 (1999)	

BENZYL PENICILLIN/PROCAINE BENZYL PENICILLIN (antimicrobial agent)				
JECFA Evaluation		36 (1990); 50 (1998)		
Acceptable Daily Intake		30 µg-penicillin/person/day (JECFA50). 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	23 (1999)	
Cattle	Liver	50	23 (1999)	
Cattle	Kidney	50	23 (1999)	
Cattle	Milk (µg/l)	4	23 (1999)	
Chicken	Muscle	50	23 (1999)	Applies to procaine benzylpenicillin only
Chicken	Liver	50	23 (1999)	Applies to procaine benzylpenicillin only
Chicken	Kidney	50	23 (1999)	Applies to procaine benzylpenicillin only
Pig	Muscle	50	23 (1999)	
Pig	Liver	50	23 (1999)	
Pig	Kidney	50	23 (1999)	

CARAZOLOL (beta-adreniceptor-blocking agent)				
JECFA Evaluation		38 (1991); 43 (1994); 52 (1999)		
Acceptable Daily Intake		0-0.1 µg/kg bw (JECFA43). ADI based on the acute pharmacological effects of carazolol		
Residue Definition		Carazolol		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	5	26 (2003)	The concentration at the injection site two hours after treatment may result in an intake that exceeds the ARfD and therefore, an appropriate withdrawal period should be applied
Pig	Liver	25	26 (2003)	
Pig	Kidney	25	26 (2003)	
Pig	Fat/Skin	5	26 (2003)	The concentration at the injection site two hours after treatment may result in an intake that exceeds the ARfD 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 bw (JECFA45)		
Residue Definition		Desfuroylceftiofur		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1000	23 (1999)	
Cattle	Liver	2000	23 (1999)	
Cattle	Kidney	6000	23 (1999)	
Cattle	Fat	2000	23 (1999)	
Cattle	Milk (µg/l)	100	23 (1999)	
Pig	Muscle	1000	23 (1999)	
Pig	Liver	2000	23 (1999)	
Pig	Kidney	6000	23 (1999)	
Pig	Fat	2000	23 (1999)	

CHLORTETRACYCLINE/OXYTETRACYCLINE/TETRACYCLINE (antimicrobial agent)				
JECFA Evaluation		45 (1995); 47 (1996); 50 (1998); 58 (2002)		
Acceptable Daily Intake		Group ADI for chlortetracycline, oxytetracycline and tetracycline: 0-30 µg/kg bw (JECFA50). 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	26 (2003)	
Cattle	Liver	600	26 (2003)	
Cattle	Kidney	1200	26 (2003)	
Cattle	Milk (µg/l)	100	26 (2003)	
Fish	Muscle	200	26 (2003)	Applies only to oxytetracycline
Giant prawn (<i>Paeneus monodon</i>)	Muscle	200	26 (2003)	Applies only to oxytetracycline
Pig	Muscle	200	26 (2003)	
Pig	Liver	600	26 (2003)	
Pig	Kidney	1200	26 (2003)	
Poultry	Muscle	200	26 (2003)	
Poultry	Liver	600	26 (2003)	
Poultry	Kidney	1200	26 (2003)	
Poultry	Eggs	400	26 (2003)	
Sheep	Muscle	200	26 (2003)	
Sheep	Liver	600	26 (2003)	
Sheep	Kidney	1200	26 (2003)	
Sheep	Milk (µg/l)	100	26 (2003)	

CLENBUTEROL (adrenoceptor agonist)				
JECFA Evaluation		47 (1996)		
Acceptable Daily Intake		0-0.004 µg/kg bw (JECFA47)		
Residue Definition		Clenbuterol		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	0.2	26 (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 adjunct therapy in respiratory diseases
Cattle	Liver	0.6	26 (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 adjunct therapy in respiratory diseases
Cattle	Kidney	0.6	26 (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 adjunct therapy in respiratory diseases
Cattle	Fat	0.2	26 (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 adjunct therapy in respiratory diseases
Cattle	Milk (µg/l)	0.05	26 (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 adjunct therapy in respiratory diseases
Horse	Muscle	0.2	26 (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 adjunct therapy in respiratory diseases
Horse	Liver	0.6	26 (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 adjunct therapy in respiratory diseases
Horse	Kidney	0.6	26 (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 adjunct therapy in respiratory diseases
Horse	Fat	0.2	26 (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 adjunct therapy in respiratory diseases

CLOSANTEL (anthelmintic agent)				
JECFA Evaluation		36 (1990); 40 (1992)		
Acceptable Daily Intake		0-30 µg/kg bw (JECFA40)		
Residue Definition		Closantel		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1000	20 (1993)	
Cattle	Liver	1000	20 (1993)	
Cattle	Kidney	3000	20 (1993)	
Cattle	Fat	3000	20 (1993)	
Sheep	Muscle	1500	20 (1993)	
Sheep	Liver	1500	20 (1993)	
Sheep	Kidney	5000	20 (1993)	
Sheep	Fat	2000	20 (1993)	

COLISTIN (antimicrobial agent)				
JECFA Evaluation		66 (2006)		
Acceptable Daily Intake		0-7 µg/kg bw (JECFA66)		
Residue Definition		Sum of colistin A and colistin B		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	150	31 (2008)	
Cattle	Liver	150	31 (2008)	
Cattle	Kidney	200	31 (2008)	
Cattle	Fat	150	31 (2008)	
Cattle	Milk	50	31 (2008)	
Sheep	Muscle	150	31 (2008)	
Sheep	Liver	150	31 (2008)	
Sheep	Kidney	200	31 (2008)	
Sheep	Fat	150	31 (2008)	
Sheep	Milk	50	31 (2008)	
Goat	Muscle	150	31 (2008)	
Goat	Liver	150	31 (2008)	
Goat	Kidney	200	31 (2008)	
Goat	Fat	150	31 (2008)	
Pig	Muscle	150	31 (2008)	
Pig	Liver	150	31 (2008)	
Pig	Kidney	200	31 (2008)	
Pig	Fat	150	31 (2008)	The MRL includes skin + fat
Chicken	Muscle	150	31 (2008)	
Chicken	Liver	150	31 (2008)	
Chicken	Kidney	200	31 (2008)	
Chicken	Fat	150	31 (2008)	The MRL includes skin + fat
Chicken	Eggs	300	31 (2008)	
Turkey	Muscle	150	31 (2008)	
Turkey	Liver	150	31 (2008)	
Turkey	Kidney	200	31 (2008)	
Turkey	Fat	150	31 (2008)	The MRL includes skin + fat
Rabbit	Muscle	150	31 (2008)	
Rabbit	Liver	150	31 (2008)	
Rabbit	Kidney	200	31 (2008)	
Rabbit	Fat	150	31 (2008)	

CYFLUTHRIN (insecticide)				
JECFA Evaluation		48 (1997)		
Acceptable Daily Intake		0-20 µg/kg bw (JECFA48)		
Residue Definition		Cyfluthrin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	26 (2003)	
Cattle	Liver	20	26 (2003)	
Cattle	Kidney	20	26 (2003)	
Cattle	Fat	200	26 (2003)	
Cattle	Milk (µg/l)	40	26 (2003)	

CYHALOTHRIN (insecticide)				
JECFA Evaluation		54 (2000); 58 (2002); 62 (2004)		
Acceptable Daily Intake		0-5 µg/kg bw (JECFA62)		
Residue Definition		Cyhalothrin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	28 (2005)	
Cattle	Liver	20	28 (2005)	
Cattle	Kidney	20	28 (2005)	
Cattle	Fat	400	28 (2005)	
Cattle	Milk	30	28 (2005)	
Pig	Muscle	20	28 (2005)	
Pig	Liver	20	28 (2005)	
Pig	Kidney	20	28 (2005)	
Pig	Fat	400	28 (2005)	
Sheep	Muscle	20	28 (2005)	
Sheep	Liver	50	28 (2005)	
Sheep	Kidney	20	28 (2005)	
Sheep	Fat	400	28 (2005)	

CYPERMETHRIN AND ALPHA-CYPERMETHRIN (insecticide)				
JECFA Evaluation		62 (2004)		
Acceptable Daily Intake		JECFA62 established a common ADI of 0-20 µg/kg bw for both cypermethrin and alpha-cypermethrin		
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	29 (2006)	
Cattle	Liver	50	29 (2006)	
Cattle	Kidney	50	29 (2006)	
Cattle	Fat	1000	29 (2006)	
Cattle	Milk	100	29 (2006)	
Sheep	Muscle	50	29 (2006)	
Sheep	Liver	50	29 (2006)	
Sheep	Kidney	50	29 (2006)	
Sheep	Fat	1000	29 (2006)	

DANOFLOXACIN (antimicrobial agent)				
JECFA Evaluation		48 (1997)		
Acceptable Daily Intake		0-20 µg/kg bw (JECFA48)		
Residue Definition		Danofloxacin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	24 (2001)	
Cattle	Liver	400	24 (2001)	
Cattle	Kidney	400	24 (2001)	
Cattle	Fat	100	24 (2001)	
Chicken	Muscle	200	24 (2001)	
Chicken	Liver	400	24 (2001)	
Chicken	Kidney	400	24 (2001)	
Chicken	Fat	100	24 (2001)	Fat/skin in normal proportion
Pig	Muscle	100	24 (2001)	
Pig	Liver	50	24 (2001)	
Pig	Kidney	200	24 (2001)	
Pig	Fat	100	24 (2001)	

DELTA METHRIN (insecticide)				
JECFA Evaluation		52 (1999); 60 (2003)		
Acceptable Daily Intake		0-10 µg/kg bw (1982). Established by JMPR (1982).		
Residue Definition		Deltamethrin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	30	26 (2003)	
Cattle	Liver	50	26 (2003)	
Cattle	Kidney	50	26 (2003)	
Cattle	Fat	500	26 (2003)	
Cattle	Milk	30	26 (2003)	
Chicken	Muscle	30	26 (2003)	
Chicken	Liver	50	26 (2003)	
Chicken	Kidney	50	26 (2003)	
Chicken	Fat	500	26 (2003)	
Chicken	Eggs	30	26 (2003)	
Salmon	Muscle	30	26 (2003)	
Sheep	Muscle	30	26 (2003)	
Sheep	Liver	50	26 (2003)	
Sheep	Kidney	50	26 (2003)	
Sheep	Fat	500	26 (2003)	

DERQUANTEL (anthelmintic agent)				
JECFA Evaluation		75 (2011); 78 (2013)		
Acceptable Daily Intake		0-0.3 µg/kg bw on the basis of a LOAEL of 0.1 mg/kg bw 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. (JECFA75)		
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. (JECFA78)		
Residue Definition		Derquantel		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	0.3	38 (2015)	
Sheep	Liver	0.8	38 (2015)	
Sheep	Kidney	0.4	38 (2015)	
Sheep	Fat	7.0	38 (2015)	

DEXAMETHASONE (glucocorticosteroid)				
JECFA Evaluation		70 (2008)		
Acceptable Daily Intake		0-0.015 µg/kg bw (JECFA42)		
Residue Definition		Dexamethasone		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1.0	32 (2009)	
Cattle	Liver	2.0	32 (2009)	
Cattle	Kidney	1.0	32 (2009)	
Cattle	Milk (µg/l)	0.3	32 (2009)	
Pig	Muscle	1.0	32 (2009)	
Pig	Liver	2.0	32 (2009)	
Pig	Kidney	1.0	32 (2009)	
Horses	Muscle	1.0	32 (2009)	
Horses	Liver	2.0	32 (2009)	
Horses	Kidney	1.0	32 (2009)	

DICLAZURIL (antiprotozoal agent)				
JECFA Evaluation		45 (1995); 50 (1998)		
Acceptable Daily Intake		0-30 µg/kg bw (JECFA50)		
Residue Definition		Diclazuril		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Poultry	Muscle	500	23 (1999)	
Poultry	Liver	3000	23 (1999)	
Poultry	Kidney	2000	23 (1999)	
Poultry	Fat/Skin	1000	23 (1999)	
Rabbit	Muscle	500	23 (1999)	
Rabbit	Liver	3000	23 (1999)	
Rabbit	Kidney	2000	23 (1999)	
Rabbit	Fat	1000	23 (1999)	
Sheep	Muscle	500	23 (1999)	
Sheep	Liver	3000	23 (1999)	
Sheep	Kidney	2000	23 (1999)	
Sheep	Fat	1000	23 (1999)	

DICYCLANIL (insecticide)				
JECFA Evaluation		54 (2000); 60 (2003)		
Acceptable Daily Intake		0-7 µg/kg bw (JECFA54)		
Residue Definition		Dicyclanil		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	150	28 (2005)	
Sheep	Liver	125	28 (2005)	
Sheep	Kidney	125	28 (2005)	
Sheep	Fat	200	28 (2005)	

DIHYDROSTREPTOMYCIN / STREPTOMYCIN (antimicrobial agent)				
JECFA Evaluation		43 (1994); 48 (1997); 52 (1999); 58 (2002)		
Acceptable Daily Intake		0-50 µg/kg bw (JECFA48). 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	24 (2001)	
Cattle	Liver	600	24 (2001)	
Cattle	Kidney	1000	24 (2001)	
Cattle	Fat	600	24 (2001)	
Cattle	Milk	200	26 (2003)	
Chicken	Muscle	600	24 (2001)	
Chicken	Liver	600	24 (2001)	
Chicken	Kidney	1000	24 (2001)	
Chicken	Fat	600	24 (2001)	
Pig	Muscle	600	24 (2001)	
Pig	Liver	600	24 (2001)	
Pig	Kidney	1000	24 (2001)	
Pig	Fat	600	24 (2001)	
Sheep	Muscle	600	24 (2001)	
Sheep	Liver	600	24 (2001)	
Sheep	Kidney	1000	24 (2001)	
Sheep	Fat	600	24 (2001)	
Sheep	Milk	200	26 (2003)	

DIMINAZENE (trypanocide)				
JECFA Evaluation		34 (1989); 42 (1994)		
Acceptable Daily Intake		0-100 µg/kg bw (JECFA42)		
Residue Definition		Diminazene		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	22 (1997)	
Cattle	Liver	12000	22 (1997)	
Cattle	Kidney	6000	22 (1997)	
Cattle	Milk (µg/l)	150	22 (1997)	LOQ of the analytical method

DORAMECTIN (anthelmintic agent)				
JECFA Evaluation		45 (1995); 52 (1999); 58 (2002); 62 (2004)		
Acceptable Daily Intake		0-1 µg/kg bw (JECFA58)		
Residue Definition		Doramectin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	22 (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	22 (1997)	
Cattle	Kidney	30	22 (1997)	
Cattle	Fat	150	22 (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	29 (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	24 (2001)	
Pig	Liver	100	24 (2001)	
Pig	Kidney	30	24 (2001)	
Pig	Fat	150	24 (2001)	

EMAMECTIN BENZOATE (antiparasitic agent)				
JECFA Evaluation		78 (2013)		
Acceptable Daily Intake		ADI of 0–0.5 µg/kg bw established by JMPR (2011), based on an overall NOAEL of 0.25 mg/kg bw per day for neurotoxicity from 14- and 53-week studies in dogs, supported by an overall NOAEL of 0.25 mg/kg bw 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 JECFA78.		
Estimated Dietary Exposure		11 µg/person per day, which represents approximately 37% of the upper bound of the ADI (JECFA78)		
Residue Definition		Emamectin B1a		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Salmon	Muscle	100	38 (2015)	
Salmon	Fillet	100	38 (2015)	Muscle plus skin in natural proportion
Trout	Muscle	100	38 (2015)	
Trout	Fillet	100	38 (2015)	Muscle plus skin in natural proportion

EPRINOMECTIN (anthelmintic agent)				
JECFA Evaluation		50 (1998)		
Acceptable Daily Intake		0-10 µg/kg bw (JECFA50)		
Residue Definition		Eprinomectin B1a		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	26 (2003)	
Cattle	Liver	2000	26 (2003)	
Cattle	Kidney	300	26 (2003)	
Cattle	Fat	250	26 (2003)	
Cattle	Milk (µg/l)	20	26 (2003)	

ERYTHROMYCIN (antimicrobial agent)				
JECFA Evaluation		66 (2006)		
Acceptable Daily Intake		0-0.7 µg/kg bw (JECFA66)		
Residue Definition		Erythromycin A		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	100	31 (2008)	
Chicken	Liver	100	31 (2008)	
Chicken	Kidney	100	31 (2008)	
Chicken	Fat	100	31 (2008)	The MRL includes skin + fat
Chicken	Eggs	50	31 (2008)	
Turkey	Muscle	100	31 (2008)	
Turkey	Liver	100	31 (2008)	
Turkey	Kidney	100	31 (2008)	
Turkey	Fat	100	31 (2008)	The MRL includes skin + fat

ESTRADIOL-17BETA (production aid)				
JECFA Evaluation		25 (1981); 32 (1987); 52 (1999)		
Acceptable Daily Intake		unnecessary (JECFA32); 0-0.05 µg/kg bw (JECFA52)		
Residue Definition		Estradiol-17beta.		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21 (1995)	Residues resulting from the use of this substance as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Liver	unnecessary	21 (1995)	Residues resulting from the use of this substance as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Kidney	unnecessary	21 (1995)	Residues resulting from the use of this substance as a growth promoter in accordance with good animal husbandry practice are unlikely to pose a hazard to human health
Cattle	Fat	unnecessary	21 (1995)	Residues resulting from the use of this substance 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		Group ADI of 0-7 µg/kg bw (JECFA50)		
Residue Definition		Sum of fenbendazole, oxfendazole and oxfendazole sulphone, expressed as oxfendazole sulphone equivalents		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	23 (1999)	
Cattle	Liver	500	23 (1999)	
Cattle	Kidney	100	23 (1999)	
Cattle	Fat	100	23 (1999)	
Cattle	Milk (µg/l)	100	23 (1999)	
Goat	Muscle	100	23 (1999)	
Goat	Liver	500	23 (1999)	
Goat	Kidney	100	23 (1999)	
Goat	Fat	100	23 (1999)	
Horse	Muscle	100	23 (1999)	
Horse	Liver	500	23 (1999)	
Horse	Kidney	100	23 (1999)	
Horse	Fat	100	23 (1999)	
Pig	Muscle	100	23 (1999)	
Pig	Liver	500	23 (1999)	
Pig	Kidney	100	23 (1999)	
Pig	Fat	100	23 (1999)	
Sheep	Muscle	100	23 (1999)	
Sheep	Liver	500	23 (1999)	
Sheep	Kidney	100	23 (1999)	
Sheep	Fat	100	23 (1999)	
Sheep	Milk (µg/l)	100	23 (1999)	

FLUAZURON (insecticide)				
JECFA Evaluation		48 (1997)		
Acceptable Daily Intake		0-40 µg/kg bw (JECFA48)		
Residue Definition		Fluazuron		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	200	23 (1999)	
Cattle	Liver	500	23 (1999)	
Cattle	Kidney	500	23 (1999)	
Cattle	Fat	7000	23 (1999)	

FLUBENDAZOLE (anthelmintic agent)				
JECFA Evaluation		40 (1992)		
Acceptable Daily Intake		0-12 µg/kg bw (JECFA40)		
Residue Definition		Flubendazole		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	10	21 (1995)	
Pig	Liver	10	21 (1995)	
Poultry	Muscle	200	21 (1995)	
Poultry	Liver	500	21 (1995)	
Poultry	Eggs	400	21 (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 bw (JECFA62)		
Residue Definition		Flumequine		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	28 (2005)	
Cattle	Liver	500	28 (2005)	
Cattle	Kidney	3000	28 (2005)	
Cattle	Fat	1000	28 (2005)	
Chicken	Muscle	500	28 (2005)	
Chicken	Liver	500	28 (2005)	
Chicken	Kidney	3000	28 (2005)	
Chicken	Fat	1000	28 (2005)	
Pig	Muscle	500	28 (2005)	
Pig	Liver	500	28 (2005)	
Pig	Kidney	3000	28 (2005)	
Pig	Fat	1000	28 (2005)	
Sheep	Muscle	500	28 (2005)	
Sheep	Liver	500	28 (2005)	
Sheep	Kidney	3000	28 (2005)	
Sheep	Fat	1000	28 (2005)	
Trout	Muscle	500	28 (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 bw (JECFA50)		
Residue Definition		Gentamicin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	24 (2001)	
Cattle	Liver	2000	24 (2001)	
Cattle	Kidney	5000	24 (2001)	
Cattle	Fat	100	24 (2001)	
Cattle	Milk (µg/l)	200	24 (2001)	
Pig	Muscle	100	24 (2001)	
Pig	Liver	2000	24 (2001)	
Pig	Kidney	5000	24 (2001)	
Pig	Fat	100	24 (2001)	

IMIDOCARB (antiprotozoal agent)				
JECFA Evaluation		50 (1998); 60 (2003)		
Acceptable Daily Intake		0-10 µg/kg bw (JECFA50)		
Residue Definition		Imidocarb		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	300	28 (2005)	
Cattle	Liver	1500	28 (2005)	
Cattle	Kidney	2000	28 (2005)	
Cattle	Fat	50	28 (2005)	
Cattle	Milk	50	28 (2005)	

ISOMETAMIDIUM (trypanocide)				
JECFA Evaluation		34 (1989); 40 (1992)		
Acceptable Daily Intake		0-100 µg/kg bw (JECFA40)		
Residue Definition		Isometamidium		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	21 (1995)	
Cattle	Liver	500	21 (1995)	
Cattle	Kidney	1000	21 (1995)	
Cattle	Fat	100	21 (1995)	
Cattle	Milk (µg/l)	100	21 (1995)	

IVERMECTIN (anthelmintic agent)				
JECFA Evaluation		36 (1990); 40 (1992); 54 (2000); 58 (2002); 81 (2015)		
Acceptable Daily Intake		0-10 µg/kg bw on the basis of a NOAEL of 0.5 mg/kg bw per day for neurological effects (mydriasis) and retardation of weight gain in a 14-week dog study, with application of an uncertainty factor of 50 (5 for interspecies differences based on pharmacokinetic studies in dogs and humans and 10 for intraspecies differences). The previous ADI of 0-1 µg/kg bw was withdrawn. (JECFA81)		
Estimated Chronic Dietary Exposure		The estimated daily intake (EDI) is 38 µg/person per day, based on a 60 kg individual, which represents 6% of the upper bound of the ADI. The GECDE for the general population is 0.9 µg/kg bw per day, which represents 9% of the upper bound of the ADI. The GECDE for children is 1.5 µg/kg body weight per day, which represents 15% of the upper bound of the ADI. The GECDE for infants is 1.3 µg/kg bw per day, which represents 13% of the upper bound of the ADI. (JECFA81)		
Acute Reference Dose		0.2 mg/kg bw, based on a NOAEL of 1.5 mg/kg bw, the highest dose tested in a safety, tolerability and pharmacokinetics study in healthy human subjects, with application of an uncertainty factor of 10 for intraspecies variability. (JECFA81)		
Estimated Acute Dietary Exposure		A combined analysis of all studies submitted showed that after 14 days, the maximum values of residues found at injection sites led to a GEADE of 52 µg/kg bw for the general population and 87 µg/kg bw for children, corresponding, respectively, to 27% and 43% of the ARfD. (JECFA81)		
Residue Definition		Ivermectin B _{1a}		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	30	40 (2017)	
Cattle	Liver	800	40 (2017)	
Cattle	Kidney	100	40 (2017)	
Cattle	Fat	400	40 (2017)	
Cattle	Milk	10	26 (2003)	
Pig	Liver	15	20 (1993)	
Pig	Fat	20	20 (1993)	
Sheep	Liver	15	20 (1993)	
Sheep	Fat	20	20 (1993)	

LASALOCID SODIUM (antiparasitic agent)				
JECFA Evaluation		78 (2013)		
Acceptable Daily Intake		0-5 µg/kg bw on the basis of a NOAEL of 0.5 mg/kg bw per day from a developmental toxicity study in rabbits and a multigeneration reproductive toxicity study in rats, with application of an uncertainty factor of 100 for interspecies and intraspecies variability. (JECFA78)		
Estimated Dietary Exposure		80 µg/person per day was calculated, which represents approximately 27% of the upper bound of the ADI (JECFA78)		
Residue Definition		Lasalocid A		
Note		JECFA78 extended the MRLs in chicken to turkey and quail and extrapolated the MRLs in chicken to pheasant. No information was available for duck, including on approved uses. As the compound is not registered for use in laying hens, according to the sponsor, it is not appropriate to recommend MRLs for egg.		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	400	40 (2017)	
Chicken	Liver	1200	40 (2017)	
Chicken	Kidney	600	40 (2017)	
Chicken	Skin + Fat	600	40 (2017)	
Turkey	Muscle	400	40 (2017)	
Turkey	Liver	1200	40 (2017)	
Turkey	Kidney	600	40 (2017)	
Turkey	Skin + Fat	600	40 (2017)	
Quail	Muscle	400	40 (2017)	
Quail	Liver	1200	40 (2017)	
Quail	Kidney	600	40 (2017)	
Quail	Skin + Fat	600	40 (2017)	
Pheasant	Muscle	400	40 (2017)	
Pheasant	Liver	1200	40 (2017)	
Pheasant	Kidney	600	40 (2017)	
Pheasant	Skin + Fat	600	40 (2017)	

LEVAMISOLE (anthelmintic agent)				
JECFA Evaluation		36 (1990); 42 (1994)		
Acceptable Daily Intake		0-6 µg/kg bw (JECFA42)		
Residue Definition		Levamisole		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	22 (1997)	
Cattle	Liver	100	22 (1997)	
Cattle	Kidney	10	22 (1997)	
Cattle	Fat	10	22 (1997)	
Pig	Muscle	10	22 (1997)	
Pig	Liver	100	22 (1997)	
Pig	Kidney	10	22 (1997)	
Pig	Fat	10	22 (1997)	
Poultry	Muscle	10	22 (1997)	
Poultry	Liver	100	22 (1997)	
Poultry	Kidney	10	22 (1997)	
Poultry	Fat	10	22 (1997)	
Sheep	Muscle	10	22 (1997)	
Sheep	Liver	100	22 (1997)	
Sheep	Kidney	10	22 (1997)	
Sheep	Fat	10	22 (1997)	

LINCOMYCIN (antimicrobial agent)				
JECFA Evaluation		54 (2000); 58 (2002); 62 (2004)		
Acceptable Daily Intake		0-30 µg/kg bw (JECFA54)		
Residue Definition		Lincomycin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Milk	150	26 (2003)	
Chicken	Muscle	200	26 (2003)	
Chicken	Liver	500	26 (2003)	
Chicken	Kidney	500	26 (2003)	
Chicken	Fat	100	26 (2003)	Additional MRL for skin with adhering fat of 300 µg/kg
Pig	Muscle	200	26 (2003)	
Pig	Liver	500	26 (2003)	
Pig	Kidney	1500	26 (2003)	
Pig	Fat	100	26 (2003)	Additional MRL for skin with adhering fat of 300 µg/kg

LUFENURON (insecticide)				
JECFA Evaluation		85 (2017)		
Acceptable Daily Intake		0–0.02 mg/kg bw based on the NOAEL of 1.93 mg/kg bw per day for tonic-clonic seizures and findings in lungs, gastrointestinal tract, liver and urinary tract in a 2-year dietary study in rats, and using a safety factor of 100 (10 for interspecies variability and 10 for intraspecies variability)		
Acute Reference Dose		Unnecessary, in view of lufenuron low acute oral toxicity and the absence of developmental toxicity and other toxicological effects likely to be elicited by a single dose		
Estimated chronic dietary exposure		1.1 µg/kg bw per day (for the general population), which represents 5.5% of the upper bound of the ADI. As lufenuron is also used as pesticide, the overall dietary exposure was estimated. The assumptions and detailed results will be displayed in the JECFA85 report. Results below are only for use as veterinary drug.		
Residue Definition		Lufenuron		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Salmon	Fillet	1350	41 (2018)	Muscle plus skin in natural proportion
Trout	Fillet	1350	41 (2018)	Muscle plus skin in natural proportion

MELENGESTROL ACETATE (production aid)				
JECFA Evaluation		54 (2000); 58 (2002); 62 (2004); 66 (2006) 70 (2008)		
Acceptable Daily Intake		0-0.03 µg/kg bw (JECFA54)		
Residue Definition		Melengestrol acetate		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	1	32 (2009)	
Cattle	Liver	10	32 (2009)	
Cattle	Kidney	2	32 (2009)	
Cattle	Fat	18	32 (2009)	

MONENSIN (antimicrobial agent)				
JECFA Evaluation		70 (2008); 75 (2011)		
Acceptable Daily Intake		0–10 µg/kg bw on the basis of a NOAEL of 1.14 mg/kg bw per day and a safety factor of 100 and rounding to one significant figure (JECFA70)		
Estimated Dietary Exposure		Using the revised MRL, the TMDI from JECFA70 was recalculated, resulting in a value of 481 µg/person, which represents 80% of the upper bound of the ADI (JECFA75)		
Residue Definition		Monensin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	32 (2009)	
Cattle	Liver	100	35 (2012)	
Cattle	Kidney	10	32 (2009)	
Cattle	Fat	100	32 (2009)	
Cattle	Milk	2	32 (2009)	
Sheep	Muscle	10	32 (2009)	
Sheep	Liver	20	32 (2009)	
Sheep	Kidney	10	32 (2009)	
Sheep	Fat	100	32 (2009)	
Goats	Muscle	10	32 (2009)	
Goats	Liver	20	32 (2009)	
Goats	Kidney	10	32 (2009)	
Goats	Fat	100	32 (2009)	
Chicken	Muscle	10	32 (2009)	
Chicken	Liver	10	32 (2009)	
Chicken	Kidney	10	32 (2009)	
Chicken	Fat	100	32 (2009)	
Turkey	Muscle	10	32 (2009)	
Turkey	Liver	10	32 (2009)	
Turkey	Kidney	10	32 (2009)	
Turkey	Fat	100	32 (2009)	
Quail	Muscle	10	32 (2009)	
Quail	Liver	10	32 (2009)	
Quail	Kidney	10	32 (2009)	
Quail	Fat	100	32 (2009)	

MONEPANTEL (anthelmintic agent)				
JECFA Evaluation		75 (2011); 78 (2013), 85 (2017)		
Acceptable Daily Intake		0–0.02 mg/kg bw based on the NOAEL of 1.93 mg/kg bw per day for tonic-clonic seizures and findings in lungs, gastrointestinal tract, liver and urinary tract in a 2-year dietary study in rats, and using a safety factor of 100 (10 for interspecies variability and 10 for intraspecies variability)		
Acute Reference Dose		Unnecessary		
Estimated Chronic Dietary Exposure		13.7 µg per kg bw per day (for the general population), which represents 68% of the upper bound of the ADI 5.0 µg per kg bw per day (for children), which represents 22% of the upper bound of the ADI 4.4 µg per kg bw per day (for infants), which represents 25% of the upper bound of the ADI		
Residue Definition		Monepantel sulfone, expressed as monepantel		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Muscle	500	38 (2015)	
Sheep	Liver	7000	38 (2015)	
Sheep	Kidney	1700	38 (2015)	
Sheep	Fat	13000	38 (2015)	
Cattle	Fat	7000	41 (2018)	
	Kidney	1000	41 (2018)	
	Liver	2000	41 (2018)	
	Muscle	300	41 (2018)	

MOXIDECTIN (anthelmintic agent)				
JECFA Evaluation		45 (1995); 47 (1996); 48 (1998); 50 (1998)		
Acceptable Daily Intake		0-2 µg/kg bw (JECFA45)		
Residue Definition		Moxidectin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	20	22 (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	22 (1997)	
Cattle	Kidney	50	22 (1997)	
Cattle	Fat	500	22 (1997)	
Deer	Muscle	20	23 (1999)	
Deer	Liver	100	23 (1999)	
Deer	Kidney	50	23 (1999)	
Deer	Fat	500	23 (1999)	
Sheep	Muscle	50	22 (1997)	
Sheep	Liver	100	22 (1997)	
Sheep	Kidney	50	22 (1997)	
Sheep	Fat	500	22 (1997)	

NARASIN (antimicrobial agent)				
JECFA Evaluation		70 (2008); 75 (2011)		
Acceptable Daily Intake		0-5 µg/kg bw on the basis of a NOAEL of 0.5 mg/kg bw per day and a safety factor of 100 (JECFA70)		
Residue Definition		Narasin A		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	15	35 (2012)	
Cattle	Liver	50	35 (2012)	
Cattle	Kidney	15	35 (2012)	
Cattle	Fat	50	35 (2012)	
Chicken	Muscle	15	32 (2009)	
Chicken	Liver	50	32 (2009)	
Chicken	Kidney	15	32 (2009)	
Chicken	Fat	50	32 (2009)	
Pig	Muscle	15	34 (2011)	
Pig	Liver	50	34 (2011)	
Pig	Kidney	15	34 (2011)	
Pig	Fat	50	34 (2011)	

NEOMYCIN (antimicrobial agent)				
JECFA Evaluation		43 (1994); 47 (1996); 52 (1999); 58 (2002); 60 (2003)		
Acceptable Daily Intake		0-60 µg/kg bw (JECFA47)		
Residue Definition		Neomycin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	23 (1999)	
Cattle	Liver	500	28 (2005)	
Cattle	Kidney	10000	28 (2005)	
Cattle	Fat	500	23 (1999)	
Cattle	Milk	1500	28 (2005)	
Chicken	Muscle	500	23 (1999)	
Chicken	Liver	500	23 (1999)	
Chicken	Kidney	10000	23 (1999)	
Chicken	Fat	500	23 (1999)	
Chicken	Eggs	500	23 (1999)	
Duck	Muscle	500	23 (1999)	
Duck	Liver	500	23 (1999)	
Duck	Kidney	10000	23 (1999)	
Duck	Fat	500	23 (1999)	
Goat	Muscle	500	23 (1999)	
Goat	Liver	500	23 (1999)	
Goat	Kidney	10000	23 (1999)	
Goat	Fat	500	23 (1999)	
Pig	Muscle	500	23 (1999)	
Pig	Liver	500	23 (1999)	
Pig	Kidney	10000	23 (1999)	
Pig	Fat	500	23 (1999)	
Sheep	Muscle	500	23 (1999)	
Sheep	Liver	500	23 (1999)	
Sheep	Kidney	10000	23 (1999)	
Sheep	Fat	500	23 (1999)	
Turkey	Muscle	500	23 (1999)	
Turkey	Liver	500	23 (1999)	
Turkey	Kidney	10000	23 (1999)	
Turkey	Fat	500	23 (1999)	

NICARBAZIN (antiprotozoal agent)				
JECFA Evaluation		50 (1998)		
Acceptable Daily Intake		0-400 µg/kg bw (JECFA50)		
Residue Definition		N,N'-bis(4-nitropheyl)urea		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	200	23 (1999)	Broilers
Chicken	Liver	200	23 (1999)	Broilers
Chicken	Kidney	200	23 (1999)	Broilers
Chicken	Fat/Skin	200	23 (1999)	Broilers

PHOXIM (insecticide)				
JECFA Evaluation		52 (1999); 62 (2004)		
Acceptable Daily Intake		0-4 µg/kg bw (JECFA52)		
Residue Definition		Phoxim		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Goat	Muscle	50	26 (2003)	
Goat	Liver	50	26 (2003)	
Goat	Kidney	50	26 (2003)	
Goat	Fat	400	26 (2003)	
Pig	Muscle	50	26 (2003)	
Pig	Liver	50	26 (2003)	
Pig	Kidney	50	26 (2003)	
Pig	Fat	400	26 (2003)	
Sheep	Muscle	50	26 (2003)	
Sheep	Liver	50	26 (2003)	
Sheep	Kidney	50	26 (2003)	
Sheep	Fat	400	26 (2003)	

PIRLIMYCIN (antimicrobial agent)				
JECFA Evaluation		62 (2004)		
Acceptable Daily Intake		0-8 µg/kg bw (JECFA62)		
Residue Definition		Pirlimycin		
Species	Tissue	MRLs (µg/kg)	CAC	Note
Cattle	Muscle	100	29 (2006)	
Cattle	Liver	1000	29 (2006)	
Cattle	Kidney	400	29 (2006)	
Cattle	Fat	100	29 (2006)	
Cattle	Milk	100	29 (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 (JECFA52)		
Residue Definition		Not applicable		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Pig	Muscle	not specified	26 (2003)	
Pig	Liver	not specified	26 (2003)	
Pig	Kidney	not specified	26 (2003)	
Pig	Fat	not specified	26 (2003)	

PROGESTERONE (production aid)				
JECFA Evaluation		25 (1981); 32 (1987); 52 (1999)		
Acceptable Daily Intake		0-30 µg/kg bw (JECFA52)		
Residue Definition		Progesterone		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21 (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	21 (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	21 (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	21 (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 bw (JECFA66)		
Residue Definition		Ractopamine		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	10	35 (2012)	
Cattle	Liver	40	35 (2012)	
Cattle	Kidney	90	35 (2012)	
Cattle	Fat	10	35 (2012)	
Pig	Muscle	10	35 (2012)	
Pig	Liver	40	35 (2012)	
Pig	Kidney	90	35 (2012)	
Pig	Fat	10	35 (2012)	The MRL includes skin + fat

SARAFLOXACIN (antimicrobial agent)				
JECFA Evaluation		50 (1998)		
Acceptable Daily Intake		0-0.3 µg/kg bw (JECFA50)		
Residue Definition		Sarafloxacin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Chicken	Muscle	10	24 (2001)	
Chicken	Liver	80	24 (2001)	
Chicken	Kidney	80	24 (2001)	
Chicken	Fat	20	24 (2001)	
Turkey	Muscle	10	24 (2001)	
Turkey	Liver	80	24 (2001)	
Turkey	Kidney	80	24 (2001)	
Turkey	Fat	20	24 (2001)	

SPECTINOMYCIN (antimicrobial agent)				
JECFA Evaluation		42 (1994); 50 (1998)		
Acceptable Daily Intake		0-40 µg/kg bw (JECFA42)		
Residue Definition		Spectinomycin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	500	23 (1999)	
Cattle	Liver	2000	23 (1999)	
Cattle	Kidney	5000	23 (1999)	
Cattle	Fat	2000	23 (1999)	
Cattle	Milk (µg/l)	200	23 (1999)	
Chicken	Muscle	500	23 (1999)	
Chicken	Liver	2000	23 (1999)	
Chicken	Kidney	5000	23 (1999)	
Chicken	Fat	2000	23 (1999)	
Chicken	Eggs	2000	23 (1999)	
Pig	Muscle	500	23 (1999)	
Pig	Liver	2000	23 (1999)	
Pig	Kidney	5000	23 (1999)	
Pig	Fat	2000	23 (1999)	
Sheep	Muscle	500	23 (1999)	
Sheep	Liver	2000	23 (1999)	
Sheep	Kidney	5000	23 (1999)	
Sheep	Fat	2000	23 (1999)	

SPIRAMYCIN (antimicrobial agent)				
JECFA Evaluation		38 (1991); 43 (1994); 47 (1996); 48 (1997)		
Acceptable Daily Intake		0-50 µg/kg bw (JECFA43)		
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	22 (1997)	
Cattle	Liver	600	22 (1997)	
Cattle	Kidney	300	22 (1997)	
Cattle	Fat	300	22 (1997)	
Cattle	Milk (µg/l)	200	22 (1997)	
Chicken	Muscle	200	22 (1997)	
Chicken	Liver	600	22 (1997)	
Chicken	Kidney	800	22 (1997)	
Chicken	Fat	300	22 (1997)	
Pig	Muscle	200	22 (1997)	
Pig	Liver	600	22 (1997)	
Pig	Kidney	300	22 (1997)	
Pig	Fat	300	22 (1997)	

SULFADIMIDINE (antimicrobial agent)				
JECFA Evaluation		34 (1989); 38 (1991); 42 (1994)		
Acceptable Daily Intake		0-50 µg/kg bw (JECFA42)		
Residue Definition		Sulfadimidine		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Milk (µg/l)	25	21 (1995)	
Not specified	Muscle	100	21 (1995)	
Not specified	Liver	100	21 (1995)	
Not specified	Kidney	100	21 (1995)	
Not specified	Fat	100	21 (1995)	

TEFLUBENZURON (insecticide)				
JECFA Evaluation		81 (2015)		
Acceptable Daily Intake		0-5 µg/kg bw on the basis of a lower 95% confidence limit on the benchmark dose for a 10% response (BMDL10) of 0.54 mg/kg bw per day for hepatocellular hypertrophy in male mice observed in a carcinogenicity study, with application of an uncertainty factor of 100 to account for interspecies and intraspecies variability. (JECFA81)		
Estimated chronic dietary exposure		The EDI is 42.9 µg/person per day, on the basis of a 60 kg individual, which represents approximately 14% of the upper bound of the ADI. The GECDE for the general population is 1.6 µg/kg bw per day, which represents 31% of the upper bound of the ADI. The GECDE for children is 2.1 µg/kg bw per day, which represents 43% of the upper bound of the ADI. The GECDE for infants is 0.9 µg/kg bw per day, which represents 18% of the upper bound of the ADI. (JECFA81)		
Residue Definition		Teflubenzuron		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Salmon	Muscle	400	40 (2017)	
Salmon	Fillet	400	40 (2017)	Muscle plus skin in natural proportion

TESTOSTERONE (production aid)				
JECFA Evaluation		25 (1981); 32 (1987); 52 (1999)		
Acceptable Daily Intake		0-2 µg/kg bw (JECFA52)		
Residue Definition		Testosterone		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	unnecessary	21 (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	21 (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	21 (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	21 (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 bw (JECFA40)		
Residue Definition		Sum of thiabendazole and 5-hydroxythiabendazole		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Cattle	Liver	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Cattle	Kidney	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Cattle	Fat	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Cattle	Milk (µg/l)	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Goat	Muscle	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Goat	Liver	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Goat	Kidney	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Goat	Fat	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Goat	Milk (µg/l)	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Pig	Muscle	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Pig	Liver	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Pig	Kidney	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use.
Pig	Fat	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Sheep	Muscle	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use

Species	Tissue	MRL (µg/kg)	CAC	Notes
Sheep	Liver	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Sheep	Kidney	100	21 (1995)	The MRL also covers residues derived from feed containing the residues resulted from agricultural use
Sheep	Fat	100	21 (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 bw (JECFA47)		
Residue Definition		Tilmicosin		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	100	23 (1999)	
Cattle	Liver	1000	23 (1999)	
Cattle	Kidney	300	23 (1999)	
Cattle	Fat	100	23 (1999)	
Chicken	Muscle	150	34 (2011)	
Chicken	Liver	2400	34 (2011)	
Chicken	Kidney	600	34 (2011)	
Chicken	Skin/Fat	250	34 (2011)	
Pig	Muscle	100	23 (1999)	
Pig	Liver	1500	23 (1999)	
Pig	Kidney	1000	23 (1999)	
Pig	Fat	100	23 (1999)	
Sheep	Muscle	100	23 (1999)	
Sheep	Liver	1000	23 (1999)	
Sheep	Kidney	300	23 (1999)	
Sheep	Fat	100	23 (1999)	
Turkey	Muscle	100	34 (2011)	
Turkey	Kidney	1200	34 (2011)	
Turkey	Liver	1400	34 (2011)	
Turkey	Skin/Fat	250	34 (2011)	

TRENBOLONE ACETATE (growth promoter)				
JECFA Evaluation		26 (1982); 27 (1983); 32 (1987); 34 (1989)		
Acceptable Daily Intake		0-0.02 µg/kg bw (JECFA34)		
Residue Definition		Cattle muscle, beta-Trenbolone; Cattle liver, alpha-Trenbolone		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	2	21 (1995)	
Cattle	Liver	10	21 (1995)	

TRICHLORFON (Metrifonate) (insecticide)				
JECFA Evaluation		54 (2000); 60 (2003); 66 (2006)		
Acceptable Daily Intake		0-2 µg/kg bw (JECFA60)		
Residue Definition		JECFA54 confirmed the MRL for cows's milk and the guidance levels for muscle, liver, kidney and fat of cattle recommended (WHO TRS 900, 2001)		
Species	Tissue	MRLs (µg/kg)	CAC	Notes
Cattle	Milk	50	29 (2006)	

TRICLABENDAZOLE (anthelmintic agent)				
JECFA Evaluation		40 (1992); 66 (2006); 70 (2008)		
Acceptable Daily Intake		0-3 µg/kg bw (JECFA40)		
Residue Definition		Ketotriclabnedazole		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	250	32 (2009)	
Cattle	Liver	850	32 (2009)	
Cattle	Kidney	400	32 (2009)	
Cattle	Fat	100	32 (2009)	
Sheep	Muscle	200	32 (2009)	
Sheep	Liver	300	32 (2009)	
Sheep	Kidney	200	32 (2009)	
Sheep	Fat	100	32 (2009)	

TYLOSIN (antimicrobial agent)				
JECFA Evaluation		70 (2008)		
Acceptable Daily Intake		0-30 µg/kg bw based on a microbiological end-point derived from in vitro MIC susceptibility testing and faecal binding data (MIC _{calc} = 1.698) (JECFA70)		
Residue Definition		Tylosin A		
Species	Tissue	MRLs (µg/kg)	CAC	Notes
Cattle	Muscle	100	32 (2009)	
Cattle	Liver	100	32 (2009)	
Cattle	Kidney	100	32 (2009)	
Cattle	Fat	100	32 (2009)	
Cattle	Milk	100	32 (2009)	
Pig	Muscle	100	32 (2009)	
Pig	Liver	100	32 (2009)	
Pig	Kidney	100	32 (2009)	
Pig	Fat	100	32 (2009)	
Chicken	Muscle	100	32 (2009)	
Chicken	Liver	100	32 (2009)	
Chicken	Kidney	100	32 (2009)	
Chicken	Fat/Skin	100	32 (2009)	
Chicken	Eggs	300	32 (2009)	

ZERANOL (growth promoter)				
JECFA Evaluation		26 (1982); 27 (1983); 32 (1987)		
Acceptable Daily Intake		0-0.5 µg/kg bw (JECFA32)		
Residue Definition		Zeranol		
Species	Tissue	MRL (µg/kg)	CAC	Notes
Cattle	Muscle	2	21 (1995)	
Cattle	Liver	10	21 (1995)	

RISK MANAGEMENT RECOMMENDATIONS (RMRs) FOR RESIDUES OF VETERINARY DRUGS**CARBADOX** (growth promoter)**JECFA evaluation:** 36 (1990); 60 (2003)**CAC adoption:** 37 (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:** 12 (1968); 32 (1987); 42 (1994); 62 (2004)**CAC adoption:** 37 (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:** 38 (1991)**CAC adoption:** 37 (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:** 34 (1989)**CAC adoption:** 38 (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:** 40 (1992)**CAC adoption:** 37 (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.

GENTIAN VIOLET (antibacterial, antifungal and anthelmintic agent)**JECFA evaluation:** 78 (2013) JECFA**CAC adoption:** 41 (2018)**Recommended risk management measures**

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

IPRONIDAZOLE (antiprotozoal agent)**JECFA evaluation:** 34 (1989)**CAC adoption:** 38 (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:** 70 (2008)**CAC adoption:** 37 (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:** 34 (1989)**CAC adoption:** 38 (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:** 40 (1992)**CAC adoption:** 37 (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 nitrofurantoin or its metabolites¹ in food representing an acceptable risk to consumers, significant health concerns were identified. For this reason, competent authorities should prevent residues of nitrofurantoin in food. This can be accomplished by not using nitrofurantoin in food producing animals.

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

OLAQUINDOX (antibacterial agent)**JECFA evaluation:** 36 (1990); 42 (1994)**CAC adoption:** 37 (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 olaquinox 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 olaquinox in food. This can be accomplished by not using olaquinox in food producing animals.

RONIDAZOLE (antiprotozoal agent)**JECFA evaluation:** 34 (1989); 42 (1994)**CAC adoption:** 38 (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: 5 (1960)

IARC evaluation: monograph 100A (2012)

CAC adoption: 37 (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.